INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA

UMI®
800-521-0600

Shaping Benghazi Center Plan

Benghazi Center Plan for the Year 2014

BY

Amer M. Ben-Ali

A Practicum submitted to the Faculty of Graduate Studies of the University of Manitoba in partial fulfillment of the requirements of the degree of

MASTER OF CITY PLANNING

THE UNIVERSITY OF MANITOBA

FACULTY OF GRADUATE STUDIES

*****

COPYRIGHT PERMISSION PAGE

SHAPING BENGHAZI CENTER PLAN
BENGHAZI CENTER PLAN FOR THE YEAR 2014

BY

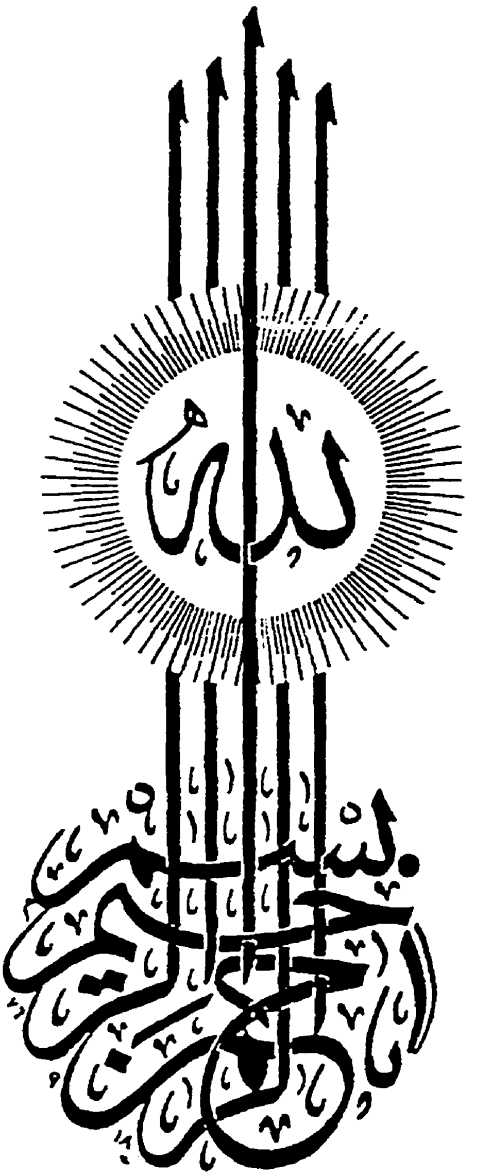
AMER M. BEN-ALI

A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University

of Manitoba in partial fulfillment of the requirements of the degree

of

MASTER OF CITY PLANNING



IN THE NAME OF GOD, MOST GRACIOUS, MOST MERCIFUL

I hereby declare that I am the sole author of this practicum.

I authorize the University of Manitoba to lend this practicum to other institutions or individuals for the purpose of scholarly research.

Amer M. Ben-Ali

I further authorize the University of Manitoba to reproduce this practicum by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

Amer M. Ben-Ali

TABLE OF CONTENTS

Chapter Three – Benghazi Context

Chapter Four – Design Proposal

Abstract

Urban design in the Arab world is now at a crossroads. Much traditional urban design has been lost, and while some city centers remain intact, the future of many of these is being threatened. It is the objective of this project to indicate how traditional design can be revived to lend character and identity to the modern city. More specifically, the goals of this study are to provide a well-organized development framework to guide and control transformations in historic districts of the **Benghazi's Center Area for the Year 2014**, and to reduce pressures from the central business district on conservation areas by providing suitable expansion opportunities in areas reserved for that purpose.

The process of arriving at the final proposal consists of the following three steps:

1. Examining literature concerning urban design, and through such material, adopting the series of guidelines that the planning and design approach of this project is based on;

2. A comprehensive survey of the historic fabric of the city, involving the collection of necessary information on historic value, physical condition, and land use. Along with this, an appraisal of existing conditions in the central business section was made;

3. After analyzing relevant literature and the actual condition of the center plan, the social and city planning requirements of an administrative center at an urban and regional level was determined. Then, the project was tested and the final proposal was presented.

Acknowledgements

Sincere thanks to my practicum committee; Dr. Sheri Blake (advisor), Dr. Carl R. Nelson Jr., Professor Rafael Gomez-Moriana, and Dr. Ian Skelton for their guidance, time, and feedback. I would also like to thank the University of Manitoba staff, and students for their support throughout my study in Canada. A heartfelt thank you goes to my mother who has always supported me in everything I have done. I cannot thank my dear wife, Fatma, enough for the support she has given, and for her patience during my completion of this degree. Thank you very much. Above all , I would like to thank my God, Most Gracious, Most Merciful, for making all this possible. Finally, this practicum is dedicated to my father.

LIST OF TABLES, ILLUSTRATIONS, & PHOTOS

LIST OF FIGURES & DRAWINGS

Figures

Drawings

GLOSSARY

Al Jabal Al Akhdar – The Green Mountains.

Baladiyat – Municipality.

Berenice – The wife of Ptolemyz III.

Cyrenaica – Greek settlers.

Funduq – livestock emporium.

Hara – Neighborhood branch out of spine "*qasaba*"

Mahalas – District

Masijid – Mosque.

Medinah – City.

Qasaba – Commercial and administrative axis.

Qbli – Southern winds from the Sahara desert during the summer.

Sabkhas – Salt marshes.

Sajad – To bow in worship.

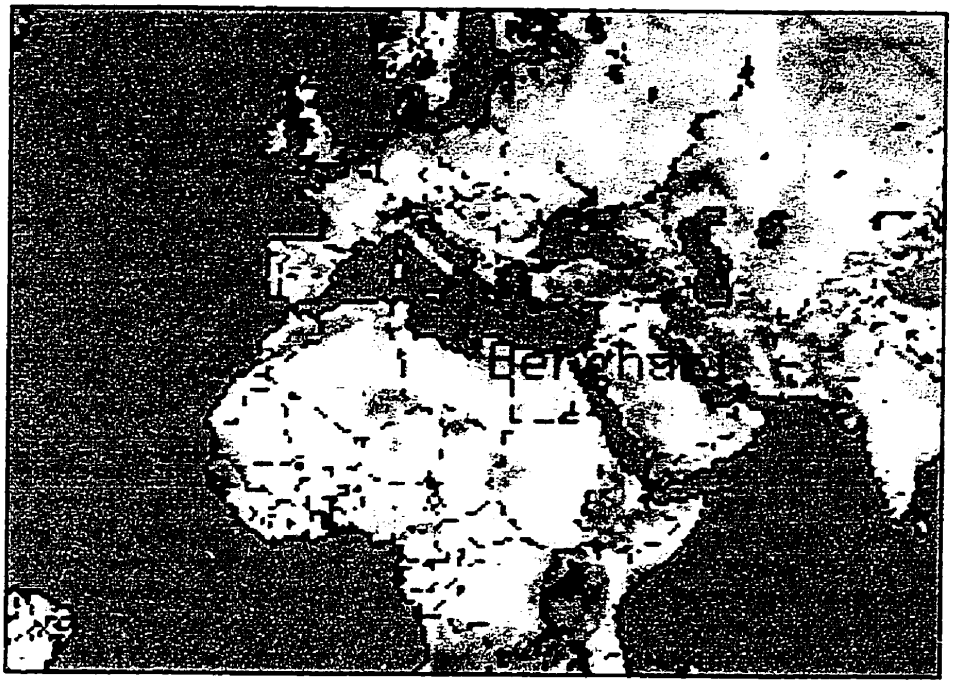
Seedi Ghazi – Libyan religious figure.

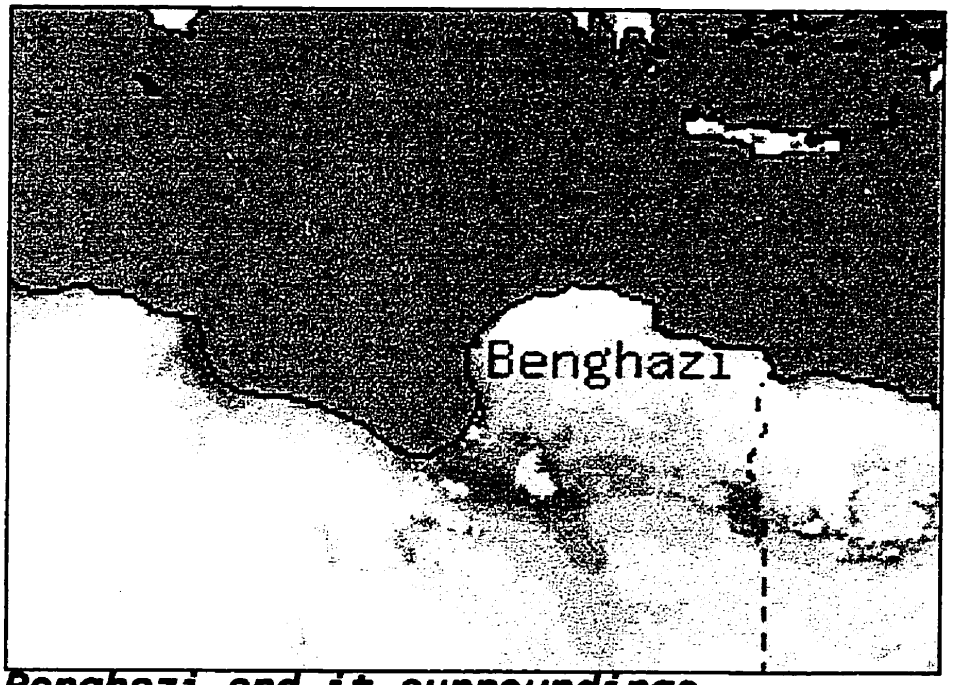
Sharia'a – Islamic legislation.

Sidi Khrebish – Greek Cemetery.

Souq – Arabic Market.

Wakalas – wholesale.





Benghazi and it surroundings

Benghazi: WHERE AND WHEN

A little history to start with

Benghazi is the second largest urban settlement in Libya and one of the major seaports on the African and Mediterranean coast. The city runs along about 4 kilometers of coast, looking west to the Gulf of Sirt, roughly at the point where it opens up to the east. Located 1,043 kilometers east of Tripoli, the city is built on a strip of land in the middle of salt marshes *sabkhas*, extending out towards the flat rocky hinterland that is the elevated plateau of the *Al Jabal Al Akhdar* (the Green Mountains)[1].

Illustration 1 :

The Historic Area of Benghazi with cemetery of *Sidi khrebish* Light house and principal tombs

The historical background of Benghazi dates back to ancient times. Greek settlers of *Cyrenaica* founded the city at the end of sixth century B.C. They named it Euesperides for its beautiful gardens. By third century B.C., it had already

been made a provincial capital in the Ptolemaic Kingdom of Egypt, and it was given the additional name of *Berenice* in honor of the wife of Ptolemy III. The ruins of this town now lie in a hilly triangle in the old core[2] **(Illustration 1).**

The Arabs conquered the city at the beginning of 7th century[3]. Much later, in 1450, Ghazi or "*Seedi Ghazi*," a respected religious figure who aided the city and its people, became the namesake for Benghazi. In the next century (1578), the Turks invaded Benghazi. After this period, it was ruled by the Karamanlis of the Ottoman Empire from 1711 until 1835. Benghazi was then selected as the chief administrative center for that empire. This function was strengthened by the transformation of the city into a chief military center during the Italian occupation (1911-1942), and by its promotion, along with Tripoli, as a dual capital of Libya in the first decade after the 1951 declaration of Libyan independence[4].

Photo 1 - Benghazi Port and the Waterfront

Over time, this dualism in national administration had a positive impact on Benghazi. The level of economic services, or commerce and business, the provision of higher order public and social facilities (administration, education, health, culture, and so forth); and the existence of an international airport and seaport, today make Benghazi comparable to Tripoli. Also, there is the immediate influence of the city over the oil-rich *Baladiyat* (region) of Al-khalij as a center for administrative and financial services. A role for Benghazi also exists on the international stage. Oil production and the resulting trade links have resulted in a range of business and economic relationships, predominantly with European countries[5].

In a regional context, the importance of the city is illustrated by the gesture of naming the surrounding region after Benghazi. Such importance is indeed surprising, given Benghazi's geographical position (**Figure 1**) as the western-most of Libya's five major urban centers[6].

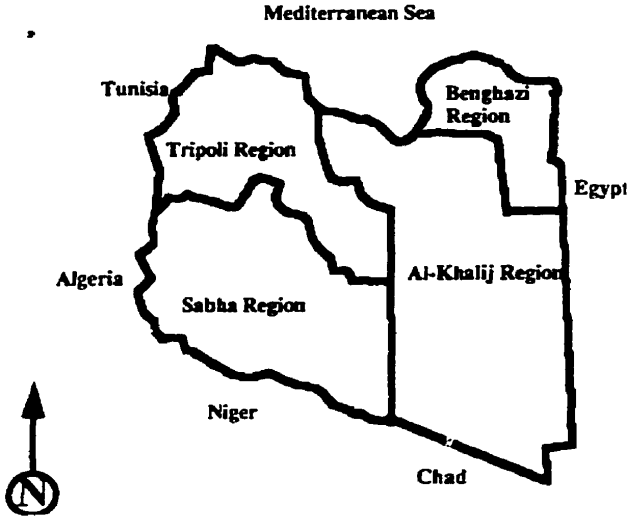


Figure 1: Libya- Regional Map

CHAPTER ONE

Introduction

Cyrene Nynph crowned by Libya

1.0 Introduction

1.1 Problem Statement

The city is a phenomenon of civilization encompassing not only social and political progress but also healthy population growth. A thriving urban center exemplifies man's ability to adapt to a given environment, to ensure social stability and a good community life, and to successfully cope with the challenges of the development and growth process. Researchers have endeavored to determine common characteristics of cities to discover and apply a universal civilized ideology to various communities[7].

Cities existed more than five thousand years ago in ancient civilizations in China and India, then in Greek and Roman empires, and later in medieval Europe[8].

Then, the Islamic City emerged, that is to say, a city with an ideological foundation based upon "Islam." Some Western researchers such as William Porter and Jacques Berque have accurately noted the advantages of the Islamic city, and how it has had a more profound effect than the Roman city, an effect equal to the cities of Greek and Western civilizations. Islamic civilization has continued to exist for over eight hundred years, and presently, an Islamic urban renaissance of note is occurring. While each Islamic city differs, they also have many common characteristics correlated to the ideological roots and civilized elements

of the Islamic way of life their development is rooted in, characteristics forming a general, shared framework[9]. The ideological roots of the Islamic city are further explored in the literature review.

Having passed the peak of the modern era, society is now standing on the brink of the post-modern era, a time, which presents a situation of ambiguity for urban developers. On the one hand, we are not in a position to naively resume the pre-industrial tradition. Too many social, economic, and technical factors in the urban system have changed both radically and gradually. However, wholesale demolition is not the appropriate way to deal with the architectural area of the city. Wherever this approach has been chosen, the results have been unfortunate; sudden disruption has resulted in chaotic conditions in both modern and historic parts of cities. The coherence of the city has been lost, and, of course, the sense of cultural identity and historic continuity has vanished. While parts of the historic urban fabric rightfully need to be replaced, others should be adapted.

The situation today is, in one respect, without precedent; previous generations have usually been able to continuously change and develop a city without causing irreparable breaks in the urban system. There are two reasons for this. First, architectural patterns used to remain more or less consistent. Secondly, interventions in the environment were not usually massive, and they were spread over long periods of time. In contrast, we are presently faced with two

opposing forms of building which are actually interconnected. At one end is the often brutal, large-scale, economically driven new developments that are realized with the immense resources of modern technology. They introduce an alienating scale and functionally rather than aesthetically motivated architecture into a historic city. At the other end, are conservation projects in reaction to the massive developments, projects that often end up being sterile because they unfortunately do not consider the requirements of a living city. Although less aggressive in physical terms than the original developments, they may just as easily lead to the eventual death of the urban fabric by squeezing out its life and vigour[10].

1.2 Objectives

The paradox facing city planners in the Islamic world today is to find solutions that lie between these extremes. This is the objective of my study. These solutions should create developments that can appropriately interrelate and reconcile conservation and innovation in optimal ways for the city of Benghazi.

The roots of the Benghazi Master plan date back to 1989, when Doxiadia Associates (consultants) drew up a new master plan for the city of Benghazi, and recommended a new city center to transform the city into a new urban-region structure. In this structure, the city center would become the fulcrum for the whole regional system of Cyernaica[11].

Their plan was to concentrate the administrative function in the center area to reduce pressure on the historic part of the city. Following the completion of this plan, the city hired Italian planners to draw up what would be a flawed master plan that would put Dioxide's recommendations into action. Fortunately, perhaps, for lack of money, the plan was only partially executed.

This project, which was promoted by the governor of Benghazi, could be called a typical "prestige plan." It included libraries, museums, auditoriums, large trade centers with specialty shops, and fifteen-story high government buildings. Its architectural composition, conceived as totally isolated schemes with no regard whatsoever for its surroundings, was very stiff.

In order not to repeat the mistakes of the previous center plan design, the purpose to undertake a comprehensive analysis of the total context - the physical, social, and economic factors affecting the city center, and the urban conditions for the central area as a whole - before beginning the urban design process. Only after completing this analysis could I begin to develop the goals and objectives for a city center, which would become part of a completely new central-area concept that could interweave the old core and the new city center development where they meet[12].

1.3 Methodology

The following step outlines the process by which the urban planning project was approached.

Define problem

After examining the master plan it became apparent that the plan did not address the special needs of the Benghazi Center Plan. Particularly, the need to upgrade the administrative center to global urban standards in enough detail to meet the requirements for predicted population growth for the region was not well met.

Examine Literature

Initially, efforts were focused on examining current literature. The literature was divided into two categories, a history of the Islamic city structure and comparable modern Islamic cities, which are discussed in chapter 2.

Preliminary Alternatives

Following the literature review, two alternative strategies were developed. One involved developing a surrounding park around the old city and a new administrative center on the site proposed by the master plan. The second alternative was to propose a new land use taking into consideration the existing textures of the city and developing from the periphery of the old city to the proposed master plan's new administrative center. Both alternatives are covered in chapter 3.

Evaluation

Once the two alternatives were developed, they were evaluated, and the second alternatives was further developed.

Redefine Study Area

During the course of the evaluation, a further definition of the study area was requested, to be achieved by going into more detail and further defining the urban context.

Goals and Objectives

After defining the context, the goal and objectives of the study area were determined. In brief, this involves an attempt to meet predicted global urban standards for the year 2014, standards based on the literature review and the predicted population at that time.

Development of selected Alternative

Once the goals and objectives were determined and the context defined, the selected alternative could be approached in further detail. This alternative was then developed into a plan of action.

1.4 Limitation

Due to the broad nature of the field of urban design and the limited time for the practicum, certain limitations have to be placed on this study to focus it toward the desired ends:

1. This study will mainly focus on modern Islamic Arabic city center plans' case studies. Because the structures for the city planning of most Arab cities are quite similar, it has therefore been assumed that the successful urban design approaches of Oil Arab cities are likely to be adaptable to the Benghazi context.
2. This project will only focus on the understanding of basic urban design principles of Islamic cities and the development of a common vocabulary, both linguistic and graphic, through which to communicate these principles.
3. This project will just consider the guidelines for the future development of the Benghazi New Center Plan within the context of its own region, taking into account both the present and future needs of the expanding city.
4. The analysis of the Benghazi context will be general, while the study of the existing center plan will take place to complete an overall physical proposal for an existing area and to formulate a design proposal for the new area.

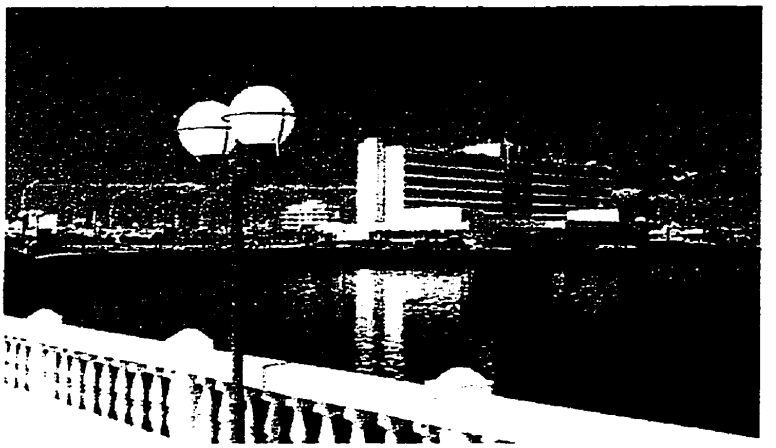
1.5 Assumptions

The proposal is based on a number of assumptions made with respect to development in the center area, projected population growth, and the transportation system. All these assumptions have been proposed and set by the city consultant (Doxiadis). When implemented, they will have a profound effect on the center plan.

CHAPTER TWO

Planning Guidelines

Examining literature relative to urban design and from this adopting a series of guidelines for a planning and design approach.



2.0 Planning Guidelines

The research method used is based on examining literature relative to urban design, specifically on how models of Islamic urban patterns were adopted for the purpose of relating to today's physical environment. For a greater ease of understanding, this literary review has been grouped under two separate headings. The first section of the literature review, entitled "The Structure of an Islamic City," is based upon an extensive examination of the characteristic patterns of the Islamic city throughout history. The purpose is to determine the patterns and relations that exist in Islamic urban form. Following this is the second section, entitled "Center Plan Guidelines," which examines current practices in central district planning as seen in modern Arabic and European cities. This part of the review provided the necessary statistical and structural background to meet the standards required of today's global cities.

2.1 The Structure of an Islamic City

The Islamic city is characterized by the existence of three main elements. First, there is the congregational mosque in its urban center,[13] or more precisely, in the middle of the *qasaba*, which is the main commercial and administrative axis, which, in turn, represents the second main element of the city. Third, there are the residential areas extending along both sides of the *qasaba* with alleys branching out from the main spine. This area consists of socially

homogeneous residents, that is, residents who are of the same profession. However, these residents have variable income levels[14].

The influence of Islamic legislation *Shari'a* was very obvious on the regulation of the physical fabric in the city, as religion was the main reference for everything concerned with construction and urbanization, either for private housing or neighborhood rights in residential buildings. In each quarter, the ruler's deputy was responsible for street order and regularity, not only regarding urban aspects but also for environmental, commercial, and social behaviour aspects. So it is evident that Islam did not neglect any part of human life, and this was physically reflected in the concern and interest with pedestrian paths as much as in polluting auto-transit paths. Furthermore, the Islamic methodology emphasized the connection between these paths, and the concentration of religious, educational, and commercial activities on pedestrian axes away from auto paths which, while not the only reason for the physical decline and deterioration of the old city, did change the social structure and the Islamic manner of cities[15].

The general urban fabric of the city signifies homogeneity and comprehensiveness. Buildings are of moderate heights and approximate sizes, distinguished by their vaults and designs made in consideration of climatic conditions, living requirements, and family privacy. Yet the geographic boundaries of the residential quarters are not as clear as

in the city, that is, they are bordered by major roads or landmarks and service facilities at the neighborhood center. Quarters are intermingled together along main activity spines *qasaba*, and eventually, secondary spines *Hara* branch out of the *qasaba*[16]. The population of these *haras* ranged between 400-600 inhabitants, which is considered a reasonable figure for a social neighborhood on the level of the *haras*. For inhabitants, social homogeneity occurs with economic disparity, and the same characteristic is also evident on the level of city districts.

The Islamic city's urban image also manifests homogeneity in structural and residential densities, as disparities between districts are very limited because social divisions in earlier times were related to occupation and not to income level. It was also found that the old city tends to extend horizontally rather than vertically because land habitation is an Islamic value and Islam has prohibited high edifices. Islam always considers modesty and calls for compromise, a fact reflected simultaneously by land subdivision, building regulations, and economics.

2.1.1 Land uses in the Islamic City.

The main spine *qasaba* in the Islamic city encompassed a variety of interrelated uses: commercial, residential, administrative, educational and religious ones. The same composition was repeated on a smaller scale in the secondary spine and further on the *hara*, where residential

use was the only and dominant activity on it. Therefore, land-use surveys are based upon floor occupancy rather than land area.

Commercial activities are always situated on the main spine. Types of commercial activity varied along the *qasaba* from retail trade opening directly on the spine to wholesale in the *Wakalas*, or spacious *souq* market. The commercial streets in the Islamic City are characterized by their specialization in certain goods and crafts, a phenomena that has stimulated commercial businesses, competition, the respecting of regulations, and the submission to supervision and inspection.

The commercial centers in the Islamic city were known for their security not only because mosques were located along the commercial spine, but to reveal the compromise between materialism and spiritualism in the Islamic methodology. Also "the call for prayers five times a day indicates that Muslims' commitment to their values come from their internal devotion and not just from obedience to positive law, as in *sura (62) Gum'a, verse (9)*: "O ye who believe! When the call is proclaimed to prayer on Friday (the day of Assembly), Hasten earnestly to the remembrance of God and leave off Business... That is best for you if ye but know.[17]"

The visual character of the commercial street varied from one part to another. Parts were covered, others open, and some areas were semi-shaded, depending upon the type of

merchandise sold and the local climatic conditions.

The residential clusters[18] comprised groups of housing units for those occupying the same profession. This socially homogeneous group encompassed a population of 400-600 inhabitants living in a group of houses which open on a dead-end alley *hara* owned jointly by the inhabitants. The *haras* as a whole constitute the residential cluster19. At the entrance of each *hara* there used to be a gate to ensure security and accentuate the unit and the solidarity of inhabitants. Subsequently, this dead-end alley opened onto a secondary spine from which other alleys branched out forming residential groups[19].

Along the secondary spine extend areas designated for commercial, educational, administrative and religious activities. Eventually, the secondary spines pour into the city's main spine, where lies the congregational mosque and ruler's palace[20].

"The boundary of neighborhood is forty houses, to the right, the left, to the front and to the back" as it was mentioned in Prophet Mohammed *Hadith* (Peace and bless be upon him). This means 160 houses in total. Therefore, if a house is considered one unit, and the average family consists of five persons, the population of the neighborhood will be 800, a number that demands a nursery, three commercial stores, and a social service unit[21].

The urban pattern of the Islamic city has developed according to both available potential and to suitable standards for roads and building masses. This, however, does not mean that there is no need for contemporary change in auto-transit or public utilities. The old pattern forms the internal network for pedestrian circulation and an underlying public utilities network, while rapid transit axes can be relocated in the outer area, allowing for light transit modes even if they interfere with pedestrian circulation.

2.1.2 Urban Design Guidelines of Islamic City

According to the literature survey, Modern Arab Cities and the historical plans of Fustat in Egypt, and Kufa and Basra in Iraq had basic design criteria and urban design standards which could be adopted for the planning and design approach.

The urban center is normally centred around the Mosque. This center consists of a complex comprising the mosque, cultural center and health center on one side, and the municipal, administrative and service building complex on the other. The two complexes are located at the district's main plaza at the center of the main spine. The urban center is serviced through external *cul de sac* roads. The municipal, administrative and service building complex includes the district's headquarters, post office, and central telecommunications offices. The cultural center encloses a multi-purpose hall, a library, sitting rooms,

utilities and a garden[22].

The size of the plaza is determined with respect to traffic density and is based upon the transversal cross section that shows appropriate building heights in proportion to the length or width of the plaza. This plaza is allocated for public activities and gatherings, therefore consolidating the community's relationship to its physical environment. The location of the mosque is inevitably well defined within the urban composition by its characteristic form and its minaret. Gathered around it in one mass are the cultural and health centers, which express the intimate role of the mosque in daily life.

The **Mosque** is the main element of the Islamic City. The word "mosque" in Arabic is pronounced *masijid*, a name derived from the verb, *Sajad*, which means to bow in worship. The service range of the mosque is determined by the maximum walking distance and the utmost point the muezzin's (announcer of the hour of prayer) voice can reach, which is a circle approximately 400-m in diameter, a measurement that takes into consideration that high buildings might obstruct the announcer's voice[23].

The population of a neighborhood determines the number of worshippers in a mosque. The area of the mosque can be calculated according to a standard per person area of prayer of 1.2 sq. m - 1.4 sq. m. Therefore, a mosque for 200 worshippers will range between 240-280 sq. m in area, and a mosque for 600 worshippers will have an area

ranging between 720-840 sq. m.

The categories of mosques, walking distances to them and their capacity area as follows:

Local Mosque: There are several levels to the local mosque, the first of which, at 48-384 sq. m, occupies from 40-320 worshippers. The second level occupies 320-960 worshippers, and its area ranges from 384-1152 sq. m. The capacity of the mosque and its area are determined according to the size of the neighborhood unit. It is the nucleus of the neighborhood unit, so walking distance to it should not exceed 150 m.

The Congregational Mosque: This lies in the district center, as walking distance does not exceed 250-300 m. It is surrounded by commercial shops, services and a public park. The capacity of the congregational mosque ranges from 2,560-7,680 worshippers, and it is of an area ranging between 3,584 and 10,752 sq. m.

The Grand Mosque (for Feast Prayer): is located at the periphery of the city. If the city's population is over 100,000 persons, more than one grand mosque could be required. There are no limits for walking distances to such mosques, but their capacity should be no less than 40,000 worshippers.

The spine, *Qasaba*, which is the principle spine, is similar to a district's center in western theory, whereas the Islamic city did not develop or originate "around the

Agoras in the Greek city, or the Forum as in the Roman city, but has developed along its principle *Qasaba*[24]."

Along its sides, the *Qasaba* holds the commercial activities on the first floors, while professional activities occupy upper floors together with residential units. The urban center lies at the middle of the *Qasaba*, and is characterized by the mosque's architectural mass, which is at the axis of administrative facilities. It holds half of the total commercial activities, while the other half is distributed along the neighborhood spines. The numbers of shops are calculated based upon a ratio of 14 shops/1000 persons. Consequently, if the district holds a population of 6,400 persons, then the corresponding number of shops reaches 90 shops, half of which extend along the *qasaba* (43-45 shops), while the other half is distributed upon the neighborhoods. These figures are calculated approximately, as they vary from one location to another depending upon the community's economic, social, and cultural status. The *qasaba* holds professional, educational and religious facilities in addition to commercial ones. Pedestrian traffic is concentrated along the *qasaba.* and is intermingled with light transportation[25].

The **open spaces and public area** in the Islamic city are determined according to the actual social values within the community relating to the pursuit of privacy and environmental conditions. Within this context, the open

areas, being defined spaces, gradually differ in size from the grand open plaza of the urban center, to the mosque's plaza, to the local center plaza, to the vast court encompassed within the residential cluster. The longitudinal space of the *qasaba*, whether shaded or open, is considered the principal axis linking those spaces together. The size of each space is defined in relation to the human scale of the individual utilizing it as well as to surrounding building heights and their architectural compositions. Ultimately, these spaces are organized appropriate to the nature of the area[26].

It is also recommended that public spaces have some social or cultural function to ensure proper guidance and care for these spaces. They could, for instance, house a social club or a sports club,

2.2 Center Plan Guidelines

2.2.1 Definition of A Central Area

Extensive research has highlighted the complex task of providing a precise definition of what exactly constitutes the center area. Apparently different terms, the central business district, the administrative center, and the central function area, all refer to it. However, they carry the same meaning, differing mainly for cultural and language reasons[27].

In modern Arab cities, the city center is identified as the

administrative center, even if it has an extensive residential function[28]. Administrative activities are "those deriving from the constantly more complex organization of contemporary society." The increasingly specific and skilled labor force, known as the tertiary production sector, has lead to a location of activities and workers in the concentrated and spatially limited area of the city center. Hence, administrative activities are the "center.[29]"

The function of the central area differs from other areas in the city, and the rule governing the concentration of administrative activities contribute to strengthen these differences. This gives rise to a concentrated "central nucleus," which lends cultural and town planning problems to the rest of the city[30].

Currently, there is a tendency in newly developed Arab cities towards the central nucleus becoming a business area[31], like the central business districts in European and American cities. In both cases, the central nucleus fulfills administrative[32], commercial[33], civic[34], and political functions at a regional, national, and sometimes international scale.

In American cities, where historical stratification is not considered as much, there is a tendency to define and separate the qualification and hierarchical classification of the center area functions from the remaining urban territory. In, fact, these central areas generally feature an urban design comprising straight lines, squares,

grid-type blocks, and so forth, all of which aim to highlight the central area amidst the city at large.

A city may be classified on the basis of the urban functions fulfilled by its central area. The economic and administrative concentration present in the area determines the quality and characteristics of the local functions to be performed. The nature of administrative activities does not solely depend on a population figure; total population is one of the less important variables in the specification of the urban central area. The central location of a city in its region may only be measured in terms of the quality and quantity of assets and services offered.

The above factors have led to the conclusion that the city center constitutes a central area allocated to specific services and facilities. So, in the design process, the type of the services supplied should be considered. In other words, the user threshold (minimum population required to sustain the supply of any given service), the zone of influence, the time necessary to reach it, and so forth, should be analyzed. This is to say, design must be considered in conformity with town-planning standards[35].

2.2.2 Relationship between Central Area and Administrative Activities

The close relationship of tertiary and administrative activities to the central area has been examined. Furthermore, the elements contributing to the area's

character have also been analyzed.

Firstly, the need to define the functions of a central area can only be fulfilled after a detailed analysis of the administrative activities and facilities. Administrative facilities comprise the whole number of sites where the decision-making centers of the entire public and private system are located. "Facility" is a term meaning a complex comprising different services and activities[36], In town planning, facilities constitute the "spatial support" which allows for services, the organized activities fulfilling town planning requirements[37].

The majority of town planning concepts consider it necessary to concentrate management functions while decentralizing operative ones. The administrative center, the city center, or the central area performs, in particular cultural, recreational, and temporary lodging functions.

In recent years, many modern Arab cities have adopted a compact type of administrative center with complex and multiple functions for example the justice palace district in Riyadh (**Illustration 2**). The connection of this center to the surrounding region (or zone of influence) is based on a "time" factor, that is, the center lies equidistant and, time-wise, is equally accessible from any place in the territory.

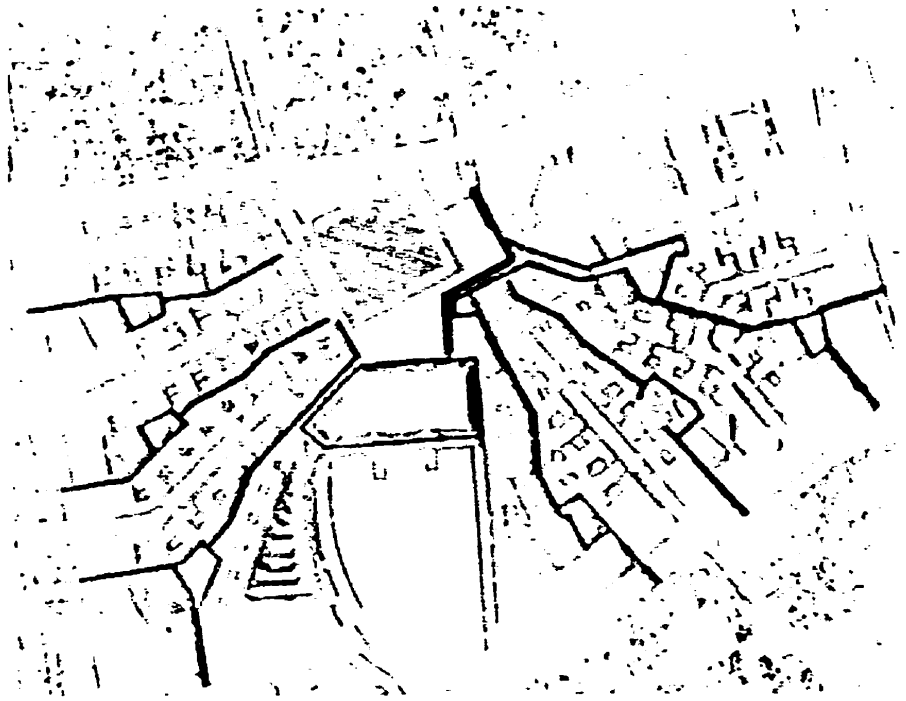


Illustration 2: Aerial view of Riyadh the New Administrative Center

The administrative facilities fulfill different functions:

- Public and private functions (local organizations, executive and judicial power, new political organizations at a regional scale, credit, institutions, professional and trade unions, etc.);
- Cultural functions (museums, libraries, press agencies, etc.);
- Commercial and consumer functions (management, agents, *souq* (department stores, etc.);
- Transportation functions (e.g. bus terminals);
- Residential functions (hotels, boarding houses, etc.).

Commercial, administrative, and representative functions are usually located in the central area of a major urban center. The term, central area, indeed refers to the

guarantee of a concentration of functions and interests, a continuous exchange of basic information, and the availability of advanced technical means. The administrative center, maybe more than any other urban area, is in constant interaction with the remainder of the city and territory, with the intensity varying according to whether or not the level administrative activities occur on an international, national, regional, or community level of importance.

It is clear that an administrative center of a large city having specific political and administrative functions is different from a center in a smaller and less important city. In a larger city, different activity sectors serving a range of areas from international to local are brought together. Moreover, the administrative center of a capital city, or even the seat of a local government, is more unique and diverse than that of other cities of the same size. However, it will have comparatively more administrative significance. This is due to functional activities in a capital city working at all levels of importance.

An in-depth analysis of the above issues has proven to be extremely useful in defining the basic criteria for choosing the administrative facilities' location. For this reason, a study of the city plan concept and the administrative facilities in Jeddah[38], "Community and Unity[39]" has been used as a starting point, with its guidelines adapted to a Libyan context.

Following is a reference system for the various central functions at different levels of importance. The central functions system is sub-divided into ten employment sectors.

Each sector, being homogeneous in character, concerns a particular field of activity and possesses its own rules and structural components.

Institutional sector

Comprised of the representative government, regional, municipal authorities, as well as those institutions working with Arabic and other countries (e.g. embassies and various international organizations).

Public administration sector

Comprised of the technical and functional agencies of the public system at a central and local level.

Special administration sector

Special operative institutions and enterprises, as well as firms, agencies, professional associations, etc.

Credit and insurance sector

Includes international, national and local banks, credit institutions, financial agencies, and insurance agencies.

Media sector

Includes foreign delegations in charge of press houses, press agencies, TV stations, movie production companies, etc.

Culture and recreation sector

Including all cultural organizations: libraries and museums, public institutions such as schools foundations, conference and performance halls.

Commercial sector

Includes hotels, real estate agencies, travel agencies, consortia, and wholesale markets *Souqs*.

Transportation sector

Includes the bodies and associations responsible for transportation infrastructure.

Religious sector

Includes all places of worship and the centers and associations for religious practice.

Health sector

Includes all the institutions and centers in charge of health research and public social security.

Each sector comprises all the institutions, which operate at all interest levels – international, national, regional, and local. Depending on the characteristics of the urban centers where they are to be found, some sectors concentrate activities mainly at one level as listed in **(Table 1)**.

	Central Functions Sys.	International Level	National Level (Libya)	Regional level (Benghazi)	Local Level (Municipality)
		Function Type	Function Type	Function Type	Function Type
1	**Institution**	Embassies and Foreign Delegations and International Agencies	Institutional HQ The High Court	Immigration Supreme Court and Court of Appeal	Municipality Headquarters
2	**Public Administration**	Foreign Public Agencies, International Chamber of Commerce	National Agencies Public Companies	Judicial Offices Regional Agencies	Municipal Court Chamber of Commerce Stock Exchange
3	**Special Administration**	Headquarters of Multinational firms	Real Estate & Engineering Firms, and Industrial & Commercial Firms	Professional Offices Research Institutes Public Relation Offices	Professional Offices
4	**Insurance and Banks**	Foreign Banks and Financial Agencies Foreign Insurance Companies	Insurance HQ, Central Bank, and Financial Agencies	Banks HQ Insurance HQ	Bank & Insurance Agencies
5	**Press and News**	Radio and Television Foreign Delegations Foreign Newspapers	Television Centers, News Papers and Magazines HQ	Regional Television and Radio Centers Newspaper Agencies	Local T.V and Radio Newspapers Press and publishing
6	**Culture and Recreation**	International Culture Centers International Libraries International Cultural Associations	Various Cultural Institutions, National Libraries and Research Institutes	Various Cultural Institutions, Conference Halls, and Sports Center	Sports, Recreational, Museums, Libraries, and Theatres
7	**Commerce**	Hotels International Travel Agencies	National Airline HQ Commercial Agencies	Hotels Commercial Agencies Market	Travel Agencies, Special shops, General Market (Souq), Real Estate Agencies, etc.
8	**Transportation**	International Airlines Import -Export Agencies	National Transport	Transport Associations	Bus Terminals Local Public Transport Private Transport
9	**Religion**	Worship Places for Other Religions		Main Mosques	Mosques
10	**Health**	International Hospital and International Health Research	Social Security	Regional Health Center	Hospital

Table 1: Central Functions at Different Levels of Interest Concerning Benghazi New Center Plan

What define the "centrality" of a center, that is, its polarization capacity with respect to the territory, are the presence of and the quality level of well-defined administrative activities. There is a relationship between the level of importance and the urban center and, more explicitly, between the functions and the classification of the city that may be defined as BI-univocal, or global and regional. In fact, although a city acting as a seat of regional government may develop administrative activities both at regional and local levels, it is also clear that the presence of administrative functions at a regional level is the reason why a city originally became the seat of the regional government[40].

2.2.3 Functions and Locations

There is a series of interrelationships among the ten categories of central activities involving functions belonging to either several activity systems or to only one other system but at different levels of importance. The functional transport system, for example, is strictly linked to the commerce sector, since transportation categories such as airport terminals overlap commercial categories including wholesale trade and the collection and storage of goods. Then, in the framework of a single system, the institutional sector, for instance, international institutions are closely related to local ones. Following are the exchange and relationship requirements of the functional system:

- Internal functional characteristics (organization,

dimension);
- Relationship with other functional systems;
- The necessity of interconnections (infra-structural network);
- Relationship with the user should the religion and institution be accessible to the public.

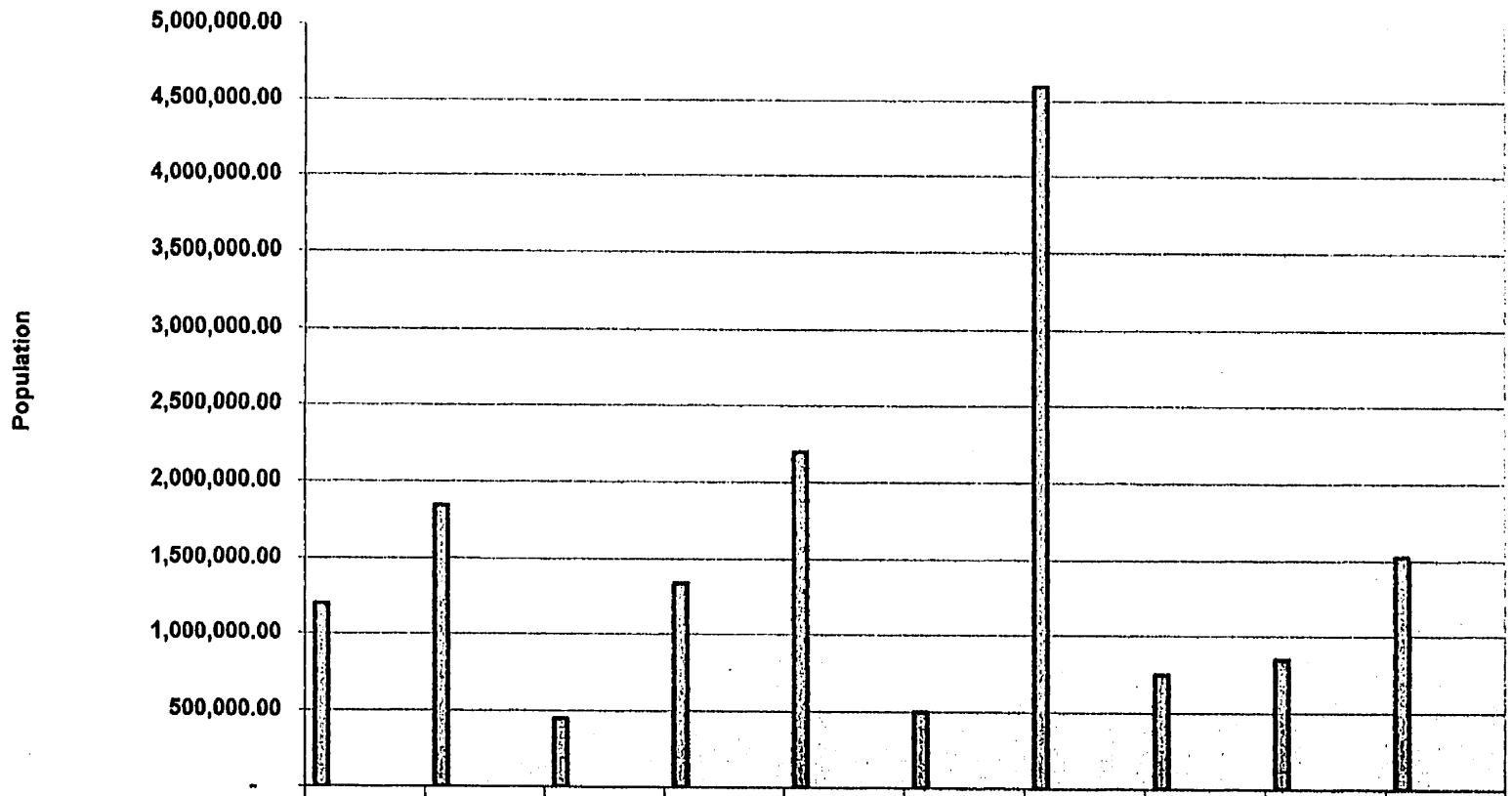
The location for any kind of activity, therefore, must take into consideration the problems related to the choice of the site.

The in-depth study of plans and projects concerning Arab countries and foreign city centers has brought to light the multi-functionality that is to be found at all levels of a city center. As a model, this study used cities with a population of over 500,000; cities, which played a prominent role in their region because of their administrative and commercial characteristics. The following states the reasons those cities listed on **(table 2)** were chosen as part of the study:

1. Modern Arab City is built with consideration to existing historical fabric;
2. Cities built within a body of water share similarities with Benghazi;
3. Cities with similar economic levels (Middle Eastern oil cities) will offer related statistics;
4. Cities centers built within the last twenty years will give pertinent information;
5. Cities with similar populations, functions, and

sizes offer useful comparisons;

6. Helsinki (was used because Helsinki University created the Urban Planning Department at the University of Benghazi);
7. Montreal (was used to compare Arab cities with North American cities and the country where the research for this project carried out).



	Tripoli	Riyadh	Manameh	Jeddah	Montreal	Helsinki	Tehran	Abu Dhabi	Kuwait	Average
Population	1,200,000.	1,850,000.	450,000.0	1,340,000.	2,200,000.	501,000.0	4,600,000.	750,000.0	850,000.0	1,526,777.
Central Area (ha)	450	380	350	215	81	35	500	288	224	280.33
Ratio Central Area Inhabitants (m2/inhab)	0.38	0.21	0.78	0.16	0.04	0.07	0.11	0.38	0.26	0.26
Built-up %	42	43	34.2	30.4	51	29	35.9	39.6	32	37.46
Roads %	28.5	31	23.6	33	21	23	24.1	28	26	26.47
Green Area, etc and Open space %	29.5	26	42.2	36.6	28	48	40.1	32.4	42	36.09
Annual Population %	3.03	2.94	3.63	3.2	0.61	0.85	2.98	3.08	7.13	3.05

Table 2: City Centers Model Study

On the basis of the model cities data, it is evident that that the city centers considered feature the same central functional activities, albeit at different levels of importance. This confirms that the existence of a series of functional activities determines the "centrality" of a given area. Therefore, the city center does not necessarily have to be located in the central area of a city. In Arabic and European cities, the location of a major city center is usually at the original historical nucleus.

2.2.4 Accessibility of a City Center

Besides featuring the values and characteristics of a multifunctional system, the city center located in the urban pattern must fulfill the requirements of accessibility[41]. This is particularly important because accessibility is, of course, directly related to the analysis of internal and external road networks. In the functional framework of a city center, a regular flow of traffic depends on the quality of road networks. Because of the constant need for exchange between functions of different sectors or levels, internal roads will influence the maximum efficiency of communications required for localized activities. On the other hand, the external road system provides the administrative complex with maximum access possibilities by allowing for the circulation of large numbers of people from and to any location in the metropolitan area.

2.2.5 Dimensioning of a city center

In order to define the quantitative and qualitative components of a city center it is necessary to:

1. Define the central functions;
2. Define the quantity of the different functions, which characterize the city center.

The modern Arab and European cities also offer data that is helpful for the dimensioning of the areas where planning is taking place. The data collected was organized into three categories **(table 2)**:

- Built-up areas: business, housing, trade, cultural activities, health, etc;
- Road network and open space areas: all parking areas (users, employees, etc.), roads, and plazas;
- Free areas: green belts, restricted areas, public parks;
- Archaeological and historical sites.

An average value among urban centers considered was determined for the above categories:

- Housing: 18.2 % of built-up areas (37.46 %);
- Road network: 24.08 %;
- Free areas: 26.47 %;

What was also deduced from the comparison of these different plans is territorial density (m2/inhab.), that is to say the territorial area for each inhabitant living and/or working in the central area. This parameter is

useful in determining the variations, on the basis of the different cities (saturated or not), in actual conditions in the areas allocated to city center functions.

Each type of function requires a survey of the population employed in the different employment sectors as well as an evaluation of the employment capacity of the central functional system. This evaluation must consider that a large city represents the "gravitation" pole of the labor force in the context of its regional territory or zone of influence.

According to urban situations described in publications[42], 30% of the population working in the tertiary sector is actively employed in administrative activities. This percentage has tended to decrease over time because of the decentralization of administrative activities either towards areas on the periphery of the city center, or to suitable areas allocated for new administrative centers.

In Jeddah, for example, the projection for the year 2000 for administrative workers in the city center was 16.7 % of all administrative workers. At the same time, it is predicted that 78 .6 % will be working in the new "equipped center," that is to say, a center that has all necessary services[43].

Such a decentralization process has occurred in cities where the center is already saturated, and where the high cost of the urban land, the historical and environmental

value of some buildings, and urban patterns have constituted an obstacle to the location of new activities and to the expansion of existing ones. The problem is quite different, though, when a city features a vast free area inside its city center, as in the case of Benghazi where the available land is about 400 hectares. In spite of it including a large archaeological site and park, it is still a suitable location for various administrative activities. These would provide a supply of jobs in the administrative sector equivalent to a minimum of 20% and a maximum of 30% of the active population.

2.2.6 Relationship between the Residential Function and the City center.

The residential function must not be excluded from the central urban system. This function, in fact, provides the urban area of the city center with a lively atmosphere, meaning the problem of deserted streets after hours a problem visible in large cities such as London and New York, will be avoided.

It is important that residential areas of a city center be well balanced with non-residential areas. Central functions define the role of the "heart of the city," and these activities will, therefore, be given the highest percentage of area over the entire center area.

Statistics usually show some available housing should be temporary (e.g. apartments) to provide for mobility of

people. This housing should mostly be of the type suitable to fulfill the residential demands of people working in the city center and neighboring areas.

According to the analysis of different administrative centers, it was verified that residential function amounts to a minimum of 4%-5% and a maximum of 25%-30% over the total built-up area. These percentages vary according to the city planning policy adopted by different administrations. They are also the result of the population growth predicted for the area to be allocated for the city center.

2.2.7 City Planning Regulations and Standards

The careful study of reference books on city planning standards in Arabic and other countries has led to the conclusion that only a few countries (e.g. Italy and France) have issued regulations governing the quantitative relationship between facilities and their users' population.

The planning regulations being applied in most Arabic cities, which have been developed after the 1960's, maintain a different value system than those of American and Western European cities. Regulations applied are not merely codes pertaining to buildings, and as such having universal applicability; regulations are a part of a larger tradition of an entire legal system, a legal system based on a certain notion of social order that is unique to the

context in which it was developed.

Furthermore, numerous theoretical studies have been made on the dimensioning of hypothetical cities of varying population statistics. As well there have been many studies concerning the necessary relationships between services and the population[44].

With regards to the city planning practice, the primary function of city planning standards, or optimum or minimum requirements to be followed in the dimensioning of areas reserved for public facilities and services and to settlement population or future possible users, is the restrictive function. Their restrictive function has the purpose of selecting and separating the areas to be allocated to community needs. In addition, city planning standards regulate both the quantitative configuration and the quality of the settlements.

By examining the two above-mentioned aspects of planning standards. And not only searching for dimensional data, but also for available projections of demographics. The ultimate purpose was to use a comparative analysis to determine the minimum needs for the area based on demographic standards:

1. The standardization of services including the determination and classification of services based on neighborhood and regional level;
2. The relationship of services to population including the

minimum threshold of utilization, and optimum user ranges, or more precisely, the service-user ratio, which verifies the operation and economic yield of a given service;

3. The relationship between the services and the employees expressed as the ratio of employee to functional unit (m2/employee).

The m2/employee ratio is very useful in the design of a given area. On the basis of the number of employees assumed for one or more services belonging to a single classification of services and functions, it is possible to calculate the built-up volume (cubic meters) necessary to satisfy this labor force.

The same results may be arrived at through a different calculation, beginning with the total volume (m3) in order to define the projected needs of the labor force.

This analysis considers all three aspects mentioned in the preceding paragraphs according to the different functional levels of public services (administrative, commercial, and cultural) and to the population served.

As far as the service-user relationship is concerned, it is clear some services (theatre, wholesale markets, courts, hospitals, etc.) exist only in cities with determined population dimensions independent of their regional role. Other services are closely related to the residential function and, these services, mostly being small shops,

will have a minimum quantity of users.

There are several evaluations to be made as a result of this, the first concerning population size. Beyond a certain population threshold – 200,000 inhabitants – all cities are considered on the same level of function.

In terms of the m3/employee ratio, after defining the central functions and the services related to residential purposes, it was determined that this significant datum may vary according to several studies carried out **Table 3:**

City	**m3/employee**	
Tripoli (Center Plan)	50.62	
Rome (Rome: west administrative center	100	50 m3 office space 15 m3 parking space 35 m3 service area
Riyadh (Riyadh) The Justice Place district)	76	
Medina AL-Munawara	56	

Table 3: Employee Ratio in m3

This variable range proves there are different criteria for the accessory elements of the administrative and/or central activity. Lower values correspond to a volume which may be defined as net volume, that is, a volume separate from the quantity related to services and parking. Furthermore, it is necessary to analyze the value of the m3/employee ratio

for the different categories primarily concerning topological units:

1. Office Buildings (Ministries, Banks, Public Authorities)

112 m3 / employee	20.22 m3/ employee
(Gross)	(Net)

It is evident that for ministries the ratio ranges from 90-m3/ employee (Riyadh) as a minimum to 113 m3/ employees (Rome) as a maximum.

2. Storehouse and Shopping center – 180 m3 / employee
3. Hotels – 85 m3/ employee
4. Building for cultural activities – 200 m3/ employee

Finally, it is important to investigate the ratio of city population/area allocated to the city center (administrative, historical, and commercial center), a variability range which has led to the following conclusions:

1. It is not possible to establish, however scientifically, criteria beforehand to determine an eventual ratio of population/area;
2. Should the areas obtained be minimal in relation to the population figure, suitable areas of adequate dimensions are arely available in the city center in cities featuring a stratified urban pattern. Quite often, in these cases, administrative centers are located in new urban areas;

3. A few examples of new centers were found, with quotas allocated for residential use of land. The average land use of those centers studied lead has resulted in the following categories:
   Area allocated for residential purposes is 19.6% of the total built-up area, with maximum values, as in the case of Medina Al-Munawara, of 32%.

Land use for the business zone, that is, the ratio cubic meters/square for office building, is equivalent to 6.5 m3 / sq. meter, while the ratio cubic meters per employee is equal to 43 m3/ employee.

A study of both Arabic and European centers' ratio of m2/ inhabitant for urban services has again shown a variable range of figures. These results have led to the conclusion that only a few European cities have relevant regulations. Others cities, mainly those in Arab countries, have specific standards, but they are not applied to all services.

2.2.8 Benghazi City Center

The estimate by Dioxides Plan for Benghazi will reach the population of 1,200,000 by 2014. Its harbor, with the traffic of goods and passengers, the convergence of various functions, the offer of new jobs, and the demographic growth, comprise the data taken as a basis in forecasting the development of the city. Benghazi is limited on one side by the sea, a natural barrier to expansion, and it has

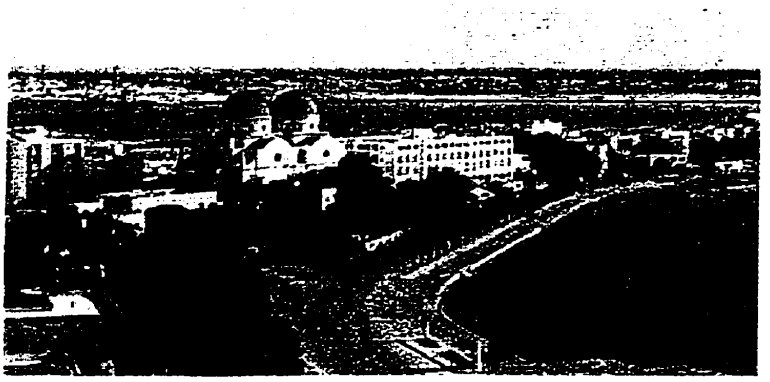
developed according to a radial-centric pattern, along trunk roads which, starting from the center, penetrate into the outlying area. Due to this geographical position and city planning precedent, as well as its service functions, Benghazi represents the "strategic" pole of a whole region that includes several municipalities. While already an important center, it continues to undergo rapid expansion.

The concept of a new city center with managerial functions, as outlined in the Dioxides Plan, will constitute the basis of transforming Benghazi into an urban-regional structure where the city center will become the active center for the whole territorial system of the Benghazi region.

CHAPTER THREE

Benghazi Context

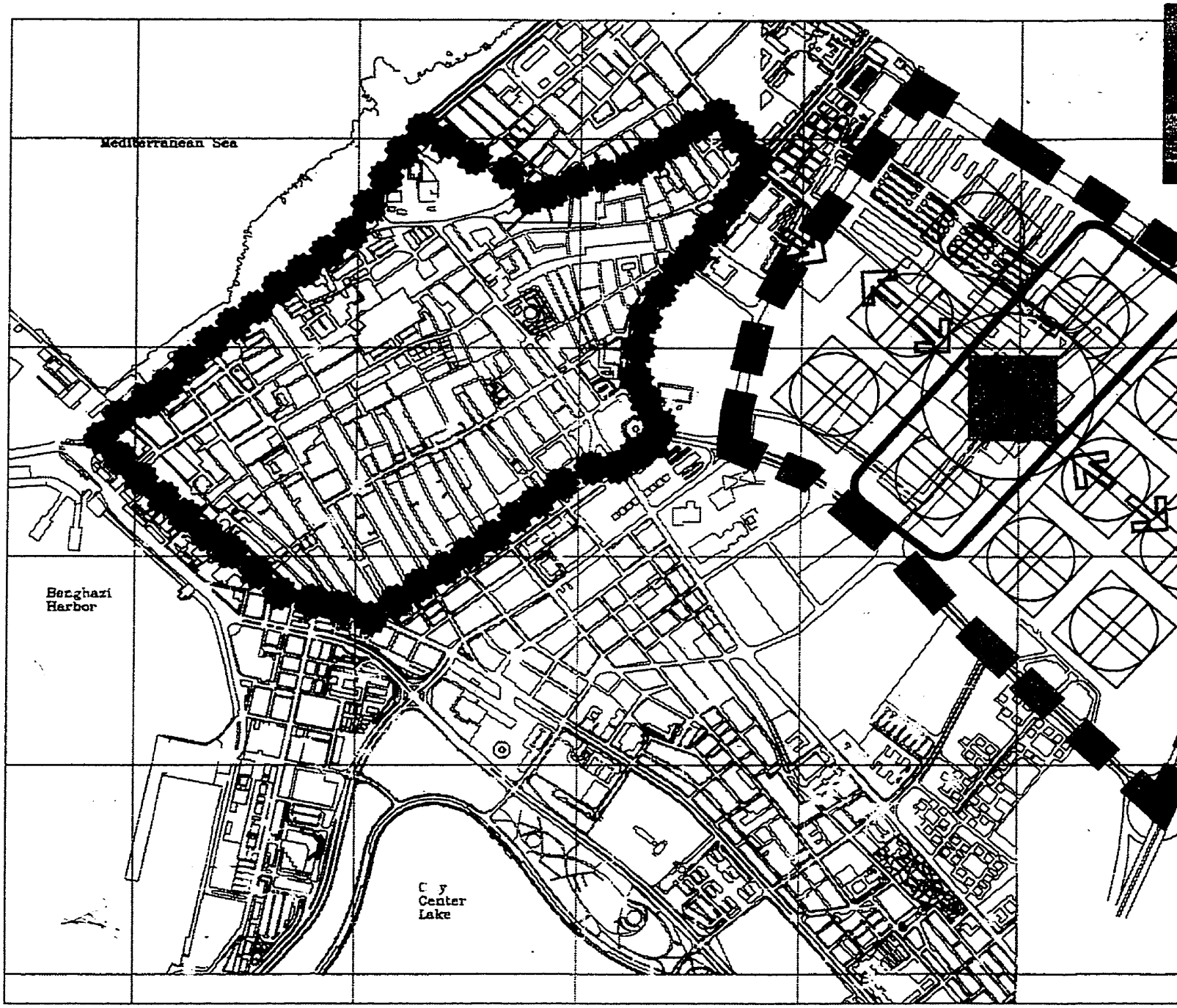
A comprehensive analysis of the total context is the first step in the urban design process.



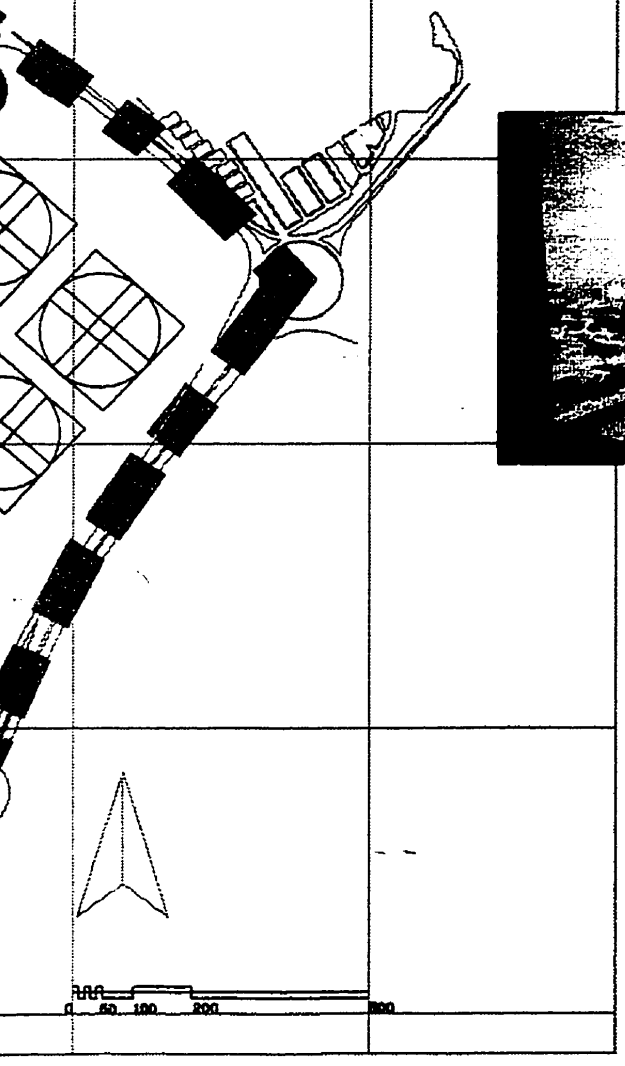
3.0 Analysis

Following the evaluation of both sections of the literature review, I was able to arrive at two alternative proposals for the Central Plan of Benghazi. First possibility was to create a landscaped wall around the old city and leave the whole area as a large historical site. Then, a new center would be designed to meet Benghazi's future requirements **(Drawing No. 1)**. This would have been the simplest solution, however, it was considered not to be appropriate for the historical center because a livelier environment, notably an active street life, would be needed, and separating the historic center with a wall would prevent this. The second and preferable solution was to design a new center that would take into account the traditional grid plan of the existing city, the city's historic character, and work with existing elements, designs, and forms in the area. This would permit the project to become part of a completely new central-area concept that could blend the historical part of the city with the proposed future development **(Drawing No. 2.)**

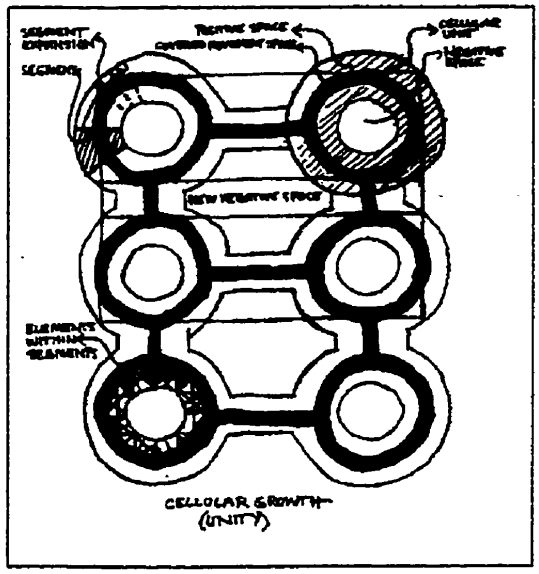
However before examining these proposals in detail, a comprehensive analysis of the existing urban context was necessary for the successful completion of the urban design process. The following chapter examines the existing soci-economic and urban conditions of Benghazi.


Mediterranean Sea
Benghazi Harbor
City Center Lake

VIEW OF THE RESERVED LAND FOR THE NEW CENTER



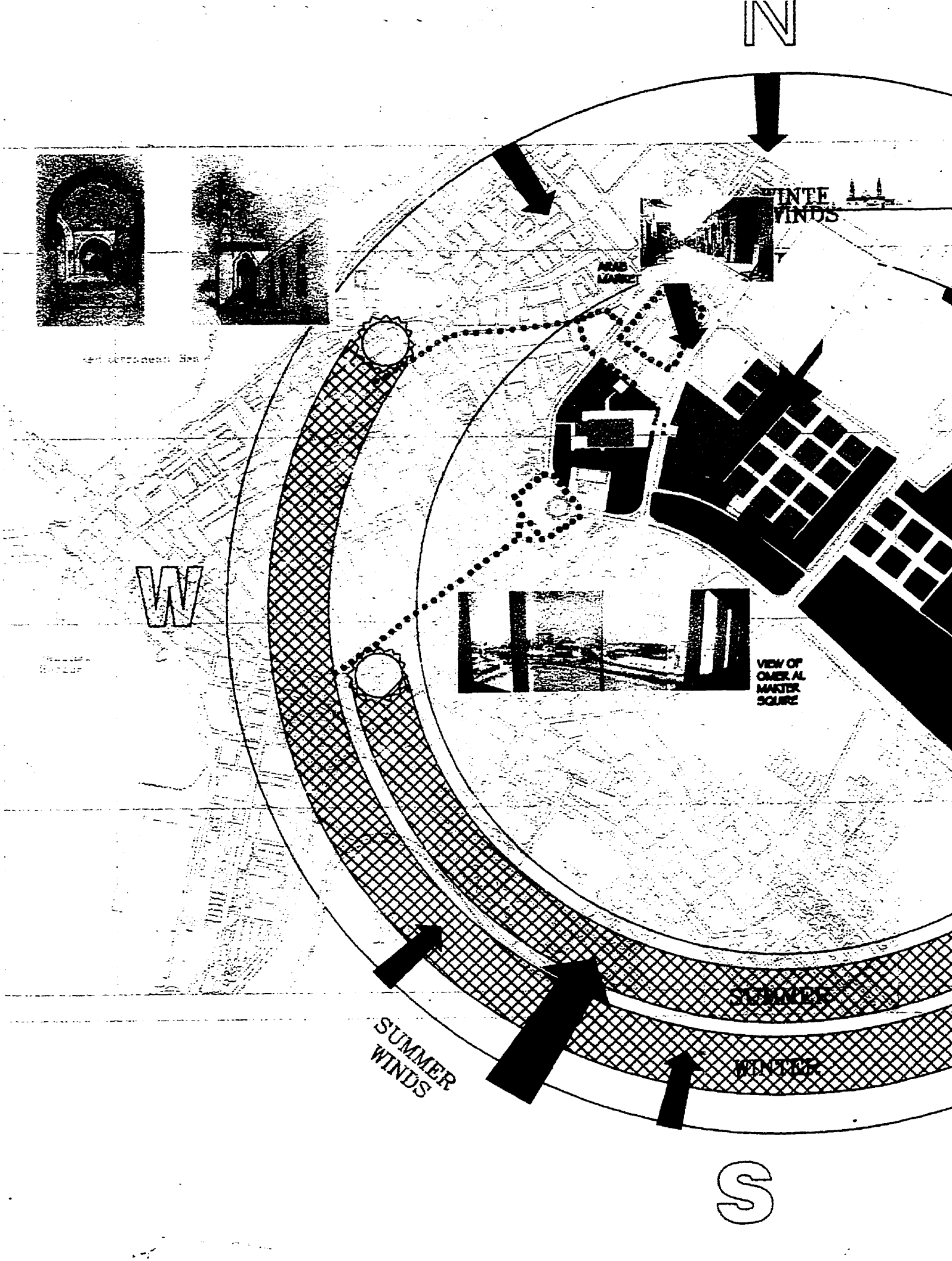
VIEW TO "OMER ALMAKTER SQUARE"

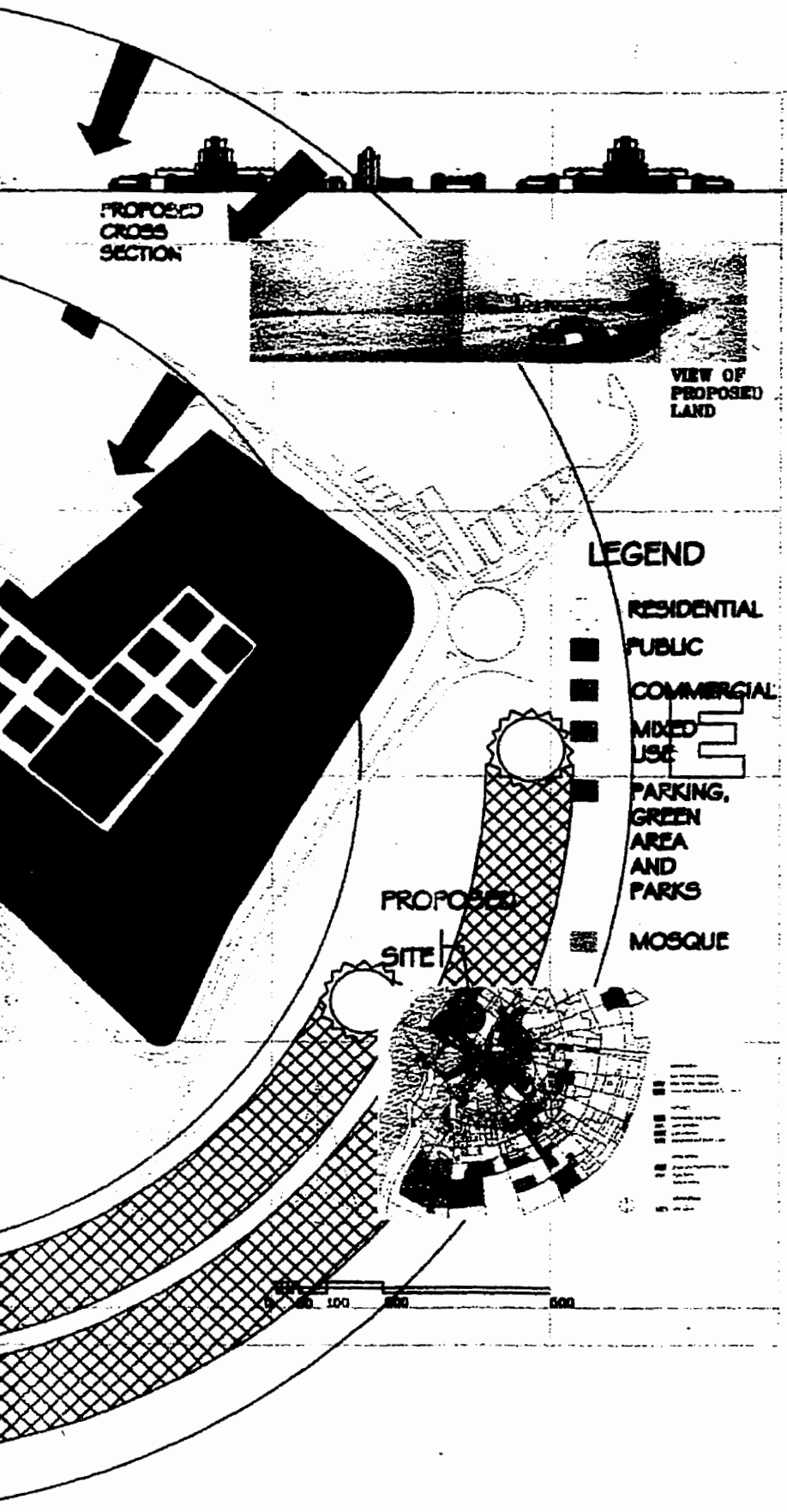


FIRST PROPOSAL

IS TO CREATE A PARK AROUND
THE OLD CITY WALLS AND TO LEAVE THE WHOLE EMPTY LAND
AS AN OPEN SPACE TO SEPARATE
BETWEEN THE NEW CENTER (USING THE RESERVED LAND) AND THE HISTORICAL AREA.

Drawing 1:
Alternative A


N
W
S
WINTER WINDS
SUMMER WINDS
SUMMER
WINTER
VIEW OF OMER AL MAKTER SQUARE



PROPOSAL 2

IS TO DESIGN A COMPLETELY NEW PROJECT THAT WOULD TAKE INTO ACCOUNT THE STRUCTURE OF THE SURROUNDINGS, AND THE CHARACTER OF THE PLACE.

Drawing 2:
Alternative B

3.1 Socio-Economic Background

As in most Arab countries, the burden of economic and social development is the responsibility of the Libyan government. It is they who stimulate industrial and urban development, build infrastructure, and establish welfare programs. The government is in charge of decisions concerning all aspects of urbanization such as land use, urban location, legislation, and economic growth and population distribution.

The absence or weakness of an internal growth factor as a local stimulus in Libya is due to it having been one of the poorest nations in the 1950s[45]. Then, after the discovery of oil in the 1960s, wealth became concentrated in the two major cities, Benghazi and Tripoli. Consequently, the private sector played a significant role in their respective developments, investing in housing and commerce. Accordingly, the public sector was considerably less involved. By 1976, the private sector had grown to be more important than the public sector. In the late 1970s, however, the government began to dismantle the private sector, with the state taking over its once dominant role in steering the country's economy. By 1982, the private sector had diminished considerably as a result of this wide-scale nationalization of all economic and social activities. The role of government intervention would increase with the growth of oil revenues, and as a result, the state is now the dominant factor in the Libyan economy[46].

In the pre-Revolutionary period, planning in Libya was limited to town planning conducted on a piecemeal basis by foreign

experts. Between 1968 and 1988, various departments recommended sectored studies as well as master plans for some towns. However, a comprehensive approach was never carried out[47]. There was, first of all, a shortage of maps, and the ones that existed were outdated, as were other documents and data necessary for planning. In addition, the organizational structure and the domestic workforce required to carry out planning tasks were insufficient. Furthermore, there were prohibitive ecological conditions including the salinization of groundwater, which would threaten the drinking water supply.

Production factors like fertile land, or even human resources, do not play an active role in the dynamics of the Libyan economy, however. The basis of Libyan self-reliance is capital from oil revenues[48]. The problem is that this capital from the Libyan production sector is not directly transferable into development productivity because it is delegated centrally, not regionally.

In 1969, Libya became an egalitarian, anti-colonist and anti-capitalist country, and it looked forward to a successful, socio-economically balanced evolution. After three years of institutional reorganization, in 1973, Libya began to prepare its first constructive development plan for the evolution of the national economy. In 1976, positive results of improvement and growth were recorded in health, education, and in some cases, industry, all of which raised hope for the quick, dynamic transformation of Libya into a booming economy. In 1979, the Secretariat of Planning, assisted by

international consultants, prepared a long-term transformation plan for the whole country that included ideas for structural economic changes and detailed proposals for investment. The plan predicted that the non-oil sector GDP would rise from 36.8% in 1970 to 94.4% in 2010[49]. Another plan called the national physical perspective plan, called for the undertaking of concrete projects such as the extension of agricultural land and irrigation and the establishment of industrial branches in all regions of Libya.

3.2 Physical Development

The most obvious factor to analyze is the cityscape. The existing city center area has little in the way of scenic attractions. What it does have is generally associated with water: the Mediterranean coast, the central lake, which curiously remains unnamed, and the *sabkhas*. Apart from these, the topography of the area is the typically undifferentiated landscape of Benghazi plain. The nearly level and featureless surface of this plan generates no significant vistas. Therefore, the punctuation of tall buildings, either civic offices or mosques **Photo 5 & 6**, solely determines the city skyline[50].

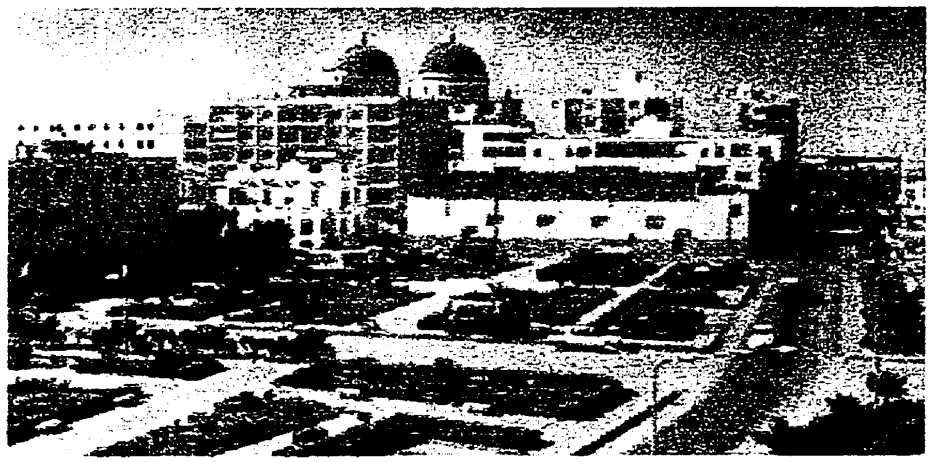


Photo 5: The City Skyline

Photo 6: A Major Mosque (*Masjid Al Baderya*)

Among those man-made elements that articulate the center townscape, the archaeological sites are of course the oldest. The historic center dates to the Medinah (**Illustration 1**) of the Arab and Ottoman periods. This area still retains the tessellated pattern of building blocks divided by narrow roadways. However, it has long since been opened up to modern traffic routes, roads that are too wide to be compatible with the city's original structure. Further, the area has been crippled by the autonomous structures of modern architecture, which failed to fit into the existing environment.

Photo 7: The Existing Historic Center (dates back to the Ottoman period)

Photo 8: Existing Mosque (Ottoman period)

Gradually, therefore, a wall of modern, high-rise buildings following the alignments of the ostentatious, Old Italian buildings lining the cities coastal avenues has encircled this section. Isolated from historical patterns of development, the actual historic center now forms a huge pocket ending on both sides of the Central *Souq*.

Its original spirit has been to some degree preserved by

tightly walled buildings along continuous but narrow access roads, which occasionally give way to wider, enclosed spaces[51]. Besides the historic *Medinah*, the city also possesses several other buildings of historical and architectural interest, most of which date only as far back as the Italian period.

There are very few old Arab and Ottoman Buildings in the city, since most were demolished during the occupation. An exception is the religious buildings, mostly of basic design and a few with minarets, of which there are about twenty within the historic area[52].

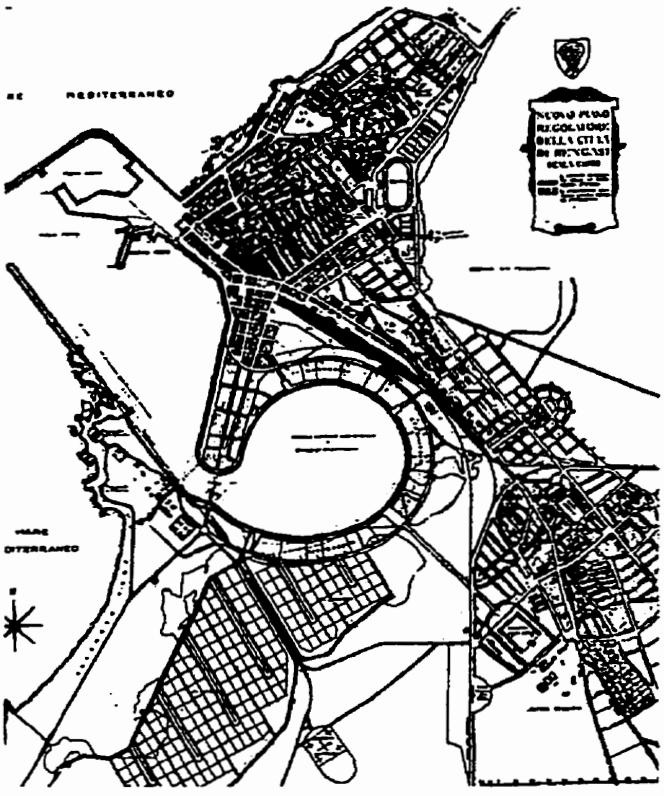
The transformation of Benghazi by the Italians was so profound that, at the time, the city resembled an Italian coastal town. Today the appearance of the city is completely different, although some Italian buildings of monumental character still exist. The most exciting remnant of this period is the arcades, which have blended well into the townscape of the Benghazi center area. The arch system can be considered a heritage from the past that is worthy of preservation. On a practical level, this system has proven valuable in protecting the public from the excessive heat of summer and in providing a good shelter from the winter rain. In addition, the arcades accentuate the varied heights of buildings, smoothing the differences between the individual structures, and reinforcing their verticality to make for an overall homogeneous effect[53].

In terms of the more elusive but vitally important factors constituting town character including human scale, meaning,

and orientation, Benghazi fares negatively in some ways, but positively in others. Older residential districts, for instance, have a strong community spirit, which arises largely from low-storied houses laid out along roads mostly utilized by pedestrians. Also, there is an integration of pedestrian and commercial uses that enrich the urban environment. However, the area still lacks basic modern facilities such as a sewage system and telephone lines. While their newer counterparts have more of these modern necessities, they are at the same time devoid of unique character, particularly when they were built by a single developer who lacked vision when it came to design. Partially responsible for such an alienating environment is that housing units in these developments usually have high exterior masonry walls built around them, walls whose uniformity make dull street facades.

3.3 Urban Conditions

In order to comprehend and then analyze the factors, which have contributed to the present patterns of urban growth and the structure of a city, a historical perspective of the city is essential[54]. Furthermore, a consideration of the surrounding natural environment is needed.



Benghazi's basic form has been greatly shaped by a peculiar topographic feature of the area, the *sabkhas* or the coastal marshes, which may be seen on **(Illustration 1)**. The development was originally confined to a narrow strip of land between the sea and the *sabkhas*, but at the end of the Ottoman period (1830); it expanded onto the open plain.

Illustration 3: Benghazi Master plan –1930

A city plan **(Illustration 3)** produced in 1930 during the Italian period laid the backbone for Benghazi's modern structure. The plan did not attempt the reclamation of *sabkhas*, but it encouraged development for residential, industrial, and military purposes. Additionally, it called for central functions and services to be located in the older part of the city, or the historic area, because of that locale's adjacency to the port.

Of all the cities in North Africa, Benghazi suffered most during World War II. The city was devastated and nearly destroyed, and during the subsequent period of British administration, its condition was to change very little[55].

After more than two decades of stagnation, by 1957, the city seems to have regained its prewar dimensions. (Maps were now available for the first time after the war). This recovery coincided with the coming of independence and the naming of Benghazi as an alternate capital, two events, which gave new impetus to the city's growth[56].

The economic boom did not result in successful urban development, however. During this early post-war period, the old core, containing the bulk of urban development and being the area best able to respond to the needs of Benghazi's inhabitants still dominated. At that time though, it began to manifest an irrational distribution of land uses. Particularly with the oil discovery and the economic boom that ensued, growth of the city center was too rapid to allow for proper control. Relatively modern commercial and business establishments coexisted with obsolescent, crowded residential quarters, which in combination with the traditional concentration of instant commercial stalls *souqs*, were now giving rise to serious land use and traffic problems[57].

Such was the situation faced by Whiting Associates when they commenced with their study of the city. In 1966 their plan **(Figure 2)** began to organize city functions, aiming to concentrate the administrative, commercial, and economic activities in a "central business district" located between the reclaimed land of the *Sabkha Al Salmany* and the landscaped shore of the lake. The road network followed a radial concentric pattern, with various ring roads and major radials, and it included an inner loop circling the central

business district. The plan projected the population of Benghazi at 1 million by 2014, and it accordingly included provisions for residential, industrial, and ancillary uses[58].

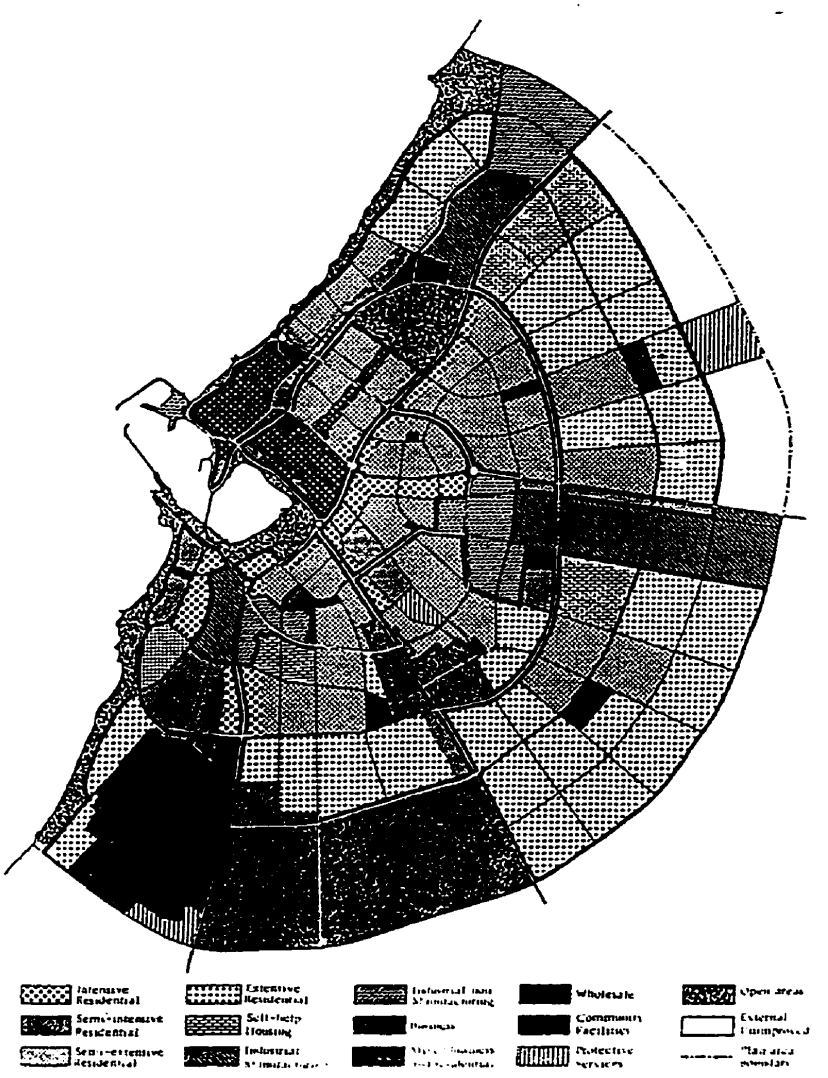


Figure 2: 1966 Benghazi Master Plan - Whiting Plan

Ultimately, Benghazi has been very successful in implementing this plan. The city's expansion in terms of land use and road

programs has followed it (**Figure 3**), with changes only being made to fit special needs or design requirements at a local scale. Such a disciplined approach allowed Benghazi to put a stop to uncontrolled growth.

The traffic plan was drawn up in 1978 by Ove Arup and its objectives are both the verification of the existing and future traffic distribution and the definition of the general transport policy. The feasible design alternatives were based on four different hypothesis linked to the types of employment distribution and the policies adopted in the transport field[59]:

A. Central employment/ high proportion of journeys by private vehicles (no restriction);
B. Employment dispersal/ high proportion of journeys by private vehicles (no restriction);
C. Central Employment / satisfactory public transport means;
D. Employment dispersal/ satisfactory public transport means.

The fourth alternative, undoubtedly the most advantageous among those recommended by Arup, would allow for the establishment of an efficient public transport system, eliminating central area congestion, reducing vehicle journeys (by means of city sub-centers) and, therefore, balancing the passenger flow to and from the central area[60].

The analytical part of the study highlights the fast urban development and population growth in Benghazi, which has reached a greater extent than that predicted in the master plan drawn up by Whiting only 12 years before. The study also

underlines the problems related to vehicular traffic, which has more than tripled in ten years or so.

A new phase began in 1981, when the new master directive plan by the consultant (Dioxides Associates), was put into effect. This period continues into the present. It was realized the municipality of Benghazi had been able to implement the previous master plan, since that plan had failed to envisage the massive scale of development that would take place over such a short time. The master plan was initiated in 1981 and was designed for the year 1990, although it was updated in 1987. The planning objectives do not differ significantly from the original master plan of 1966 by Whiting.

The analysis carried out concerns several aspects of the physical, social, and economic structure of the city, especially the following:

- The population dynamics;
- The factors contributing to the development and evolution of the economic basis and the labor force;
- The use of land for agricultural, residential and social purposes residential densities, etc;
- The situation of the transport system and infrastructure networks;
- The consultants defined the future requirements and the policies to be adopted on the basis of the critical evaluation of the existing conditions and evolution trends.

However, a number of difficulties still remain. If Benghazi continues to grow at its present rate and concentric pattern, it is likely to undergo an undesirable transformation. The periphery will grow at a reasonable rate, but its center will be forced into out-of-control growth; in fact, such growth is already showing signs of occurring. Additionally, further growth will transform those parts of the city which are close to it, changing their function from residential to commercial, modifying the contents and structure, and/or distorting the architectural and traditional values that have so far been preserved. An appropriate new master plan for the Benghazi center area should offer a pattern permitting natural growth and respecting current concentric growth patterns. In other words, new additions should never be permitted to damage existing forms.

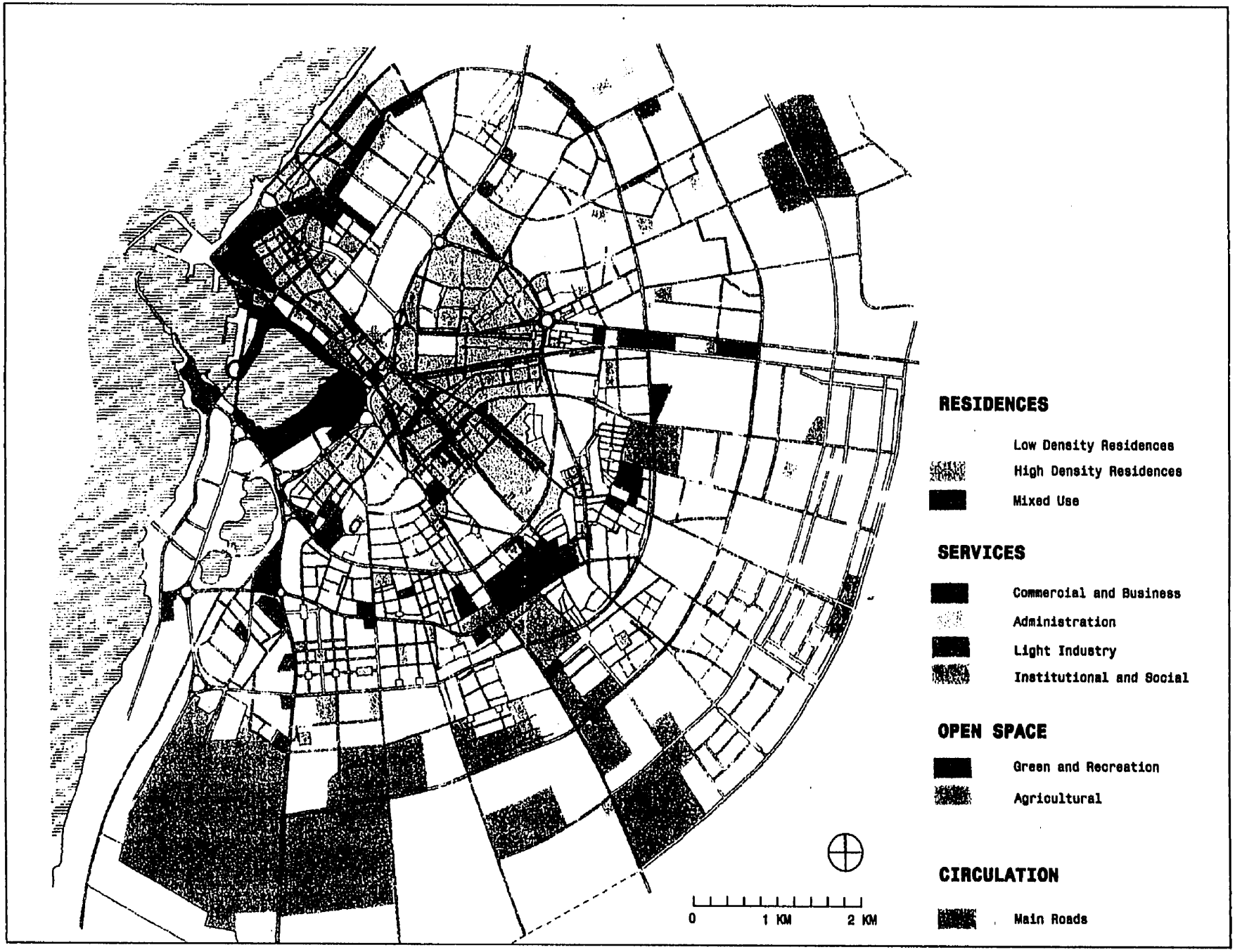


Figure 3: Existing Land-Use (1989)

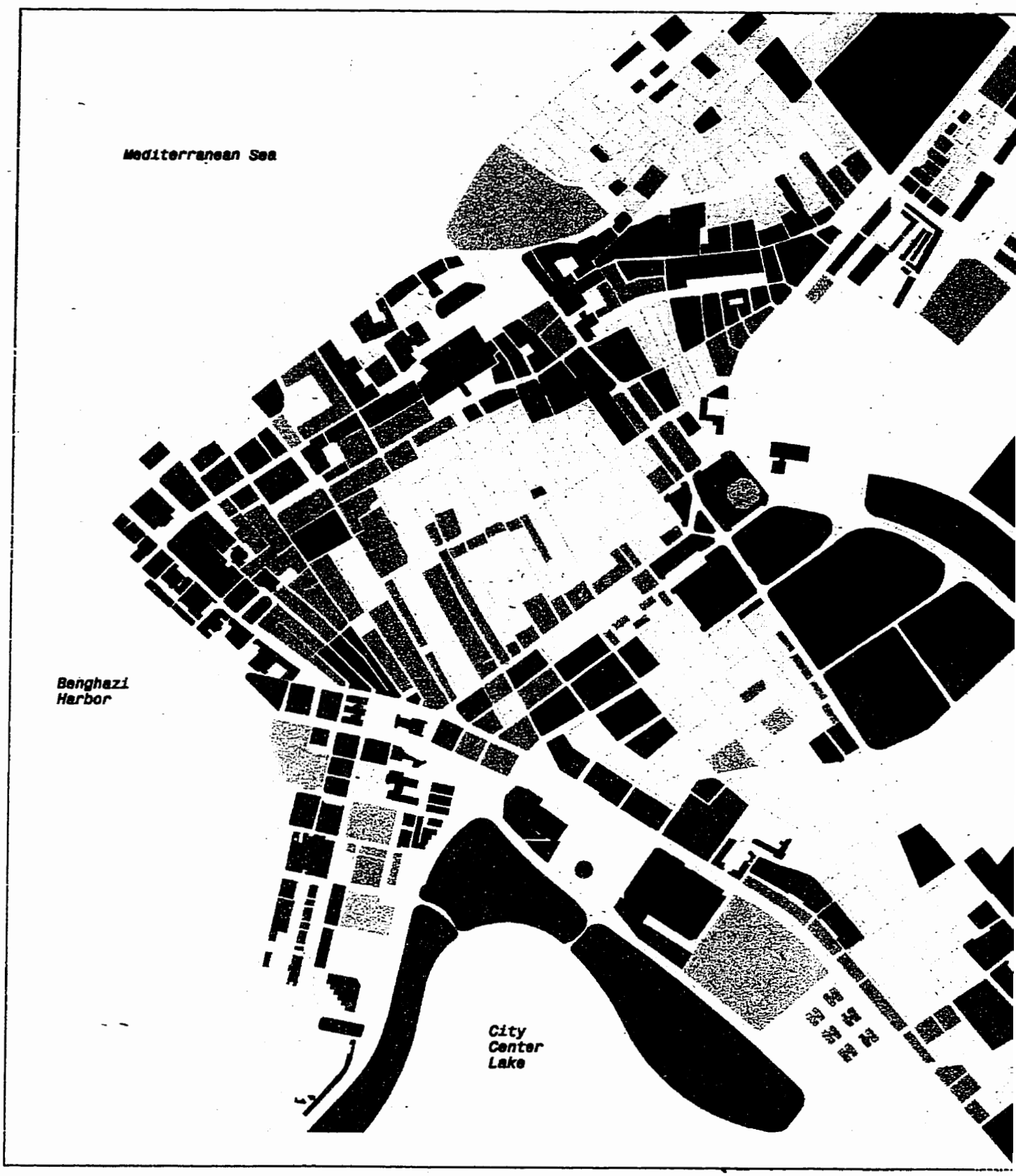
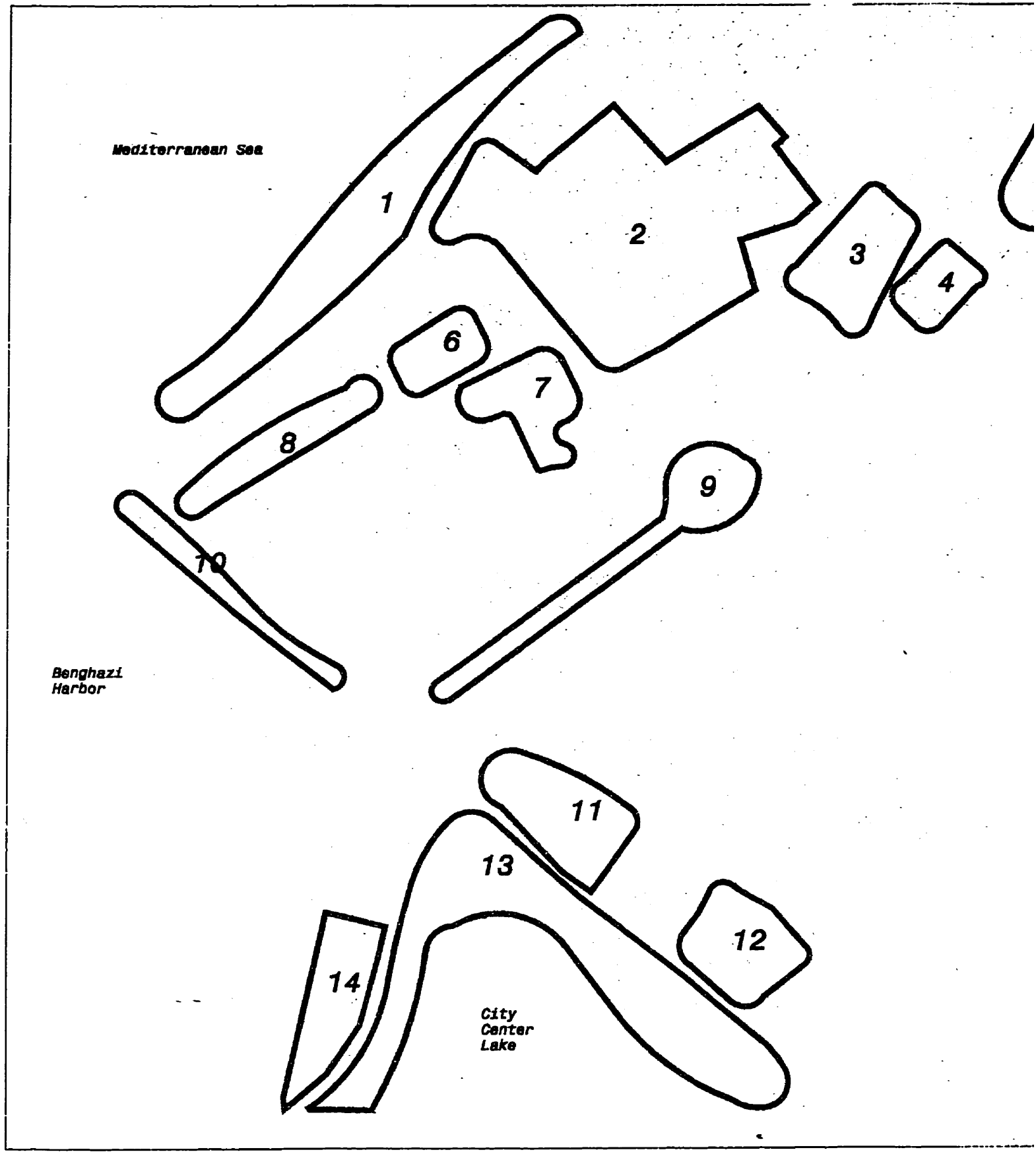
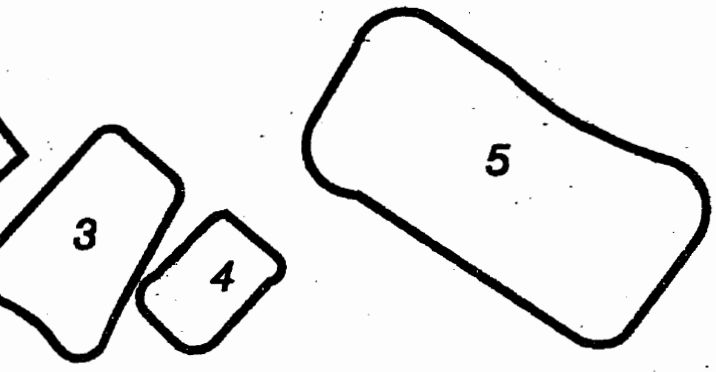
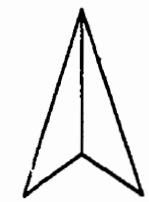

Mediterranean Sea
Benghazi
Harbor
City
Center
Lake

Figure 4:
Benghazi Center Plan
Existing Land-Use (1997)


Mediterranean Sea
1
2
3
4
6
7
8
9
10
Benghazi
Harbor
11
13
12
14
City
Center
Lake



1. Coastline Project
2. Old City (Souq)
3. Veg. & Fruit Market
4. Intl. Bus Station
5. Arab Market
6. Omer Mukter Plaza
7. Gold Market
8. Government Build.
9. Civic Center
10. Major Banking
11. Jamel Library
12. Hotels
13. Central Park
14. Convention Center



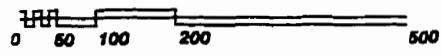


Figure 5:
Benghazi Center Plan
Activity Cluster (1997)

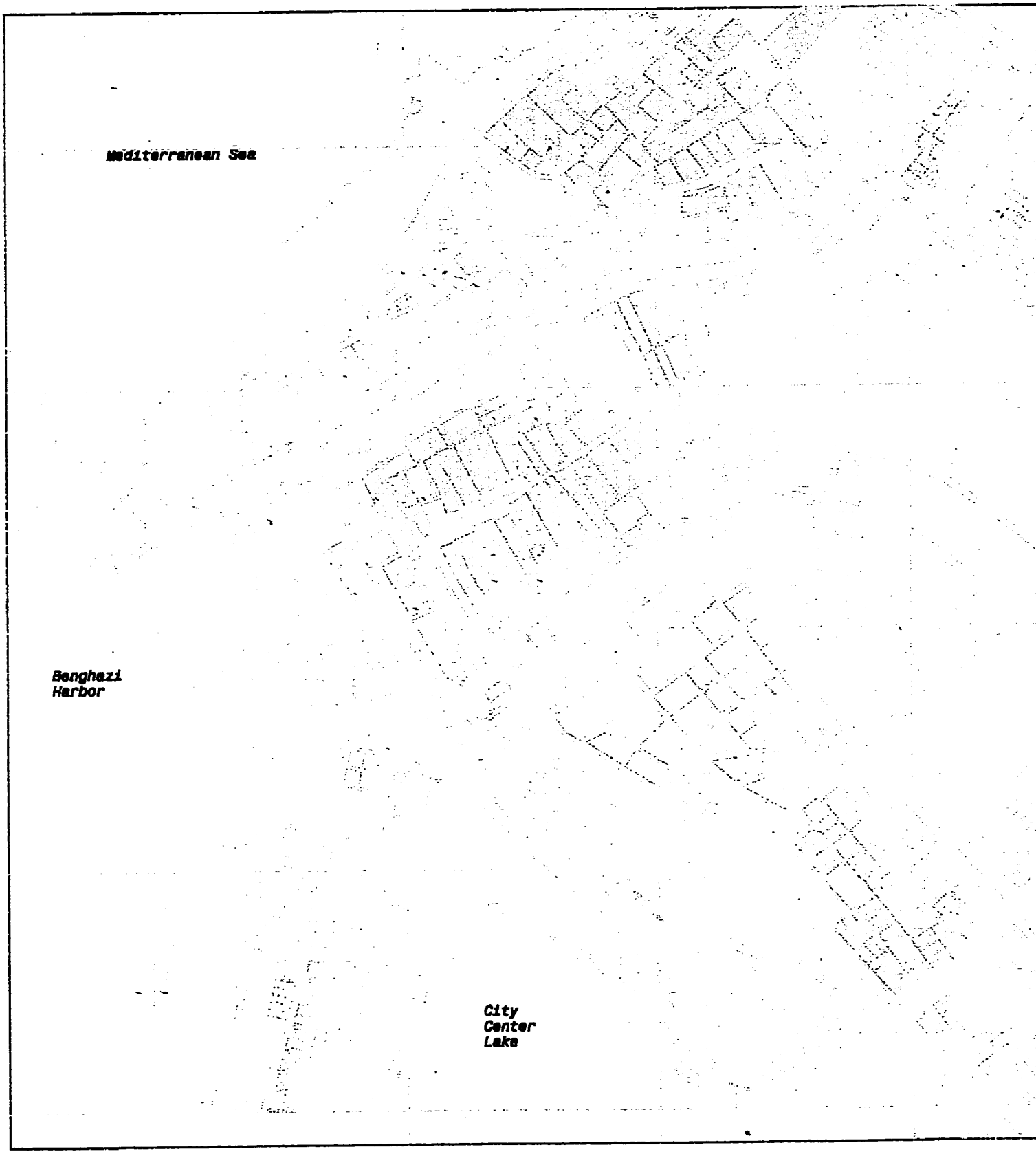
3.3.1 Residential Areas / Hotels

In the central area land is most often used for residential purposes. In fact, residential areas account for more then half of the land (**Figure 6**). In terms of pattern and layout design, residential quarters have evolved into a continuous texture of urban tissue, with the pattern of the usually irregular blocks of plots resulting in an irregular system of roads. Residential space is dispersed throughout the area, while hotels and/or apartment hotels are concentrated on *Jamel* road surrounding the central business district.

3.3.2 Business and commerce

In defining commercial and business areas in the center area, one is faced with the difficulty of deciding which category the complex, traditional Arab shopping areas, or *souqs*, fit into. It may be more accurate to refer to them as commercial streets rather than areas, as they comprise a winding network of narrow pedestrian streets where all kinds of trading activities occur. Commerce usually takes the shape of small units rather than specialized or large enterprises. These units are usually grouped in districts of homogeneous activity and are intermixed with administrative buildings, police stations, and post offices as well as restaurants, cinemas, and coffeehouses. Such commercial or public administrative activities usually occur on the ground floor of buildings, while the upper floor typically consists of dwelling units.

This creates a blending of residential use in what is already


Mediterranean Sea
Benghazi
Harbor
City
Center
Lake

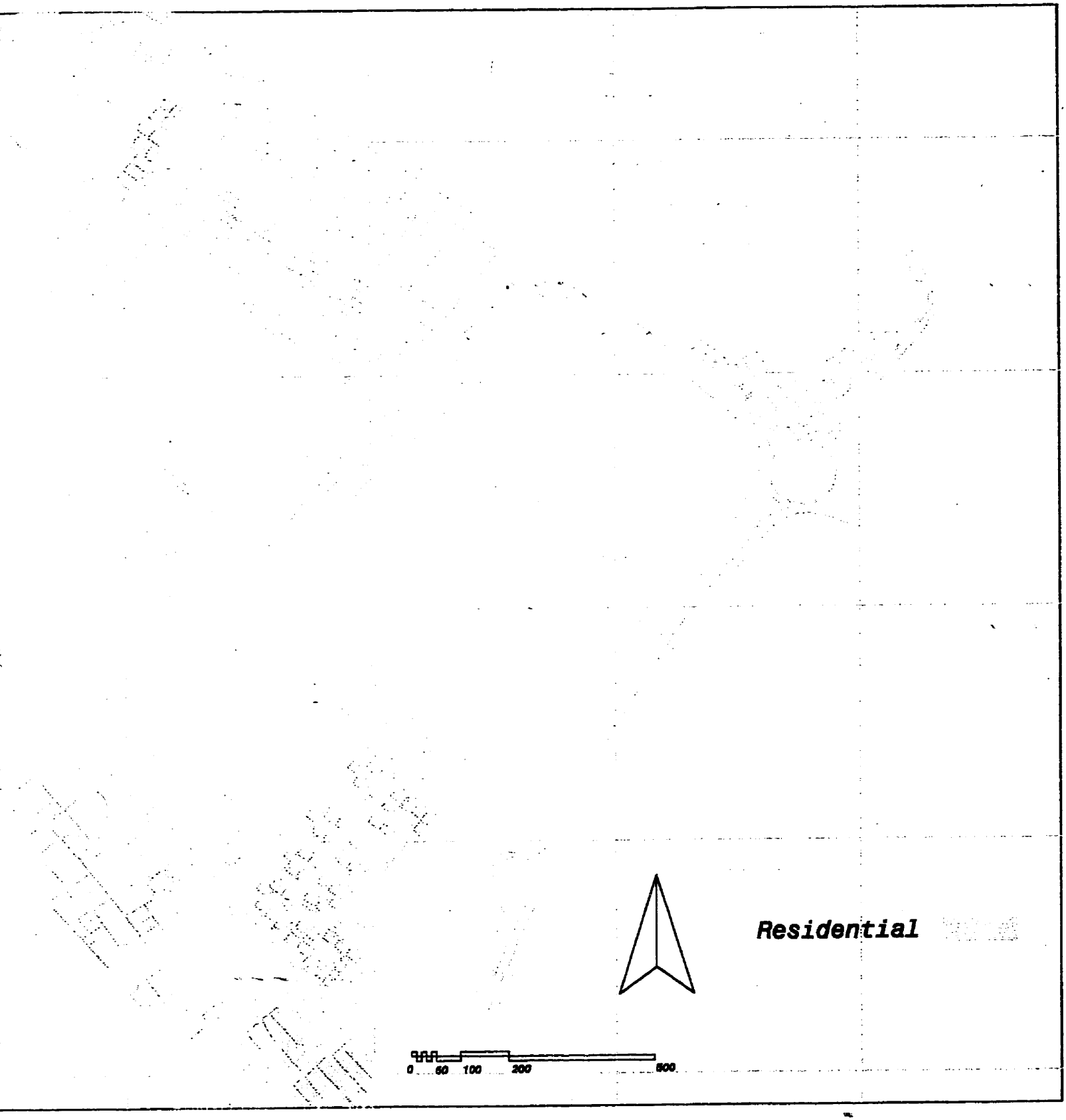


Figure 6:
Benghazi Center Plan
Residential Area (1997)

a mixed-use area (**Figure 7**). The above area pattern is typical of the historical section of the Medinah, an area which mixes historic value with commercial purpose.

The area designated as the central business district (**Photo 9**) offers a variety of administrative services. In addition to finance, the central business district offers professional services, shopping, and entertainment. It also has a high concentration of higher educational, social and cultural establishments, health and welfare institutions, and recreational activities.

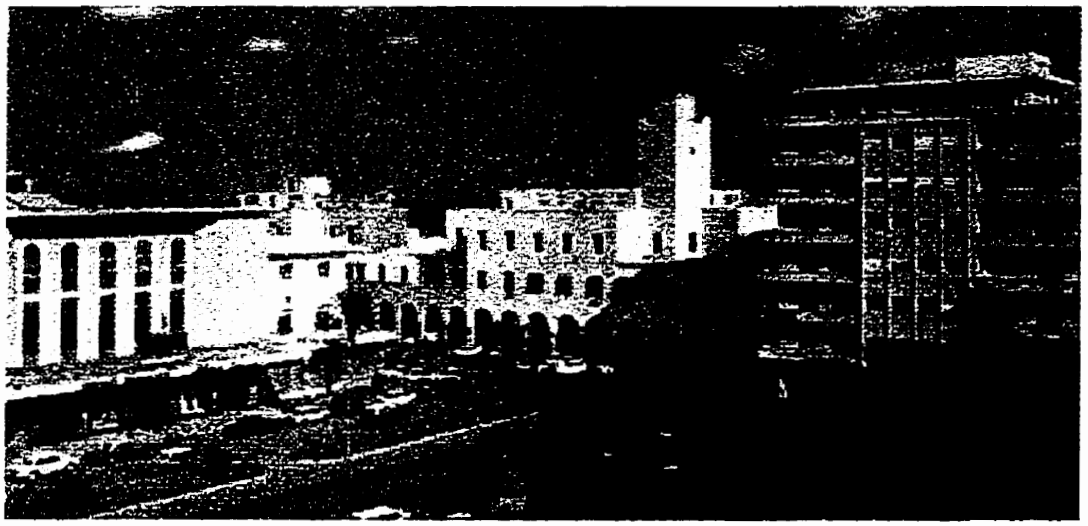
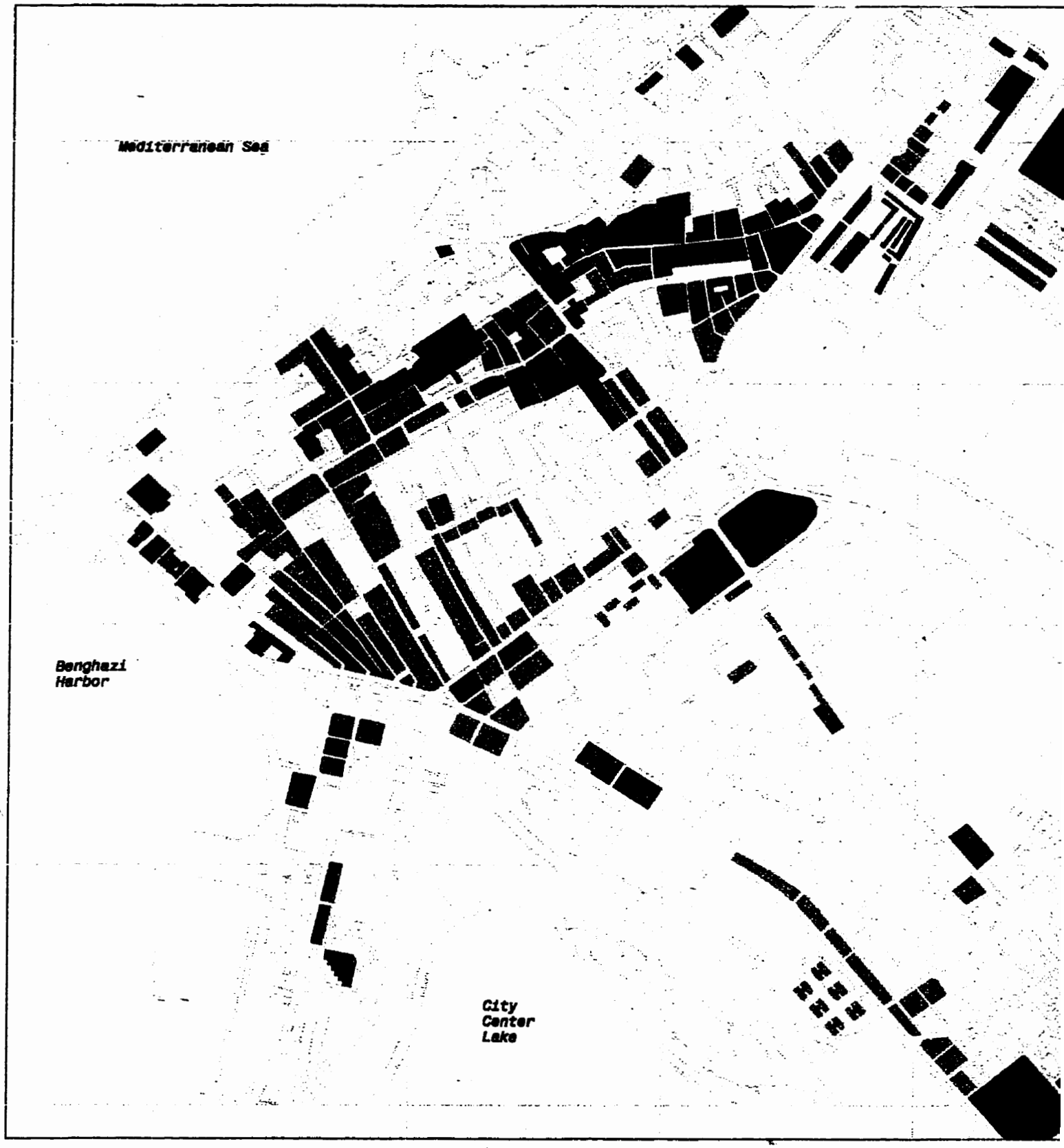


Photo 9: Central Business District – *Omar Al Mukhtar* Street

The two major characteristics of the historical area are the Central *Souq* and the *Funduq*. The *Souq* is a remnant of the traditional Arabic-type market, with its arcade-covered alleys and its trading fever. It has its terminal at the end of *Omer Al Mukhtar* Street and in the Municipal *Souq*, or *Funduq*. It remains devoid of any exceptional architectural or vernacular features. The *Funduq*, although traditionally a


Mediterranean Sea
Benghazi Harbor
City Center Lake

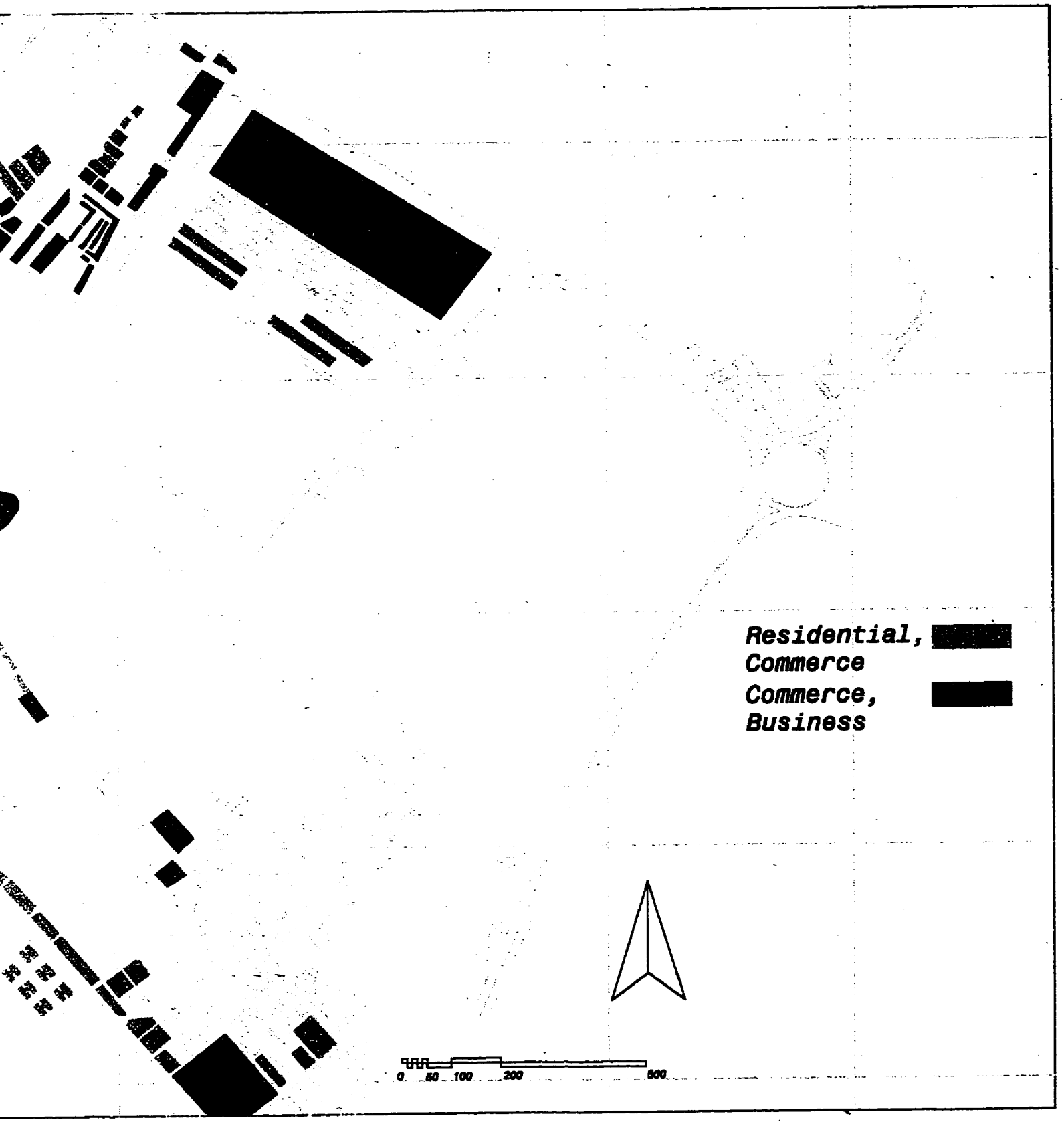


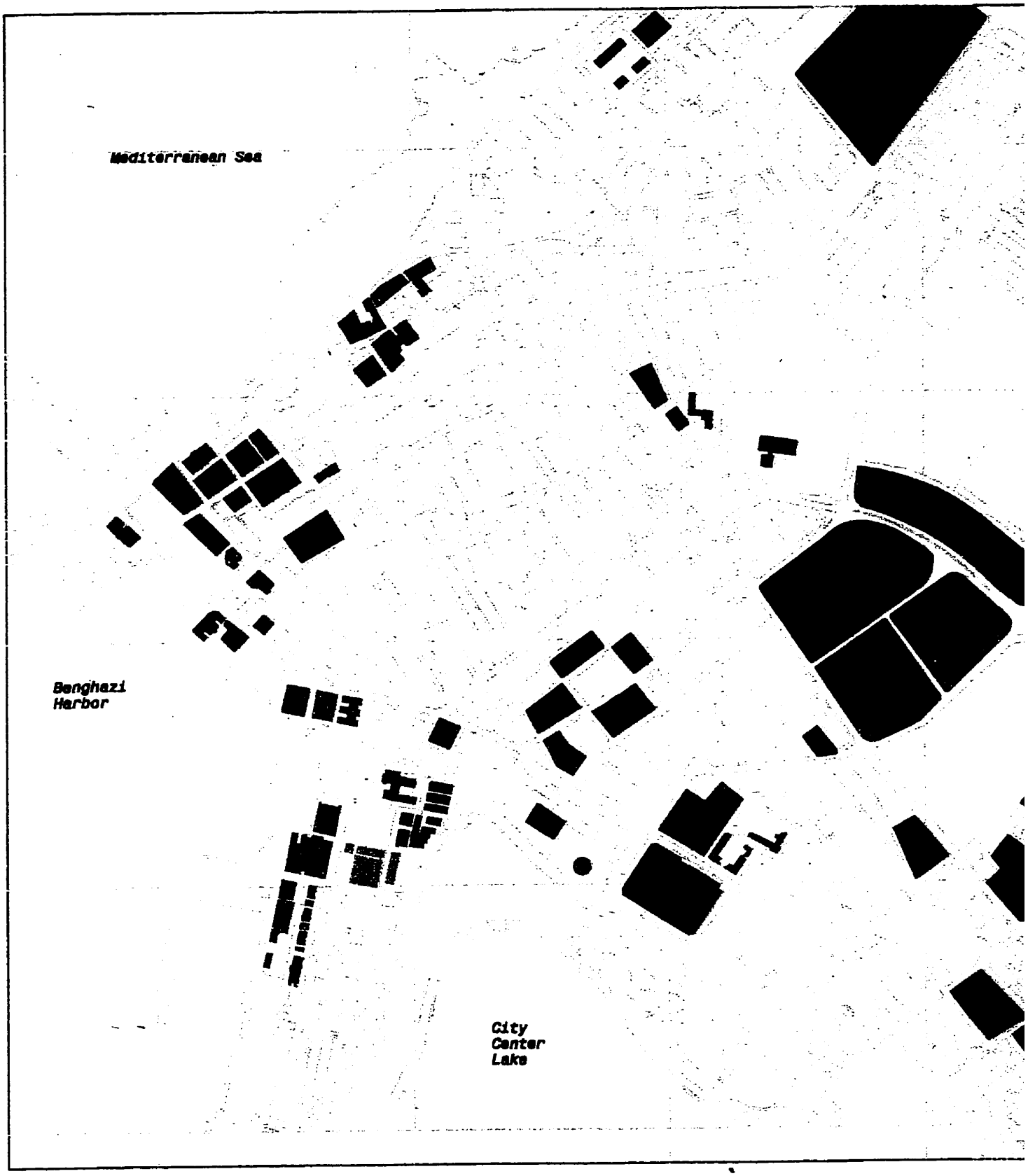
Figure 7:
Benghazi Center Plan
Business And Commerce (1997)

livestock emporium, has today been converted to a market for food and other groceries[61].

As far as the development of commercial areas in the residential neighborhoods is concerned, two patterns may be seen. Commercial shops, usually groceries, retail shops, and stores offering personal services are spread throughout the built-up area. They are concentrated along some primary roads, forming a continuous frontage of shopping units along residential blocks. As well, one can see spontaneous formations of *souqs* on some narrow pedestrian streets.

3.3.3 Public/Institutional Buildings

Despite its history as an administrative center of national importance, Benghazi lacks properly designed areas to house related services. Administration is concentrated in the westernmost apex of the *Medinah* (the central business district), while branches of secretariats and national departments (e.g. the immigration office and the statistics office) are found all over this area as are several other central administrative bodies operating at the *Baladiyat* or city level. The harbor has attracted the customs office and the port authority to the district. Several police stations, which are supplemented by local traffic police offices, are distributed throughout the city with one of them being located adjacent to the *Baladiyat* offices. Finally, there are ten post offices located throughout the city, with postal headquarters located on *Omer Al Mukhtar* Street[62]. **(Figure 8)**


Mediterranean Sea
Benghazi
Harbor
City
Center
Lake

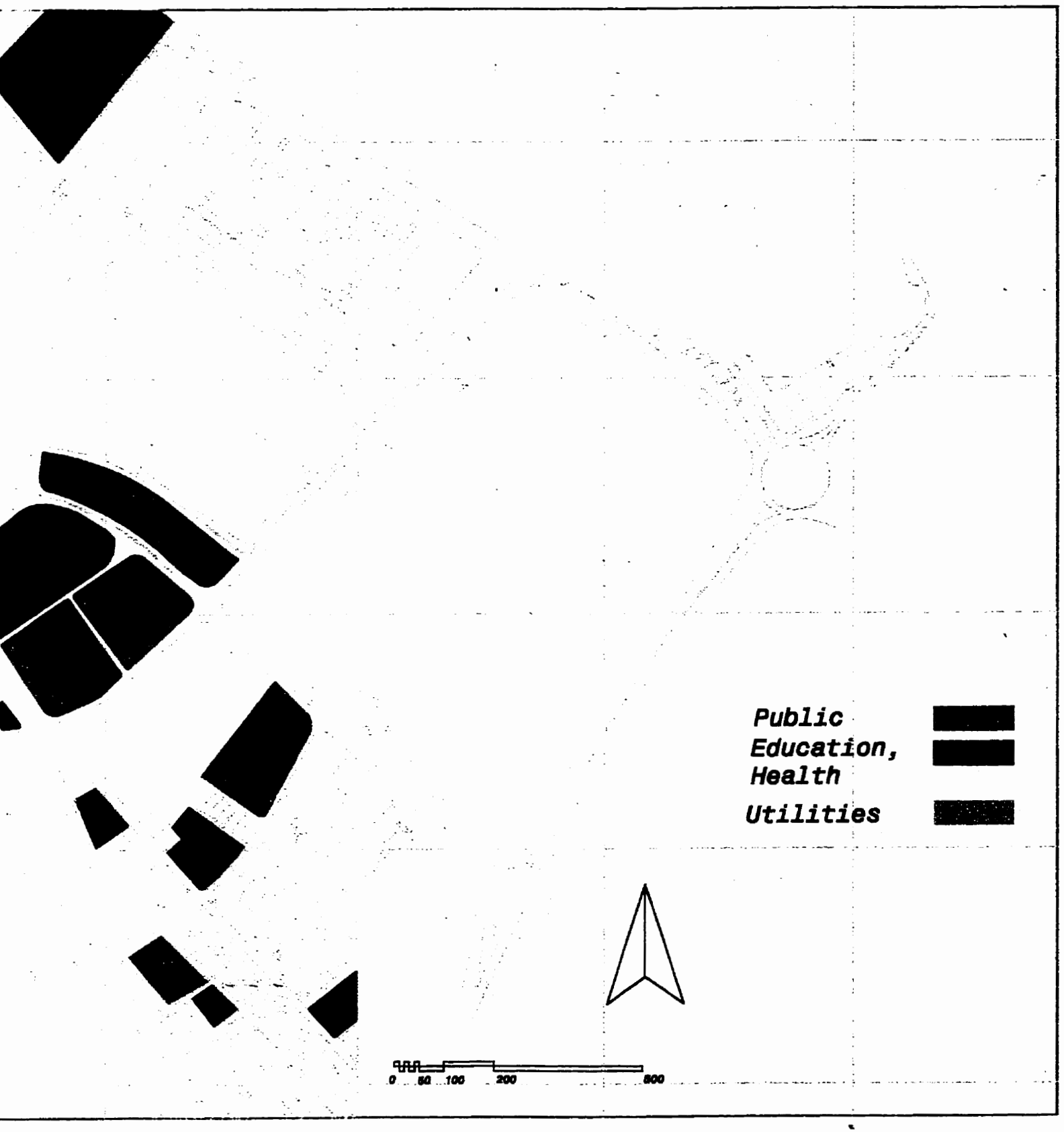


Figure 8:
Benghazi Center Plan
Public/Institutional (1997)

3.3.4 Transportation

A central concern when considering urban planning has been the transportation system[63]. The transportation network has clearly been a key contributor in the shaping of the city from its earliest days. In the 1960's plan for Benghazi, transportation considerations involved a roads-based approach, the central element of this being an elevated urban motorway encircling the City Center[64]. A mid-1980's review of transportation strategy expanded upon the earlier plan by offering three possible approaches: a road-oriented scheme very similar to the 1960's plan proposals; an alternative strategy with an emphasis on buses; and finally, a plan dependent upon a balanced use of private vehicles and buses[65].

Presently, public transport in Benghazi consists of buses and taxis. The existing plan for public transport has 25 bus lines serving the city (**Figure 9**), although only 13 bus lines are actually operating. Public transport is used in a limited way throughout Benghazi City as well as in the study area (center plan) for the following reasons[66]:

- The lack of bus services and lack of shelter maintenance discourages people from using public transportation;
- There are only small numbers of public buses operating because of a shortage of drivers and of spare parts for broken down buses;
- Inadequacy of public buses themselves. (This is why many parts along the center area are not served by bus routes);

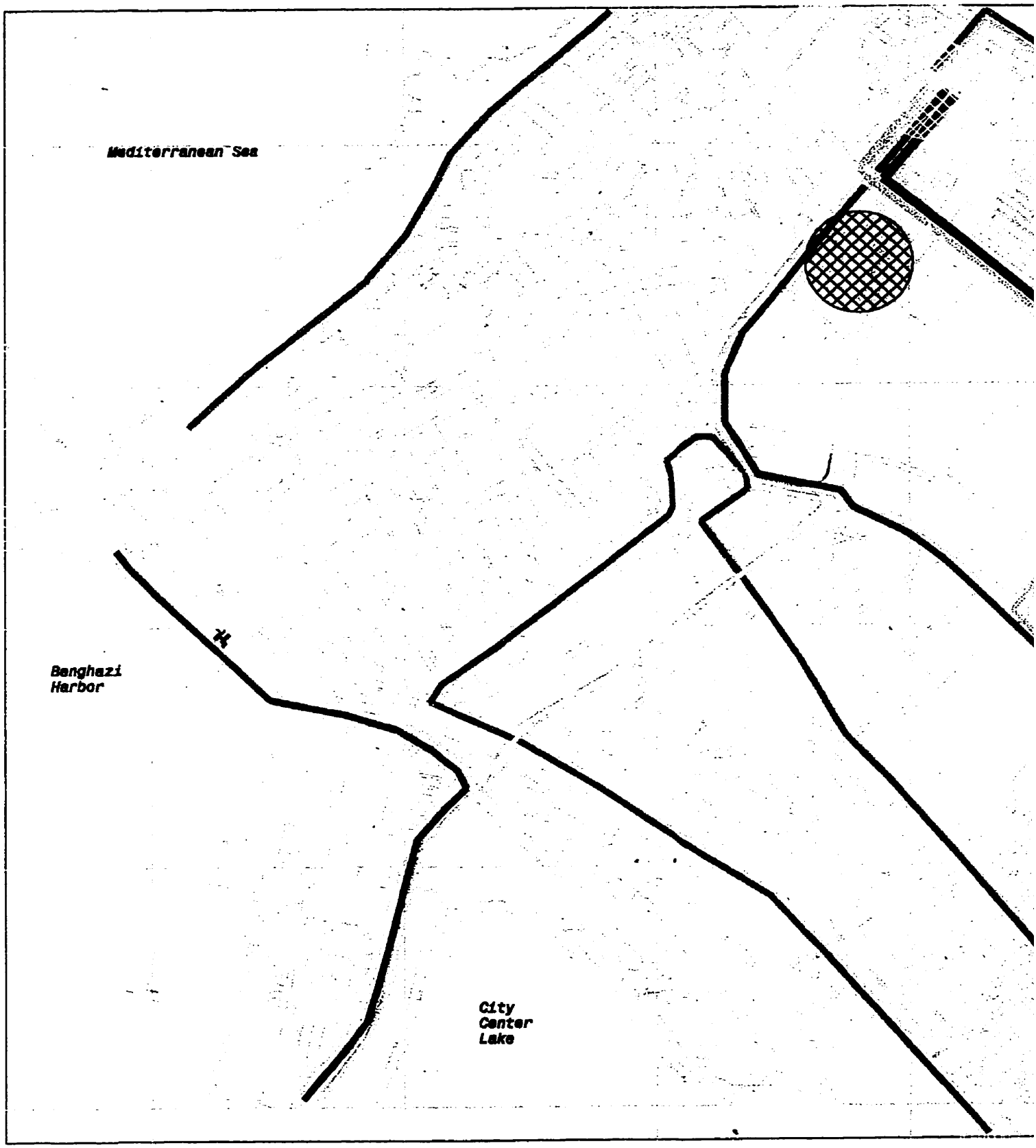
- The unbalanced distribution of bus terminals. They are concentrated in only two areas, Funduk and Berka, both of which are difficult to access.

There is no clear transportation strategy in Benghazi. Public transportation has failed to be user-friendly, either in conception or in function.

The existing road network in Benghazi shown in **(Figure 3)** consists of several ring roads connected to arterial roads. Service facilities are distributed along important roads (arterial roads), which connect the western and eastern parts of the city, and also connect major industrial areas in the southern and northern parts of the city. In the center plan, there are two major arterials in addition to *Mohamed El Mkaryief*, a road which connects the center area with the airport, and the 23rd of July Road, which extends south to the city of Slug.

The major arterial networks are joined by other secondary and tertiary classes of roads, which also extend from the Center Plan to the periphery of the city. The plan for a ring road network, consisting of five ring roads, was initiated in 1985. The third ring road is now in the last stage of construction, while the north part of the fifth ring road and the middle section of the fourth ring road were constructed two years ago.

The traffic between *Mahalas* and the Center Plan area is severely congested, the result of a concentration of


Mediterranean Sea
Benghazi
Harbor
City
Center
Lake

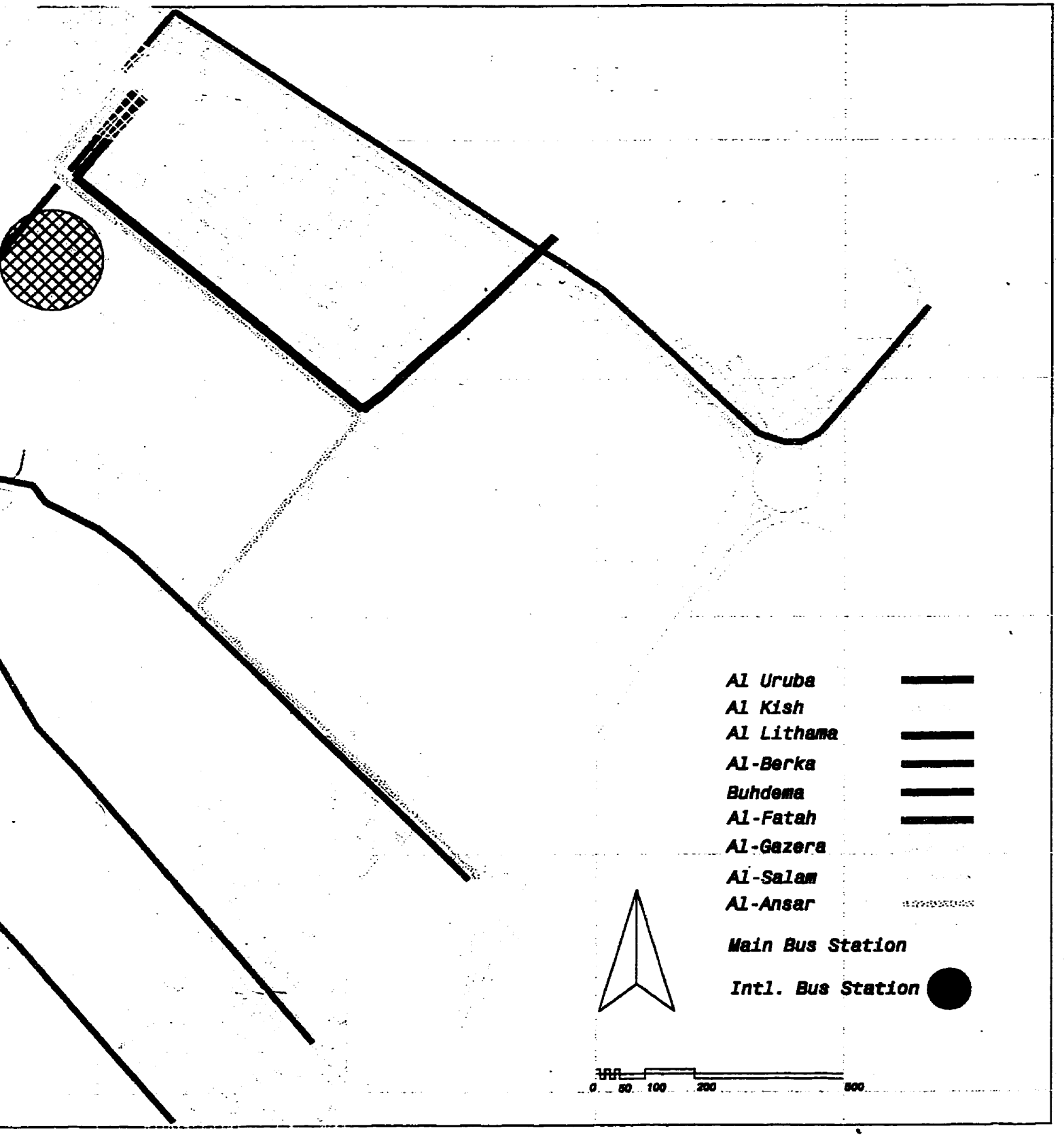
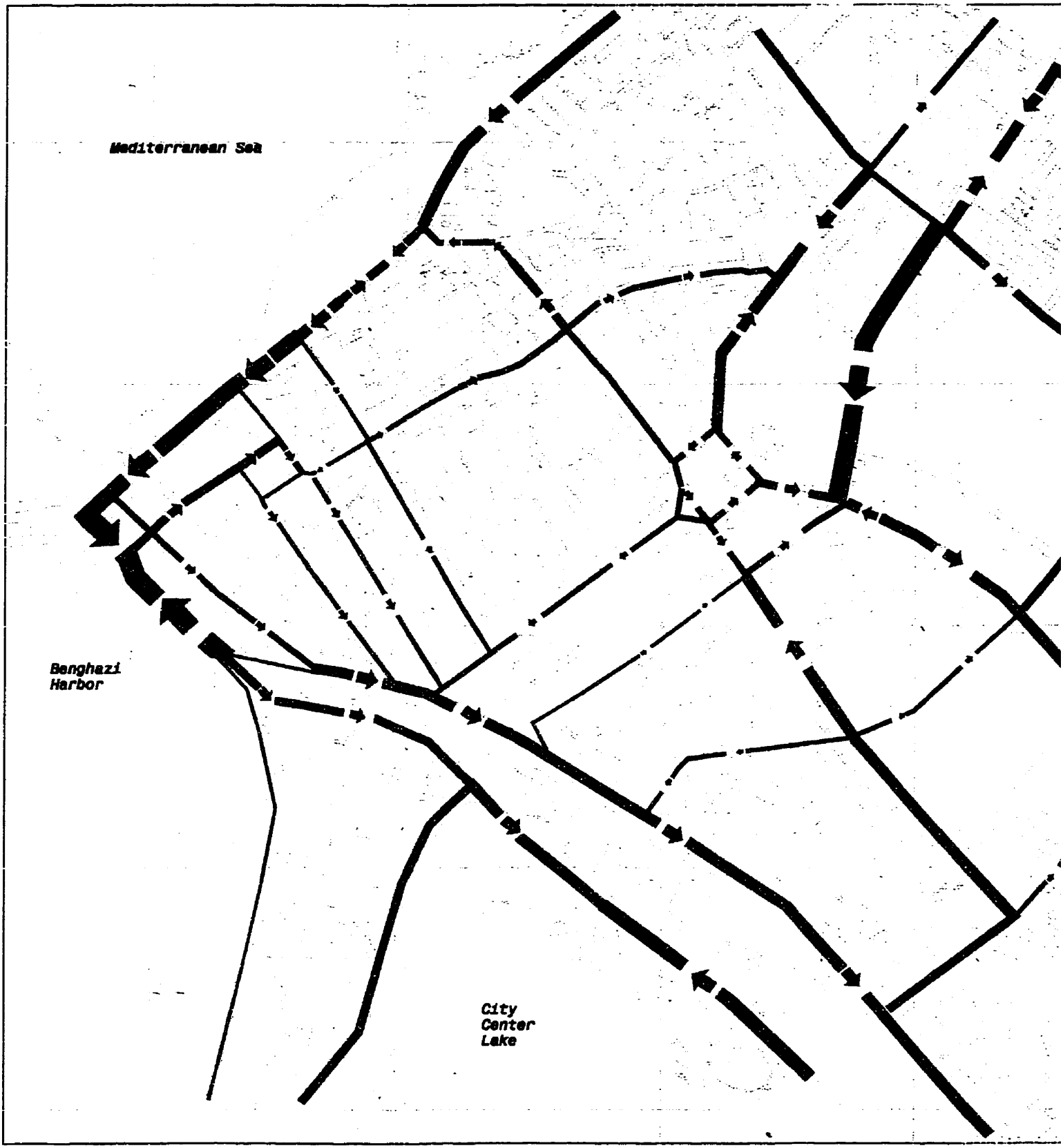


Figure 9:
Benghazi Center Plan
Public Transport (1997)


Mediterranean Sea
Benghazi
Harbor
City
Center
Lake

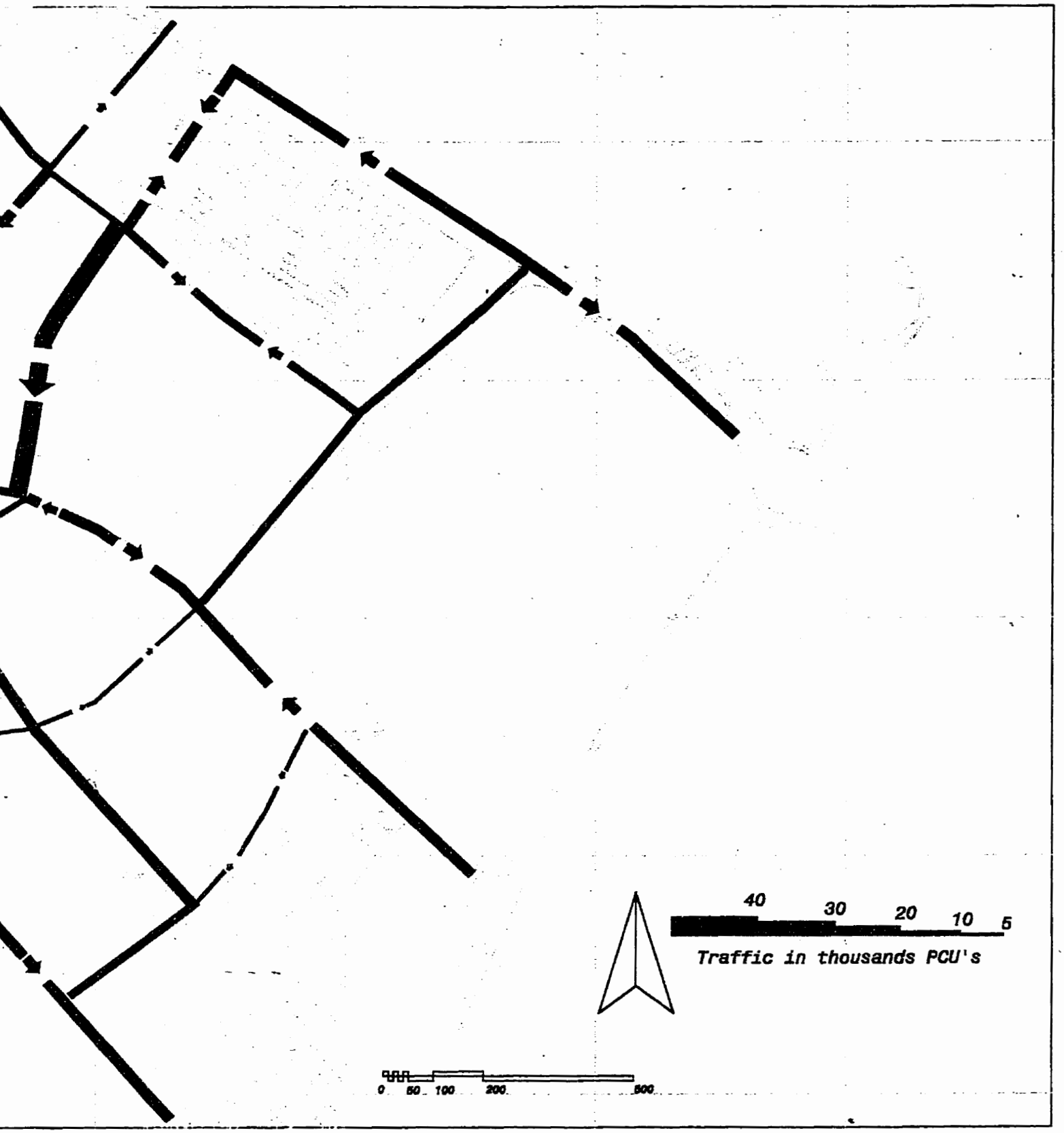


Figure 10:
Benghazi Center Plan
Average Daily Traffic (1997)

services and facilities within the Center Plan area[67]. The total daily number of trips between *Mahalas* and the center area is 37,015. The following drawing **(Figure 10)** shows the type of trips made to the center plan area.

3.3.5 Parking

Both on-street and off-street parking is free of charge for an unlimited amount of time, so there is no difference in frequency of use. There are no parking lots, expensive or otherwise, and there are no long-term or short-term parking facilities. Vehicle owners simply park closest to their destination.

However, off-street parking does not seem sufficient for the demand generated by work, shopping, and other commercial activities. Extensive on-street parking may be seen as a result of this. As a general rule, parking is allowed on both sides of those streets having two-way traffic, and on one side of one-way streets unless they happen to be very wide[68].

3.3.6 Climate

Owing to its location on the Mediterranean coast far from high mountain ranges and a considerable distance from the Sahara desert, Benghazi's climate is typically Mediterranean in temperature and humidity. These are the two primary climatic features that make for working efficiency and living comfort, and they are perfectly interrelated to create a favorable climate during most months of the year. The most inimical climatic feature is the southerly *qbli* winds in summer. Although they are of short duration (three weeks per year), they carry large quantities of sand from the desert and cause rapid rises in temperature[69].

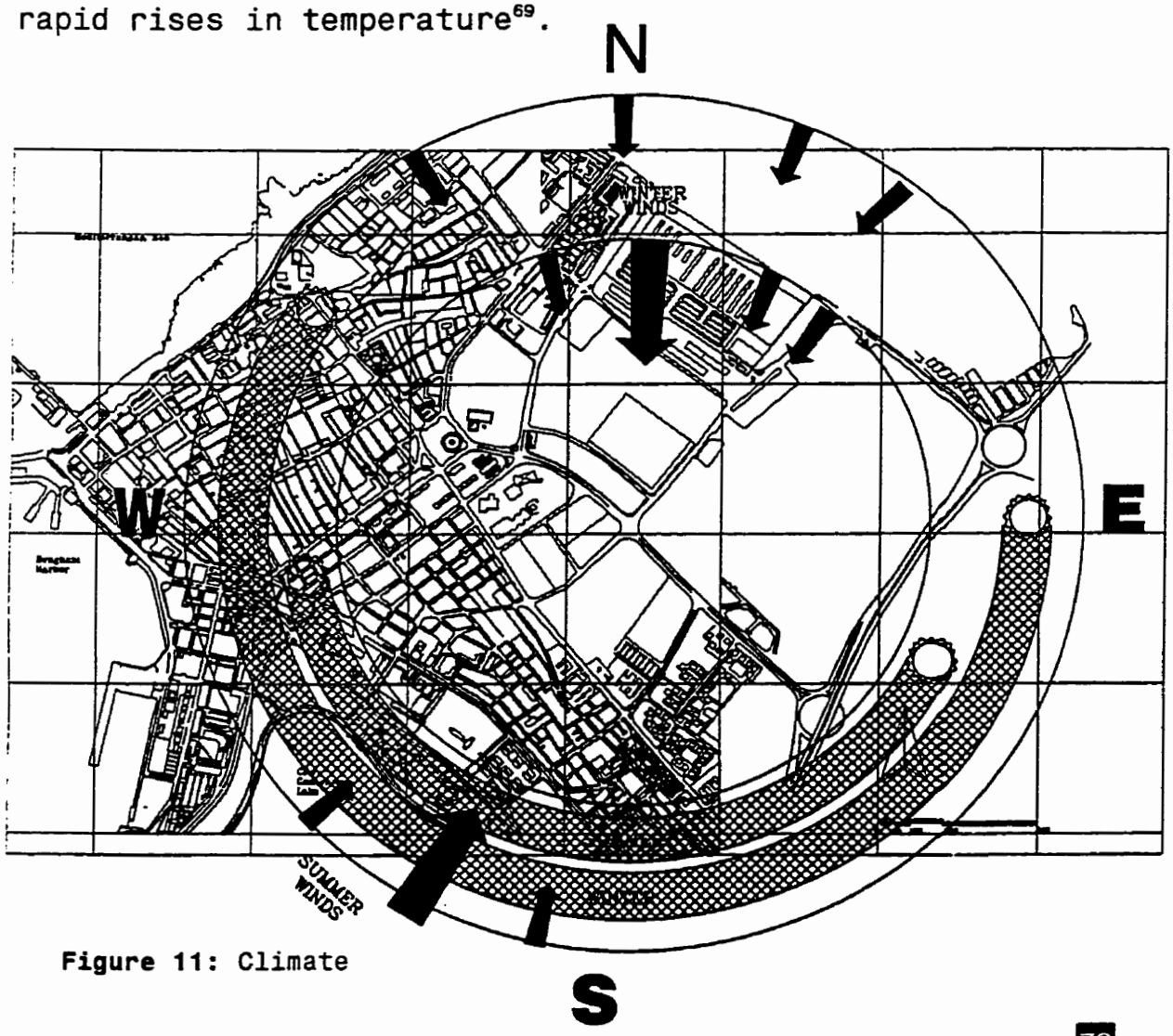


Figure 11: Climate

3.4 Population and Employment

To predict the physical size of the city center, it is best to examine Benghazi's and comparable cities' populations **(Table 2)**. According to such an analysis, residential function is of utmost importance to the life of an Arabic City center[70].

On January 1996, the resident population of Benghazi was 683,000[71], 155,000 of whom are actively employed. The tertiary sector, the chief production sector, employs 78,500 people, or 55% of the total working population. The present residential population of the central area is approximately 87,000, which is 13.7 % of the city's population.

Benghazi's predicted population for the year 2014 ranges from 1,066,000, a minimum estimated by the Whiting Plan, to 1,262,000, a maximum estimated by the Arup Plan, a plan designed by transportation consultants. Moreover, the Dioxides Plan predicts a population of 1,470,000, while the Humphrey Plan, a plan drawn up by water and sewer consultants, predicts it to be 910,000.

The Dioxides Plan predicts Benghazi's working population to be 248,900 inhabitants by the year 2000. This is equivalent to 33.47% of the residential population projected for that year. While it is estimated this population may be subdivided into the three actives sectors, standard practice dictates that working populations are divided in to four sectors. However, it was decided to continue with Dioxides standards and combine the tertiary and quaternary sectors as shown in **(Table 4)**:

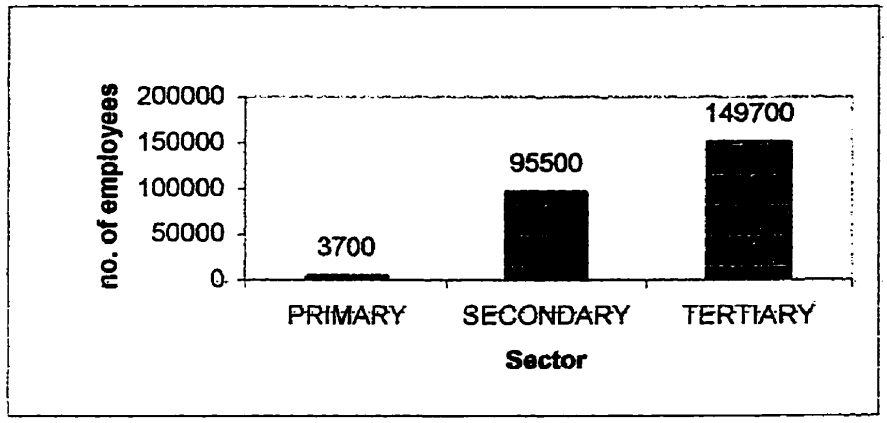


Table 4: Benghazi Active Population-subdivided into the three active sectors for the Year 2000.

The tertiary sector, in turn, may be subdivided according to the following projections in **(Table 5)**:

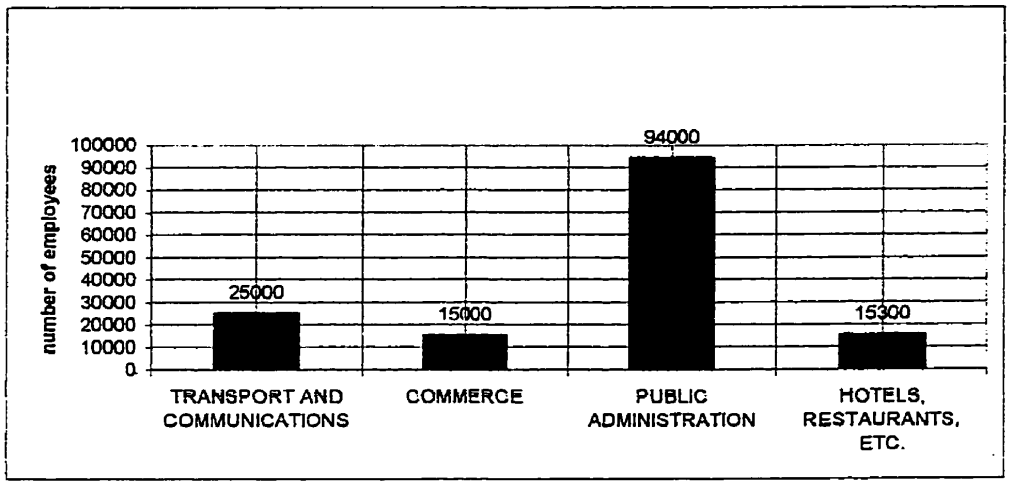


Table 5: Benghazi Active Population in the tertiary sectors for the Year 2000.

The Dioxides Plan predicts that 59,070 of these employees will work in the central business district. Employment will be distributed in the following manner **(Table 6)**:

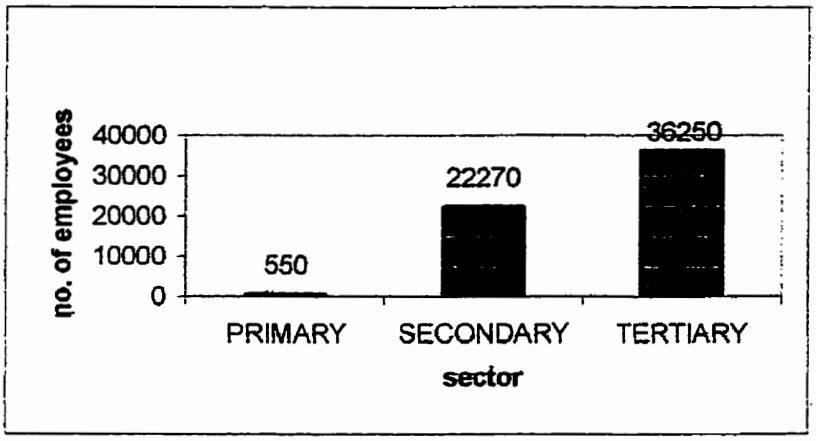


Table 6: Benghazi C.B.D. Employment Distribution by the Year 2000.

A further 19,550 employees will work in the areas allocated by the Master Plan for administrative and civic functions (central and local government buildings). They will subdivide into categories listed in **(Table 7)**:

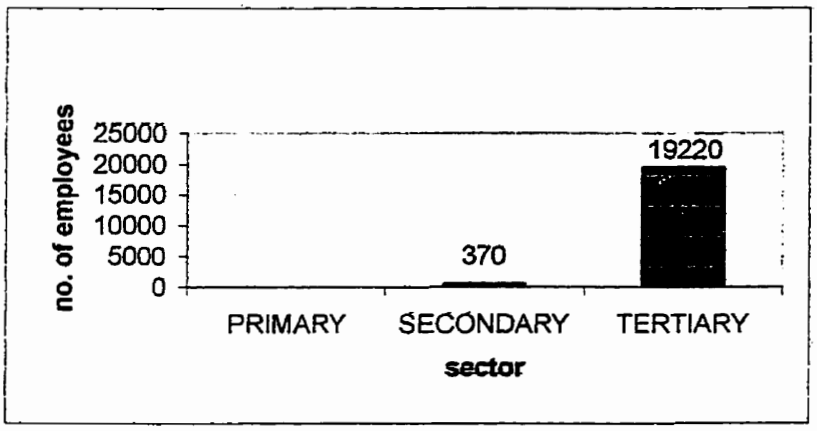


Table 7: Benghazi Administrative Center Employment Distribution by the Year 2000.

And 51,760 employees will work in institutional areas (including a cultural center). Employment will be distributed as follows **(Table 8)**:

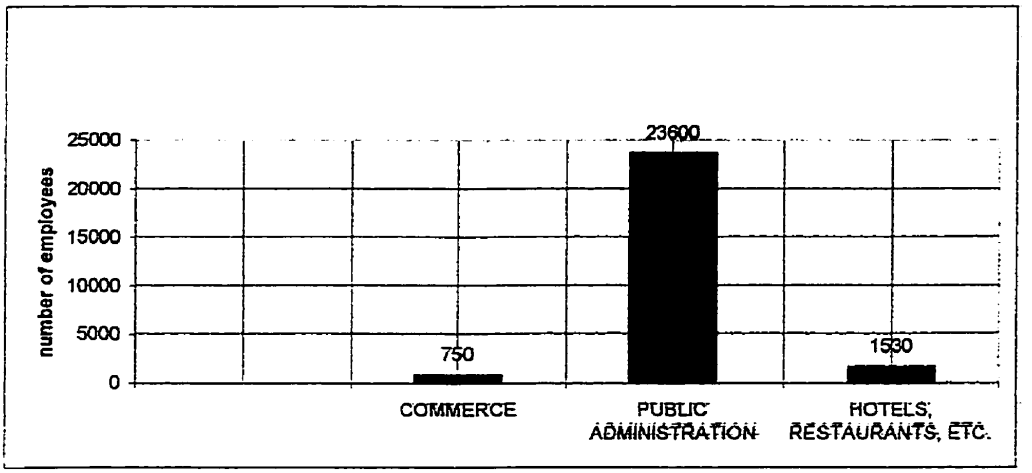


Table 8: Benghazi Culture and Institutional Employment Distribution by the Year 2000.

According to the forecasts made for the next twenty years, Benghazi will show a population growth ranging from 56% to 145%, while the central area will experience a considerably lower growth rate. This is due to the fact that the city center favors administrative over residential functions.

Also by examining central business districts through studies carried out by Ove Arup Engineering and Architects in 1978, it may be deduced that the area's residential population will decrease from between 10.6 % to 6.5% by the year 2000. On the other hand, the whole city's population is growing. It is evident that the tendency of residential percentages to decrease is linked to design hypotheses that disperse central functions by distributing them in a well-balanced way throughout the whole city, with the intent of avoiding traffic congestion in the city center[72].

Finally based on the comparison between the employees percentages present in the Dioxides plan and the existing studies, the number of administrative activities employees predicted for Benghazi's central business area in 2014 is 30,900, or 26.60% of the total active population in the tertiary sector.

CHAPTER FOUR

DESIGN PROPOSAL

The preceding chapter discussed the problems related to the designing of a city center. This analysis has led to a determination of the social and city planning requirements of an administrative center at the urban and territorial level, a center of attraction of the whole city and territory. The central activity sectors were determined according to the different levels of interest. Having completed this delineation, it is possible to proceed with testing the project and presenting the final proposal.

4.0 Design Proposal

The plans arise from a series of investigations of the experiences of other countries in designing similar central areas, the characteristic patterns of the Islamic city and planning standards based on UN Experts recommendations, with modifications in order to adapt them to the particular economic and social conditions in Libya. Both are attached to this study **(Appendix A)** in the form of reports and tables. These serve as a manual to the technical aspects of the plan and as an overview of the standards the reader[73].

4.1 Plan Organization

The criteria at the foundation of the design of the new center involve the definition of a detailed architectural plan coordinating the implementation of different building zones. The goal of this design is to achieve the greatest flexibility in adjusting various development hypotheses within the framework of the plan.

The areas studied tend to hold in common the soundest achievements of the rationalistic climate of the "international style." Clearly, though, the different solutions arrived at and the way they were implemented reflect the specific culture and location of each city. As a result, respected cities are vested with a definitive charisma, or the spiritual "look" of the city. In keeping with this approach, the goal of the design of Benghazi's new center is to take into consideration a historical, cultural, and environmental

study of Islam-influenced Libyan and Mediterranean areas. While reflecting a historical-environmental context, the proposal for the new center should result in the creation of a lively and attractive urban center endowed with all the comforts made available by advanced technology.

The proposed design takes into account the continuous and irrepressible variability of factors affecting the development and ultimate use of urban settlements. This constantly increasing change ability is the consequence of the social, economic, and cultural dynamism characterizing our age. It radically differs from the conditions of life in the past that determined patterns for a defined city with a consistent design.

There are, however, no forecasting methods allowing one to estimate exact trends in changing populations of urban environments beyond only a limited time. This may appear contradictory to planning in accordance to rigidly defined patterns to arrive at a structure intended to meet future requirements. On the other hand, regional and urban planning cannot simply be abandoned, especially when this problem concerns a complex area to plan like the plan of city center, or there will be no potential at all for controlled future growth.

The basic problem in preparing any city planning and architectural design is the relationship between quantitative forecasts and qualitative achievements, between a master plan and its translation into urban planning solutions. The answer

lies in a plan's flexibility. The Benghazi center plan defines the concrete form of the city center: its position, dimensions, and formal architectural features. It will act as a guidance plan preserving the expressive freedom of the architects who will design the different units. At the same time, it will contain directions of enough regulatory strength to ensure subsequent decisions will be in full compliance with the "spirit of the plan."

This detailed zoning and architectural plan will express an "urban design" defining public, commercial, and social spaces as interconnected. This approach will make the center the real "hub of the city."

4.2 The organizational principles of the urban space proposal are as follows:

1. Special attention was given to physical constraints on the historic fabric, so that an attractive pedestrian city center can be reestablished there;
2. Traffic pressures have to be controlled to stop the trend towards further dissection and problems of crossing historic districts;
3. Maximum integration of urban activities;
4. Access facilities for automobiles;
5. Functional and architectural characterization of public buildings;
6. Rediscovery of space for craft trading;
7. Extensive view from the house of the panorama of historic facades, the street, and open spaces;
8. Evolutionary nature of the urban organization;

9. Principle of unity and diversity characteristic of Islamic cities' urban design.
10. Integration of the arts, and especially the visual arts. Special attention was given to prevent physical threats to the historic fabric, so an attractive pedestrian city center can be reestablished.

4.3 Layout Distribution Principles

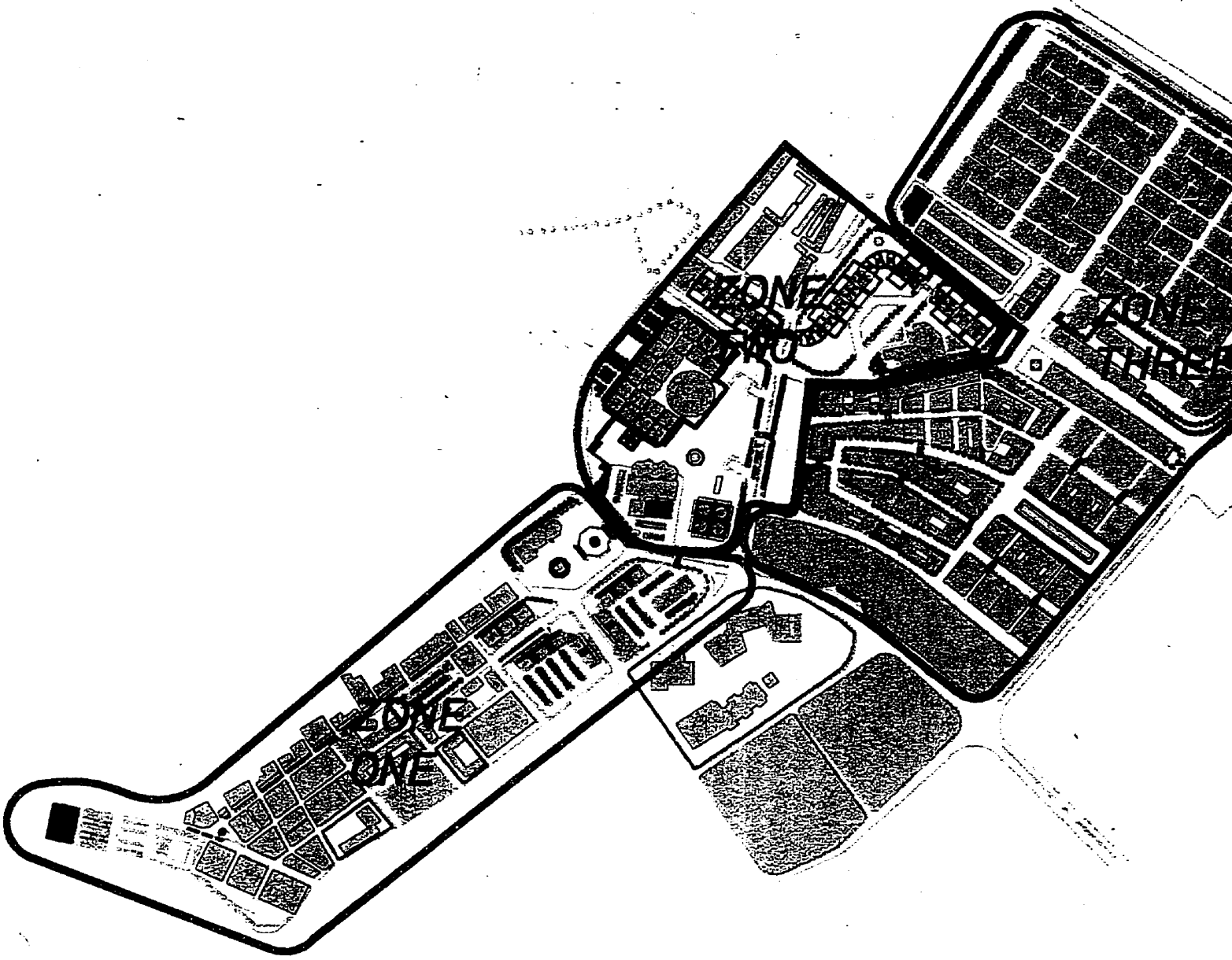
The project has been divided into three main zones **(Drawing 3)**:

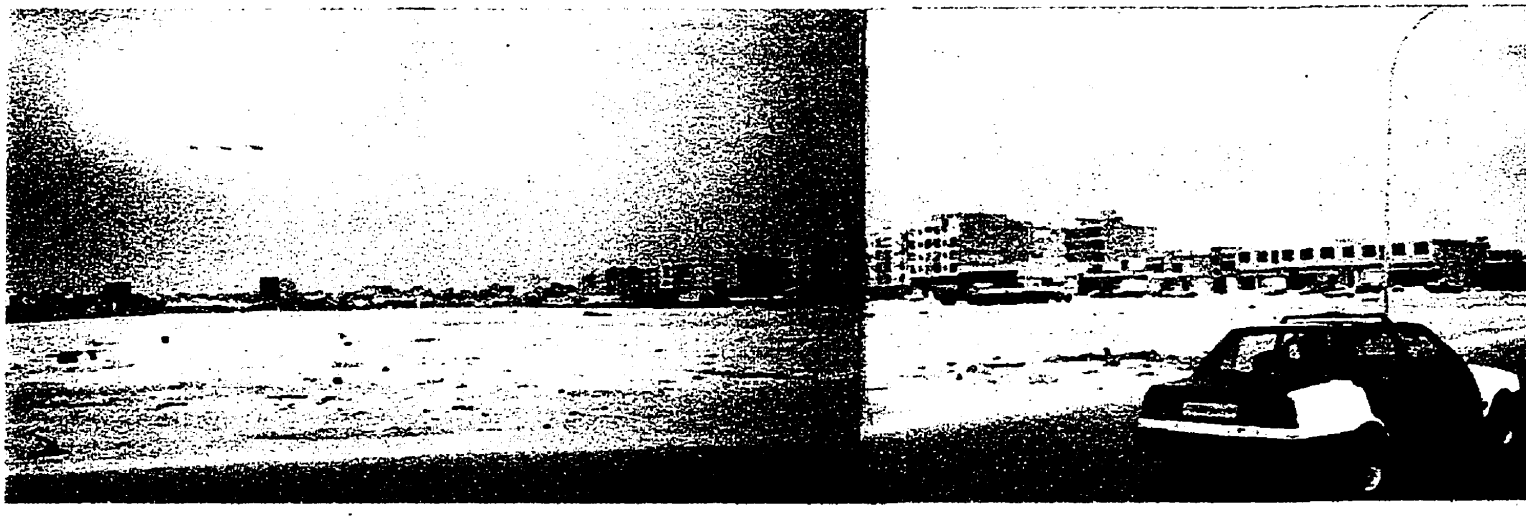
Zone One is the area around the *Omer El Mukhtar* monument, which is linked to the new center of the city *by Omer Ibin ElAss* Street.

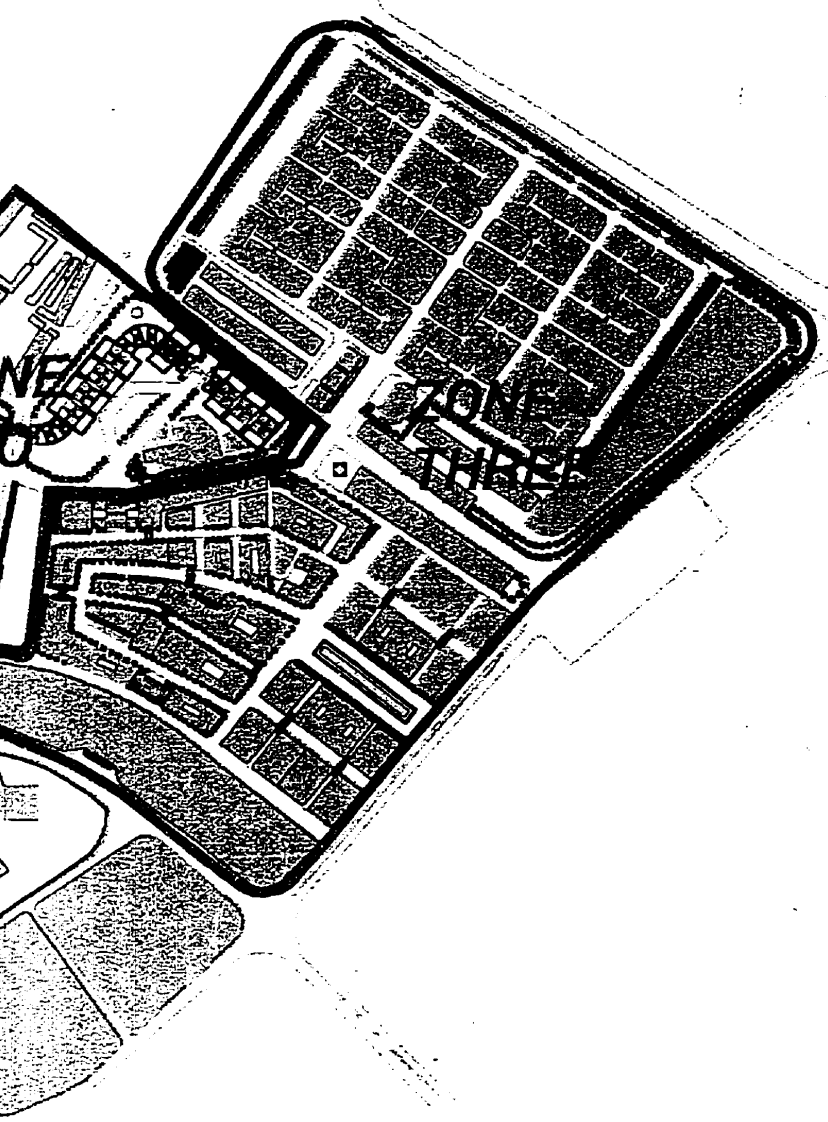
Zone Two includes areas reserved for religion, culture, (including shows and exhibitions), promotional activities, as well as the existing *Souq*.

Zone Three: The area reserved for the construction of public buildings as well as other uses which will guarantee the "life" of the new center.

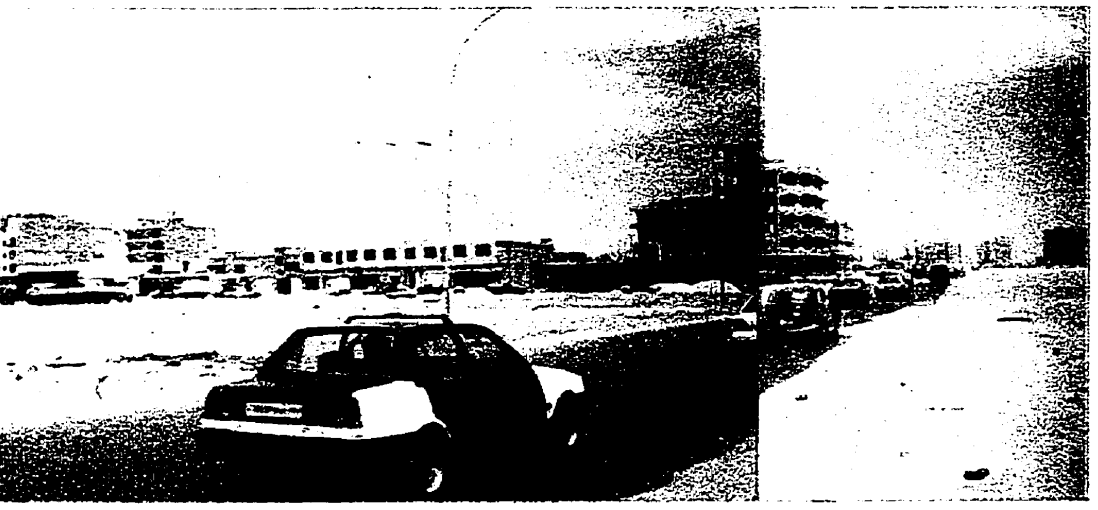
The allotments of mixed building units are based upon quotas for business and residential space. These quotas come with a degree of flexibility to ensure the most varied possibilities of functional and morphological aggregations. This mixed character will guarantee the necessary vitality and will avoid the problem of a city center that becomes deserted after the shutting down of offices and shops for the day.


ZONE
ONE
ZONE
TWO
ZONE
THREE





PROPOSED SITE



Drawing 3:
Proposed Zoning

The dimensioning of the center is a function of many variables and one which is based on the needs and requirements of a city center with a predicted population of 1,200,000 inhabitants by the year 2014.

The zone under consideration of course does not have the necessary surface area as would be expected from the data of the standards. In order to resolve this problem, a precautionary hypothesis has been made based on the space necessary for the central business zones and the public building zones indicated by the formulas of the standard proposed in the No. 24 Dioxides report **(Appendix)**. This report multiplies the number of employees by the surface area required by each employee to arrive at the number of floors needed to be constructed for a given building.

Taking into consideration the design philosophy proposed in **(Drawing 2)**, I would propose an average building height of four floors. This result a densities area of about 180 employees per hectare in the central administrative zone. The dimensioning of residential building which guarantees the vitality of the urban center is based on a ratio for the business center of Riyadh, and also that proposed for, Rusafa, the business center of Baghdad[74]:

$$\frac{\text{Business employees}}{\text{Housing}} = \frac{1}{1.5}$$

In Benghazi's case, once the number of employees is fixed, the number of residents will stabilize at 1.5 times the number of

employees' units. The general outline of the distribution of basic data is a hypothesis as in **(Table 9)**.

The proposal being presented here is necessary at a preliminary level. It should be noted, moreover, that there cannot be a single final function, but by proposing to do everything to fulfill the requirements a reasonable solution can be achieved.

Taking all analysis undertaken into consideration, three possible solutions for the area have been proposed. One is to develop the area along a spine that links the new main mosque, *souq*, and other public buildings. Secondly, the area would be developed into a grid, each of whose parts could independently develop. The third alternative is to use the mosque, the cultural center, and the justice buildings as a focal point for pedestrians, and then proceed radially into the rest of the area.

To aid in choosing the best solution of the three, it was taken into account that the area would be developed over a long period of time. A spine would allow development just along that spine, leaving other construction to follow independently. This plan assumes important elements will be placed along its course and it encourages growth outward, but it is not appropriate for this area because it comprises a defined space that results in surrounding spaces appearing less important.

Choosing a grid makes it possible to develop any one block individually without affecting the others. However, the grid

				ZONE ONE	ZONE TWO	ZONE THREE	TOTAL	%
AREA	TERRITORIAL		m2	265.000	659.000	830.000	1754.000	
	EDIFYING	NON. RES.	m2		122.300	168.000	290.300	
		RESIDENTIAL	m2		85.200	80.000	165.2	
	TOTAL						2209.500	100%
POPULATION			no.	7.625	14.400	19.220	41.245	
			%	100%	100%	100%		
INHABITANTS			no.		9.600	10.230	19.830	
			%		100%	100%	100%	
VOLUMES	NON RESIDENTIAL		m3	320.000	532.330	887	1739.330	
	RESIDENTIAL		m3		282.900	382	664.900	
	RES. EXIST		m3		1090.29	1090.29	2404.230	
	TOTAL		m3	320.000	1905.520	2359.290	4584.810	100%
SERVICES	EDUCATION		m2		193.000	32.000	225.000	
	SOCIAL		m2		112.000	42.000	154.000	
	PARKING COVERED		m2		62.000	155.000	379.000	
	PARKING		m2	18.200	24.000	75.000	117.200	
	GREEN AREA		m2	5.300	38.350	169.500	213.150	
	TOTAL		m2	23.500	429.350	473.500	1088.350	100%
STREET AREA			m2	27.000	195.58	185.400	407.980	

TABLE 9: Proposed Data Distribution

causes the center to lose its identity because people can go from one location to another without ever passing the important elements of the project.

Finally, it was decided to use the third alternative, the radial approach, because it gave prominence to the buildings on which Islamic society has placed value: the mosque, the court, and the cultural center.

By designing the center around the focal point of the main mosque, the area was divided into a number of sectors that could be developed at any stage. By examining traditional cities, one may see commercial facilities mixed with other uses in the same area. There is no need to separate them. The life of an area depends on the activities that take place there, and if they are eliminated, public spaces will be deserted. Therefore, different kinds of shopping were carefully introduced into each section of the area. Specialized shopping facilities, areas where people can find a good number of shops selling the same kind of merchandise, are important for attracting people to the city center. The shopper can then conveniently compare prices and goods as they would in a traditional *souq*. The *souq* itself will be centrally located adjacent to the cultural center and the Mosque.

All of these sectors have pedestrian walkways leading towards the mosque so that as people walk, they will feel they are moving towards a center. The center distribution layout originates from the old center, crossing *Omer Ibin ElAss*

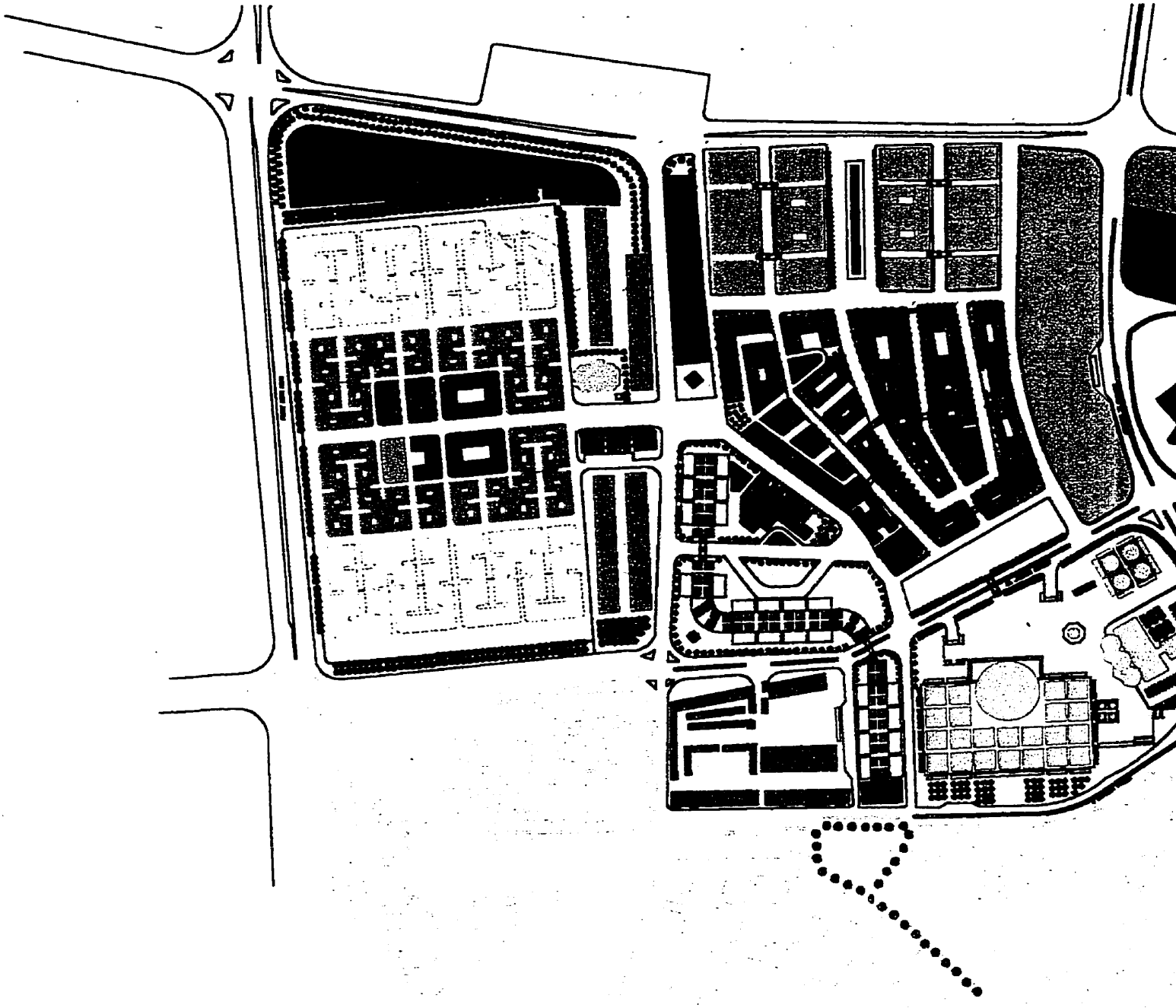
Street and *Omer Al-Maktar* Square, to the new cultural center and out to the radial plan. A trunk road, ideally linking together two historical and cultural areas, will utilize accessibility in helping to make the hub of the city a special area. **(Drawing 4)**

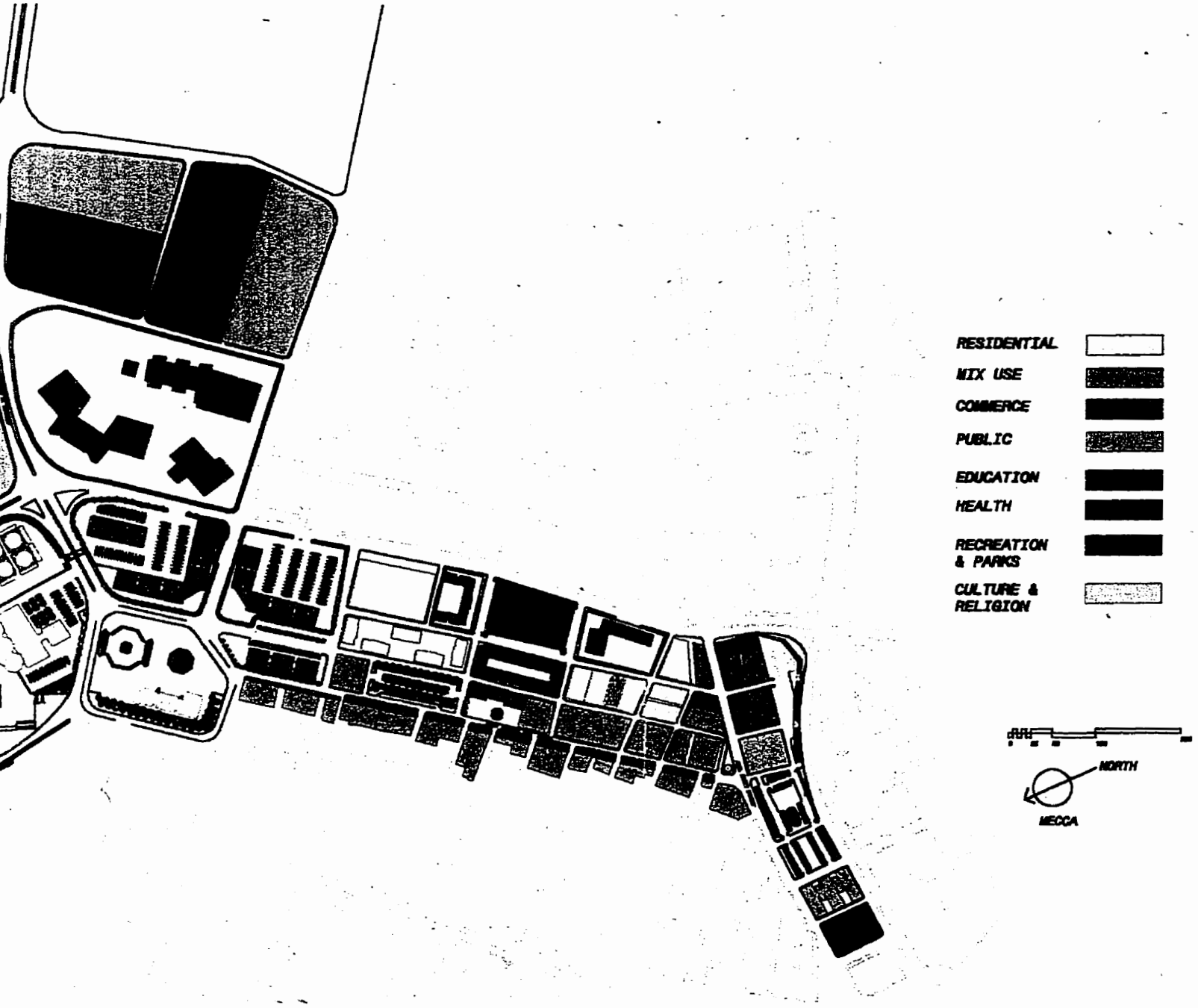
4.3.1 Cultural Center

The cultural center where the main mosque is located occupies the heart of the city; everything else revolves around it. The mosque is not only physically but also symbolically the center of religious, social, and cultural life. The cultural center forms a meeting point, but also it represents a modern interpretation of the meeting place of Islamic cities, which included a mosque, a *souq*, and court buildings.

Concentrating all services at one major point of attraction comprising as many types of social and cultural interest as possible offers the advantage of favorable meeting possibilities for people of different social strata and cultural levels. It offers a manifold of functions, which can be adapted and expanded when the needs of city life are changed according to outside growth and development. Finally, being situated near the urban, regional, and air terminal bus stations, it is the prominent meeting point of the city and the region, the city's communication center with Libya and abroad.

The building height around the cultural center (library, *souq*, and culture center buildings) will be kept low so these





Drawing 4:
Proposed Land Use

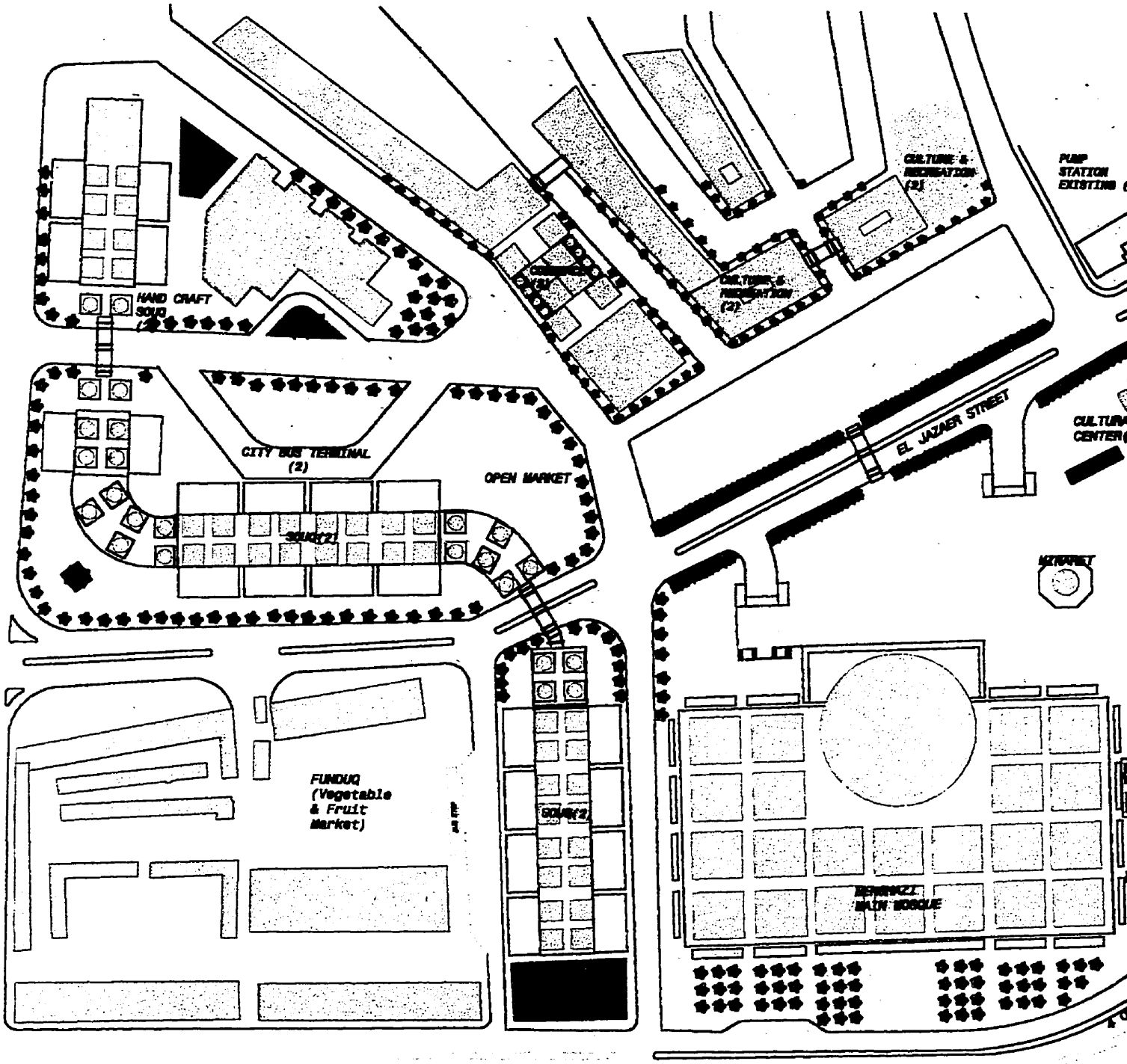
important elements will maintain their importance. Government and commercial buildings on the periphery will rise up to four floors **(Drawing 5)**.

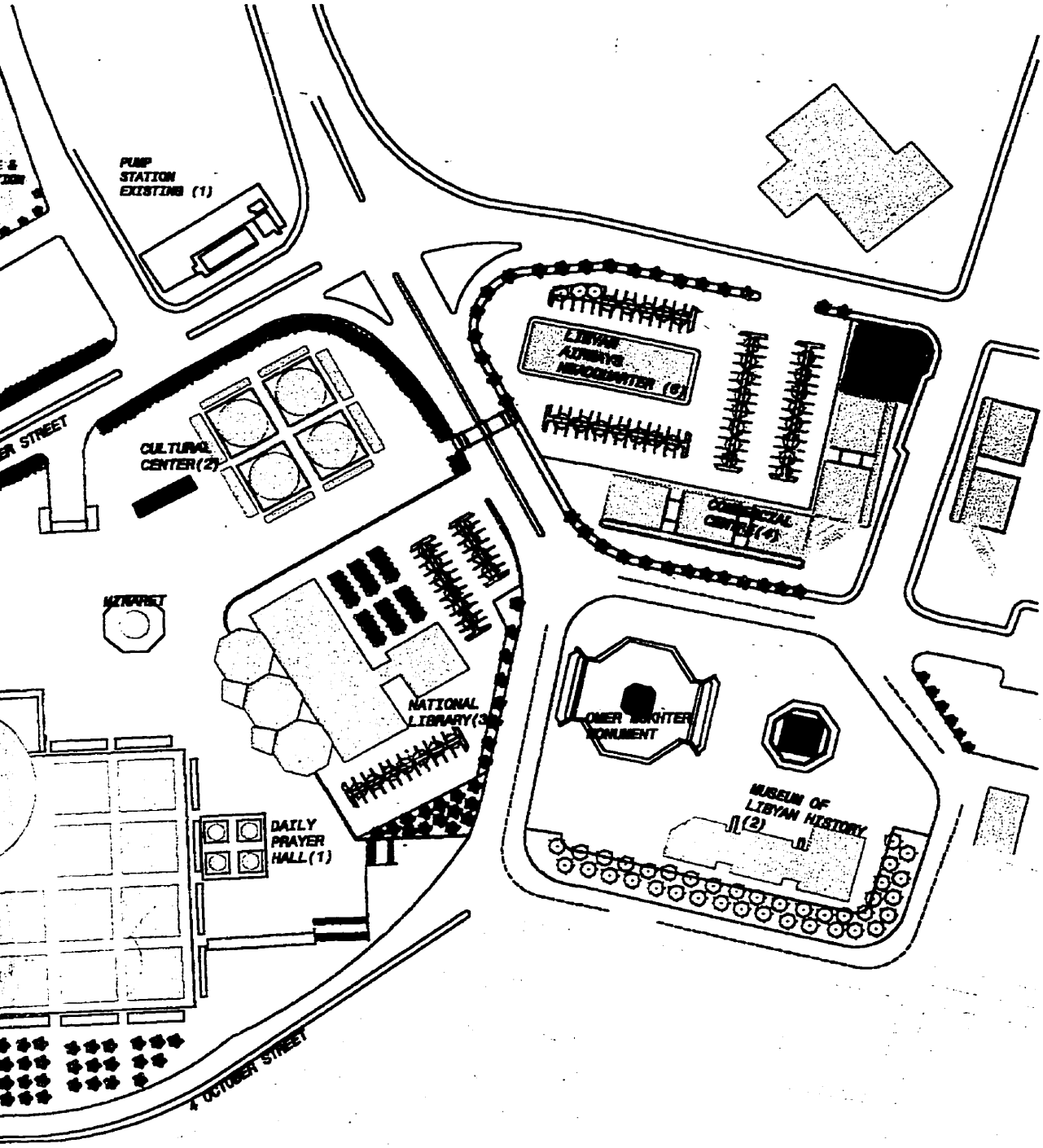
4.3.2 Public Square

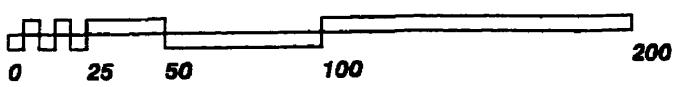
The main public square will provide a collective meeting-place for important festivals, notably the annual festival of Islam. In this large, integrated space, with colonnades, and tree-lined areas with fountains, shops and craft workshops, monuments, and a historical museum, people will be able to rediscover an affinity with their habitat.

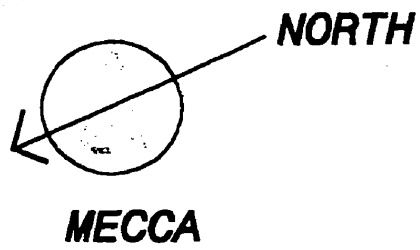
The public square is the main axis that joins two poles: the new and the old. It is linked to the old center by wide covered units, which have been constructed by pulling down the spine of the buildings which have been raised between streets and *Omer Ibn ElAss* street and its parallel. The public square, consisting of various articulations, will be flanked with the following important buildings **(Drawing 6)**:

1. The National Library;
2. Office and Bank Buildings;
3. The Monument of Omer Al-maktar;
4. The Historical Museum.

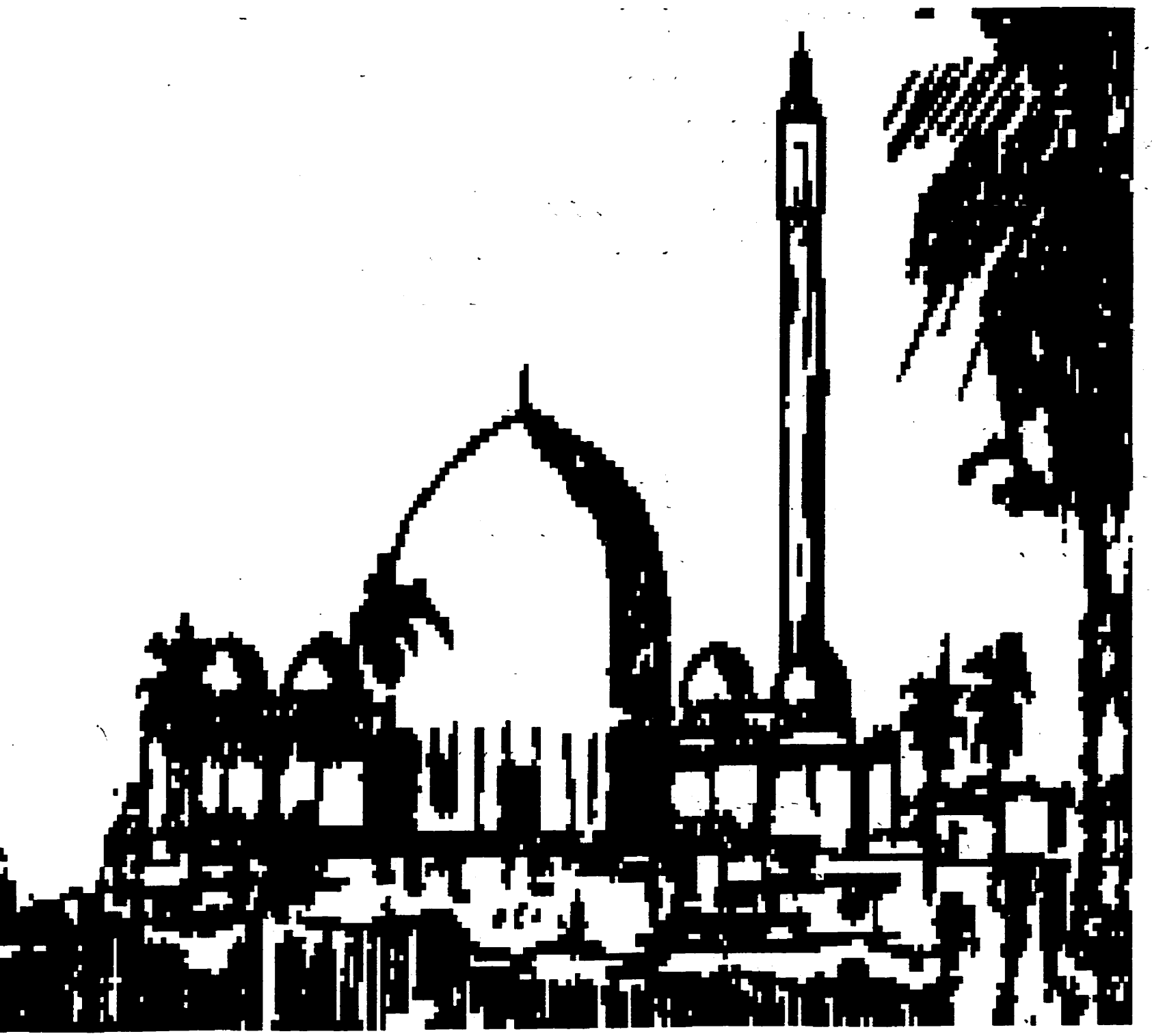

HAND CRAFT
SOUQ
CITY BUS TERMINAL
(2)
OPEN MARKET
SOUQ(2)
CULTURE &
RECREATION
(2)
PUMP
STATION
EXISTING
EL JAZAER STREET
CULTURAL
CENTER
MZYARET
FUNDUQ
(Vegetable
& Fruit
Market)
SOUQ(2)
BENHAZI
MAIN MOSQUE



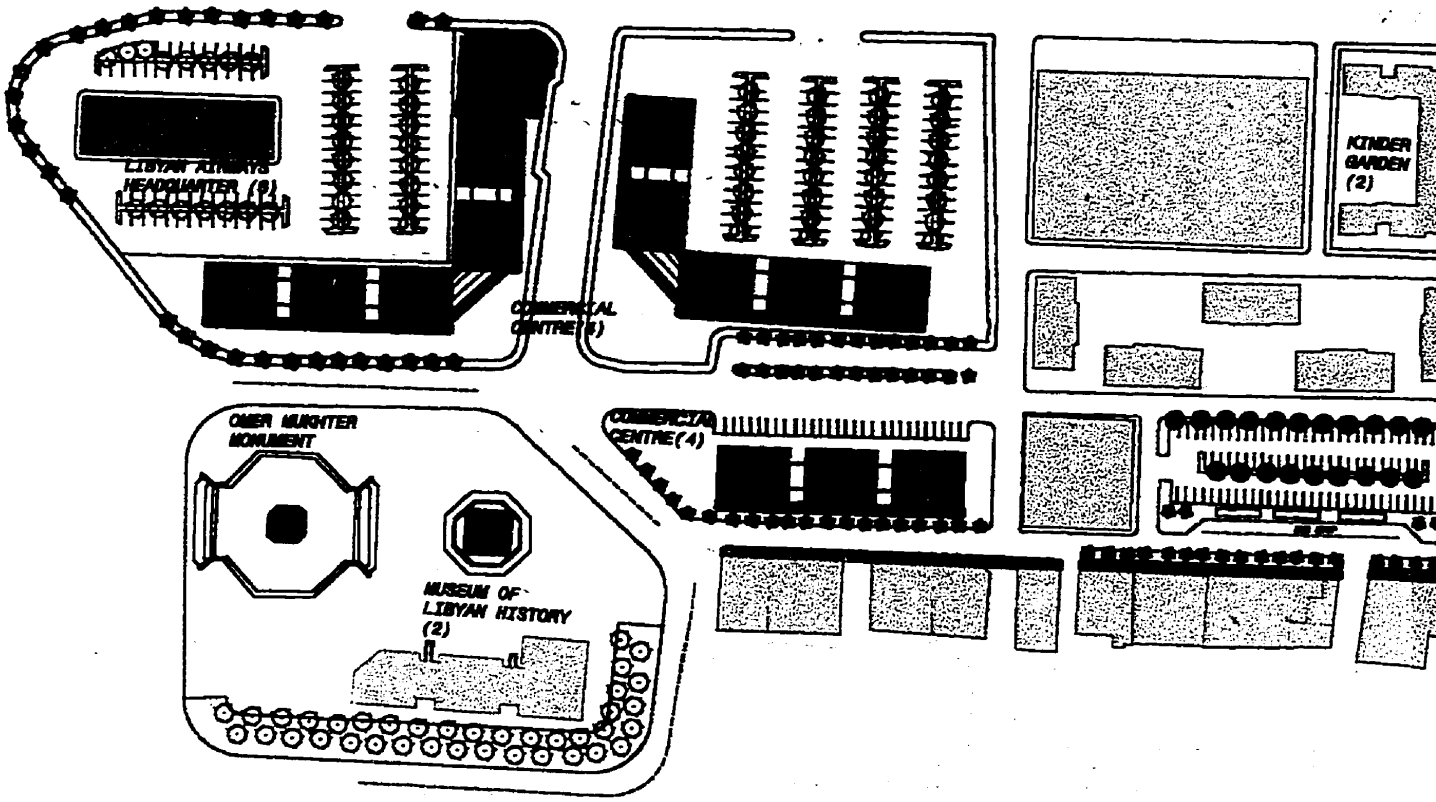




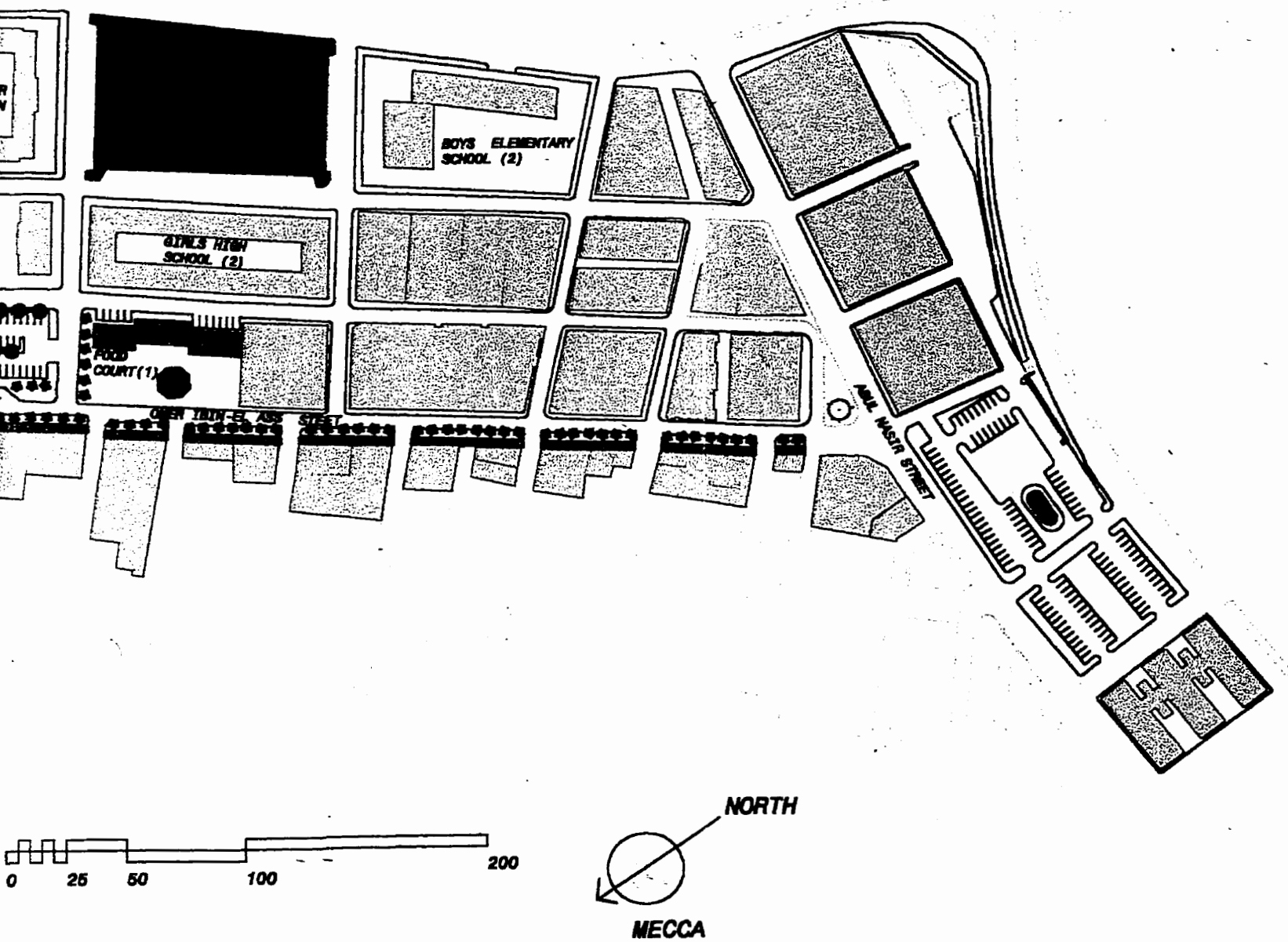
Drawing 5:
Proposed Culture Center



Drawing 5:
Proposed Culture Center
Skyline


LIBYAN AIRLINES HEADQUARTER (2)
COMMERCIAL CENTRE (3)
KINDER GARDEN (2)
OMER MUKHTER MONUMENT
COMMERCIAL CENTRE (4)
MUSEUM OF LIBYAN HISTORY (2)

0



Drawing 6:
Proposed Link to
Omer Al-Maktar Street

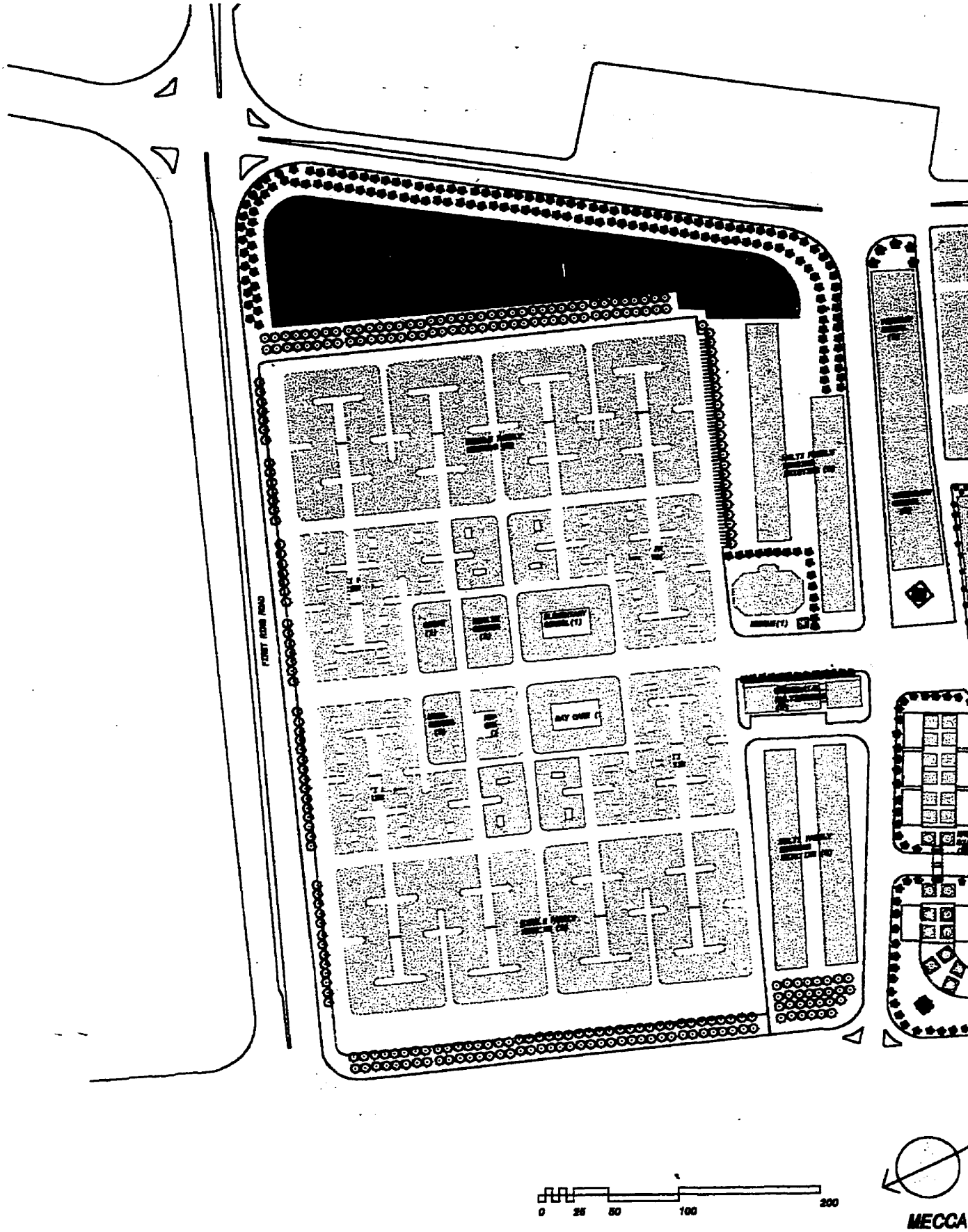
4.3.3 Administration Center

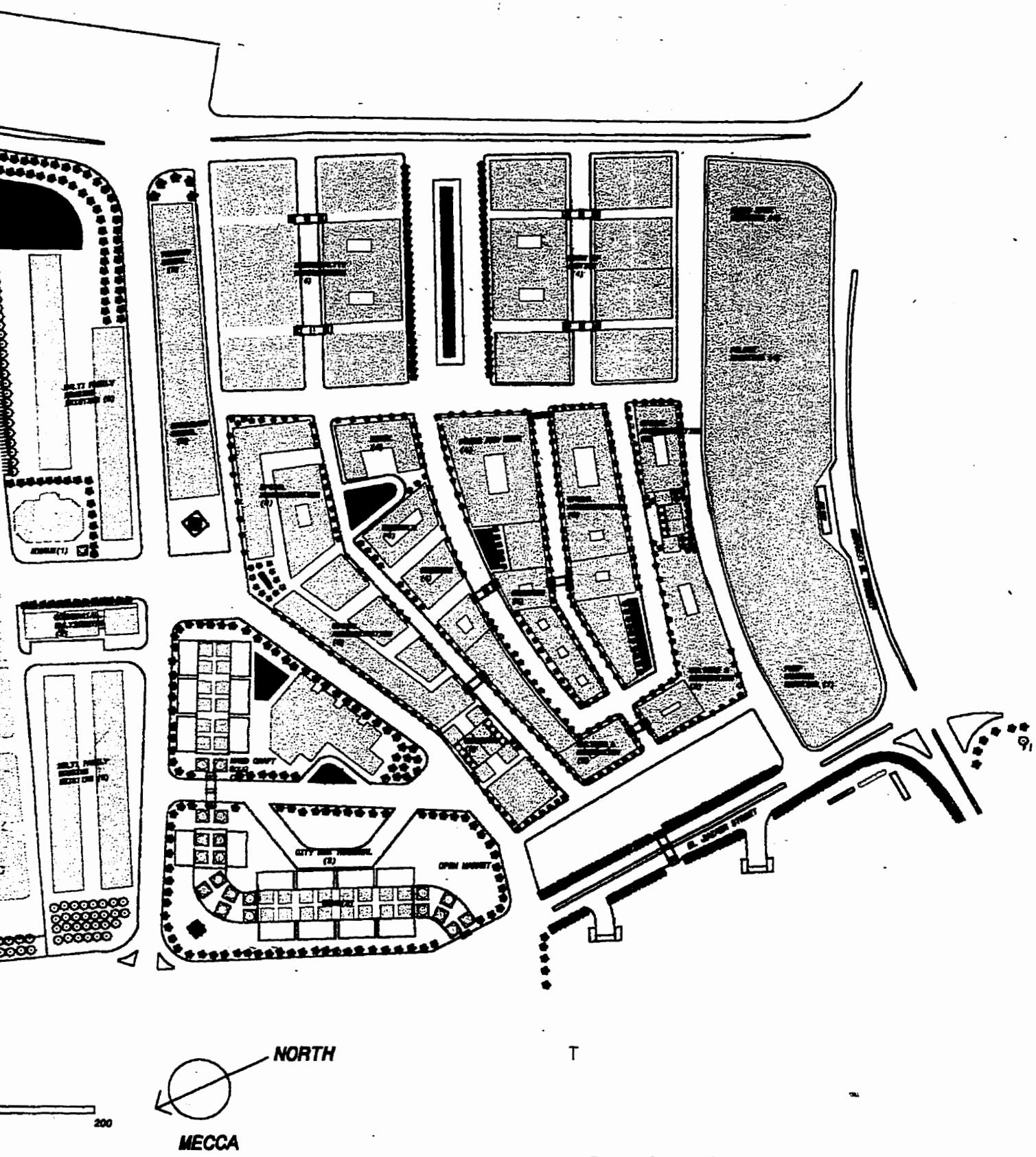
The eastern sector of the cultural center is the administration center, the second most important area of the new city center, an area with a large amount of public buildings but developed for mixed use. Most of the government buildings from the old city have been located here to reduce traffic congestion and to offer a wide range of government services in the heart of the city.

Further east is the People's Park, and according to Islamic principles, the design concept of the garden is composed of independent space. For this reason, the people's park is located at an interesting point in the urban scenery, following a line moving up and down between the new center. The People's Park, the residential tower buildings, and the new lake, all of which will be created at the east end of the new center area, will constitute the second attraction point **(Drawing 7)**.

4.4.4 The Residential Complex

The fundamental idea is to establish a residential urban section within the new center of Benghazi with a great portion of flats, single family housing and little shops. The plan concept intends to take up the rich traditions of the houses in the Arab world. In this way it will correspond to the cultural and social aspects of life. This four floor residential complex is placed at the north west corner of the culture center. This complex site is bounded on the west with


FOREST ROSE ROAD
0
25
50
100
200
MECCA



Drawing 7:
Proposed Administration
Center & Residential complex

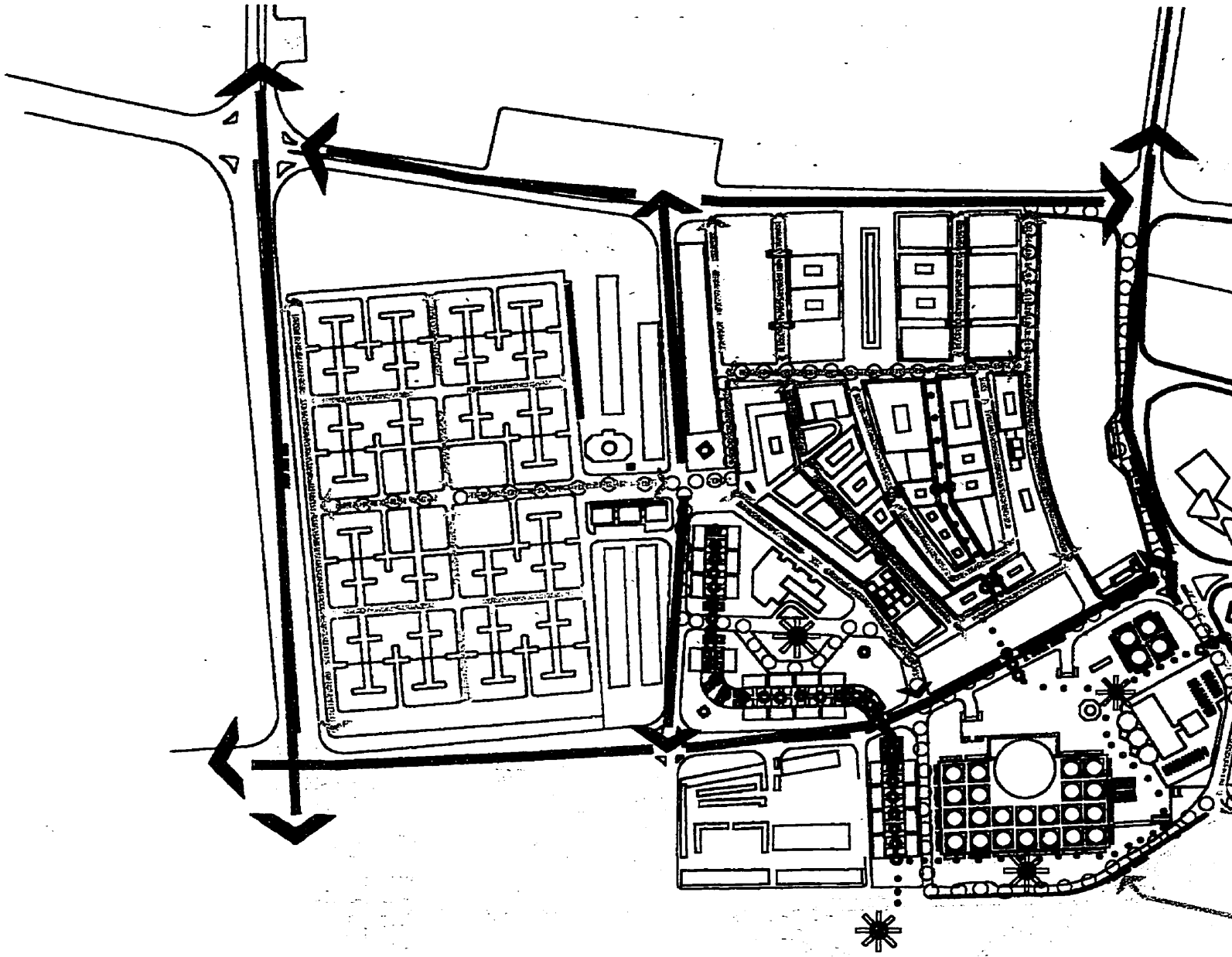
existing residential area and on the north with the People's Park. **(Drawing 7).**

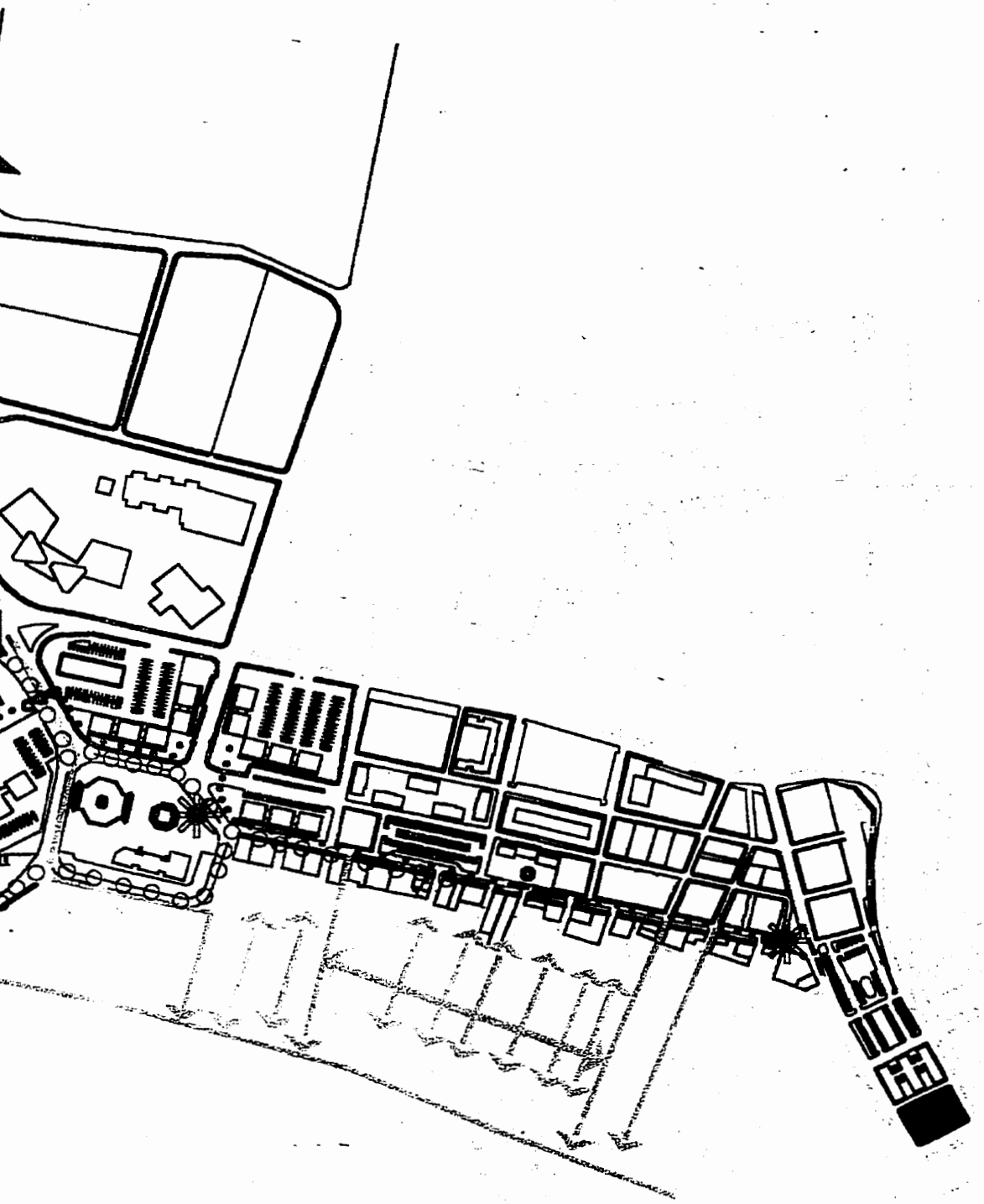
4.4.5 Traffic and Pedestrian Runs

The original Islamic Arab City was, of course, a pedestrian city. The design of the modern city, however, is affected by measurements relating to the flow of traffic. To give the city a sense of humanity, it is necessary to find a way to relate human movement with the movement of the car. The traffic system for the city center plan has been designed on the basis of a gradation in scale of movement between traffic flow and pedestrian movement to achieve a balance between modern day requirements and the consideration for the human environment that is characteristic of the old Islamic city[75].

First, it was important to limit accessibility. The proposed network would limit traffic in the area to people visiting to city center. To do this, city traffic was rerouted to avoid cross circulation from east to west and from south to north. Then, a secondary road was added to be used for short journeys. Exits from and entrances to the parking areas were confined to these secondary roads. Thirdly, car use was restricted in the main alleys of the project, roads that form part of the architectural space **(Drawing 8).**

In considering how to make the center area suitable for pedestrian use, pedestrian runs through the city centers in various countries were considered. The rediscovery of the pedestrian streets of ancient towns has had a great





Drawing 8:
Proposed Movement

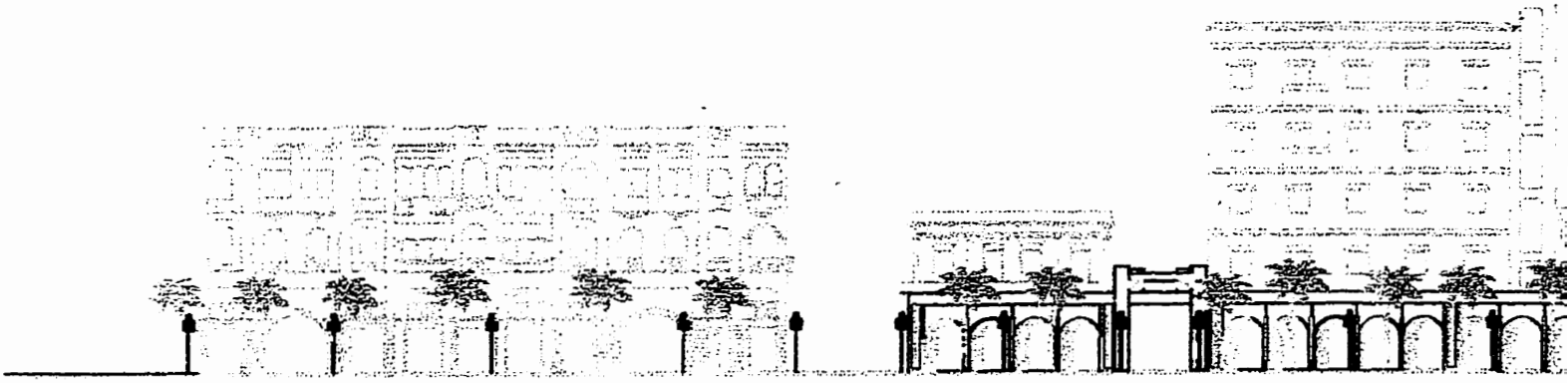
development during the last 30 years, so the number of cities who have prohibited vehicular circulation in their centers has greatly increased.

In European countries such as Germany, Great Britain, and Italy, and in Islamic countries such as Iraq and Saudi Arabia, pedestrian runs through ancient city centers have been successfully tested. In Germany alone, pedestrian areas have been created in 32 cities since 1970. In addition, it is noteworthy around the world this policy for city centers is under study by responsible administrations as one of the basic problems of city traffic.

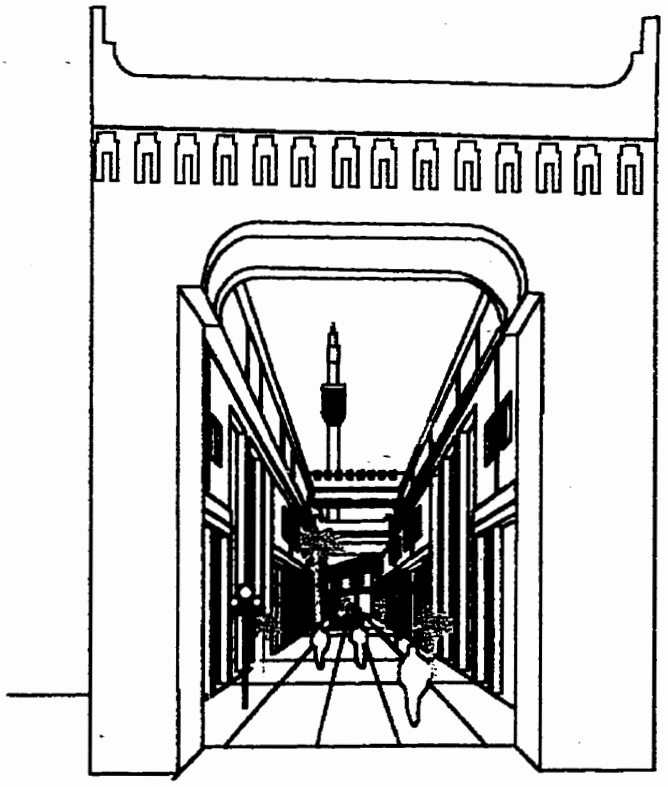
Along the variously interconnected pedestrian walkways, which incidentally are protected from the summer sun by wide colonnades, people are able to rediscover the pleasure of meeting in highly crowded places, the same way they would in the traditional *souq*.

The project also provides for tree-lined pedestrian zones, which form a natural covering and a green landscape on a small scale. This will eliminate the character of the "walled street." To add further variety to these pedestrian areas, hotels, schools, cultural buildings and so forth were included. In modern city planning, these buildings have typically been placed in comparatively isolated, suburban locations.

Since pedestrian traffic has been distinguished from car traffic in the new center, buildings will directly overlook



PROPOSED STREET WALKWAY COVER FOR (OMER IBIN ELAss ST



VIEW OF A PEDESTRIAN WALKWAY PASSING THROUGH THE ADMINISTRATION SECTOR TO LINK THE CENTER TO THE MAIN MOSQUE

Existing Street

Existing Street (OMER IBIN ELAss STREET)

Drawing 9:
Proposed Pedestrian Walk-Way

the pedestrian way on one side, while on the other side, buildings will be at a lower level. They will be directly linked to a traffic network **(Drawing 9)**.

4.4.6 Parking

When developing the parking plan, It was first considered centralized parking structures, but found people didn't like them (based on parking discussion of a planning conference held in Benghazi). They would rather find a parking place on the street closer to their exact destination. Therefore, an attempt was made to spread parking over the whole area by putting it under buildings, so that people can drive as close as possible to where they want to be. However, when parking space was calculated, space constraints required two levels of parking, so this alternative cannot be possible due to the type of land to be built on. Finally, it was decided to put parking on the ground with a level above that for pedestrians. This solution allowed the dedication of the entire area to pedestrian traffic, while at the same time allowing people to drive to their destination.

4.4.7 Public Transit

Omer Ibin ElAss would be reserved for buses, taxis, and services access. Public accessibility could be improved by a comfortable shuttle bus operating along the full length of the street and connected to the main bus terminal in the new administration section **(Drawing 8)**.

1st of October street will be the main transit connection through the study area and the most important spine of the New administration area, between *Omer Al maktar* Square and the culture center to the rest of the city.

4.4 Concluding word

"…I feel that modernism should have accepted the indigenous human identity, the great variety of it, and allowed that identity to be integrated back again into a wholeness…

The continuity of tradition in architecture – which I firmly believe in – should not mean living in the past. It should be a question of the past living in the present for a better future…"

(From **Mohamed Makiya** Post Islamic Classicism)

5.0 Notes

[1] Dioxides Associates International Consultants, Benghazi Region, Final Report, Report BF5, (Athens, 1989), p.7.

[2] Abdalla Ahmed Abdalla, The Islamic Cities in Libya,. European University Studies, (Frankfurt, 1997), p.21.

[3] Ibid.p.23.

[4] Ibid.p.23-24.

[5] Doxiadis Associates International Consultants, Benghazi Region, Benghazi Baladiya: Report No. 5 Volume 2, 1979, p.14.

[6] El-Bouri Amira W., Transferring the Planning Technology, University of New York (Buffalo, 1994), p. 32-33.

[7] Organization of Islamic Capitals and Cities, The Islamic Methodology for Architectural Urban Design, (Jeddah,1992), p.13.

[8] Mosaid A. Al-Angary,The Islamic city Its Urban and Architectural Development, (Riyadh,1992), p.71-72.

[9] Ismail Serageldin and Samir El-Sadek, Arab Urban Development Institute, The Arab City-Its Character and Islamic Cultural Heritage, (Saudi Arabia, 1981), p.21-26.

[10] Organization of Islamic Capital and Cities, Principles of Architectural Design and Urban Planning During Different Islamic Eras, (Jeddah,1992), p.9. (Arabic & English)

[11] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF5,(Athens, 1989), p.168.

[12] The techniques and principles related to urban land use were thoroughly discussed in numerous articles written by Onokerhoraye, Andrew G. and Omuta Gideon E., Urban Systems and Planning, University of Benin, (Benin, 1986), p. 231-280.

[13] In Al-Madina of Mohammed (P.B.U.H) structures to meet everyone's basic needs of were in or around Friday Mosque or state management officials were, there around the clock to listen to and to manage thing for everyone. The home of Mohammed (P.B.U.H) was part of Friday Mosque in Al Madina.

[14] Baseem, Hakeem, Arabic-Islamic Cities, Building and Planning Principles, (London:Kpl), p. 142-170.

[15] D. Ibrahim, A., The Islamic View to the Theory of Architecture, First Edition, Center for Planning and Architectural Studies, (Cairo, 1986), p.9-30.

[16] This article reviews the values and factors that limit the traditional Islamic City. Dr. Osama A. Masaud, Originating the Cultural and Inherited Values for Cities building, Al-Bilad Printing & Publishing Press, (Jeddah, 1992), p. 197-205.

[17] All Quran Translations are taken from Marmaduke Pickthal, The Glorious Koran (Albany, N.Y.: SUNY Press, 1976).

[18] Mohammad Kmayhan, Urban Design Criteria For The Development of The Islamic Residential Environment, Al-Bilad Printing & Publishing Press, (Jeddah, 1992), p. 77-92.

[19] Organization of Islamic Capital and Cities, Principles of Architectural Design and Urban Planning During Different Islamic Eras, (Jeddah,1992), p.643. (Arabic & English)

[20] Ibid.p.644-645.

[21] Ibid.p.634-638.

[22] Ibid.p.637.

[23] Ibid.p.648-649.

[24] Adel A. Ismail., "Origin, Ideology and Physical Patterns," Ekistics, no.195, February, 1972.

[25] Organization of Islamic Capital and Cities, Principles of Architectural Design and Urban Planning During Different Islamic Eras, (Jeddah,1992), p.652. (Arabic & English)

[26] Hakim, S.B., Arabic-Islamic Cities, First Edition, KPI (London,1986), p.15-55-102-130.

[27] This section of this book defines the important components of the urban structure concerning the city center or the C.B.D, and the role of the C.B.D in the commercial sector. Onokerhoraye, Andrew G. and Omuta Gideon E., Urban Systems and Planning, University of Benin, (Benin, 1986), p. 190-191.

[28] Ibrahim, Abdelbaki, The Islamic Methodology for the Theory of Urban Design, Organization of Islamic Capitals & Cities, (Jeddah, Saudi Arabia, 1992), p14 . (Arabic & English)

[29] This chapter is about past populations and assumptions about future populations and employment growth and how they underlie the amount of development pressure and the pace of urban development to be accommodated and addressed: Kaiser, Godschalk, and Chapin, Urban land use planning, University of Illinois Press,(Chicago, 1995), P. 117.

[30] Ibid. p.318.

[31] Three Arab city articles written by Arab authors about new developed Arab cities state the central nucleus is becoming "a business area," very similar to the Central Business District in Anglo-Saxon countries:
Al-Ali Salih, A. Khotat al-Basra and its Area. Baghdad, Iraqi Centre, 1989.
Al-Bayati, Basil, "Community and Unity," Academy Editions/ St. Martin's, New York, 1983.
Al-Hathloul and Mughal Muhammad A., "City Profile Jeddah", Cities, November, 1991.

[32] Areas devoted primarily to accommodating employment center. A city sector where most administrative functions of the city are carried out: Kaiser, Godschalk, and Chapin, Urban Land Use planning, University of Illinois Press, Chicago, 1995. p.318-320.

[33] Commercial centers are focal points for culture, entertainment, and trade. In addition, the center of a city is where commercial activities are carried out and where department stores, shops and markets are located.
Ibid. p.320-321.
Onokerhoraye, Andrew G. and Omuta Gideon E., Urban Systems and Planning, University of Benin, (Benin, 1986), p. 194-197.

[34] The civic center is the urban sector which include the main public buildings of a city. The civic center comprises the various administrative, commercial, and cultural centers:
Kaiser, Godschalk, and Chapin, Urban Land Use Planning, University of Illinois Press, Chicago, 1995, p.320.

[35] Kaiser, Godschalk, and Chapin, Urban Land Use Planning, University of Illinois Press, Chicago, 1995. P. 323-340.

[36] The facilities or the community facilities falls into one of the seven categories stated by the Author:
Kaiser, Godschalk, and Chapin, Urban Land Use Planning, University of Illinois Press, Chicago, 1995. p. 320-321.

[37] Ibid. p.312

[38] Al-Hathloul and Mughal Muhammad A., "City Profile Jeddah," Cities, November, 1991.
Organization of Islamic Capital and Cities, "Principles of Architectural Design and Urban Planning During Different Islamic Eras," Jeddah, 1992.

[39] His planning ideas were based upon the geometric discipline used in most Islamic cities, in various buildings and in details of elements within buildings. The basic idea of the planning comes from

old bazaars of Islamic cities, which include all complementary services within an integrated framework.
Al-Bayati, Basil, "Community and Unity," Academy Editions, St. Martin's, New York, 1983.

[40] Kaiser, Godschalk, and Chapin, Urban Land Use Planning, University of Illinois Press, Chicago, 1995. p. 316-318.

[41] Ibid. p.324-325.

[42] Ibid. p.320.

[43] Al-Hathloul and Mughal Muhammad A., "City Profile Jeddah", Cities, November, 1991.
Farsi M.S. and Amer H.I., "Islamic Architectural Features in the Arabian Peninsula and their Reflection in Planning Old and New Jeddah," The Arab Urban Development Institute, Riyadh, 1982.

[44] The problems related to the town planning standard were thoroughly discussed in numerous articles written by both Arab and foreign authors:
Abu Al-Soud Fouad S. and El-Sabban Ali, "The Islamic Methodology for Architectural and Urban Design", Organization of Islamic Capitals & Cities, Jeddah, Saudi Arabia, 1992.
El-Amid, Taher M, "The Arabic Islamic Cities Planning", Baghdad, University of Baghdad, 1986.
Ibrahim, Abdelbaki, "The Islamic Methodology for the Theory of Urban Design," Organization of Islamic Capitals & Cities, Jeddah, Saudi Arabia, 1992.p 13-18.(Arabic & English)

[45] Allan, J.A., McLachlan, K.S. and Buru, M.M., Libya: State and Region, SOAS Center in Near and Middle Eastern Studies, (London, 1989), p.149.

[46] "The state can be described as both the engine of development and purveyor of amenities" Allan, J.A., McLachlan, K.S. and Buru, M.M., Libya: State and Region, SOAS Center in Near and Middle Eastern Studies,(London, 1989) p.151.

[47] Polservice, Tripoli Region, Development Plans, Report TF-94, (Warsaw, 1984), p.8.

[48] Allan, J.A., McLachlan, K.S. and Buru, M.M., Libya: State and Region, SOAS Center in Near and Middle Eastern Studies, (London, 1989), p.32.

[49] Ibid. p.31.

[50] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF5,(Athens, 1989), p.8.

[51] Abdalla Ahmed Abdalla, The Islamic Cities in Libya, European University Studies, (Frankfurt, 1997), p.61-64.

[52] This was the first planning study of the city of Benghazi after the oil discovery in 1966: Whiting Associates International, "1966 Preliminary Report of Benghazi Master Plan," 1966.

[53] Whiting Associates International, "1966 Preliminary Report of Benghazi Master Plan,"1966.

[54] Onokerhoraye, Andrew G. and Omuta Gideon E., Urban Systems and Planning, University of Benin, (Benin, 1986), p. 231.

[55] Abdalla Ahmed Abdalla, The Islamic Cities in Libya, European University Studies,(Frankfurt, 1997), p.61-62.

[56] Whiting Associates International, "1966 Preliminary Report of Benghazi Master Plan," 1966, p.10.

[57] Ibid. p.12.

[58] Ibid. p.10-32.

[59] Doxiadis Associates International Consultants, Benghazi Region, Physical Development Plan, Draft Final Report, Report No 61,(Athens, 1982).

[60] Arup II, Benghazi Transportion Study, Possible Location of Sub-Centers, (Benghazi, 1978), p. 64.

[61] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF5,(Athens, 1989), p.34.

[62] Ibid. p.41.

[63] The problems related to city planning standards, land use, and circulation elements are discussed in the guide to transportation planning standards: Kaiser, Godschalk, and Chapin, Urban Land Use Planning, University of Illinois Press, (Chicago, 1995), p. 228-235.

[64] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF5, (Athens, 1989), p.63.

[65] Ibid. p.65.

[66] This information is based on information was given to the author by The Benghazi public transportation, summer 1997. Printed information is not available.

[67] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF5,(Athens, 1989), p.64.

[68] Most information is based either on observations field work conducted during the Summer of 1997 and information collected by the Doxiadis Consultants for the Benghazi Master Plan 1989.

[69] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF4, (Athens, 1989), p.8.

[70] Ibrahim, Abdelbaki., The Islamic Methodology for the Theory of Urban Design, Organization of Islamic Capitals & Cities,(Jeddah, Saudi Arabia, 1992), p13. (Arabic & English)

[71] Secretariat of Planning, Census and Statistical Dept., Population Census, Benghazi 1996. (Arabic)

[72] Middle East Construction, Urban Renewal in Tripoli, Vol.9, p.19, Jan 1984.

[73] Doxiadis Associates International Consultants, Benghazi Region, Final Report, Report BF5,(Athens, 1989), p.211-231.

[74] Stefano, Biaca., Designing Compatibility with Local Tradition, (Baghdad, 1992), p.21-33.

[75] Adel A. Ismail., "Origin, Ideology and Physical Patterns," Ekistics, no.195, February, 1972, p.113-123.

6.0 Bibliography

Abdalla Ahmed Abdalla. The Islamic Cities in Libya. Frankfurt: European University Studies,1997.

Abu Al-Soud Fouad S. and El-Sabban Ali. The Islamic Methodology for Architectural and Urban Design. Saudi Arabia: Organization of Islamic Capitals & Cities,1992.(Arabic & English)

Abu-sha'ara, Mohammad A. The Coastal Islamic Libya Ribats. Libya in History. Benghazi: University of Libya,1990.

Al-Ali Salih. A. "Khotat al-Basra and its Area." Baghdad, Iraq Centre,1989.

Al-Bayati, Basil. Community and Unity. New York: Academy Editions St. Martin's, 1983.

Al-Hathloul and Mughal Muhammad A. "City Profile Jeddah." Cities, November, 1991.

Alex G. Papadopoulos., Urban Regimes and Strategies Building Europe's Central Executive District in Brussels. Chicago: University of Chicago Press,1996.

Allan, J.A., McLachlan, K.S. and Buru, M.M. Libya: State and Region. London:SOAS Center in Near and Middle Eastern Studies,1989.

Amirahmadi, Hooshang and El-Shakhs, Saleh. Urban Development in the Muslim World. Brunswick, New Jersey: The Center for Urban Policy Research,1993.

Andrew G. Onokerhoraye and Gideon E.D. Omuta. City Structure and Planning For Africa. Benin City: Ilupeju Press,1994.

Antoniou, Jim. Islamic Cities and Conservation. Geneva:The Unesco Press, 1981.

Banerjee, Tridib and Chakravorty, Sanjoy. "Transfer of Planning Technology and Local Political Economy: A Retrospective Analysis of Calcutta's Planning." Journal of American Planning Association, Winter, 1994.

Berque, Jacques. Toward New Models for the Future Islamic City, An Islamic Heliopolis. (No date available)

Boal, Frederick W. Shaping A City. Belfast: The Institute of Irish Studies, The Queen's University of Belfast, 1995.

Buru, M. M, Ghanem, S. M, and McLachlan, K.S. Planning and

Development in Modern Libya. London: Middle East and North African Studies Press limited,1985.

Chokor, Boyowa. "The Perception of Spatial Inequalities in a Traditional Third World City." Urban Studies, Vol, 28, April, 1991.

Doxiadis Associates International Consultants. Benghazi Region Final Regional Plan. Athens: Summary Report BF2,1983.

Doxiadis Associates International Consultants. Benghazi Region. Athens: Report No. 5 Volume 2, 1979.

Dyckman, Kreditor and Banerjee. "Planning in an Unprepared Environment: The Example of Bahrain." Town Planning Review, 55; 2,1984.

El-Amid, Taher M. The Arabic Islamic Cities Planning. Baghdad: University of Baghdad,1986.

El-Balloushi, Ali. The Mosque and its Features. Tripoli: The Encyclopedia of Islamic Archaeology in Libya, 1980. (Arabic)

El-Bouri Amira W. Transferring the Planning Technology. New York: University of Buffalo,1994.

Farley, Rawle. Planning for Development in Libya. New York: Praeger Publishers,1975.

Farsi M.S. and Amer H.I. "Islamic Architectural Features in the Arabian Peninsula and their Reflection in Planning Old and New Jeddah." Riyadh: The Arab Urban Development Institute,1982.

Finmap, OY. Al-Khalij Region. Helsinki: Final Regional Plan, Summary Report KF1March, 1984.

Finmap, OY. Sabha Region. Helsinki: Final Regional Plan, Summary Report SF1,March,1984.

Hall, Peter. Cities of Tomorrow. Cambridge: Basil Blackwell, 1988.

Hakim, Besim S. "Urban Design in Traditional Islamic Culture Recycling its Successes." Cities, November 1991.

Howard Humphrey & Sons Consulting Engineers. Benghazi Main Drainage. England: Thorncroft Mannor Leathered,1978.

Howard Humphrey & Sons Consulting Engineers. "Urban Renewal in Tripoli." Middle East Construction,Vol.9,Jan 1984.

Hugh P. Roberts. An Urban Profile of the Middle East. London: Croom Helm,1979.

Hutt, Anthony. Islamic Architecture, North Africa. London: Scorpion Publication Ltd, 1977.

Ibrahim, Abdelbaki. "The Islamic Methodology for the Theory of Urban Design." Organization of Islamic Capitals & Cities. Saudi Arabia,1992. (Arabic & English).

Ismail Serageldin and Samir El-Sadek. The Arab City-Its Character and Islamic Cultural Heritage" . Arab Urban Development Institute. Saudi Arabia, 1981.

Kaiser, Godschalk, and Chapin. Urban land use planning. Chicago: University of Illinois Press,1995.

Khader, Cichara and El-wafati,Bashir. The Economic Development of Libya. London: Croom Helm,1987.

Lloyd, J.A., R. Reece, J.M. Renold and F.B. Sear. "Excavations at Sidi Khribish Benghazi (Bernike)." Supplements to Libya Antiqua, Vol. V, Tripoli: Dept of Antiquities, 1977.

Makiya, Kanan. Post-Islamic Classicism. Saqi Books, 1990.

Onokerhoraye, Andrew G. and Omuta Gideon E. Urban Systems and Planning. Benin University of Benin, 1986.

Organization of Islamic Capital and Cities. Principles of Architectural Design and Urban Planning During Different Islamic Eras .Jeddah, 1992. (Arabic & English)

Polservice. Tripoli Region. Warsaw: Development Plans, Report TF-94, , 1984.

Porter, William. Architecture in Islami: The search for Form. (No date available).

Serageldin, Ismail and Yunus Muhammad. The Architecture of Empowerment- People, Shelter and Livable Cities. London: Academy Editions, 1997.

U.N. Technical Cooperation. Secretariat of Municipalities. Coordination Manual for the Preparation of Master and Regional Plans, Tarabulus, March 1978.

Whiting Associates International. 1966 Preliminary Report of Benghazi Master Plan," 1966.

7.0 Appendix

Outline of the adopted Planning and development Standards.

1. GENERAL

1. The adopted standards are based on U.N. Experts recommendations. Modifications were also introduced in order to adapt them to the particular economic and social conditions in the Socialist People's Libyan Arab Jamahiriya. Report No. 55, DOX-LIB-A 353, issued on April 1981 and Report No. 2 (revised), originating from the Committee for Evaluation of Regional and Local Planning Studies deal extensively with the standards and should be considered for details, the following outline intending to provide concise information mainly in the form of Tables. This it can serve as a manual to technicians dealing with the master plan and as an overview of the standards to the non-specialised readers.

2. The present outline differs from the one included in the reports on the master plan concerning towns: It includes additional aspects of standards, more general, that are of use in the calculations for area requirements concerning large urban areas (distribution of employment within cities, standards for C.B.D.'s etc.).

2. HOUSEHOLD AND DWELLING UNIT SIZES

3. Current standards suggest one dwelling unit per household. It is assumed that the average household size in the Region of Binghazi will fall according to Table 1.

TABLE 1

HOUSEHOLD SIZE FORECASTS 1980-2000 (ppdw)

	1980	1985	1990	1995	2000
BINGHAZI	5.5	5.2	4.9	4.7	4.6
4 BIG CITIES	5.7	5.4	5.1	4.9	4.8
TOWNS	5.7	5.5	5.4	5.2	5.0

4. The size of dwelling units will vary according to the household sizes but an average of 100 sq.m gross floor area per unit is assumed in all cases.

3. RESIDENTIAL AREAS - HIERARCHY AND STRUCTURE

3.1 Residential Densities

5. The existing average gross residential densities in the urban areas of Binghazi Region vary considerably between about 50 ppha and 170 ppha. For future developments, an average gross residential density between 100 ppha and 140 ppha is adopted, taking into account both the type of future residential development and the anticipated average household size.

3.2 Residential Communities

6. Walking distance is the factor used to determine the size of the residential community whose average population in urban areas will range around 2,000 inhabitants, i.e. the number served theoretically by one primary school with 12 classrooms. Requirements for central functions in a typical community are given in Table 2.

3.3 Residential Neighbourhoods

7. The population level in urban areas is put at the order of 8,000 (four communities of 2,000 population), corresponding to two primary schools with 24 classrooms each. However, a variation of the size of the neighbourhood between 4,000-12,000 inhabitants is accepted. Table 3 is a guide to the function and space requirements pertaining to differently sized residential neighbourhoods.

3.4 Residential Districts

8. In principle, four neighbourhoods of a total population of 32,000 may provide the yardstick for a residential district, but depending on the local

TABLE 2

RESIDENTIAL COMMUNITY PUBLIC FACILITIES AND CENTRAL FUNCTIONS AREA REQUIREMENTS (in hectares)

Assumed Population of a Community: 2000	Local Centre(1)	Selected Locations(2)
Primary School (3)		0.85
Primary Health Care Unit	0.12	
Cultural Centre	0.20	
Mosque	0.10	
Children's Playground		0.30
Shops (4)	0.15	
Sub-total	0.57	1.15
Parking Spaces and Public Open Space(5)	0.13	0.25
	0.70	1.40
Total	2.10 ha	

(1) Commercial streets and squares; certain uses can be associated with residential.

(2) Distributed or grouped in selected locations within the residential community area.

(3) One 12-classroom primary school.

(4) Including restaurant and tea or coffee-house.

(5) Assumed 25% for the local centre and 20% for the special areas.

TABLE 1

RESIDENTIAL NEIGHBOURHOOD - PUBLIC FACILITIES AND CENTRAL FUNCTIONS AREA REQUIREMENTS
(in hectares)

Population of a Neighbourhood	4,000		4,500		5,000		5,500		6,000		6,500		7,000		7,500		8,000		8,500		9,000		9,500		10,000		10,500		11,000		11,500		12,000	
	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.	N.C.	S.L.
Kindergarten (1)	-	0.24	-	0.24	-	0.28	-	0.32	-	0.32	-	0.32	-	0.36	-	0.40	-	0.40	-	0.40	-	0.46	-	0.52	-	0.52	-	0.52	-	0.58	-	0.64	-	0.64
Primary School	-	1.95	-	1.95 (2)	-	2.20	-	2.20 (3)	-	3.15	-	3.15 (4)	-	3.40	-	3.40 (5)	-	3.65	-	3.65 (6)	-	3.90	-	3.90 (7)	-	4.15	-	4.15 (8)	-	4.40	-	4.40 (9)	-	5.35 (10)
Preparatory School	-	1.20 (11)	-	1.40	-	1.40 (12)	-	1.50	-	1.50 (13)	-	1.70	-	1.70 (14)	-	1.80	-	1.80 (15)	-	2.00	-	2.00 (16)	-	2.10	-	2.10 (17)	-	2.45	-	2.45 (18)	-	2.70	-	2.70 (19)
Primary Health Care Unit	0.12	-	0.12	-	0.18	-	0.18	-	0.18	-	0.18	-	0.24 (20)	-	0.24	-	0.24	-	0.24	-	0.24	-	0.36 (21)	-	0.36	-	0.36	-	0.36	-	0.36	-	0.36	-
Pharmacy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.08	-	0.08	-	0.08	-	0.08	-	0.08	-	0.08	-	0.08	-	0.08	-	0.08	-
Cultural Centre	0.58	-	0.59	-	0.60	-	0.61	-	0.62	-	0.63	-	0.64	-	0.65	-	0.66	-	0.67	-	0.68	-	0.69	-	0.70	-	0.71	-	0.72	-	0.73	-	0.74	-
Mosque	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-	0.25	-
Neighbourhood Parks and Playing Fields	-	0.48	-	0.54	-	0.60	-	0.66	-	0.72	-	0.78	-	0.84	-	0.90	-	0.96	-	1.02	-	1.08	-	1.14	-	1.20	-	1.26	-	1.32	-	1.38	-	1.44
Shops and Workshops	0.34	0.10	0.37	0.12	0.41	0.13	0.45	0.15	0.49	0.16	0.53	0.17	0.58	0.18	0.62	0.19	0.66	0.20	0.70	0.22	0.73	0.24	0.77	0.26	0.81	0.27	0.86	0.28	0.89	0.30	0.93	0.31	0.98	0.32
Postal Agency (22)	-	-	-	-	-	-	-	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-	0.10	-
Housing Maintenance Depot (22)	-	-	-	-	-	-	-	-	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30	-	0.30
Sub-total	1.29	3.97	1.33	4.25	1.44	4.61	1.49	4.83	1.64	6.15	1.69	6.42	1.81	6.78	1.86	6.99	1.99	7.31	2.04	7.59	2.08	7.98	2.25	8.22	2.30	8.54	2.36	8.96	2.40	9.35	2.45	9.73	2.51	10.75
Parking Spaces and Public Open Space (23)	0.32	0.60	0.33	0.64	0.36	0.69	0.37	0.72	0.41	0.92	0.42	0.96	0.45	1.02	0.47	1.05	0.50	1.10	0.51	1.14	0.52	1.20	0.56	1.24	0.58	1.28	0.59	1.34	0.60	1.40	0.61	1.46	0.63	1.61
Total (in round figures)	1.6	4.6	1.7	4.9	1.8	5.3	1.9	5.5	2.0	7.1	2.1	7.4	2.3	7.8	2.3	8.0	2.5	8.4	2.5	8.7	2.6	9.2	2.8	9.5	2.9	9.8	2.9	10.3	3.0	10.8	3.1	11.2	3.1	12.4
	6.2		6.6		7.1		7.4		9.1		9.5		10.1		10.3		10.9		11.2		11.8		12.3		12.7		13.2		13.8		14.3		15.5	

1) Including child care facilities (0.05 ha)
2) One 30-classroom
3) One 36-classroom
4) One 18-classroom and one 24-classroom
5) Two 24-classroom
6) One 24-classroom and one 30-classroom
7) Two 30-classroom
8) One 30-classroom and one 36-classroom
9) Two 36-classroom
10) Two 24-classroom and one 30-classroom
11) Two 6-classroom (b, g)
12) One 9-classroom (b) and one 6-classroom (g)
13) Two 9-classroom (b, g)
14) One 12-classroom (b) and one 9-classroom (g)
15) Two 12-classroom (b, g)
16) One 15-classroom (b) and one 12-classroom (g)
17) Two 15-classroom (b, g)
18) One 18-classroom (b) and one 15-classroom (g)
19) Two 18-classroom (b, g)
20) Two units (0.12 ha)
21) Two units (0.18 ha) or three units (0.12 ha)
22) In neighbourhoods with population more than 6,000 inhabitants
23) Assumed 25% for the neighbourhood centre and 15% for the selected locations

N.C.: Neighbourhood Centre
Commercial streets and squares; certain uses can be associated with residential

S.L.: Selected Locations
Distributed or grouped in selected locations within the residential neighbourhood area

b : boys, g: girls

4. EDUCATIONAL BUILDINGS

4.1 Kindergartens

9. Standards are based on a coeducational system (mixed classes). One typical kindergarten consists of three classrooms with 15-20 pupils each, a total of 45-60 pupils, which corresponds at least to 4,000 inhabitants.

4.2 Primary Schools

10. Attendance is based on an average 19% of the total population. Enrollment 100%. One typical primary school consists of six classes of 25-30 pupils each, for a total of 150-180 pupils (coeducational system). School size from 6 to 36 classrooms.

4.3 Preparatory Schools

11. Attendance is based on an average 8% of the total population. Enrollment 110% (10% for those staying beyond normal age limits). One typical preparatory school consists of three classes, but six classes of 25-30 pupils each, a total of 150-180 pupils is considered the minimum economical size for such a school. Standards are generally based on separate educational systems. School size from 6 to 24 classrooms.

4.4 Secondary Education

12. Attendance is based on an average 5% of the total population. One third of these students (1.7% of total population), will attend secondary schools while the rest (3.3%) will attend vocational schools. An increment of 10% is allowed to this figure for those staying beyond normal age limits. The typical size of a secondary or vocational school is three classes but six classes of 20-25 students each, a total of 120-150 students, is considered the minimum economical size for such schools. Standards are generally based on separate educational systems. School size from 6 to 24 classrooms.

4.5 Summary

13. Table 5 summarises the main standards concerning educational buildings.

5. HEALTH ESTABLISHMENTS

14. Table 6 summarises the main standards concerning the health establishments.

6. CENTRAL FUNCTIONS

15. Tables 7-11 summarise the main standards concerning the following:

a. Cultural and religious facilities (Table 7).

b. Social and youth facilities (Table 8).

c. Administration (Table 9).

d. Trade, business and tourist accommodation establishements. (Table 10).

e. Other public facilities (Table 11).

16. These tables refer to standards concerning "units" and "plots" within the areas designated in the master plan for central functions. When these central functions are associated with the residential areas (e.g. neighbourhood centres), the total area requirements as such are calculated in Tables 2-4 and included in the requirements for "residential areas".

17. In order to assess the requirements for the remaining urban areas (e.g. C.B.D., Institutional), it is imperative to figure out the distribution of employment within them. This distribution will enable the application of standards relating to the expected number of employees within a major use area, and the expected type of development, with the area requirements.

18. Table 12 illustrates the trends of employment distribution into major use areas. While it is based on general observations of cities in the world, it is also adapted to specific conditions prevailing in Libyan cities. On compiling the respective Table for a city, the fact that a proportion of total employment will not require specific accommodation, should be also taken into consideration.

7. CENTRAL BUSINESS DISTRICT

19. The space requirements of this area must be calculated on the basis of "employment in central business district" figures.

20. Generally, assuming a 20.0 sq.m of floor space standard per (office) employee, plus 10 sq.m of parking space and a 100% increment of roads, pedestrian walkways and open spaces, the following formula is arrived at:

Space requirements for the central business district:

$$2 \times \left(\frac{20 \text{ sq.m} \times \text{employment}}{\text{average number of storeys}} + 10 \text{ sq.m} \times \text{employment} \right)$$

8. ADMINISTRATIVE CENTRES

21. The calculation of the area requirements of an administrative centre follows the procedure described in the central business district. In small urban areas, those facilities can be affiliated with the central business districts.

22. Administrative and civic centres are often handsomely and spaciously planned to express civic dignity and pride. Accordingly, 30 sq.metres of floor space per (office) employee, plus 20 sq.metres of parking and a 100% increment over the resulting area to provide for circulation, pedestrian walkways and open spaces are assumed as standards, leading to the following formula.

Space requirements for the administrative centre:

$$2 \times \left(\frac{30 \text{ sq.m} \times \text{employment}}{\text{average number of storeys}} + 20 \text{ sq.m} \times \text{employment} \right)$$

9. INSTITUTIONAL AREAS

23. It is difficult to generalise about area standards for institutions. Some of them, such as special schools, may need to be large enough to include playing fields, while others such as convalescent homes would benefit from the proximity of a public garden. An index of around 1.0 hectare of institutional area per 1,000 people seems most appropriate to apply as a general guide. Actual building requirements should rather be based on the unit standards.

10. CITY PARKS AND SPORTSCENTRES

24. A standard of 0.2 hectare per 1,000 persons is adopted in all cases for the sportscentres and a range of 0.2 to 0.4 hectare per 1,000 persons for the city parks depending on the specific urban area.

11 INDUSTRIAL AREAS

25. The area requirements for industry are calculated on the basis of the anticipated number of industrial employees and the type of industrial activities. In general, a density between 75 and 150 employees per hectare within the industrial areas is adopted.

12. URBAN TRANSPORTATION STANDARDS

12.1 Urban Road Network

26. The urban road network is classified as follows:

Arterial Roads: taking part in the formation of the primary road network of the urban area. These roads carry high traffic volumes and serve long trips at relatively high speeds.

Collector Roads: connecting the residential neighbourhoods and localities of the urban area with the arterial roads. They accommodate trips of moderate length at lower speed levels. This road category is further divided into two subcategories, namely:

- Collector Roads I (with median)
- Collector Roads II (without median)

Feeder Roads: serving short trips at low speeds. They provide access from the residential neighbourhoods to the collector roads and therefrom distribution traffic to the various areas of the city.

Access Roads: i.e. roads providing access to adjacent plots and properties. They include driveways and culs de sac, as well as service roads within residential communities directing local traffic to the feeder roads.

27. Typical cross sections corresponding to each road category are shown in Figure 1, while the recommended physical design standards are presented in Table 13. The same table includes standards for freeways and expressways which may also be part of the regional road network.

TABLE 4

RESIDENTIAL DISTRICT
PUBLIC FACILITIES AND CENTRAL FUNCTIONS AREA REQUIREMENTS
(in hectares)

Assumed Population of a District:36,000	District Centre(1)	Selected Locations(2)
Secondary Schools (3)		1.20
Vocational Schools (4)	1.50	1.20
Primary Health Care Centre	0.60	
Cultural Centre (5)	1.20	
Public Library	0.50	
Mosque	0.50	
Cinema (6)	0.10	
District Parks and Sports Club Facilities (7)		4.30
People's Congress Hall and Administration	0.20	
Police Station	0.30	
Shops, Offices and Workshops (8)	2.20	0.70
Post Office	0.20	
Car Workshop and Filling Station	2.00	
Sub-total	9.30	7.40
Parking Spaces and Public Open Space (9)	2.50	0.80
Total	11.80	8.20
	20.00 ha	

(1) Commercial streets and squares; certain uses can be associated with residential.

(2) Distributed or grouped in selected locations within the residential district area.

(3) One 9-classroom secondary school for boys (0.7 ha) and one for girls (0.5 ha).

(4) One 12-classroom vocational school for boys (0.9 ha) and one for girls (0.6 ha) in district centres and one 9-classroom vocational school for boys (0.7 ha) and one for girls (0.5 ha) in selected locations.

(5) 0.2 sq.m/person, including social care and education centre, and 0.5 ha for youth centre.

(6) One unit of 350 seats, 3.0 sq.m/seat.

(7) 1.2 sq.m/person.

(8) Including restaurants, tea or coffee-houses.

(9) Assumed 25% for the district centre and 10% for the selected locations.

TABLE 5

STANDARDS ON EDUCATIONAL BUILDINGS

Category of Building	Provision in Settlements	Catchment Population	Computation of Requirements in Classrooms*	Size Variations	Hectarage	Location
Kindergarten	With a population over 5000	a. 4,000 persons (indicative) b. maximum 8,000 persons (= residential neighbourhood)	1 unit of 3 classrooms per 4,000 persons		0.16	Residential neighbourhoods
Primary School	All, if at least one 6-classroom primary school can be supported	a. master plan areas, within a radius of 500 m b. layout plan areas, within a radius of 1,500 m + population of remaining settlements c. maximum 6,000 persons	6 classrooms per 1,000 persons	36-classroom 24-classroom 12-classroom 6-classroom	2.2 1.7 1.2 0.6	Residential neighbourhoods
Preparatory School	All, if at least one 6-classroom preparatory school can be supported**	a. master plan areas, within a radius of 750 m b. layout plan areas, within a radius of 4 km + population of remaining settlements c. maximum, 8,000 persons (= residential neighbourhood)	6 classrooms per 2,000 persons	24-classroom 12-classroom 9-classroom 6-classroom	Girls Boys 1.4 2.2 0.7 1.1 0.6 0.9 0.5 0.7	Residential neighbourhoods
Secondary School	a. in Baladiyat centres b. all remainder, if at least one 6-classroom secondary school can be supported	a. master plan areas, within a radius of 1,000 m b. layout plan areas, within a radius of 10 km + population of remaining settlements	6 classrooms per 8,000 persons 50-70% for boys 50-30% for girls	24-classroom 15-classroom 12-classroom 9-classroom 6-classroom	Girls Boys 1.2 1.8 0.7 1.1 0.6 0.9 0.5 0.7 0.4 0.5	Residential districts
Vocational School	a. in Baladiyat centres b. all remainder, if at least one 6-classroom vocational school can be supported	a. master plan areas, within a radius of 1,000 m b. layout plan areas, within a radius of 10 km + population of remaining settlements	6 classrooms per 4,000 persons 50-70% for boys 50-30% for girls	24-classroom 18-classroom 12-classroom 6-classroom	Girls Boys 1.2 1.8 1.0 1.4 0.6 0.9 0.4 0.5	Residential districts
Higher Vocational Institutes	Al Abyar, Al Aquriyah, Al Bayda-Shahhat Binghazi, Baninah, Addiraiyah, Darnah, Al Marj, Susah, Tubruq					Institutional Areas Central Areas, Industrial Areas
University	Binghazi (Qar Yunis) University Al Bayda University					Institutional Areas

Standards for provisional estimate of classrooms. The exact needs will of course derive from the spatial distribution of the schools, according to the statistics of the settlement, the walking distance, the plot layout, etc.

In cases less than six classrooms can only be supported, a combined primary and preparatory school should be provided.

TABLE 6

STANDARDS ON UNIT REQUIREMENTS - HEALTH ESTABLISHMENTS

Category of Establishment	Provision in Settlements / Computation of Unit Requirements*	Size Variations		Hectarage	Location**
rimary Health Care Unit	a. Selected settlements serving a catchment population between 2,000 and 5,000 persons b. In larger settlements, one Health Care Unit per neighbourhood c. In central areas, every 5,000 employees	Catchment population of settlement or neighbourhood	2000-3500 3,500-5,000	0.12 0.18	a. Centre of settlement b. Neighbourhood centre c. Central areas, industrial areas
rimary Health Care Centre	a. Selected settlements serving a catchment population between 15,000 and 30,000 persons b. In larger settlements one Health Care Centre per district	Catchment population of settlement or district	15,000-20,000 20,000-25,000 25,000-30,000	0.4 0.5 0.6	a. Centre of settlement b. District centre
olyclinic	In cities and towns	Population per unit	40,000 50,000 60,000	1.2 1.5 1.8	In town centres
eneral Hospital	In cities and towns with population over 30,000 persons, 6-8 beds/1,000 persons		200-300 beds	80 sq.m/bed	Institutional areas
harmacy	a. Selected settlements serving a catchment population 8000-15000 persons b. In larger settlements, one pharmacy per neighbourhood with a population not less than 8,000 persons c. In central areas, every 8,000 employees			0.08	a. Centre of settlement b. Neighbourhood centre c. Central areas, industrial areas
pecialised Health stablishments	1/5 of the general hospital units		200-300 beds	80 sq.m/bed	Institutional areas
anatorium	Al Jabal Al Akhdar				
eterinary Offices	In selected settlements			0.2	
ndemic Disease Control entre	Binghazi City			0.5	Affiliated with a general hospital
uarantine Station	International ports and airports, border posts				

Standards for provisional estimate of unit requirements. The exact needs will derive from local conditions and the design of the plan

** "a", "b" and "c" under "Location" correspond to "a", "b" and "c" under "Provision in Settlements"

TABLE /

STANDARDS ON UNIT REQUIREMENTS - CULTURAL AND RELIGIOUS FACILITIES

Type of Facility	Provision in Settlements / Computation of Unit Requirements*	Size Variations	Hectarage	Location**
Cultural Centre	In all settlements	population less than 500 500-2,500 2,500-5,000	0.1 0.2 0.3	Local centres
	In settlements with overall population more than 5,000 persons		0.2 sq.m per person	Neighbourhood or district centres; central areas, institutional areas
Public Libraries	One library every 30,000 persons		0.5 + parking	District centres; central areas; institutional areas
Mosques	In all settlements	(Large mosques:1.00 ha)	a. 0.10 b. 0.25 c. 0.50	a. Local centres b. Neighbourhood centres c. District centres
Cinemas	20 seats per 1,000 persons	Minimum, 350 seats Typical in district centres; 350 seats Typical in central areas:1,000 seats	3.0 sq.m per seat for built-up space + 5.0 sq.m per seat for parking space of cinemas having more than 600 seats	District centres (50% of seats) Central areas (50% of seats)
Theatres Concert halls Ballet theatres Open air theatres	Al Bayda-Shahhat, Binghazi, Darnah, Al Marj, Tubruq	Provisions should be made from cinema seat provisions	+50% on cinema standards	Central areas Institutional areas
Children's fairy-land	Binghazi, (Al Bayda-Shahhat, Darnah, Al Marj, Tubruq)			
Zoo	Binghazi			
Broadcasting Centre	Binghazi			
Printing, Press and News Centre	Binghazi			
Museums	Archaeological sites Urban centres Areas with natural beauty Selected settlements			

* Standards for provisional estimate of unit requirements. The exact needs will derive from local conditions and the design of the plan

** "a", "b" and "c" under "Location" correspond to "a", "b" and "c" under "Hectarage"

TABLE 8

STANDARDS ON UNIT REQUIREMENTS - SOCIAL AND YOUTH FACILITIES

Type of Facility	Provision Recommendations	Location
Nursery	Settlements over 5,000 population Affiliated with a kindergarten*	Residential neighbourhoods
Social care and education centre	Affiliated with cultural centres**	District centres Institutional areas
Homes for the aged, physically handicapped, deaf and blind, mentally retarded, orphans, animal welfare, etc.	Large urban areas	Institutional areas (Central areas)
Youth centres	Increment of 0.5 to 1.0 ha $\frac{3}{4}\left(\text{Total number of neigh'ds}\right)+\frac{1}{4}\left(\text{Total number of districts}\right)$	Preparatory or secondary schools Cultural centres Social care and education centres Sports club or town sports centre
Children's playground	Size:0.3 ha***	Residential communities
Neighbourhood parks (incl. playing fields)	Size:1.2 sq.m/person***	Neighbourhood centres
District parks (incl. sports club)	Size:1.2 sq.m/person***	District centres
Town sports centre	(In large urban areas)	Town or district centres
Regional sports centre	(In Binghazi)	
Picnic spots Short stay caravanning and camping Youth camps and hostels		Areas associates with sea (beaches) Areas of natural beauty (Al Jabal Al Akhdar) Archaeological sites

* Unit requirements in nurseries will equal requirements in kindergartens (see Table 5)

** Unit requirements in social care and education centres will equal provisions of cultural centres in district centres and institutional areas (see Table 7)

*** Unit requirements in these facilities will equal the estimated number of residential communities, and neighbourhood and district centres

TABLE 9

STANDARDS ON UNIT REQUIREMENTS - ADMINISTRATION

Type of Facility	Provision in Settlements*	Hectarage or Site Requirements*	Location*
People's Congress Hall and Administration	Non-status settlements with an overall population:		
	a. less than 2,000	a. Affiliated with Cultural Centres	
	b. between 2,000 and 8,000	b. 0.1 ha	b. Centre of settlement
	c. More than 8,000	c. 0.3 ha	c. Centre of settlement
Baladiyat office	a. Baladiyat centre - large	a. 80, sq.m/employee	a. Town centre
	b. Baladiyat centre - small	b. 70 sq.m/employee	b. Centre of settlement
	c. Baladiyat branch - residential district	c. 0.2 ha	c. District centre
Regional capital	Binghazi city	80 sq.m/employee	Administrative centre
Courts	Baladiyat centre	0.2-0.5 ha	Town centre
Regional Court	Binghazi City	1.0 ha	Administrative centre
Police Station	a. Practically all settlements with an overall population less than 15,000: 1 unit	a. 0.1 ha	a. Centre of settlement
	b. Towns with an overall population between 15,000 and 30,000: 2 units	b. 0.2 ha	b. Town centre
	c. Cities with an overall population over 30,000: 1 unit per district (minimum 2 on the aggregate)	c. 0.3 ha	c. District centre
Police Headquarters	Baladiyat centres	0.5 ha	Town centre
Regional Police Centre	Binghazi City	1.0 ha	Administrative centre
Special Police Branches	In selected settlements or locations		
Correctional Institutions	In Binghazi City or in selected settlements		

* "a", "b" and "c" under columns are correlated

TABLE 10

STANDARDS ON UNIT REQUIREMENTS - TRADE, BUSINESS AND TOURIST ACCOMMODATION ESTABLISHMENTS

Type of Facility	Provision in Centres/ Settlements	Plot Area (sq.m) per 1,000 inh.	Remarks
Shops	Local centres	660	
Shops and Workshops	Neighbourhood centres	900	+20% where town centre coincides with the highest ranking of these centres
Shops, workshops and offices	District centres	720	
Hotels	Large cities (population over 300,000)	420	
	Large towns (population 50.000-300,000)	300	A minimum of 3,600 sq.m for baladiyat centres
	Large settlements (population 20,000-50,000)	180	
Rest Centres	Small settlements (population below 20,000) Selected sites outside the urban areas		
Restaurants, Tea- or Coffee-houses	Town centres District centres Neighbourhood centres Local centres Selected locations		Included in area standards for shops etc.

TABLE 11

STANDARDS ON UNIT REQUIREMENTS - OTHER PUBLIC FACILITIES

Type of Facility	Provision in Settlements*	Hectarage or Site Requirements*	Location*
Postal agency	a. in urban centres: in every residential neighbourhood b. in rural centres: 8,000 catchment population	0.1	a. Neighbourhood centre b. Centres of nodal settlements
Post office	in urban centres: in every residential district	0.2	District centre
Central post office	Al Bayda-Shahhat, Binghazi, Darnah, Al Marj, Tubruq		Central areas
Fire Brigade	a. Binghazi b. Al Bayda-Shahhat, Darnah, Al Marj, Tubruq c. Other baladiyat centres	a. 1.0 + 0.5 b. 0.8 c. 0.5	Nodal locations
Housing maintenance depot	a. settlements over 5,000 population b. residential districts	0.3	Where road accessibility is high
Car workshops and filling station	a. settlements over 5,000 population b. in urban centres: in every residential district c. at 30' or 25 km intervals between settlements	a. 2.0-5.0 b. 2.0 c. 3.0-5.0	On main roads
Burial sites	(Burial site requirements at the end of a period) = (Mean population of the period) X (Average death rate per annum of the period) X (Number of years in the period)		
Slaughterhouse	Areas with intensive animal breeding	One single unit (3.0 ha) every 100,000 population	Industrial area

* "a", "b" and "c" under columns are correlated

TABLE 12

TRENDS OF DISTRIBUTION OF EMPLOYMENT BY SECTORS OF ECONOMIC ACTIVITY INTO THE MAJOR USE AREAS

Sector of Economic Activity	Residential Areas*	Central Business District	Administrative Areas**	Institutional Areas, City Parks & Sports Centres	Industrial Areas	Other Remarks
Agriculture, Forestry Hunting, Fishing	X	-	X	X	-	To take place normally outside the urban area properly defined
Mines and Quarries	X	-	X	X	-	
Manufacturing	-	S	X	X	P	
Electricity, Gas and Water	-	S	-	X	P	A proportion of total employment in each sector to be assumed as not requiring accommodation
Construction	-	S	X	X	P	
Transportation, Communication, Warehousing	-	S	-	X	P	
Wholesale and Retail Trade	P	P	S	-	S	
Finance, Insurance, Real Estate, etc.	S	P	S	-	-	
Public, Social and Personal Services	S	S	P	P	-	

P = Predominant use, normally permitted

S = Secondary use, normally permitted

\- = Ancillary use, scantily provided

X = Normally prohibited

* Includes district centres, local centres, neighbourhood centres

** In smaller urban areas there can be affiliated with the central business areas

TABLE 13

URBAN ROAD DESIGN STANDARDS

Road Characteristics	ROAD CATEGORIES						
	Freeway	Urban Expressway	Arterial	Collector I	Collector II	Feeder	Access
1. Access control	Full	Partial	Partial	None	None	None	None
2. Intersection type	Grade separated	Grade separated, or at grade with improved signalisation	At grade with improved signalisation	At grade with improved signalisation	Signalisation or stop sign	Stop sign or no control	No control or stop sign
3. Pedestrian traffic	None	Limited	Yes	Yes	Yes	Yes	Yes
4. Service roads or frontage roads	Frontage roads	Either as necessary	Service roads as necessary	None	None	None	None
5. Median	Yes	Yes	Yes	Where possible	No	No	No
6. Emergency lanes	Yes	Yes	No	No	No	No	No
7. Parking	Prohibited	Prohibited	Usually prohibited	Yes	Yes	Yes	Yes
8. Lane width (m)	3.75	3.5	3.5-3.75	3.5	3.5	3.0	2.5 (min)
9. Number of through lanes	4-8	4-8	4-6	4	2	2	2
10. Capacity (PCUs per lane)	1,400-1,700	1,400-1,700	1,000-1,200	800-1,000	400-600	300-500	-
11. Design speed (km/h)	120	120	100	80	60	50	30
12. Operating speed (km/h)	100	100	70	40	30	20	10
13. Minimum horizontal curvature (m)	700	700	350	250	100	40	40
14. Maximum gradient							
a. Through pavement	3%-5%	3%-5%	6%	8%	8%	10%	10%
b. Ramps down	8%	-	-	-	-	-	-
c. Ramps up	7%	-	-	-	-	-	-
15. Maximum superelevation	4%	4%	4%-6%	4%-6%	4%-6%	6%	6%