

## **Country report for ISRAEL**

**Prepared by Shalom Hakkert and Caroline Matar 14 February 2007**

**Within the framework of the COST358 project**

**Updated by Elisheva Blum 14 April 2009**

### **1. Facts and Figure**

The statistical data for Israel was collected from the Central Bureau of Statistics publications. In the past 30 years, there have been three travel surveys. The first was conducted in 1973 and it investigated 7% of the population of Israel. The second was in 1984 and it investigated 0.3% of the population; this survey also investigated the pedestrian traveling habits. The third was conducted in 1996/7 and it investigated 1% of the population. Another survey was conducted in 2006 and 2007 by the Geocartography Institute. The observations were of pedestrians' behaviour in urban areas. In addition, other surveys were conducted in specific cities, such as Tel Aviv and Haifa. These surveys included some information about pedestrian traveling habits.

The relevant statistical data of Israel can be found in the attached Excel file.

### **2. Publications on pedestrian issues**

#### **2.A Engineering**

**Authors:** D. M. Zaidel, I. Hocherman, T. Klein

**Title:** Safety of Pedestrian Crossing Signalized Intersections

**Kind of Publication:** Research Report No.84-48 (In Hebrew)

**Year of Publication:** 1984

**Short Abstract:**

Zaidel et. al. (1984) investigated the safety of pedestrians crossing signalized intersections. Three intersections were investigated: an uncontrolled (but marked) crossing at the right turning filtering lane; a pedestrian crossing phase concurrent with the vehicle phase; and an exclusive pedestrian phase, separating pedestrians from turning vehicles. The researchers collected data regarding the geometry, traffic, and operational characteristics of 320 signalized intersections in Tel-Aviv, Jerusalem, and Haifa, and details of 5132 vehicle accidents and 1310 pedestrian accidents which took place at those intersections during 1977-1982. The results showed that the various crossing types had little influence on the number of pedestrian accidents, and no effect on the number of vehicle accidents.

**Authors:** I. Hocherman, J. Bar-Ziv, A.S.Hakkert

**Title:** Methodology of Pedestrian Counts in Urban Areas

**Kind of Publication:** Research Report No. 85-85 (In Hebrew)

**Year of Publication:** 1985

**Short Abstract:**

This study dealt with the methodological aspects of conducting counts of pedestrians crossing urban streets. These counts were carried out in order to plan pedestrian facilities for research purposes. The study concentrated on describing the delay distributions of pedestrians crossing residential and CBD streets in Israel. It also dealt with the problem of adequacy of short counts for estimating hourly pedestrian volumes. The results showed that the daily distribution of crossing pedestrians was featured by three peak periods: 7:00-8:00, 12:00-13:00, and 17:00-18:00. In the residential neighborhoods, the morning peak was higher than in the CBD, while the noon and afternoon peak periods were shorter. In addition, it was found that the recommended periods for counting pedestrians for the purpose of estimating the daily volume were 8:00-10:00 and 14:00-15:00. Short counts of the magnitude of 15 minutes were not recommended for estimating hourly or daily pedestrian volumes on residential streets.

**Authors:** D. Zaidel, A. Elgrichi, A. Katz

**Title:** The Influence of Pedestrian Held Flags on Communication between Drivers and Pedestrians.

**Kind of Publication:** Research Report No. 88-128 (In Hebrew)

**Year of Publication:** 1988

**Short Abstract:**

Zaidel et. al. (1988) examined the effect of holding flags during road crossing events. 500 pedestrians were interviewed and 20,000 were observed crossing streets during morning and afternoon hours at four non-signalized marked crosswalks in two residential neighborhoods. The participants were asked to hold yellow flags or raise their hands before they cross the street. The observations showed that only 15% of the pedestrians used the flags. However, there was not found any significant difference between the three conditions of crossing: use of flag, use of hand, and no communication.

**Authors:** A. Katz

**Title:** The Protection of Pedestrians from Road Vehicle Related Injury: Suggested Research Based on Review of the Literature

**Kind of Publication:** Research Report No. 89-146 (In English)

**Year of Publication:** 1989

**Short Abstract:**

The paper reviewed literature on the topic of pedestrian safety. The findings from the literature were categorized into three groups: (1) information and safety support systems; (2) roads and traffic; (3) pedestrian and driver behavior. The author concluded that much research would be needed on the topics of: (1) safety practices, especially in the engineering fields; (2) safety of pedestrians on arterial and heavily trafficked streets; (3) public information and community action countermeasures; (4) the methodology and decision priorities of land use allocation and town planning, with the express purpose of maximizing pedestrian safety.

**Authors:** A. Katz, A. Elgrishi

**Title:** Stop Before Crossing—A Process Evaluation of a National Road Safety Campaign

**Kind of Publication:** Field Study, Research code No. 511-515/5 (In Hebrew)

**Year of Publication:** 1992

**Short Abstract:**

This study aimed to (1) evaluate the national planning for the pedestrian safety campaign conducted by the Road Safety Authority of the Israel Ministry of Transport; (2) evaluate the local planning in six cities, and (3) evaluate the crossing guard operation on a daily basis in the six cities. 500 pedestrians were interviewed two months after the campaign. The results showed that the national planning was deficient in providing sufficient publicity material to the cities—both in quantity and when needed. In addition, the large cities fulfilled 23% of their planned volunteer activity and small cities 48%. Even though the volunteers received instruction in their task in advance, supervision was poor.

**Authors:** D. Moukwas

**Title:** Developmental Aspects in Pedestrian Safety

**Kind of Publication:** Publication No. 94-091(In Hebrew)

**Year of Publication:** 1994

**Short Abstract:**

Young pedestrians are hurt and injured more in severe accidents than in other kinds of accidents. Dealing with this problem requires not only finding geometric solutions, but also rendering protective measures based on recognizing the pedestrian's weak points. This study addresses the cognitive development of children and its ramifications on the children's ability to use the road safely. In addition, the paper presents data on the basic instructions regarding safe road crossing.

**Authors:** A.S. Hakkert, V. Gitelman, E. Ben-Shabat

**Title:** Controlled experiment with new model of crossing with no traffic light

**Kind of Publication:** The Transportation Research Institute (In Hebrew)

**Year of Publication:** 2000

**Short Abstract:**

**Authors:** A.S. Hakkert, V. Gitelman, E. Ben-Shabat

**Title:** An Evaluation of Crosswalk Warning Systems: Effects on Pedestrian and Vehicle Behaviour

**Kind of Publication:** Transportation Research Board 80<sup>th</sup> Annual Meeting

**Year of Publication:** 2002

**Short Abstract:**

**Authors:** A.S. Hakkert, V. Gitelman, E. Ben-Shabat

**Title:** An Evaluation of Crosswalk Warning Systems

**Kind of Publication:** Transportation Research Board 80<sup>th</sup> Annual Meeting

**Year of Publication:** 2002

**Short Abstract:**

**Authors:****Title:** A Validation of the efficiency of a pedestrian information campaign during 2006-2007**Kind of Publication:** The New Wave Research and the Geocartography Institute (In Hebrew)**Year of Publication:** 2007**Short Abstract:****2.B Research on Children****Authors:** A. Elgrichi, A. Katz**Title:** An Evaluation of the Pre-School Safety Program 'Children in the Road'.**Kind of Publication:** Evaluation, Project No. 82-6 (In Hebrew)**Year of Publication:** 1982**Short Abstract:**

The study aimed to assess a Pre-school Safety Program whose purpose had been to inform parents of pre-school children how to deal with the problem of traffic safety. The program was evaluated with regards to: (1) parents' understanding of the material presented in the program, and (2) parents' and kindergarten teachers' satisfaction with the program. The participating parents had three evening meetings with specially trained instructors, and they were also required to help their children complete a workbook at home. The overall evaluation was positive in respect to understanding of the material and satisfaction with the program.

**Authors:** A. Katz, A. Elgrichi, L. Guttman**Title:** Child Safety: 1. Traffic Control and Safety in School Zones; 2. Travel, Activity, and Accidents after School Hours**Kind of Publication:** Research Report No. 84-59 (In Hebrew)**Year of Publication:** 1984**Short Abstract:**

The aim of this report was twofold: (1) to survey the regulations and conditions related to traffic control and school zones, and (2) to survey the children's activities and travel behaviors after school hours. In the first survey, it was found that many countries had specific regulations pertaining to school zones, and covering such issues as parking, speed control, signing, crossings, etc. The traffic regulations in Israel did not treat the school zone as a separate topic. A survey of 870 children who were asked to keep an activity and travel log for one week showed a large range of away-from-home and outdoor activity during the afternoon and early evening hours. Most (65%) of their trips consisted of walking, 25% traveled by car, and 10% traveled by bus.

**Authors:****Title:** The involvement of children in road accidents in Bnei-Berak**Kind of Publication:** מת"ת (In Hebrew)**Year of Publication:** 2002**Short Abstract:****Authors:** V. Rafaely, J. Meyer, I. Zilberman-Sandler, S. Viener

**Title:** Perception of traffic risks for older and younger adults. Accident Analysis and Prevention

**Kind of Publication:** Accident Analysis and Prevention

**Year of Publication:** 2006

**Short Abstract:**

## **2.C Research on Elderly People**

**Authors:** A. Katz, A. Elgrichi

**Title:** Traffic Safety Knowledge and Travel Habits of the Elderly in Israel

**Kind of Publication:** Research No. 83-39 (In Hebrew)

**Year of Publication:** 1983

**Short Abstract:**

Katz and Elgrichi (1983) described the results of Part 2 of a multi-stage research project, the purpose of which was to find ways to reduce the traffic accident involvement of elderly pedestrians. 487 elderly people were interviewed individually and asked about their travel habits, accident involvement, safety knowledge, knowledge of traffic signs, and knowledge of safe walking habits. The findings showed that, as a group, elderly people do not correctly identify traffic signs and do not have a good understanding of safe walking habits. In addition, they were found to be dependent on the walking mode and public transport for their mobility.

**Authors:** A. Katz, A. Elgrichi

**Title:** Safety Problems among Elderly Pedestrians and Ways of Improving Them

**Kind of Publication:** Research No. 95-229 (In Hebrew)

**Year of Publication:** 1995

**Short Abstract:**

There were three aims of this study: first, to investigate and update literature which deals with elderly pedestrians in order to learn how other countries deal with safety problems among these pedestrians. Second, to report and give examples of educational and explanatory materials with regard to the elderly pedestrian safety. The last was to survey the involvement of elderly people in traffic accidents in Israel.

**Authors:** V. Rafaely, J. Meyer, I. Zilberman-Sandler, S. Viener

**Title:** Perception of traffic risks for older and younger adults. Accident Analysis and Prevention

**Kind of Publication:** Accident Analysis and Prevention

**Year of Publication:** 2006

**Short Abstract:**

## **2.D Research on Accidents**

**Authors:** D. Zaidel, T. Klein

**Title:** Pedestrian Accidents at Signalized Intersections

**Kind of Publication:** Research Report No. 82-12 (In Hebrew)

**Year of Publication:** 1982

**Short Abstract:**

Zaidel and Klein (1982) compared pedestrian accident rates at signalized intersections with rates at non-signalized intersections. In addition, they examined the effect of partial at-level separation between vehicle and pedestrian movements at signalized intersections on accidents. The database comprised 324 signalized intersections in Tel-Aviv, Jerusalem, and Haifa, 129 non-signalized intersections in Tel-Aviv, and accident data for 1977-1979 or 1980. The findings showed that signalization increased the number of pedestrian accidents and at high volume intersections it also raised the rate of collision accidents. On the other hand, partial separation arrangements at signalized intersections have not increased pedestrian's risk compared to intersections with completely separated timing of vehicle and pedestrian movements.

**Authors:** A. Katz, L. Guttmann

**Title:** Elderly Pedestrian Accidents in Israel

**Kind of Publication:** Research Report No. 82/118 (In Hebrew)

**Year of Publication:** 1982

**Short Abstract:**

This study analyzed national traffic accident data pertaining to pedestrians over the age of 65 and who had been injured in Israel during the period 1970-1980. In addition, the researchers studied 200 police files which described injury accidents to elderly pedestrians in the city of Haifa during the years 1977, 1978, and 1979. The results showed that (1) 45% of the elderly pedestrians injured were within walking distance of home; (2) 75% of the elderly pedestrians were injured on streets with heavy traffic volumes; (3) elderly people are overrepresented as residents in areas of the city of Haifa characterized by heavy flow; (4) the age specific injury rate of pedestrians over 65 was 2.1/1000 persons, compared to 0.6/1000 persons for adults aged 25-44; (5) 9% of elderly pedestrians suffered fatal injuries; (6) rain and/or extended darkness increase the number of heavy accidents involving elderly pedestrians; (7) 85% of elderly pedestrians were injured while crossing the road and 15% while walking or standing on the road, and (8) the majority of injured elderly pedestrians were men.

**Authors:** A. Katz, A. Eligrishi, O. Eisenman

**Title:** Israel Pedestrian Accident and Injury Fact Book

**Kind of Publication:** Research Report No. 84-49 (In Hebrew)

**Year of Publication:** 1984

**Short Abstract:**

The aim of this report was to provide statistical information with respect to pedestrian injuries and accidents for the years 1979-81. The data presented in the study represented 35% of all traffic accidents in Israel, 25% of all personal injuries, and 46% of all traffic deaths for these years. The statistics were organized into three sections: (1) pedestrian injuries analyzed by the age of the injured pedestrian; (2) pedestrian accident location on road network urban/interurban, intersection/non-intersection, and urban road type-center city, residential, arterial, industrial, and (3)

pedestrian fatalities analyzed by the age of pedestrian, type of road, hour of day, vehicle striking, etc.

**Authors:** D. Zaidel, A. Eligrishi, O. Eisenman

**Title:** Risk Factors of Pedestrians Crossing Arterial Streets

**Kind of Publication:** Research Report No. 86-104 (In Hebrew)

**Year of Publication:** 1986

**Short Abstract:**

Zaidel et. al. (1986) described three related research activities: (1) an analysis of factors involved in pedestrian accidents on arterial streets; (2) the continued development of a method for assessing crossing difficulty, and (3) an attempt to characterize streets in term of pedestrian crossing activity and crossing difficulty. With respect to the first research activity, a three-year accident analysis based on a Haifa street inventory combined with an accident file showed that the higher the density of junctions on arterial streets, the greater the number of accidents. Regarding the second research activity, the observation method for recording pedestrian crossing events and rating their level of friction was improved and adapted for mid-block situations.

**Authors:** T. Rosenbloom

**Title:** Pedestrians' behavior at intersections in ultra-orthodox and secular cities

**Kind of Publication:** Transportation Research

**Year of Publication:** 2004

**Short Abstract:**

### **3. Current research project**

**Authors:** M. Margalith

**Title:** "Pedestrian Oriented Environments": The protection of pedestrians' rights - The improvement of quality of life in urban environments.

**Kind of Publication:**

**Year of Publication:** ongoing

**Short Abstract:**

The study aims to reduce accidents in which pedestrians' rights are violated and to propose models for urban environments suitable for pedestrians. The research was composed of three parts:

**A. Gathering of information** based on field surveys in urban environments in Israel and abroad:

A/1. The percentage and classification of pedestrian road accidents.

A/2. The physical environments of pedestrian accidents; location, neighbourhoods, roads, land-use, activity systems, physical geometry and characteristics.

**B. Analysis and evaluation** of information in comparative methods. Models in Israel and abroad will be compared and evaluated to their possible impact on the reduction of pedestrian accidents.

- B/1. Evaluations of existing models, and proposals of new models for traffic reduction and control in urban environments.
- B/2. Evaluation of existing and proposed land-use and activities in relation to reduction, control of traffic and pedestrians' safety.
- B/3. Physical characteristics of existing and proposed "Pedestrian Oriented Planned Environments", accompanied by diagrams, drawings, and illustrations.
- C. Implementation of research conclusions**, co-ordinated with government and city agencies.
- C/1. The implementation of models to existing and planned environments.
- C/2. Guidelines and standards for models of "Pedestrian Oriented Environments".

**Authors:** The Ministry of Transportation  
**Title:** Regulations for Planning Pedestrian Traveling  
**Kind of Publication:** Research Report (In Hebrew)  
**Year of Publication:** 2006 and ongoing  
**Short Abstract:**

The aim of this study is to present new regulations which aim to create a frame for an organized, clear, and methodological planning of urban streets. The regulations present the needs of pedestrians, the policy for determining their movement on the street, and the various planning components required for these pedestrians. These regulations are based on the regulations and the most updated results from countries experienced in planning and developing infrastructure for pedestrians.

**Authors:** M. Avitzour  
**Title:** Injured Pedestrian – circumstances, injury profile and outcome  
**Kind of Publication:**  
**Year of Publication:** Ongoing  
**Short Abstract:**

The aim of this study is fourfold: (1) to quantify the true scope of hospitalized injured pedestrians (among all road users); (2) to describe hospitalized injured pedestrians based on demographic variables, injury circumstances, injury diagnosis profile, injury severity, treatment, hospitalization characteristics and outcome; (3) to describe the process of evacuation and transfer between hospitals for injured pedestrians, and (4) to analyze the data on outcomes of hospitalized injured pedestrians, by variables mentioned in clause 2 above. 3272 pedestrians registered in the Israel National Trauma Registry during 2003-2004 were studied (all pedestrian injuries hospitalized at 10 hospitals).

**Authors:** Y. Rofè, M. Schwartz, K. Martens, & R. Ishaq.  
**Title:** Barriers to the Implementation of Traffic Calming in Israeli Towns and the Policies Needed to Overcome Them  
**Kind of Publication:**  
**Year of Publication:** Forthcoming



### Short Abstract:

This study will document the state of the art of traffic calming in Israel. It will investigate the attitudes and positions with regard to traffic calming among the relevant players. In addition, it will investigate obstacles to its wide implementation, and review past and existing policies for the promotion of traffic calming in Europe and elsewhere, as a source for possible policies that may help overcome these barriers. The methods include interviews with key policy makers in Israel, local officials, community leaders, regional officers of relevant government officials, and a sample of traffic and road engineers. The researchers will also solicit feedback from local officials and residents on three case studies of planned traffic calming areas. In addition, they will undertake a literature review of foreign traffic calming policies and will carry out interviews with key policy makers in Europe, in order to identify successful tools and approaches that could be employed to promote the implementation of traffic calming areas in Israel. The research will sum up the obstacles to the implementation of traffic calming in Israel, and recommend policies to overcome them.

**Authors:** D. Shinar

**Title:** Understanding the mistakes of children as pedestrians while perceiving the risks when crossing a road

**Kind of Publication:** Ben Gurion University

**Year of Publication:** Ongoing

**Short Abstract:**

**Authors:** T. Rosenbloom

**Title:** Waiting periods of pedestrians at crossing with and without traffic island

**Kind of Publication:** Bar Ilan University

**Year of Publication:** Ongoing

**Short Abstract:**

## 4. Policy statements

## 5. The legal position of pedestrians in Israel

### Regulations for Pedestrians according to the Israel Ministry of Transportation and Road Safety

No.	Description
108	(a) Pedestrians should not walk on the side of a road unless there is a pavement or wide shoulders or a footpath; (b) Sub-regulation: regulation (a) does not hold for a pedestrian crossing the street.
109	(a) Pedestrians should walk next to the left side of the road with their faces towards the traffic; (b) When a group of pedestrians walks on an unlit road, the first and the last pedestrians should carry flashlights or reflective materials which can

	be seen by drivers.
110	<p>(a) Pedestrians should always watch the traffic on both sides and cross when it is safe;</p> <p>(b) Pedestrians should cross roads where there are pedestrian crossings;</p> <p>(c) Where there is no pedestrian crossing, pedestrians should cross the road near intersections;</p> <p>(d) Pedestrians should always cross the road at a reasonable speed and in a straight, short line.</p>
111	Pedestrians should not get off the pavement suddenly or uncautiously while a vehicle is approaching them.
112	Pedestrians should not stand on the road in order to stop a vehicle for a ride or any other purpose unless they are on duty.
113	<p>(a) Pedestrians should not cross the road where there is a pedestrian barrier on the side of the road or a two-level crossing;</p> <p>(b) Pedestrians should not be on the road where there is a pedestrian barrier.</p>
114	A pedestrian should not disturb other pedestrians on the pavement.
115	<p>(a) Regulations number 109, 110, and 114 do not hold for pedestrians participating in funerals or in a religious procession;</p> <p>(b) Regulations number 108a, 109, 110b, 110c, 110d, and 112 do not hold for pedestrians in residential yards (where there is no separation between the sidewalks and the pavement).</p>
116	A blind pedestrian should not walk on the road unless accompanied by another adult pedestrian or a guide dog.
117	<p>(a) Pedestrians should cross a railroad crossing unless they checked that there is no approaching train;</p> <p>(b) Pedestrians should not cross the railroad tracks and should not pass the barrier. Pedestrians should be 6 meters away from the railroad tracks if there is no barrier;</p> <p>(c) Pedestrians should not pass the barrier in anyway while it is closed.</p>

### **Regulations for Planning Pedestrian Traveling (2006)**

In this section, we will outline the regulations for planning pedestrian traveling (2006). This is part of a publication recently published (December 2006) on the planning of streets and urban spaces adapted for pedestrian's needs

- Definitions relevant to pedestrians (pavement, pedestrian lanes, pedestrian crosswalks...)
- Regulations concerning the signing and marking of pedestrian crosswalks
- Signing and Marking pedestrian crosswalks
- Planning for pedestrians in urban signalized intersections.

- Safety Barriers for pedestrians

## 6. Best Practices

## 7. Innovations

**Authors:** A.S. Hakkert, V. Gitelman, E. Ben-Shabat

**Title:** An Experimental Evaluation of a New Type of Uncontrolled Pedestrian Crossing

**Kind of Publication:** Research Report No. 115-203 (In Hebrew)

**Year of Publication:** 2000

**Short Abstract:**

The study presents a model that includes systems for detecting pedestrians near the crosswalk zone and for warning drivers on pedestrian presence; this is achieved by means of flashing lights towards the approaching vehicles embedded in the pavement adjacent to a marked crossing. The study evaluates the safety impact of the model, through consideration of changes in road user behavior in the crosswalk zone; in addition, it examines the operation under field conditions. Four sites were observed, two in Haifa and two in Bat-Yam. The findings show that under certain conditions the system can bring (1) about a 2-5 kph reduction in vehicle speeds near the crosswalk zone, (2) an increase in the rate of giving way to pedestrians, (3) a significant reduction in the conflict rate, and (4) a reduction in the share of crossings outside the crosswalk.

## 8. General Atmosphere

In general, although many regulations exist deciding on the priorities of the pedestrians while crossing, the atmosphere is one that strongly favours the motorized vehicles. Generally pedestrians will act defensively while crossing the road- and with good reason.

The introduction of traffic calmed areas is only in its beginning and even there the pedestrians have to behave cautiously- in spite of their rights and priority. The maximum speed in such areas is 25 kms/hour which is too high for combined pedestrian/vehicle movement.

By enhancing pedestrian safety at intersections, local governments can help facilitate achievement of the Plan's mission "reduction of pedestrian fatalities and serious injuries by 20% in five years. Marked Crosswalks. While marked crosswalks are an essential tool for channeling pedestrian movement in a predictable manner across roadways, they do not, in and of themselves, slow traffic or reduce pedestrian crashes. If the bus stops are not near a signalized intersection, an effective mid-block crossing should be designed. Remember that during the winter months, commuters using these bus routes may need to cross in the dark and the crosswalk will need pedestrian-scale lighting. New Jersey Department of Transportation. To enhance pedestrian safety, there is a need to improve the pedestrian facilities at signalized intersections. The study objective is to develop pedestrian safety index model in crosswalks at signalized intersections under mixed traffic conditions. The data were collected from selected eight signalized intersections in Mumbai, India by performing video graphic and questionnaire surveys. The Pearson correlation test was performed to identify significant factors with respect to pedestrian perceived safety index score. Stepwise linear regression method was applied to develop a safety index model. This paper introduces the concept of pedestrian safety conflict index and establishes a safety level system for evaluating the safety of crossing pedestrians based on the study of the mechanism of left-turn vehicle and pedestrian conflict at signalized intersections, with the hope of providing an improvement to pedestrian safety evaluation at signalized intersections.

## 2. Mechanism of Left-Turn Vehicle and Pedestrian Conflict.

At intersections that allow left turning, left-turning vehicles often start at the same moment as or shortly after (e.g., leading pedestrian interval) through traffic and