Transportation accessibility to and within tourist attractions in the Old City of Jerusalem

Yechezkel Israeli and Yoel Mansfeld

Department of Geography and Center for Tourism, Pilgrimage and Recreation Research, University of Haifa, Israel

Abstract

Using the case of the Old City of Jerusalem, this study investigates the interrelations between urban tourism and transportation systems needed to support tourist activity. The study first characterized the parameters influencing the level of accessibility of tourist flows to the main tourist attractions of Jerusalem. This characterization process proved that the unique urban structure of Jerusalem and, more specifically, its old walled city, has major bearing on the mobility of its visiting tourists. Subsequently, it looked at the most effective strategies of transportation management to be supported by appropriate infrastructure and means of transport. These strategies are categorized into three approaches: transportation-orientated approach, tourism-orientated approach and technology-based approach. The derived end product was a recommendation on the preferred combined strategies, involving techniques such as decentralization of the tourism demand, better transportation-orientated management of the tourist attractions, improved tourism demand management, improved solutions to constraints imposed on land-use in the Old City and the introduction of information technology as a supporting management tool. All recommendations made as a result of this study are subject to Jerusalem's security situation and to the geo-political agreement, which will hopefully be attained shortly in this city.

Keywords: urban tourism, transportation systems, transportation-orientated management, Jerusalem

Introduction

Frequent visits to cities and towns, mainly in Europe and North America, are among the most distinguishing features of the evolving tourism industry. The continuous growing demand to visit such urban destinations has...
generally brought them economic wealth and prosperity. Cities such as Prague, Barcelona, Venice, Jerusalem, Paris and many others, which still have highly attractive inhabited, historical quarters, have capitalized on this increasing demand. However, in the wake of this growing interest, many of these cities have experienced various negative manifestations. Overcrowded narrow streets, noisy roads and traffic congestion, generated or worsened by tourism, are only parts of the price paid by locals and visitors alike. Such syndromes are predominantly a reflection of poor planning and bad management of the transport systems, which is supposed to support the influx and movement of tourists in and around these historic districts.

The need to improve transportation systems around, to and within historical towns is in the interest of the two most important stakeholders of urban tourism: local residents and tourists. Locals’ interests are to improve their standard of living as a result of introducing tourism as a legitimate urban economic activity, and to preserve a high quality of life through friendly urban environmental conditions. Tourists visiting such historic towns look upon the local transportation system as a manifestation of product quality. Thus, an old town, suffering from acute transport problems and high tourism demand, is seen as possessing a low service quality by the tourist and an undesirable abode for the locals. In order to avoid, or at least minimize, such dual negative perception, there is a need to thoroughly investigate various aspects of the relationship between urban transportation systems and the characteristics of urban tourism in historical–old towns.

Using the case of the Old City of Jerusalem, this paper will investigate those interrelations, while focusing on the three basic research purposes:

1. to characterize the specific relationships between transportation and tourism in the Old City of Jerusalem;
2. to examine the factors which influence the accessibility of tourist attractions within the Old City of Jerusalem;
3. based on the above, to define planning and management policies, which will facilitate appropriate and sustainable transportation and tourism infrastructures for the Old City.

Establishing the functional relationship between transportation and urban tourism

Transport has been acknowledged as one of the most significant factors shaping the development of international and domestic tourism (Page 1999). However, the importance of tourism-related mobility has never been thoroughly investigated in mobility studies (Chew 1987; Hall 1991; Inskeep 1991; Gunn 1994; Page 1994, 1999). This lack of theoretical basis occurred despite the fact that tourism has been the most substantial type of mobility over the past two decades.
The ongoing research into the relationship between transportation and tourism defined transport as a facilitator of tourism activity and tourism expansion (Page 1999). Within this framework, transportation has been linked to tourism in terms of technological innovations and through the development and marketing of tourist products (Page 1999). Another approach to the relationships between transport, recreation and tourism is offered by Halsall (1998), who sees them as complex interweaving and interrelated interests. Transport provision is a major issue in destination development, itself a product of increasing mobility, leisure time and affluence.

The study of transport in relation to tourism has been mainly descriptive, focusing on the transport modes used to move tourists from their origins to their destinations and back. These studies also recognized the role of transport systems in urban tourism development (i.e. Wall 1971; Kaul 1985; Hodgson 1988; Prideaux 1993; Page 1994; Wheatcroft 1994; Giulano 1995; Halsall 1998).

Urban tourism has been one of the fastest growth sectors of the market over the last ten years (Ashworth & Tunbridge 2000). It accounts for approximately one-third of the international trip volume. According to the World Tourism Organization (WTO) and European Travel Monitor (ETM) these figures should even be higher since their statistics exclude excursionists and domestic tourism (WTO 1989–2000; ETM 1989–2000).

The consequences of rapid urban tourism growth have resulted in infrastructure growth-related problems for historical cities. Such problems characterize mainly those old cities that attract mass tourism to their cultural and historical heritage sites. These cities are exposed to a major extent to accessibility and other transport-related problems. In the wake of these overlapping problems severe environmental and social impacts are created. Problems of increased traffic congestion, safety, air and noise pollution and destruction of landscapes are only some of the negative outcomes of this situation (Hall 1993; Page 1995; Halsall 1998).

Despite the need to explore the interrelations between tourism mobility, systematic mobility and transportation networks and to develop comprehensive management solutions, studies dealing with these issues are still numerous; solutions are still elusive and remote (ARTIST 2000). Furthermore, conventional transport research has developed much knowledge on systematic demand trips (such as commuting, shopping and education) that have only one origin and one destination. Consequently, it is relatively easy to obtain data on these kinds of regular repetitive trips. The irregularity of the tourist trip imposes, therefore, a major problem of data availability – a prerequisite for any decision-support system that should lead to a transport and tourism planning and implementation policy.

Most studies have opted for analysing travel behaviour and travel patterns to tourist destinations rather than issues of accessibility and transport management (Patmore 1971; Wall 1971; Elson 1979; Thompson 1979;
Walsh et al. 1990; Mortazavi and Nerhagen 1997; Cohen and Harris 1998; Halsall 1998). The characteristics of tourist flows have also been given attention, since these patterns, to some extent, overlap those of regular traffic (Lundgren 1982; Pearce 1987; Regnes and Segui-Pons 1998; Prideaux 2000). Those studies that have looked into mobility management issues did so through a very narrow prism. Their conclusions called, for example, for encouragement of public transport use (mainly buses) and limiting the access of cars in order to reduce congestion (Patmore 1983; Halsall 1998). Accessibility improvement can be complemented also by other methods. For example, the importance of integrated transportation systems. Such systems, for example, were analysed between airports and city centres in the USA (Lehrer & Freeman 1998). Information systems are also highly significant in supporting transportation management solutions. A preliminary study aimed at identifying tourist preference and use of such systems proved the extent to which such information systems influence tourists’ preferences (Mahmassani et al. 1998).

It becomes apparent that managing tourism and visitor mobility is becoming a central factor in urban destinations that seek viable tourism development. At the same time, it is imperative to impose it in order to maintain high service quality for tourists visiting attractions located in busy urban centres (Javalgi et al. 1992; Mansfeld 1992). This need calls for the introduction of environmentally friendly transport systems that provide adequate accessibility and reduced traffic congestion. In order to achieve such goals, Hall (1993) suggested that coordinated action will provide integrated transport strategies that will look at high-quality public transport services, while ensuring a high standard of environmental control for all users of urban areas (Hall 1993).

Appropriate solutions require a set of accessibility, mobility and traffic control strategies and courses of action as a tool to manage urban tourism. These strategies need an integrated approach that combines tourism, transport and urban planning, involving all stakeholders who contribute to the development of the destination and thus to tourism mobility. This paper aims at contributing towards these goals by analysing the relationship between transport and tourism patterns in the Old City of Jerusalem.

The case study: the Old City of Jerusalem

Jerusalem as a urban tourist destination

Jerusalem, the capital of Israel, is located on a mountainous ridge in the heart of the Judea Mountains, 800 m above sea level and extending over 25,000 acres. The city is divided into two sections: the Old City surrounded by a wall and the new city, which is the entire municipal area outside the
The relatively low socio-economic status of Jerusalem is also reflected in its low motorization (Choshen & Shahar 2001). Consequently, Jerusalem residents are also the greatest users of public transportation in Israel. In spite of the relatively low motorization rate, the city has traffic problems because of commuters’ movement patterns within the city.

Being a multi-cultural and religious centre, Jerusalem has been attracting tourists and pilgrims for centuries and long before the Old City was annexed to Israel after the Six Day War in 1967. The city offers a variety of cultural attractions, which are accompanied by general urban tourist facilities and services.

In terms of accommodation, in 2001 Jerusalem had 71 graded hotels, 38 located on the Western side and 33 on the Eastern side of the city. These hotels have a capacity of 9,107 hotel rooms – 7,127 in the West and 1,980 in the East. Such a capacity puts Jerusalem as the major urban destination in Israel (Choshen & Shahar 2002; State of Israel 2002).

In times of security stability, Jerusalem’s tourist demand is characterized by a large proportion of international tourists (75% in 2000). The city managed to attract around 1,212,000 overnight guests who generated 3,435,000 person-nights in the year 2000. This forms an average staying period of 2.83 nights. However, international tourists stayed on average longer than domestic tourists – 3.26 nights compared to 1.61 nights (State of Israel 2001). Since the average staying period of international tourists in Israel is just over eight nights, it is evident that Jerusalem is the leading and most important destination for them (State of Israel 2000).

The Old City of Jerusalem: a platform for a constrained tourist attraction

The area of the Old City of Jerusalem is only 562 square miles. Its population size is 35,000 inhabitants, which creates a multi-cultural array of 70 percent Muslim, 8.5 percent Jew and 21.5 percent Christian (Choshen & Shahar 2001). The city dates back to the biblical period and is surrounded by high walls enclosing four quarters: Jewish, Moslem, Christian and Armenian (see Figure 1). The wall has eight gates, which lead into the Old City. Its main attractions include: the Wailing Wall – a relic of the Jewish Temple; the Temple Mount – hosting the Dome of the Rock and El Aksa mosques; the Church of the Holy Sepulcher – the traditional site of the crucifixion, burial and resurrection of Jesus; and the famous ‘Via
Dolorosa'. Secondary tourist attractions are also located outside the walled city.

Israel hosted 2,416,800 international tourists in the year 2000. Based on the annual survey of tourists visiting Israel, 90 percent (2,175,120) visited Jerusalem and the Old City. If the number of domestic day visitors to Jerusalem is added, the total number of visitors to Jerusalem’s Old City for the year 2000 is estimated at 3,600,120 (CBS 1997; State of Israel 2000; Choshen & Shahar 2001). It is this volume of overall visitors to Jerusalem in general and to the Old City in particular, that forms the actual pressure on its infrastructures. Such pressure has direct bearing on accessibility to and mobility within the Old City.

Figure 1 The Old City of Jerusalem: proposed possible solutions.
The impact of security situations on tourism demand for Jerusalem

Jerusalem has faced a variety of security events that stem from the Israeli–Palestinian conflict. These include suicide bombing, car bombs, shooting, stone throwing etc. Although the majority of these events did not target tourists, their coverage in the international media has given the city a very poor security image. Consequently, tourists have tended to avoid visits to Jerusalem while guns are still smoking! When the security situation calmed down the influx of tourists regenerated (Mansfeld 1999). The most detrimental impact of such security events has taken place since the start of the Al Aksa Intifada in September 2000. Since then, the number of tourist arrivals to Israel generally, and to Jerusalem in particular, fell by about 70 percent (IBS 2003). Doubtless, security constraints and the subsequent upsurge in tourist arrivals when conditions improve constitute a major dilemma for transportation planning. Should Jerusalem plan its transportation for the Old City based on fluctuations of demand or for times of peace and tranquility only? This question will be dealt with later in this paper.

Tourism flow into the Old City of Jerusalem: accessibility, current constraints and problems

This section of the paper will look thoroughly into the problems of accessibility to Jerusalem, and to and within the Old City of Jerusalem. It will depict the special urban, planning and management constraints that characterize Jerusalem as a case study.

Transportation accessibility to Jerusalem

Jerusalem can be accessed from abroad by Ben Gurion Airport, which is located 45 km northwest of Jerusalem on the Tel Aviv–Jerusalem highway No. 1. This route serves also as the main gateway for domestic tourists and commuters. In terms of public transportation the primary means of mass transportation are buses and shared taxis. Currently, there is no functioning rail system to Jerusalem, but there are plans for the future, using a new, fast, efficient line. Thus, due to limited mass transportation alternatives, the use of automobiles as a mean of access to Jerusalem is massive, resulting in chronic congestion at the entrance to the city.

Transportation accessibility to the Old City

The Old City of Jerusalem can be accessed solely through the city centre of Jerusalem. This means that the Old City is connected only to the local
transportation system of Jerusalem. The City’s central bus station is located in the city centre, close to the main city entrance. Jerusalem enjoys a highly developed bus service. The city structure, the increase of private cars in the city centre and the absence of a policy regarding effective traffic limitation, create high congestion. The use of transportation means for tourism in Jerusalem is distributed as follows: 43 percent of the total number of visitors use tourist coaches, 35 percent cars, 11 percent public transport and 6 percent taxis. These figures change when focusing on the international tourist market: 56 percent of these tourists use tourist coaches, 33 percent public transport and 11 percent rented cars (State of Israel 2000).

Transportation accessibility within the Old City

Access to the Old City is maintained by a ring road surrounding the walls (see Figure 1). Entering into the Old City through the wall gates is not permitted to tourist coaches but small vehicles may enter through four out of the eight existing gates. The road system and the parking lots in the area around the Old City are inadequate for sustaining the volume of tourist, residents and commuter traffic. Consequently, illegal parking further reduces road capacity. The outcome of these traffic problems is serious traffic jams and delays (Municipality of Jerusalem 1999).

Severe budget constraints cause further difficulties. Other problems are narrow, congested pedestrian lanes in the Old City. There are steep, winding roads due to topography variations of 155 m. Subterranean archaeological works, extreme climatic conditions, high residential density and the proximity of buildings to prayer places of the three religions all add to transportation problems. Other factors are frequent closure of the city for special events, and a limited site carrying capacity. Most of the religious sites were planned for prayer and have difficulties handling a large volume of visitors, creating overcrowding in access lanes to the sites, long queues affecting the duration of stay in the Old City and duration of parking. There is poor visitation coordination between multicultural holy sites controlled by different organizations and/or authorities and a shortage of traffic and sites’ information systems.

Accessibility management to and within the Old City of Jerusalem

As a consequence of the problems depicted above, it is essential to produce effective strategies of transportation management, to be supported by appropriate infrastructure and means of transport. It should be emphasized that usually none of the solutions can be selected separately, because an effective solution is, in fact, a set of coordinated solutions. Thus, the resulting end product should be a recommendation on the
Tourism and religion: Transportation in Jerusalem preferred combined strategies. Appropriate solutions to solve the accessibility and mobility problems are presented herewith by different strategies. Each of the strategies comprises a list of actions that can be performed together or separately, depending on the type of solution. It must be noted that each and every suggested course of action may be derived from more than one strategy.

**Strategy 1: Reduction of traffic flows**

This strategy deals with reducing time of access to tourist destinations, usually by reducing the congestion incurred by cars. The demand is kept concentrated on the main traffic corridors but mobility is improved. This 'pure' transportation approach is quite popular with planners. A number of possible actions needed in order to implement this strategy.

(a) Traffic plan
   Involves changing sections of some of the ring roads into one-way streets in order to reduce the traffic volume, and creating a bus lane (see Figure 1).

(b) Enhancement of the road network
   Involves planning and implementation of a full-scale road network for Greater Jerusalem based on arterial and ring roads. This will allow for a flow of inter-urban traffic bypassing the city centre.

(c) Limited access to private cars
   This action requires the following components: road blocks; new traffic arrangements in the ring roads; Park & Ride close to the Old City with shuttle lines to the gates; promotion of public transport; increasing parking spaces and Intelligent Transport Systems (ITS) with electronic posting signs (see Figure 1).

(d) Park & Ride
   The applicability of this action is constrained by availability of land. It is suggested that a Park & Ride parking lot is operated at the entrance to the city, where there are relatively fewer land constraints.

(e) Integrated public transportation system
   Encouraging the use of public transport through coordination of the bus lines, transfer facilities, and coordination of time-tables and integrated trip tickets.

(f) Tourist Transportation Terminal (TTT)
   TTT located at the city entrance, near the central bus station and the future planned train station will combine all tourist and transportation services such as Park & Ride, bus lines, city tour lines and car rental agencies (JTMT 1996).

(g) Parking payment policy
   This action of demand management is achieved by setting parking and/
or entrance tariffs for cars arriving in the Old City compound at certain

**Strategy 2: Tourist coach management**

Establishment of parking lots for coaches outside and near the Old City limits. Passengers will reach the Old City either by shuttle services or by walking from a planned alighting stop near the gates (‘Kiss & Ride’).

**Strategy 3: Flexible urban transport services**

A flexible system takes into account the significant seasonal variations of flows in order to satisfy both stable systematic demand (i.e. commuters) and variable tourist demand. This strategy involves a Light Rail Transit (LRT) connecting the entrance of the city to the city centre and to the Old City fringe, with sustaining bus lines (JTMT 1995).

**Strategy 4: Spread of tourist demand over space**

This strategy deals with demand spread over space in a given period of time. It enables the reduction of flow concentration and overcrowding. The following possible actions fall within this strategy framework.

(a) City Tour line

Diffuses the demand for visiting tourist attractions which are located at varying distances around the Old City and in Western Jerusalem.

(b) Integrated ticket of sites and public transportation

Enables the use of public transportation to different destinations.

(c) A cable car

A cable car between panoramic hot spots facing the Old City will reduce parking demand for both cars and tourist coaches inside (see Figure 1).

(d) A fun train

Encircles the Old City externally and will allow visitors to enter the city section at various convenient points including Park & Ride parking lot as one of its shuttle services (see Figure 1).

(e) Pedestrian trails around the Old City

Will encompass less frequently visited tourist attractions and will be integrated into shuttle services.

(f) Information Technology systems

This is a supporting action to those mentioned earlier and operates in real time. The applications are: (1) Intelligent Transport Systems (ITS), involving traffic-light control and variable transport and tourism
message panels; (2) Tourist Information Systems (TIS) – Internet sites, continuing telecommunication services and info-kiosks in different locations of the city; (3) Electronic Booking Systems, consisting of electronic booking, payment and monitoring of demand, for instance through smart cards.

**Strategy 5: Tourist demand management**

This strategy deals with two aspects: (1) distribution of the tourist demand in various time periods, in order to reduce the demand for tourist attractions during peak hours; (2) managing tourist behaviour within those attractions in order to diminish the length of stay and overcrowding.

(a) Site management
   Management by opening hours and by site layout.
(b) Information Technology Systems
   The use of TIS (see Strategy 4f above), providing demand distribution over a whole time period through comprehensive information on transportation, sites and tourist services.
(c) Management by seasonality
   Diffusing the seasonality factor by the promotion of off-season events.

**Strategy 6: Reduction of environmental and social impacts**

Since the city is very condensed, flows within the Old City should be very carefully controlled. Mobility within the Old City, apart from walking, should be enabled, and needs of the disabled and the elderly taken into consideration.

(a) Small electrical vehicles
   Connecting the main sites with the gates, where visitors can be transferred to outside shuttle services.
(b) A conveyer
   The introduction of an electric conveyer can overcome the topographic constraint and collect tourists at the end of the tour at the eastern side of the Old City.
Evaluation of solutions related to the various actions

Applicability of problem solutions

The solutions suggested here, based on various actions, may substantially improve the problems of accessibility and congestion on the way to, and within, the Old City. Each of the actions presented herewith can solve a wide variety of problems. Also, each defined problem can be approached by a variety of actions. Table 1 summarizes the problems and their corresponding solutions.

Multi-attribute evaluation of the proposed actions

A multi-attribute analysis model (MAA) was applied in pursuit of the optimal action to be recommended.

Various types of MAA as a decision-support system have been used in a wide range of social sciences, environmental and planning-orientated studies (Huang et al. 1996). Applying an MAA tool enables planning and operational decisions to be made, based on a multi-dimensional evaluation of the various factors that impinge on the traffic situation in a given city or region (Holguín-Veras 1995). A set of characteristics underline the principle of the MAA model applied in this study.

- The model is based on a matrix that depicts vertically the various attributes (or factors) that shape the traffic pattern of the Old City, and horizontally the various alternative actions that could be taken in order to reduce or even avoid problems of accessibility and congestion.
- Each alternative action is ranked with reference to each evaluating attribute.
- Ranking is based on the professional judgement of a group of tourism and transportation experts and uses a ranking scale.
- Once all actions are ranked per attribute, the model calculates the total score and the relative score each alternative action obtained.
- The result is a matrix that forms the basis of multi-attribute evaluation, which is then generated by a series of simulations.

Attributes selection

The current application of a MAA method is based on a qualitative ranking of each solution per attribute. This ranking is based on a scale of 1–10, 1 representing the lowest efficiency value, while 10 stands for a maximum efficiency value. Seven defined efficiency attributes follow.
Table 1  Cross-tabulation of problems versus solutions through the various actions

<table>
<thead>
<tr>
<th>Problems</th>
<th>Solutions for the various actions</th>
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<tbody>
<tr>
<td>Accessibility</td>
<td>A       B       C       D       E       F       G       H       I       J       K       L       M       N       O       P       Q       R       S       T</td>
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| Problematic accessibility to the entire city  | X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X       X      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<thead>
<tr>
<th>Problems</th>
<th>Solutions for the various actions</th>
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<tr>
<td><strong>Concentration of accommodation and tourist facilities in the same area</strong></td>
<td>X</td>
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<td><strong>Time concentration of flows</strong></td>
<td>X X X X X X X X</td>
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<td>Systematic mobility peaks</td>
<td>X X X X X X</td>
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<td>Seasonality of tourist flows</td>
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<td>Impact of excursionists</td>
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<td>Impact of special events</td>
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<td><strong>Inadequate tourist supply</strong></td>
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<tr>
<td>Inadequate and inappropriate accommodation facilities</td>
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<tr>
<td>Undiversified tourist attractions and inadequate use of them</td>
<td>X X X X X X X X</td>
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<tr>
<td><strong>Inadequate information systems</strong></td>
<td></td>
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<tr>
<td>Lack of transport and tourism data to forecast tourist flows and to facilitate efficient transport management systems</td>
<td>X</td>
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<tr>
<td>Lack of standardized travel information system to facilitate local and inbound tourist flows (including booking and payment)</td>
<td>X X X X</td>
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<tr>
<td><strong>Other negative aspects</strong></td>
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<tr>
<td>Negative impacts of transport infrastructure on the urban environment</td>
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<td>Air and noise pollution</td>
<td>X X X X X X X X</td>
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<tr>
<td>Poor safety and security situations</td>
<td>X</td>
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<tr>
<td>Topographic problems</td>
<td>X X X X X X X X</td>
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<tr>
<td>Occasional closure of the city for traffic due to religious events</td>
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<tr>
<td>Condensed urban structure</td>
<td>X X X X X X X X</td>
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<td>Inflexible land use policy and availability of land</td>
<td>X</td>
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</tbody>
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Key: A, Traffic plan; B, limited access by private cars; C, Park & Ride around the Old City (with shuttle service, including Fun Rail); D, management of tourist coaches; E, Park & Ride at the city entrance; F, Tourist Transportation Terminal (TTT); G, improving access between urban, inter-urban roads and networks; H, parking payment policy; I, Light Rail Transit (LRT); J, city tour line; K, pedestrian trails; L, cable car; M, conveyor; N, small electrical vehicles; O, site management by opening hours; P, site management by layout planning; Q, Intelligent Transport Systems (ITS) (including electronic posting); R, integrated public transport (fares and services); S, Tourist Information Systems (TIS), electronic booking and payment systems (including smart card); T, management by seasonality.
• **Contribution to accessibility**: evaluates to what extent each solution guarantees appropriate accessibility and reduced congestion.
• **Cost**: deals with evaluating the cost of a given solution against the available budget.
• **Exposure to bureaucracy**: deals with aspects of public sector involvement in transportation planning, development and implementation.
• **Environmental and social constraints**: deals with a variety of factors that shape the complexity of the transportation solution relevant to the physical and/or socio-cultural environment.
• **Implementation horizon**: deals with the time needed to implement an entire action.
• **Viability**: measures the level of sustainability of each solution.
• **Independency**: different combination of actions shows that some of them need only a small integration with the rest, while others are highly dependent on the availability of more actions. Thus, the less dependent an action is on the other actions, the better it is.

**Analysis**

Table 2 depicts the basic MAA matrix used in order to rank and, consequently, select the optimal action for reducing congestion in and facilitating improved accessibility to the Old City of Jerusalem.

The results of the simulation appearing in Table 2 show clearly that the more expensive the solution, the better its contribution to the reduction of congestion and the improvement of accessibility. This finding stems from the inverse relationship between ‘cost’ and ‘contribution to accessibility’ attributes (low cost value means high cost and corresponds to high accessibility value). Such an expensive solution brings about high viability but involves a relatively long implementation horizon. The aggregated scores, which represent the overall utility of the different actions, demonstrate a ‘compromised solution’. It seems from Table 2 that some actions representing relatively low contribution to the reduction of congestion or those that cannot be applied as independent actions are still ranked relatively high on the MAA simulation. Two actions representing such situations are parking payment policy and pedestrian trails (see Table 2). In order to guarantee an efficient solution that substantially improves accessibility; a transportation-orientated simulation was performed using only two attributes – ‘Contribution to accessibility’ and ‘Independency’ (see Table 3).

The results show that in most cases comprehensive (and expensive) actions are the most promising solutions for improving the accessibility to the Old City. Indeed, all first eight out of twenty ranked actions belong to this type. Such solutions are usually characterized by long implementation periods. Also, it is not surprising that the most promising solution that
stemmed out of the simulation was ‘Limited access to private cars’. After all, this is the most comprehensive solution, based on a package of actions. As such, it becomes highly independent, yet substantially expensive if compared to the other solutions. The lowest priority was assigned to the ‘Traffic plan’ solution which, if simulated without ‘contribution to accessibility’ and ‘independency’ was found to be the most promising one in the basic simulation (scoring 82%). This was a result of various attributes such as its low cost, rapid implementation and very limited bureaucratic involvement. However, in terms of ‘pure’ transport solution its rank was the lowest (see Table 3), as a result of being a highly short-term solution, questionably viable and highly dependent on other solutions.

Summary and conclusions

Using the case of the Old City of Jerusalem, this study investigated the interrelations between urban tourism and transportation systems needed to support tourist activity. The study is focused on management of accessibility towards the tourist destinations. The general purpose is to achieve a viable development that maintains both stable systematic demand and tourist
variable demand, and guarantees equilibrium between the physical environment and the quality of visit.

In order to improve the accessibility of tourists to and within the Old City, the study developed various strategies of transportation management, which are grouped into six categories – each describes a different path for encountering the problem. On the more tactical and pragmatic levels, twenty different actions are included in those strategies. In order to find out which of them is more likely to contribute to the solution, a set of seven transport utility attributes were selected. Using a multi-attribute analysis model designed specifically for this study, all the twenty actions could be prioritized. The results show that the most preferred actions are comprehensive actions, which are costly and depend on big budgets. However, these actions also represent low dependency on other actions. Therefore, this paper may conclude that in order to solve the accessibility and congestion problem in a high-demand tourist attraction – the Old City – these preferred actions should be seriously considered by planners and decision-makers. This conclusion corresponds well with those of former studies, which emphasize the crucial role of efficient transport systems in the overall development of tourist destinations (e.g. Prideaux 2000).

Furthermore, the strategies and solutions in the way of actions discussed in this paper can be easily adapted to other historic towns. This can be achieved with only minor calibration, made necessary due to the specific

<table>
<thead>
<tr>
<th>Actions</th>
<th>Contribution to accessibility</th>
<th>Independency</th>
<th>Efficiency ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>10</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>G</td>
<td>10</td>
<td>8</td>
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<tr>
<td>C</td>
<td>6</td>
<td>10</td>
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</tr>
<tr>
<td>D</td>
<td>8</td>
<td>7</td>
<td>75</td>
</tr>
<tr>
<td>F</td>
<td>7</td>
<td>8</td>
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</tr>
<tr>
<td>E</td>
<td>6</td>
<td>8</td>
<td>70</td>
</tr>
<tr>
<td>L</td>
<td>5</td>
<td>8</td>
<td>65</td>
</tr>
<tr>
<td>Q</td>
<td>9</td>
<td>3</td>
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</tr>
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<td>J</td>
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<td>5</td>
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<tr>
<td>R</td>
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</tr>
<tr>
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<td>2</td>
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<tr>
<td>S</td>
<td>4</td>
<td>3</td>
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</tr>
<tr>
<td>O</td>
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<td>2</td>
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</tr>
<tr>
<td>N</td>
<td>4</td>
<td>2</td>
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</tr>
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<td>P</td>
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<td>2</td>
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</tr>
<tr>
<td>I</td>
<td>3</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>K</td>
<td>2</td>
<td>1</td>
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<tr>
<td>A</td>
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<td>10</td>
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</tbody>
</table>

For key to ‘Actions’, see Table 1.
constraints characterizing each such town. Finally, adequate and workable solutions to the transportation problem of the Old City of Jerusalem must also take into account the existence of external constraints. The most obvious one is Jerusalem’s geo-political situation. As long as the Old City of Jerusalem is part of a wider geo-political conflict, this dispute will most probably deter any move from a theoretical to practical transportation solution as a result of an ongoing decline in tourism demand. Thus, there is no use in adopting a comprehensive yet expensive solution if fluctuations in tourism demands prevail.

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Biographical notes

Yechezkel Israeli (PhD) specializes in tourism management, transportation planning and in the interrelationship between transportation and tourism. He is a senior teaching associate at the Department of Geography, University of Haifa and the head of the Tourism Department at the Jordan Valley Academic College, Israel. He also holds a position as a senior research associate in the Centre for Tourism, Pilgrimage and Recreation Research, University of Haifa and in the Transportation Research Institute, the Technio-Israel Institute of Technology, Haifa. (Department of Geography, University of Haifa, 31905 Israel)

Yoel Mansfeld (PhD) is a senior lecturer of tourism studies, Department of Geography, University of Haifa, Israel. His main research interests are tourism planning and development, tourism and consumer behaviour and the relationships between safety, security and tourism. Yoel Mansfeld is also the Head of the Center for Tourism, Pilgrimage and Recreation Research at the University of Haifa and the co-editor of Tourism, Crime & International Security Issues and of Consumer Behavior in Travel and Tourism. (Center for Tourism, Pilgrimage & Recreation Research, IBM building, University of Haifa, 31905 Israel; e-mail: yoel@geo.haifa.ac.il)

Résumé: Accès par les transports aux attractions touristiques de la Vieille Ville de Jérusalem

Cette étude se sert de la vieille ville de Jérusalem pour examiner les relations entre le tourisme urbain et le système de transport qu’une telle activité requiert. On a d’abord cherché à identifier les paramètres qui permettent aux flots de touristes de rejoindre les principales attractions touristiques de Jérusalem. Cette recherche prouve que la structure urbaine unique de Jérusalem et, en particulier, sa vieille ville murée déterminent la mobilité de ses visiteurs. On a ensuite examiné les stratégies les plus efficaces de gestion des transports en tenant compte d’une infrastructure et de moyens de transport appropriés. Ces stratégies ont été classées selon trois approches: une basée sur les transports, une sur le tourisme et une sur la technologie. En conclusion, nous avons recommandé une combinaison de stratégies qui concerne la décentralisation de la demande touristique, une gestion des attractions touristiques plus sensible aux

Mots-clés: tourisme urbain, systèmes de transport, gestion tournée vers les transports

Zusammenfassung: Verkehrszugänglichkeit der Touristenattraktionen in der Altstadt von Jerusalem


Stichwörter: Stätetourismus, Verkehrssysteme, verkehrsorientiertes Management