THE ACCESSIBILITY OF BUS TERMINAL DESIGN

By
SITI SYAMIMI BT. DARUSAN
(0115276)

This thesis is submitted in partial fulfilment of the
Bachelor of Landscape Architecture

DEPARTMENT OF LANDSCAPE ARCHITECTURE
KULLIYYAH OF ARCHITECTURE AND ENVIRONMENTAL DESIGN
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
53100 KUALA LUMPUR

2003/2004

ACKNOWLEDGEMENT

In the name of Allah, Most Gracious, Most Merciful

Thank you to the Almighty Allah for His willingness to make me able to finish this research. Also, there are persons who had helped me in order to finish this research. Here, I would like to thank to those who had given me his or her sincere help while I am doing this report.

First and foremost, my deepest gratitude goes to Bro Zainul Mukrim b. Baharuddin who have guided and assisted me with his valuable knowledge, comments and advice throughout the completion of this research paper. His concern and support is greatly appreciated.

My special thanks to all of the involved lecturers from the Department of Landscape Architecture for their contributions in compile this report especially for Topical Studies subject course coordinator, Madam Mazlina bt. Mansor.

I would also like to thank Mr. Norlisan and Mr Zanzahid b. Md Tahir the officer of Urban Transport Deparment, Dewan Bandaraya Kuala Lumpur, for their cooperation while I was conducting the interviews.

Last but not least, to my mother and father for their support as well as to all my friends who had helped me in some ways in completing this research paper.

Thank you very much.

CONTENTS

CHAPTER 4
Result and Findings

CHAPTER 5
Conclusion

ABSTRACT

Terminals are end stations of one or more bus routes often used for any large station with facilities, such as waiting rooms, ticket offices, and so on. Bus terminal, on the other hand are off-street areas or buildings with stops point for several bus routes. The arrangement of the spaces provided at the terminal must also take into consideration, which will determine the accessibility of the bus terminal layout.

"Accessibility should be coordinated not only by analysing and responding to the context of the site but coordination should exists between parking areas, curb ramps, paved areas, rest areas with adequate seatings, lighting signages, building entries, and interiors. Continuous accessibility is also needed between building and within building, between parking areas, corresponding destinations and native destinations." (Charles and Nicholas, 1998).

There are some problems being identified, as an obstacle to make bus terminals accessible. There is no suitable measurement and scale provided for bus circulation and movement and no accessible facility for pedestrian especially for disabled person implemented in bus terminal design such as ramp, signage and hand railings. The existing guidelines provided by local authority and Public Transportation Department should be the reference in designing bus terminal. As a conclusion, to ensure the accessibility of bus terminals, it is not only the satisfaction of the users that matters but also the planning for circulation of the buses itself.

LIST OF FIGURES

Chapter 1

Chapter 2

Chapter 3

Chapter 4

Chapter 5

CHAPTER 1
Introduction

1.1 RESEARCH BACKGROUND

Bus terminal is one of public terminal provided. It is created mainly to provide facilities for users as a transit places from one place to another. The other meaning of bus terminals is, off-street areas or buildings with stops for several bus routes (Vuchan, 1981).

This research paper is mainly to investigate the most accessible of bus terminal design. In order to have the accessible design of bus terminal, this research paper will focusing on the study of design guideline and standard of bus terminal.

The accessibility of bus terminals is not only for human accessibility only. But it is also including its planning and circulation of the bus itself. The circulation of bus itself will ensure the accessibility of the bus terminal.

In order to facilitate the bus terminals, it's also being supported by other function such as restaurants, shops and so on. By that this research paper also will investigate the function of spaces that include in bus terminal design. So, it is important to have best design and layout of bus terminal in order to make it accessible.

Since bus terminals consist of various types of users, so that the design should be accessible and user friendly. The facilities of bus terminal such as ticket counters, signages and ramp for disabled users should be considered it terms of its location. This research paper will study on the design that can cater various types of user and also the accessible facilities that should been provided at bus terminal.

Hopefully this research paper will come out the best design and solution of bus terminal design and guidelines. It is to improve bus terminal facilities that mainly to provide ease for bus terminal users by having accessible bus terminal.

1.2 GOALS

The goal of this research paper is to study the accessibility of bus terminal design in terms of its design and layout. This research paper mainly to improve the accessibility of bus terminal design so that, it can upgrade the quality of services at bus terminals, since bus terminals have various types of users.

1.3 OBJECTIVES

There are several objectives need to be achieves in the process of completing this research paper.

i) To study design guidelines and standards of bus terminal design.

ii) To study accessible planning design for accessible bus circulation.

iii) To identify landscape element that functions as accessible features in bus terminal design.

iv) To study and highlight the function of space and its accessibility between each other.

1.4 PROBLEM STATEMENT

1) The design of bus terminal, which is not considering about user movement, is one factor in causing inaccessibility in bus terminal design. So that, the guidelines for access to public transport need to be implemented in designing accessible bus terminal.

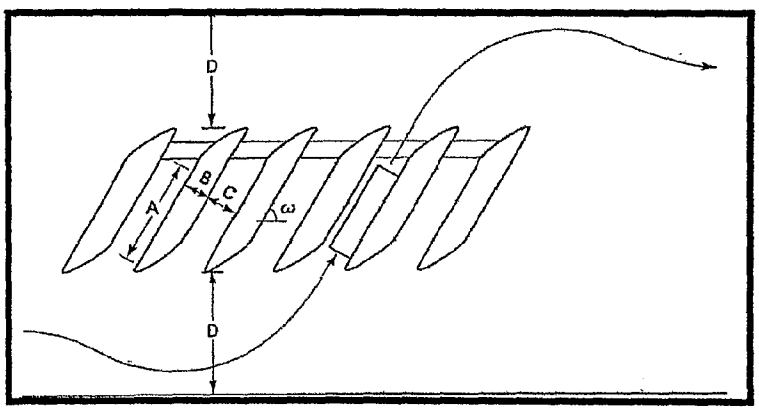
2) The lack of awareness of the access need of persons with disabilities in public transportation was identified as a cause of inaccessible public transportation systems. The situation had been compounded with the negative attitude towards disabled persons and ignorance of the abilities and aspirations of persons with disabilities.

3) In bus terminal design there is no specific design of facilities that can be accessible for disabled person. The design only considers about the comfort ness of normal people. In order to have accessible bus terminal design, the facilities of bus terminal must be barrier – free designs, so that they can be used by disabled people.

1.5 SCOPE OF STUDY

There are several types of bus terminal layout currently being used. Each of its layouts has its own advantages and disadvantages. In designing bus terminals, the trade – off between operating flexibility and curb length required must be evaluated. Independent arrivals and departures are always desirable for flexible operation. The greater length involves walking distances and requires more shelters and more elaborate passenger information. (Vuchan, 1981)

One layout of bus terminal was, bus terminal with "Parallel Island". It is the terminal which having series of parallel island separated by single-lane roadways. This layout is efficient for major terminals with many routes. The common design of island is at angles of 45^0, 60^0 and 90^0 to access the roadways. The shaper the angle, the larger the dimensions are, because of sharper turning angles. (Vuchan, 1981)



	A	B*	C	D
45^0	L' or 2L + 1.00	1.50-3.00	3.25	8.00-10.00
60^0	L' or 2L + 1.00	1.50-3.00	3.50	10.00-12.00
90^0	L' or 2L + 1.00	1.50-3.00	3.75	12.00-14.00

* For stairs or escalators leading to pedestrian mezzanine 1.50-2.50 m should be added

Figure 1.1: Design dimensions for island bus stops

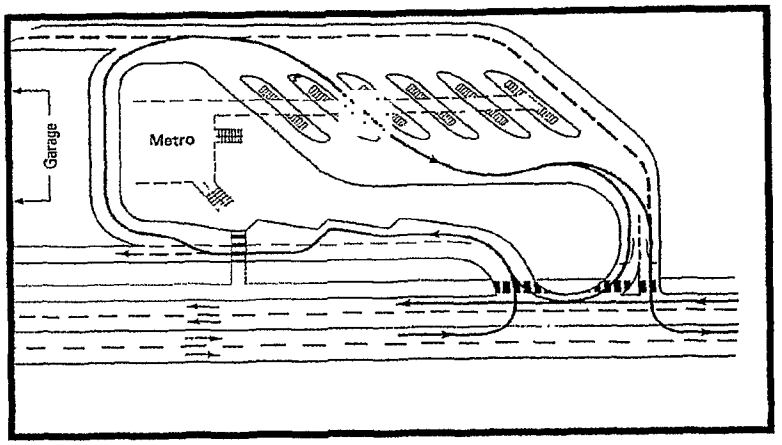


Figure 1.2: Bus-rail transfer station with island stops

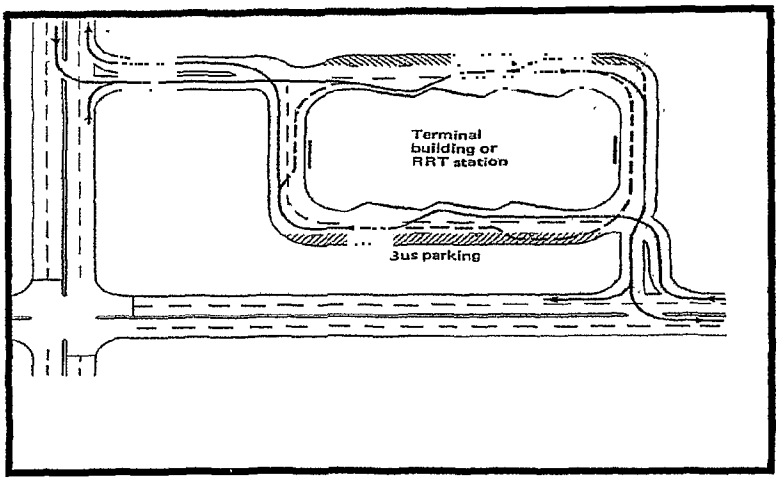


Figure 1.3: Central Island station in quadrant of an intersection

Another types of bus terminal layout were called "Central Island". It is the best layout for pedestrian safety, comfort and convenience. This layout of this bus terminal was, terminal around a major rectangular or oval shape. This arrangement allows passengers transfer among all bus routes or between buses without crossing a roadway. The station is thus a complete " pedestrian zone". The pedestrian crossing provides connections with adjacent streets. However, the crossings may be omitted and pedestrian access even prohibited in order to make the island a "ticketed area" (area restricted to passengers who have paid fares). They then can transfer between buses and trains without fare payments and controls. (Vuchan, 1981).

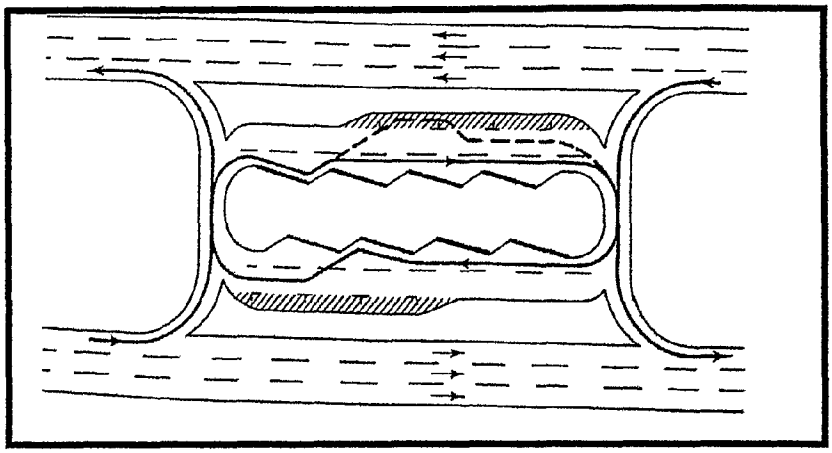


Figure 1.4: Parallel station between a pair of one-way streets

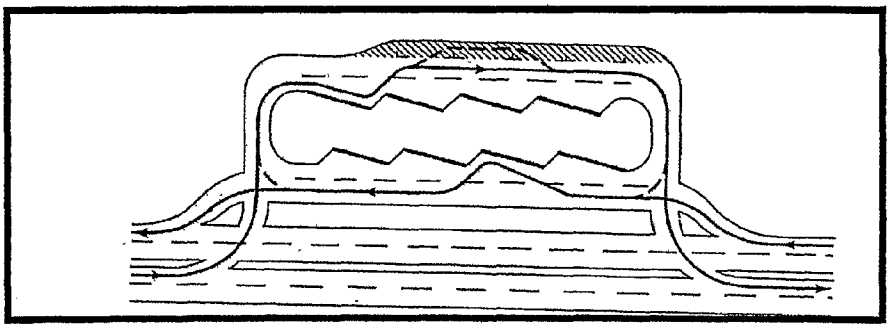


Figure 1.5: Parallel station on the side of a two-way street

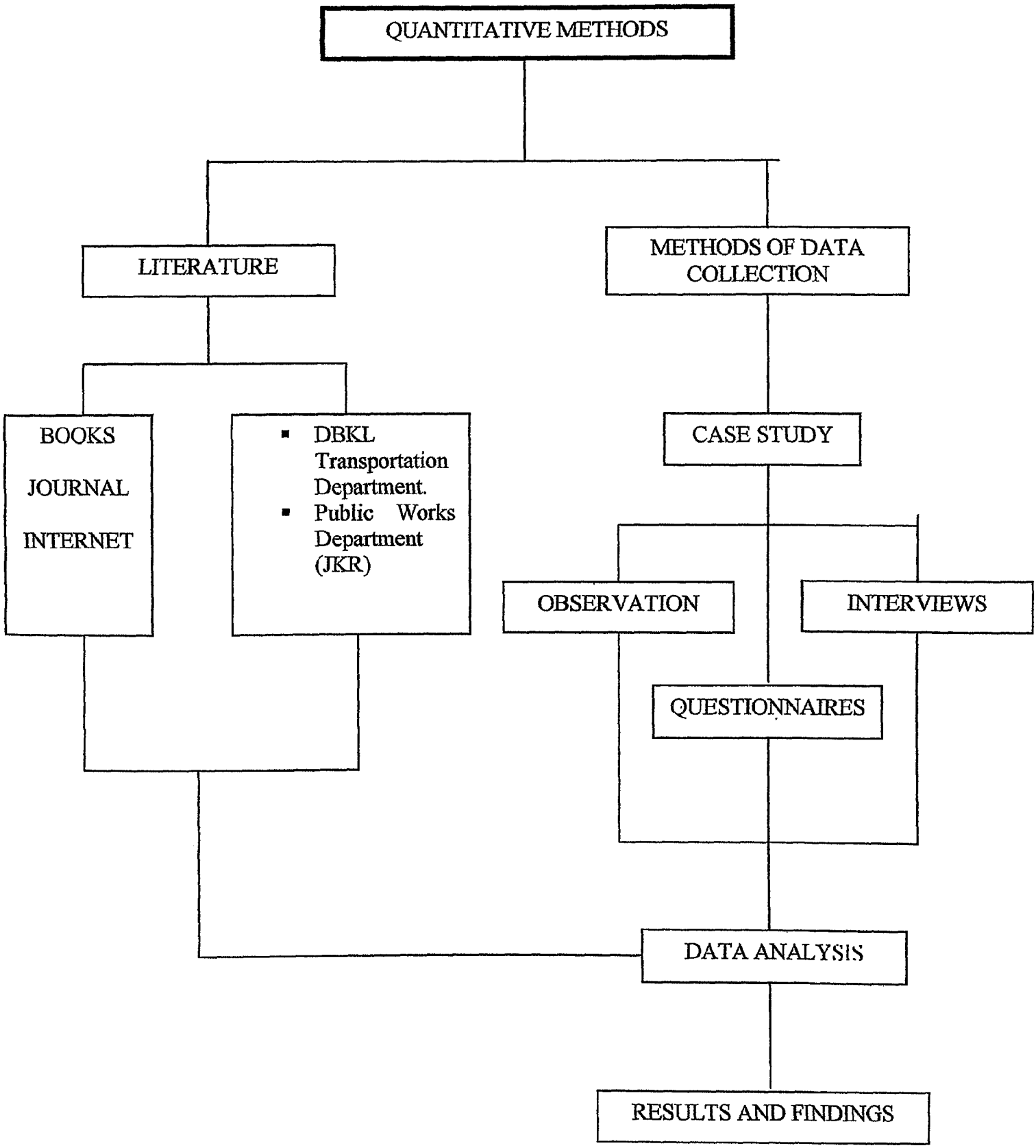
The central island also has excellent operating features. The circular roadway allows buses to unload passengers at one location, move to a waiting area, then return to the same, or to another stop location for boarding. Moreover, these stations can be used by routes passing through, as well as for the terminating ones with buses simply "looping" around the island and returning to the same direction. (Vuchan, 1981)

For this research paper the study of bus terminal will focusing on outdoor layout of bus terminal. For this types of layout, the layout of bus terminal will be different from the other layout that been mention before. This is because the building area that is accommodate ticketing area and other facilities will be located separately.

For the departure and arrival areas will be at outdoor area an. This area will be covered with structures to give comforts to users. The selection of this bus terminal layout is because of to concentrate in landscape design at outdoor bus terminal. A part of it, it is also to study the accessibility of bus itself in terms of its circulation.

By having outdoor landscape for bus terminal it is hope that this research paper will help in upgrading outdoor bus terminal services. It is mainly to provide better facilities of bus terminal for user convenience.

1.6 METHODOLOGY



This research aims to achieve several goals and objectives as been stated. In this topic there will be an explanation about the main methods that being used in this research paper. Different methods will be employed in exploring a problem situation, helping solve a problem, or establishing acceptability or otherwise of a hypothesis. Some of these methods can complement each other. (Roger, 1981). The methods being used for this research paper is quantitative methods.

1.6.1 Literature reviews

In order to do research, the understanding of the topic of should be the first. To understand the topic several types of gathering information had been done through literature study that related to this topic. There were various references such as books, journals, Internet and magazines being used as a literature study in this research.

a) Books

There are numbers of books being used during completing this research paper. All books that related with bus terminal design and guidelines being used as a references. In order to make this research paper complete, any kind of books that related with accessible design and study also being used as a guidelines. It is to get the exact accessible design guideline to be implement in designing bus terminal.

b) Journals

A part of using books as a reference, some journals that related with this research paper also being user in collecting data and information. I is to search the design that been implemented in bus terminal and to get the information on it accessibility.

c) Internet

In completing this research paper, method of using internet being used in collecting information as reference study. It is mainly to get the information and design of bus terminal from the overseas. This is to explore the variety of design from overseas that been implement successfully in making bus terminal more accessible. It is also being

used in collecting literature reviews of the accessibility of bus terminal design.

d) Magazines

To make this research paper complete, the overview of some issues and problems need to be compiled to strengthen the problem statement. It will be the base and foundation to solve the problem that related in bus terminal.

Apart of it, the information also gathered by collecting information from any department that related with this topic. From here, the selection departments were, Malaysia Transportation Department and Public Works Department (JKR) Malaysia. On this stage there will be interview session in completing data collection. The respondents of interview session consist of the person which expert in this field. The intention is to get exact layout and design of bus terminal from those of the department, at the same time to get their opinion and suggestion about this research topic.

a) DBKL Transportation Department

From the DBKL Transportation Department the information related on, management and services would be collected. The information being collected through interviews method and data analysis.

b) Public Works Department (JKR)

There are also the collections of information from this department. The purpose is mainly to get the information on layout and design of bus terminal.

The information gathered will cover all topics in this research paper. It contains the information about bus terminals design and guidelines. The literature review will cover about accessible design of bus terminal. It is to investigate what is landscape element that function as accessible features in bus terminal and function of each space in bus terminal. A part of it, it is also to collect information about design that related with disable person and facilities that can be accessible by them.

1.6.2 Case studies

The observation of several case studies will be conduct in order to collect information about bus terminal. There are several consideration been taken through the observation on the case study. The consideration based on, its design and layout, the spaces provided in bus terminal and also accessible features that playing role making bus terminal more accessible, covering user accessibility and vehicles accessibility aspect.

There were two bus terminals been selected to be as case study. The selection of case study is based on the design and layout of the bus terminal. A part of it, it is also based on the circulation pattern of the bus terminal which is can be considered as quite successful in its accessibility. The selected bus terminals were, Larkin Bus Terminal, Johore Bahru and Hentian Duta bus Terminal Kuala Lumpur.

Through this case study there are several method being used in collecting data. It is to make the collection of data more effective and useful. The methods being used were, observation, interviews and questionnaires distribution.

a) Observation

The observation on the case study will be based on to study what is happen in bus terminal. It is mainly to observe users activity and to get the layout of the bus terminal. The observation also will cover on the circulation of user movements on each every spaces in bus terminals. The methods of observation will be from photograph and