



Proceedings
of
Seminar J

The 22nd European Transport Forum

(The PTRC Summer Annual Meeting)

**Traffic Management and
Road Safety**

12 – 16 September 1994

TRAFFIC MANAGEMENT AND ROAD SAFETY

Proceedings of Seminar J held at the
PTRC European Transport Forum
University of Warwick, England
from 12 - 16 September 1994

Volume P381

Price for Delegates: £24.00

Price for Non-Delegates: £32.00

Published by
PTRC EDUCATION AND RESEARCH SERVICES LTD

on behalf of
**THE PLANNING AND TRANSPORT RESEARCH AND COMPUTATION
INTERNATIONAL ASSOCIATION**

1994

ACKNOWLEDGEMENT

PTRC would like to thank members of the Traffic Management and Road Safety Programme Committee who have so willingly given their time in helping to organise the programme for this Seminar:-

Colin Chick (Chair), London Borough of Hounslow, UK
Werner Brilon, Ruhr-Universität Bochum, Germany
John Brownfield, Oscar Faber TPA, UK
Richard Cunard, Transportation Research Board, USA
Benoit Ferry, INRETS, France
Peter Gray, Maunsell, UK
Carmen Hass-Klau, Environment and Transport Planning, UK
Ken Huddart, Independent Consultant, UK
Nigel King, London Transport, UK
Chris Leithead, Metropolitan Police Services, UK
Christian Machu, SETRA, France
Olivier Noel, ONSER, France
Neville Patterson, Queensland Department of Transport, Australia
Rod Smith, Cheshire County Council, UK
David Stark, Department of Transport, UK
Burt Stephens, Federal Highway Administration, USA
Hartmut Topp, Universität Kaiserslautern, Germany
Fred Wegman, Netherlands Institute for Road Safety Research, The Netherlands
Sam Yagar, University of Waterloo, Canada
Francesca Vinti (Programme Secretary), PTRC, UK

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Available from PTRC Education and Research Services Ltd.
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PEDESTRIAN ENVIRONMENT PROBLEMS ENCOUNTERED
BY THE MOBILITY HANDICAPPED IN CAIRO

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1. INTRODUCTION

United Nations declarations state that handicapped people have a natural right to all aspects of a normal and decent life regardless of their origin, status or type of disability. However, in many countries of the world the handicapped are considered as a minority dis-privileged group. One of the basic rights of any person should be the ability to move easily and comfortably from one place to another.

In recent years many countries in the world are giving more attention to the transport and pedestrian environment problems of handicapped people. Unfortunately in most developing countries the situation is still relatively neglected. This paper is concerned with this aspect of the daily life of handicapped people in Cairo. Cairo, the capital of Egypt, is considered as one of the most densely populated cities in the world. The pedestrian walking and crossing environment in Cairo is considered to be unfriendly and uncomfortable for ordinary pedestrians. The situation is much more aggravated when it comes to a handicap person walking on sidewalks or crossing streets in Cairo.

This paper presents the results of a questionnaire survey that was specially designed with the purpose of identifying the perception of mobility handicapped to pedestrian environment problems that they face in the streets of Cairo.

2. OBJECTIVES

This study has two main objectives. The first objective can be stated as attempting to identify the most profound difficulties and problems that the mobility handicapped face while walking on sidewalks and crossing streets in Cairo. The second objective is to suggest a set of policies and measures that are meant to improve the pedestrian environment for the mobility handicapped in Cairo.

The main known disabilities include sight impairment, hearing impairment, physical disabilities and mental disabilities. It was decided to concentrate the research efforts on surveying the Physically Handicapped (PH) and the Visually Impaired (VI) people. These are people who have difficulties in moving along sidewalks and crossing streets as well as difficulties in using available public transport facilities. It is to be noted that the (PH) within the scope of this study are those whose disabilities are mainly in their lower limbs (paralysis, amputation, disfigurement). The survey took the form of a questionnaire that was completed by a total of 314 mobility handicapped, of which 172 are (PH) and 142 are (VI). The collected data was coded and statistically analysed. The results of the analysis show the most serious and frequently encountered problems that mobility handicapped face in their pedestrian environment.

3. SURVEY DETAILS

Due to the lack of centralised statistics on handicapped people, the authors started by identifying the main associations and organisations that serve and represent handicapped people in Cairo. This includes educational, training, medical and social/cultural organisations, and district rehabilitation centres. Before designing the questionnaire, several preliminary visits to some of the main educational and rehabilitation centres for (VI) and (PH) people in Cairo were conducted. These visits included discussions and personal interviews with social workers as well as with people with mobility handicapped. In addition, meetings and consultations with managerial personnel responsible for these organisations were carried out. Parallely, several published studies in this area were examined. All in all, these helped to identify the different factors and problem areas thought to affect the transport accessibility and the street/kerb mobility of handicapped people in Cairo. Based on the previously stated study objectives and the insight gained from the pilot meetings, discussions and reviewed studies, a final questionnaire was designed by the authors, see Abbas and Mabrouk 1994 for questionnaire details.

Pilot questionnaire interviews were conducted by the authors. These showed the difficulties and the time consumed in completing the questionnaire forms. The first difficulty was perceived whilst conducting the pilot questionnaire with some of the (VI) people. The factors in the ranking questions had to be repeated two to three times and the final ranking stated by the (VI) respondent had to be restated by the interviewer so as to ensure that this is the correct meant ranking. Other difficulties were mainly related to the shyness of some of the young handicapped people to speak to the authors. On the other hand, some of the adult handicapped people exhausted a lot of time in discussing other issues unrelated to the study with the authors. It was decided to train some of the social workers in these places to help in conducting the final survey. The questionnaire forms were distributed and completed by the mobility handicapped with the assistance of social workers. In addition a large proportion of the (PH) survey was conducted using mail back questionnaires.

4. SAMPLE REPRESENTATION AND SOCIO-DEMOGRAPHIC DATA

In Egypt, as well as in many other countries, proper statistics on the numbers of handicapped people do not exist. This conclusion was reached by the authors after several formal and informal discussions with government officials responsible for handicapped people in Egypt. However, according to United Nations reports it is accepted to assume that the percentage of handicapped people in any country is around 10% of the population. Discussions with Egyptian government officials assured this percentage and further indicated that this percentage can be divided as 5% (PH), 3% mentally handicapped, 1% deaf and 1% (VI).

A sample, including (PH) and (VI) people, was selected to complete the questionnaire. The study followed the same approach of previously conducted studies in randomly drawing the sample of respondents from the registration books of associations and organisations that serve and represent handicapped people in Cairo, see Gallon and Oxley 1990, Harney 1992, May 1992, and U.S. DOT 1985. According to May 1992 "these could be classified as the active mobility handicapped". The sample representation is displayed in table 1. The table shows the number of questionnaires distributed and the level of response. The response rate to the questionnaire survey was considered acceptable when compared with other similarly conducted studies, see Dallmeyer 1976.

Survey Details (Sample Representation)	Type of Handicap	Physically Handicapped	Visually Impaired
Population in Cairo in 1993 (*)		68 13000	68 13000
Percentage/Number of Handicapped		5% i.e 340650	1% i.e. 68130
Sample Size (Percentage/Number)		1% i.e. 3406	1% i.e. 681
Final Sample Size Chosen (Percentage/Number) (**)		0.3% i.e. 1000	0.3% i.e. 200
Number of Returned Questionnaires		304 (***)	167
Number of Successfully Completed Questionnaires		172 (****)	142

- (*) Population in Cairo is based on 1986 census and 1976-1986 rate of growth. Source: 1991 Statistical Year Book, Central Agency for Mobilisation and Statistics, Cairo, Egypt.
- (**) Due to limited resources a decision was taken to reduce the sample size to 0.3%
- (***) Response rate for the (PH) is relatively low compared to response rate of (VI). This is mainly due to conducting a large proportion of the (PH) survey using mail back questionnaires forms.
- (****) Number of successfully completed questionnaires is relatively low as all (PH) with upper limb disabilities were excluded.
- (*****) All surveys and data collection work were conducted during the year 1993.

Socio-demographic data of the sample of respondents is displayed in table 2. The table shows that the respondents are mainly males. The level of education of most of the respondents is between illiteracy and primary school. Most of the respondents are government employees. Most of the (PH) respondents suffer from lower limb paralysis. As for the current age of the respondents, the mean age for the (PH) respondents is 30 years and for the (VI) is 33 years. On the other hand, the mean age for the (PH) respondents at which disability occurred is 5 years while for the (VI) is 7 years.

Table 2: Socio-demographic statistics of questionnaire respondents

Socio-Demographic Data	Responses		Statistics		Responses		Statistics	
	Number	Percentage	Mode		Number	Percentage	Mode	
Gender								
Male	146	85	Male		95	67	Male	
Female	26	15			47	33		
Level of Education								
Illiterate	54	31	Illiterate		47	33	Illiterate	
Primary school	54	31						
Secondary school	42	24						
University/Institute	19	11						
Postgraduate	1	1						
Other	1	1			1	1		
Employment								
Employed with government	66	39	Employed with the Government		55	39	Employed with the Government	
Employed with private sector	60	36						
Self-employed	6	4						
On-pension	0	0						
Unemployed	12	7						
Student	16	10						
Other	7	4			27	19		
Type of Work								
Unemployed/Student/On-pension	28	17	Worker/Civil Servant		44	31	Worker/Civil Servant	
Educator	3	2						
Worker/Civil Servant	65	39						
Trainee	7	4						
Craftsman	58	35						
Stall-holder/Hawker	6	3						
Other	0	0			1	1		
Type of Physical Disability								
Paralysis of lower limb(s)	132	77	Paralysis of Lower Limb(s)					
Amputation of lower limb(s)	35	20						
Disfigurement in lower limb(s)	5	3						
	Mean	Stand. Dev.	Mn.	Max.	Mean	Stand. Dev.	Mn.	Max.
Age	30	10	12	68	33	14	7	63
Age at which disability occurred	5	7	Birth	40	7	11	Birth	49

5. PEDESTRIAN ENVIRONMENT PROBLEMS ENCOUNTERED BY MOBILITY HANDICAPPED

The mobility needs for both the (PH) and the (VI) are displayed in table 3. The table shows that most of the surveyed (PH) need a crutch or a stick to help them in their movement. On the other hand, the table demonstrates that most of the surveyed (VI) need to be escorted by other people to aid them in their movement.

Table 3: Mobility needs statistics of questionnaire respondents

PHYSICALLY HANDICAPPED

Mobility Needs	Response		Mode
	Number	Percentage	
Need the help of others	7	4	Need a Crutch/ Stick
Need a wheel-chair	7	4	
Need artificial limb(s)	19	12	
Need a crutch/stick	33	20	
Need artificial limb(s) & the help of others	14	8	
Need a wheel-chair & the help of others	19	12	
Need a crutch/stick & the help of others	29	18	
Do not need help but still have mobility problems	24	15	
Do not need any aid	12	7	

VISUALLY IMPAIRED

Mobility Needs	Response		Mode
	Number	Percentage	
Need the help of others	82	60	Need the Help of Others
Need a walking stick	15	11	
Need the help of others and a walking stick	23	17	
Do not need any aid	17	12	

5.1 Problems of Mobility Along Sidewalks

In terms of handicapped mobility on sidewalks, figure 1 shows that the (PH) perceive **unevenness of sidewalks** as the most serious problem that they encounter when moving on sidewalks. This is followed in order of seriousness by:

- * narrow width of sidewalks,
- * vehicles parked and occupying sidewalks' space,
- * overcrowding of pedestrians on sidewalks,
- * existence of obstacles on sidewalks, and finally
- * lack of courtesy and concern of other pedestrians.

As for the (VI) people, figure 2 demonstrates that **obstacles on sidewalks** is perceived as the most serious problem that they face whilst moving on sidewalks. This is followed in order of seriousness by:

- * unevenness of sidewalks,
- * opened electricity kiosks,
- * narrow width of sidewalks,
- * overcrowding of pedestrians on sidewalks, and finally
- * lack of courtesy and concern of other pedestrians.

5.2 Problems of Mobility While Crossing Streets

The other component of pedestrian environment mobility is concerned with handicapped crossing of streets. The questionnaire revealed that the (PH) perceive the **general inadequacy of provision for pedestrian crossing** as the most profound problem that (PH) face when attempting to cross streets in Cairo, see figure 3. The figure shows that this problem is followed in order of seriousness by:

- * high level of kerbs,
- * high speed of approaching vehicles,
- * lack of concern of drivers, and finally
- * wide streets to cross.

As for the (VI), figure 4 demonstrates that they also perceive the **general inadequacy of provision for pedestrian crossing** as the most significant problem that they confront whilst attempting to cross streets in Cairo. The figure further shows that this problem is followed in order of seriousness by:

- * lack of concern of drivers,
- * lack of safety barriers around opened gutters/potholes,
- * high level of kerbs, and finally
- * wide streets to cross.

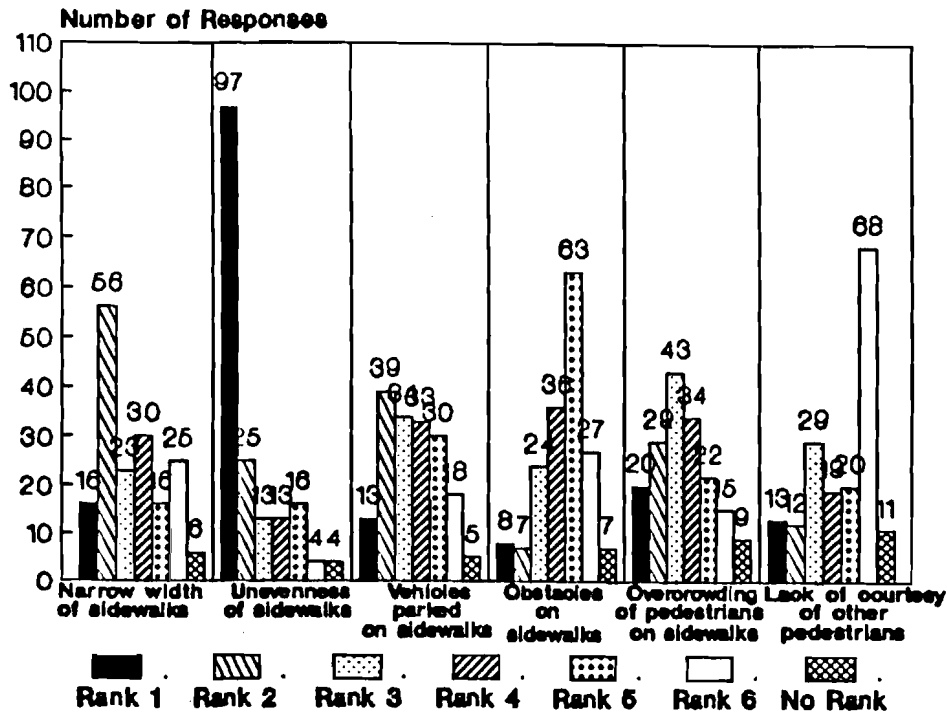


Figure 1: Ranking of side-walks mobility problems encountered by the physically handicapped questionnaire respondents

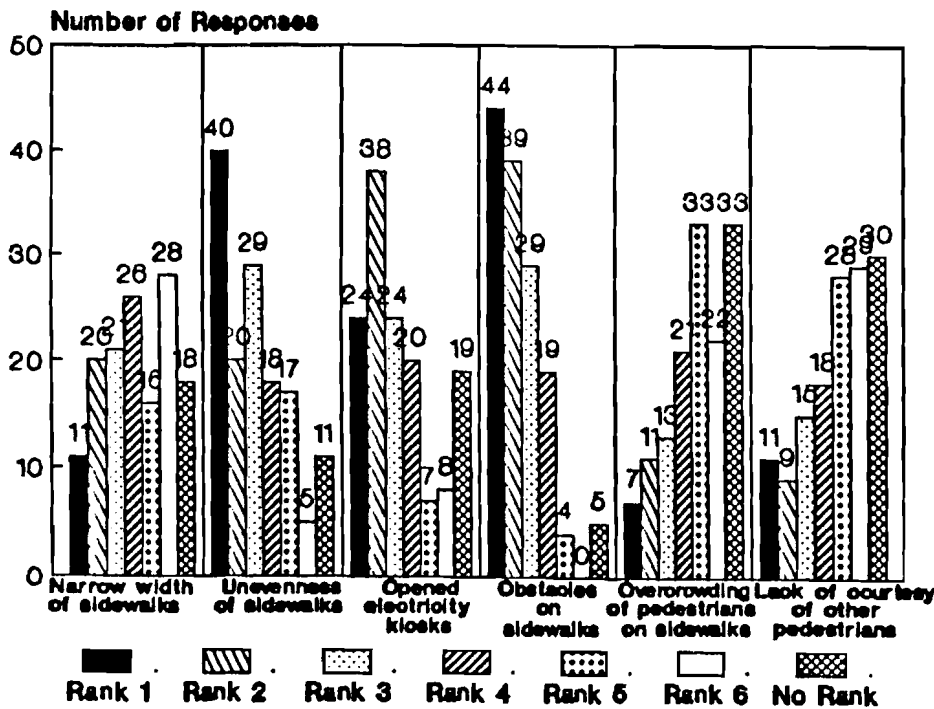


Figure 2: Ranking of side-walks mobility problems encountered by the visually impaired questionnaire respondents

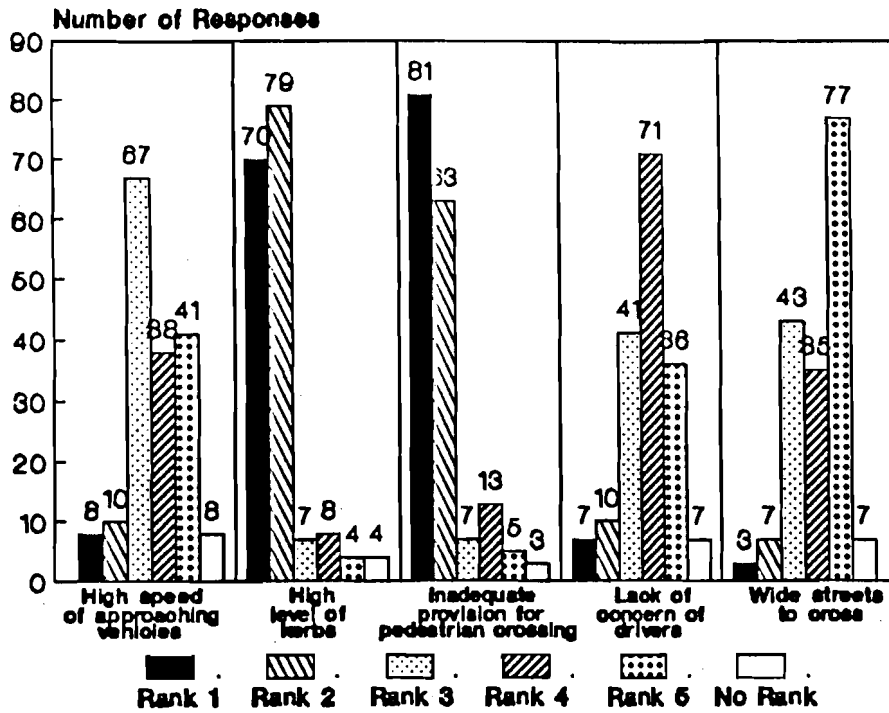


Figure 3: Ranking of cross streets mobility problems encountered by the physically handicapped respondents

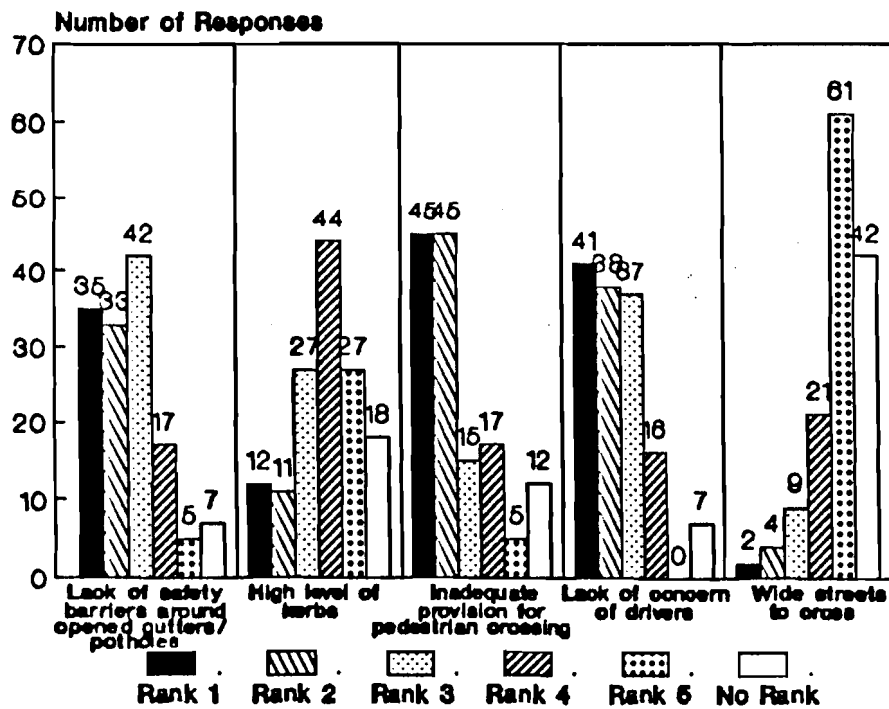


Figure 4: Ranking of cross streets mobility problems encountered by the visually impaired respondents

6. POLICIES AND MEASURES SUGGESTED TO IMPROVE PEDESTRIAN ENVIRONMENT FOR MOBILITY HANDICAPPED IN CAIRO

It is widely known that the enhancement and the betterment of the pedestrian environment for mobility handicapped induce broad benefits to all transport users especially the elderly, children, women particularly pregnant women, sick people (heart disease, diabetics) and in general all other able-bodied passengers.

Based on the literature survey and the study results, the following presents a set of suggested policies and measures that could be embraced and implemented to improve the pedestrian environment for mobility handicapped and to relieve the current problems that they face when walking along sidewalks or whilst crossing streets.

- * Enforce penalising car drivers for parking on sidewalks thus obstructing the pedestrian movement and specially the mobility handicapped pedestrians.
- * Prohibit stall holders, hawkers, petty-sellers, and shops from displaying their merchandise on sidewalks specially in heavily pedestrianised areas. This is meant to reduce the intensity of obstacles that hinder the mobility of handicapped pedestrians and might cause accidents.
- * Include in the design specifications of roads an increase in the width of sidewalks to allow for a more comfortable and easy movement of mobility handicapped.
- * Kerbs should be dropped at pedestrian crossings to ease the crossing of the (PH). However this should be accompanied with tactile surfaces to indicate the location and the layout of crossing points for the (VI).
- * Governorate road officials should guarantee the use of high quality materials for paving sidewalks and ensure an appropriate level of workmanship and regular maintenance so as to avoid the frequent occurrence of uneven sidewalks.
- * Hazardous locations such as open electricity kiosks should be fenced and visual and audible warning signs should be installed.
- * Promoting the awareness and courtesy of other able-bodied pedestrians towards mobility handicapped pedestrians. This can be achieved through continuous media campaigns and school children education so as to instigate a society feeling of understanding and appreciation of the difficulties that disabled people may encounter in their day to day pedestrian environment.
- * Savill and Chinn 1993 have reached a set of recommendations which ought to be considered in Cairo. These include: "installing audible signals at crossings and increasing the length of the green time".
- * Increase the number of controlled crossing points.
- * Establishment of appropriately placed resting places and seats so as to stage the walking distances made by the mobility handicapped.
- * Providing the (VI) with illuminated sticks (florescent or phosphoric) that enable them to signal to drivers to stop and give them priority to cross streets, specially at night. This traffic regulation should be added to the driving rules and new drivers applying for driving licences should demonstrate their knowledge of this traffic regulation among other driving rules and regulations.

- * Use of special tactile surfaces to provide high differences in sidewalks' surface roughness that can be felt and discriminated by the (VI). "Tactile surfaces are recommended to provide information in the following situations: warning of dropped kerb at crossing street; proceed with caution e.g. at steps; guidance through pedestrianised and platform areas; warning of heavy or light rail platform edge; information points (e.g. location of a telephone kiosk, bus stop, ticket kiosk), see Barham et al. 1994. In addition these can serve as warning signals for any obstacles or hazards.

7. CONCLUSION

In an attempt to identify the perception of mobility handicapped towards the seriousness of pedestrian environment problems that they encounter, a questionnaire was designed to serve this purpose. A sample, including (PH) and (VI) people, was selected to complete the questionnaire. The sample representation, including the number of questionnaires distributed and the level of response was discussed in the paper.

Socio-demographic data of the sample of respondents was presented. This include disaggregating respondents according to gender, level of education, employment, type of work, type of physical disability, current age and age at which disability occurred. Most of the surveyed (PH) need a crutch or a stick to help them in their movement, while most of the surveyed (VI) need to be escorted by other people to aid them in their movement.

The main results of the study can be summarised as follows.

1. In terms of handicapped mobility on sidewalks in Cairo, the (PH) perceive unevenness of sidewalks as the most serious problem that they encounter when moving on sidewalks. As for the (VI) people, obstacles on sidewalks is perceived as the most serious problem that they face whilst moving on sidewalks.
2. In terms of handicapped crossing of streets, the study revealed that the (PH) perceive the general inadequacy of provision for pedestrian crossing as the most profound problem that they face when attempting to cross streets in Cairo. Similarly the study demonstrates that the (VI) also perceive the general inadequacy of provision for pedestrian crossing as the most significant problem that they confront whilst attempting to cross streets in Cairo.

In conclusion, a set of policies and measures that could be adopted and implemented to improve the pedestrian environment for the mobility handicapped in Cairo and to relieve the current problems that they encounter when moving along sidewalks and whilst crossing streets, were suggested.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude and appreciation to Dr. Mohammed Nour and Mr. Moustafa Abd-Elatif of the Demonstration Centre for the Rehabilitation of the Blind, and to Mrs. Malek El-Sherbeeny of Al Nour Wa Al-Amal Society for the Blind. They were extremely encouraging and supportive in every sense. The authors are particularly indebted to Mr. Aly Elenshassy of the Demonstration Centre for the Rehabilitation of the Blind, who has voluntarily contributed his time and effort to support the authors in completing the surveys with the visually impaired people. Thanks and appreciation go to all the social workers, too numerous to mention individually, who have offered us assistance and support throughout this study. These people are and will remain a source of inspiration for the authors to conduct further research in this field.

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