

MODERNITY AND TRADITION IN THE DESIGN OF NEW TOWNS: SADAT CITY, EGYPT AND YANBU, SAUDI ARABIA

by Khalil S. Mogassabi

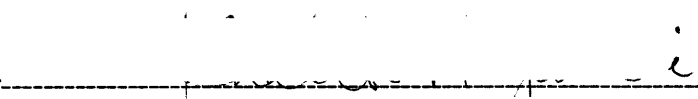
B. Arch., University of Detroit, 1983


Submitted to the Department of Urban Studies & Planning in partial fulfillment of the requirement for the Degree of Master of City Planning

at the Massachusetts Institute of Technology, May 1990

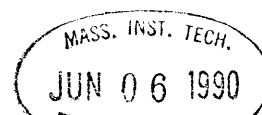
© K. S. Mogassabi, 1990. All rights reserved

The author hereby grants to M.I.T. permission to reproduce and to distribute copies of this thesis in whole or in part.

Signature of Author  -----
Department of Urban Studies & Planning, May 11, 1990

Certified by  -----
Professor Gary Hack, Thesis Supervisor

Accepted by  -----
Professor Donald A. Schon, Chairperson, M.C.P. Committee
Department of Urban Studies & Planning



MODERNITY AND TRADITION IN THE DESIGN OF NEW TOWNS: SADAT CITY, EGYPT AND YANBU, SAUDI ARABIA

by Khalil S. Mogassabi

Submitted to the Department of Urban Studies & Planning
on May 11, 1990 in partial fulfillment of the
requirement for the Degree of Master of City Planning

ABSTRACT

New towns built in North Africa and the Middle East incorporate modern elements into their built environments unprecedented in the traditional city of the region. This thesis addresses the questions: Do these new built environments respond to the prevalent culture? What modern and traditional design qualities enable new towns to maintain cultural integrity?

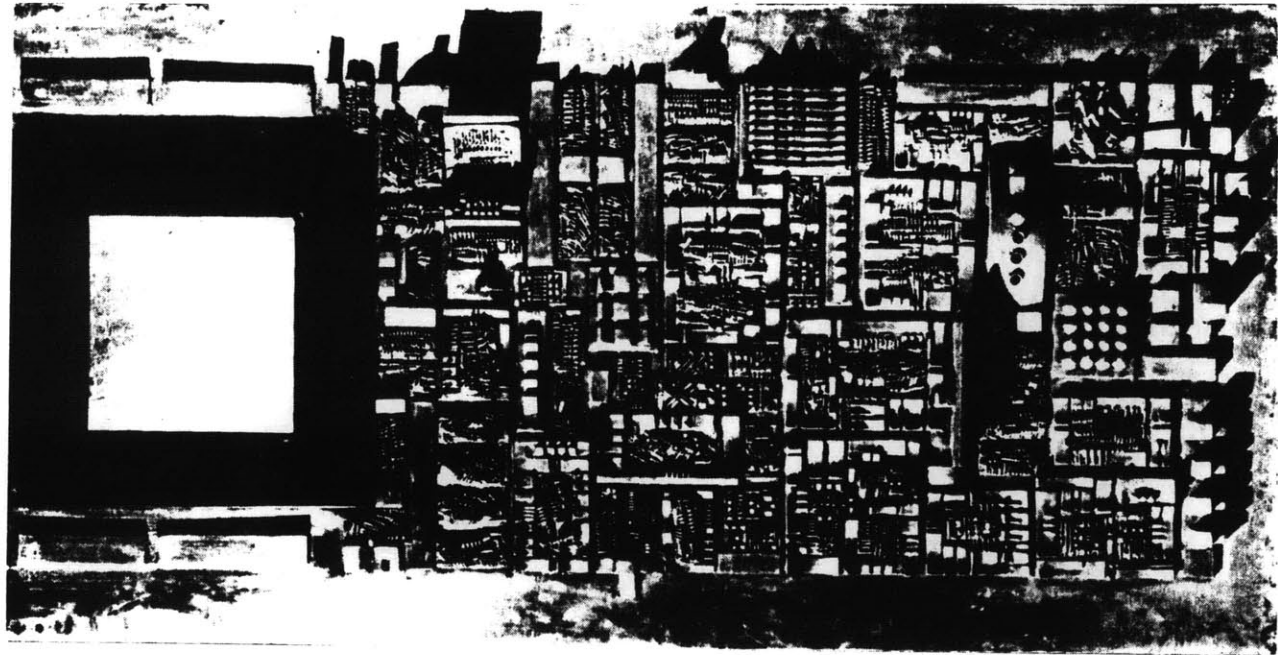
The new towns Sadat City, Egypt and Yanbu, Saudi Arabia are the central focus of this analysis. In Part I, a model of the traditional city of the region is set forth. Qualities of three elements in the city, the street, the building and the urban space are examined and provide a framework for comparison to the same elements in Sadat City and Yanbu, in Parts II and III, respectively. Through this analysis, a framework for the design of new towns is presented—an approach that incorporates modern elements with responsive traditional qualities.

Thesis Supervisor: Gary Hack
Title: Professor of Urban Design & Development

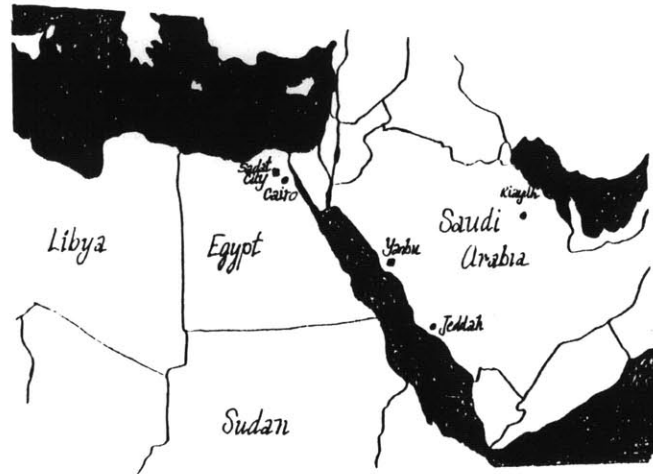
FOR MARY

CONTENTS

TITLE PAGE	1
ABSTRACT	2
DEDICATION	3
CONTENTS	4
INTRODUCTION	5-13
PART I : THE TRADITIONAL CITY	14-28
THE STREET	
THE BUILDING	
THE URBAN SPACE	
PART II : SADAT CITY, EGYPT	29-45
BACKGROUND	
THE PLAN	
THE STREET	
THE BUILDING	
THE URBAN SPACE	
PART III : YANBU, SAUDI ARABIA	46-64
BACKGROUND	
THE PLAN	
THE STREET	
THE BUILDING	
THE URBAN SPACE	
CONCLUSION	65-83
ILLUSTRATIONS	84-88
REFERENCES	89-90
BIBLIOGRAPHY	91-92



INTRODUCTION

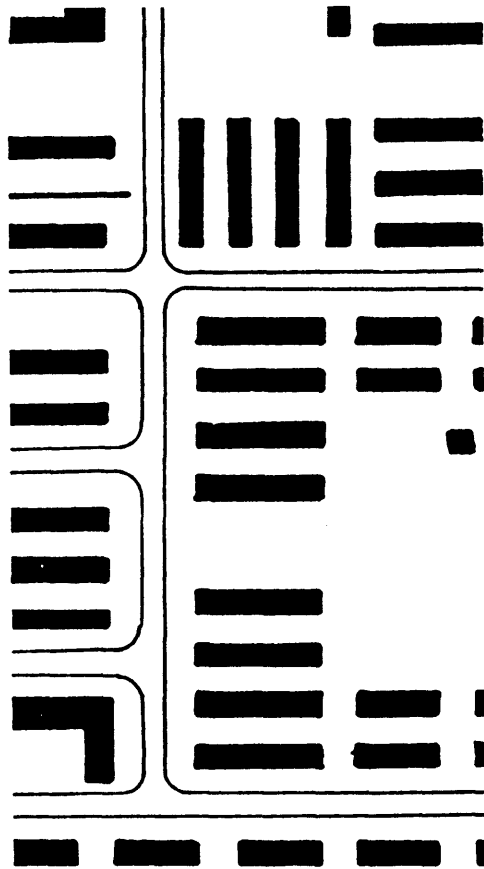


2.

Within the last two decades Saudi Arabia and Egypt have embarked on building new towns as part of a broad national economic and social planning strategy. The building of new towns such as industrial towns marks an important stepping stone in the development of these societies. In his book, *New Towns: Antiquity to the Present*, Ervin Y. Galantay stated: ". . . the need for new towns arises at transitional phases in the evolution of a society . . . and corresponds to the changed economic base. (1)

For Egypt and Saudi Arabia, social and economic transitions are more visible in the transformed built environments reflected in the design of new towns.

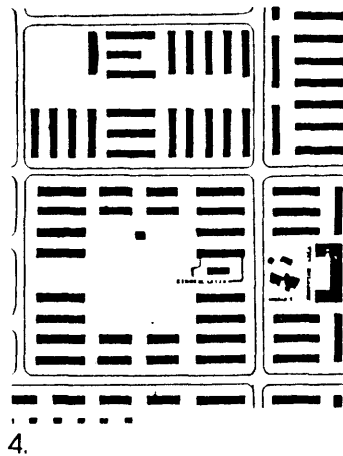
New towns built in this region reflect modern elements different from those of the traditional city. " New towns are



3.

planned communities consciously created in response to clearly stated objectives. . . (and) formalized in a plan prepared before the site is altered by the arrival of the first new residents. . . rapidly built to achieve 'critical mass' within a crucial initial time span." (2) For that reason, it is important to investigate the cultural dimension in the design of new towns and assess their physical and spatial responsiveness to the prevalent culture.

Do the built environments of new towns in this region respond to the prevalent culture? What modern and traditional physical design qualities enable new towns to maintain cultural integrity? To answer these questions, I will examine two new towns, Sadat City, Egypt and Yanbu, Saudi Arabia.



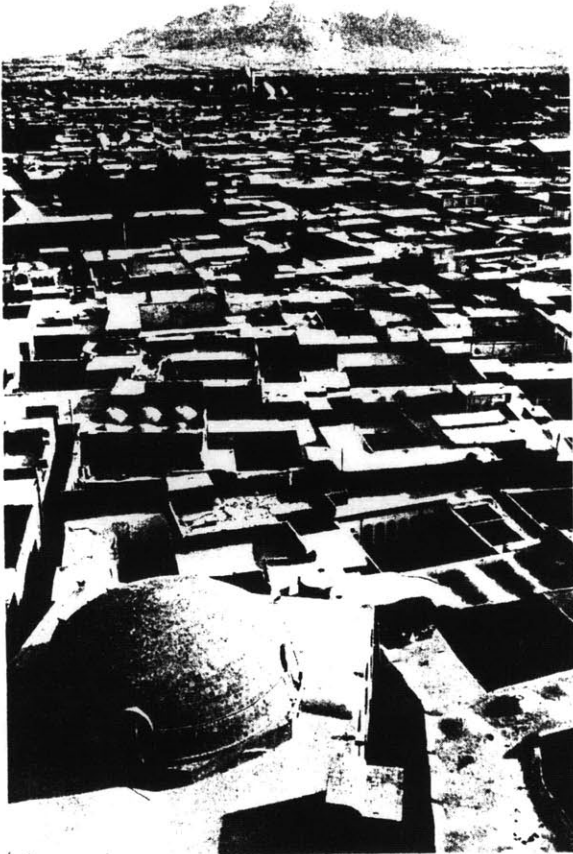
4.



5.

I will focus on the proposed urban form, structure and fabric of Sadat City and Yanbu. I will identify and analyze the design qualities underlying their proposed physical plans and contrast them to those same qualities in the traditional city. A basis for contrast will be the street--the circulation pattern; the building and the urban space--land use distribution. For example, I will examine the street hierarchy and its physical qualities drawing comparisons between the traditional city and the new towns. I will also examine the physical qualities of the fabric associated with mixed and zoned land uses using the same framework for comparison.

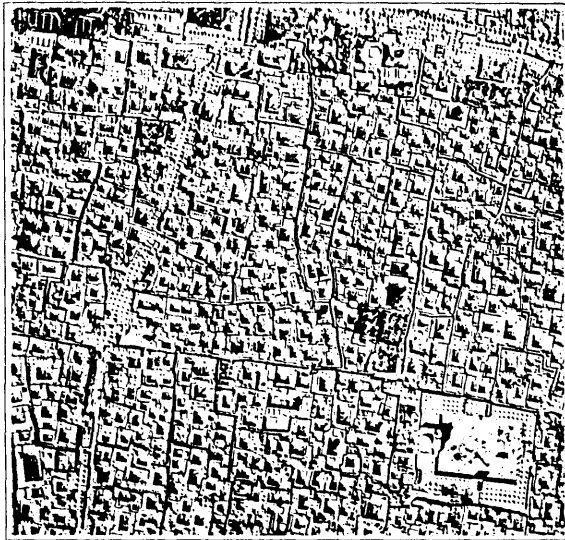
By contrasting the town form of Sadat City and Yanbu to the traditional North African and Middle Eastern city, specifically its traditional urban form, structure and fabric--I am able to examine their responsiveness to the culture.



6.

The traditional city of North Africa and the Middle East has traditional elements which have physical qualities that make its built environment responsive to the culture and therefore, suitable and desirable for its inhabitants. The qualities of traditional environments are more than a manifestation of cultural norms and values; they are about human scale, the relationship to the built environment (i.e. to the street, building and open space) and how it is perceived.

For the purpose of this thesis, the traditional city will serve as a model for comparison to Sadat City and Yanbu. This framework for comparison presupposes the cultural responsiveness of the traditional city because: ". . . its genesis and evolution was organic or agglomerate" (3) occurring naturally over time and determined by factors inherent in the region and its inhabitants.



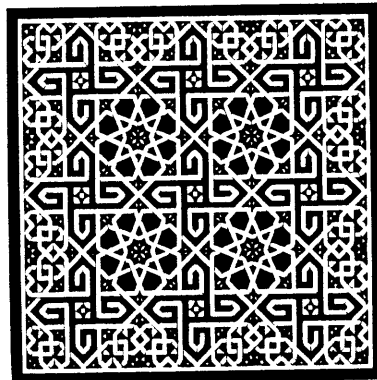
7.

In Part I, I will discuss the physical qualities of the street, the building and urban space of the traditional city in North Africa and the Middle East. Traditional cities such as Tunis, Tunisia; Tripoli, Libya; Cairo, Egypt; Riyadh, Saudi Arabia will illustrate these physical qualities and are appropriate for comparison since cultural and geographical characteristics between these cities are similar.

In Part II and III, I will compare Sadat City and Yanbu respectively to the traditional city by examining the qualities of three elements: the street, the building and the urban space. My analysis will be based on the proposed Master Plan. At the larger scale, I will focus on the town center. At the smaller scale, I will examine the neighborhood module--also called *haji*, quarter or *hara*.

Finally, based on the design analysis and examination of Sadat City and Yanbu, I will summarize and present a framework for the design of new towns--an approach which incorporates modern elements with responsive traditional qualities.

In analyzing and discussing the design of Sadat City and Yanbu, it is appropriate at this point to define some of the terms that will be encountered in the following sections.



8.

TERMS

The term "traditional" will refer to qualities of the urban form, structure and fabric that respond to the culture of North Africa and the Middle East. The term "traditional city" will refer to a representational model of physical elements that have desirable qualities (i.e. narrow streets, identifiable



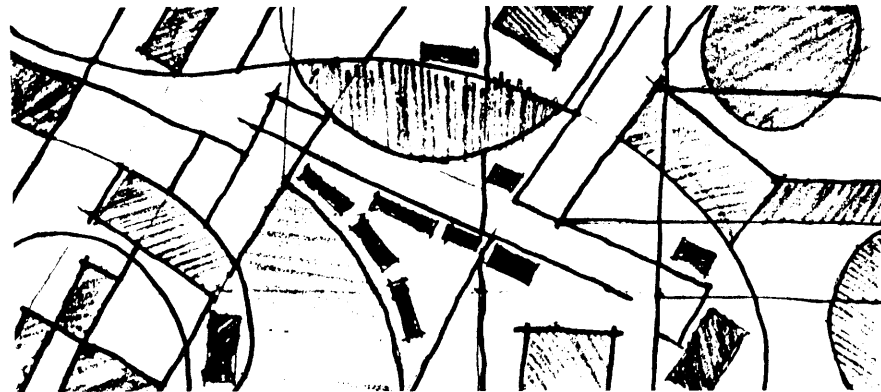
9.

neighborhood quarter, distinguishable town center or clustering of trades) which characterized the traditional city across the region and emerged over time. For the purpose of creating a clear distinction between the old and new city form, the term "traditional city" is used in the past tense. However, it is acknowledged that the traditional city continues to exist today.

The term "urban structure" will refer to the two-dimensional quality of the city, specifically its circulation patterns and land uses. The term "urban form" will refer to the three-dimensional quality of the overall plan of the city. The term "urban fabric" will refer to the streets, the buildings and urban spaces and how they relate to each other to make up the whole. The term "node" will refer to the convergence of two elements, such as two streets, at a

space to bring special interest. The term "landmark" or "focal point" will refer to a physical element such as a major building or space that provides a sense of reference and orientation.

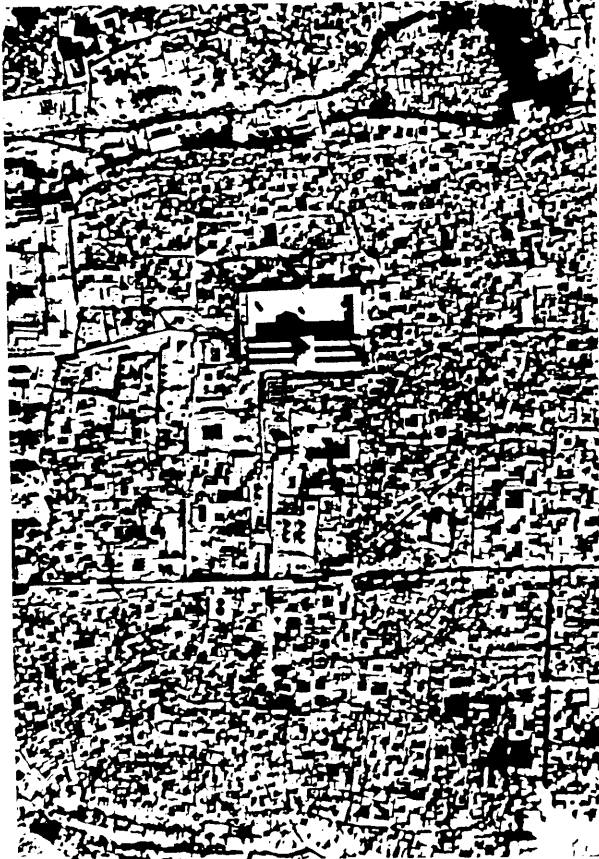
The term "modern" will refer to elements or qualities incorporated in the design of cities that have no precedence in the traditional city, such as modern modes of transport or specialized zoning.



10.



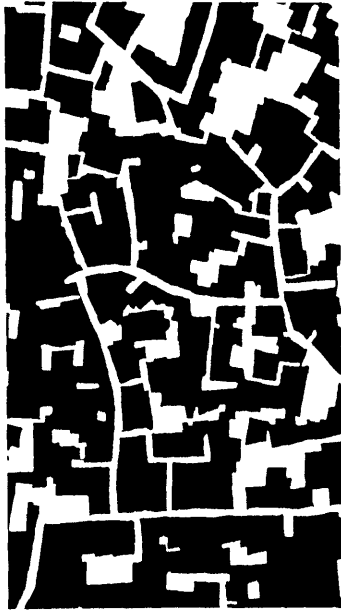
PART I : THE TRADITIONAL CITY



12.

In his book, *The City in History* Lewis Mumford made the remark about cities: “. . . more organic plans representing the slowly developing needs and decision of many generations, require time to achieve their more subtle and complex richness of form.” (4)

This remark is appropriate to describe the traditional city of North Africa and the Middle East. The urban fabric of the traditional city provided an environment of visual variety and differentiated experiences. For example, the width of a street in the traditional city increased or decreased depending on the limits and demarcation of land ownership or space transition from public to semi-public to private. Because there was no formal authority to reinforce maintenance of the street, property owners often took initiative to maintain the street; the price of such informality

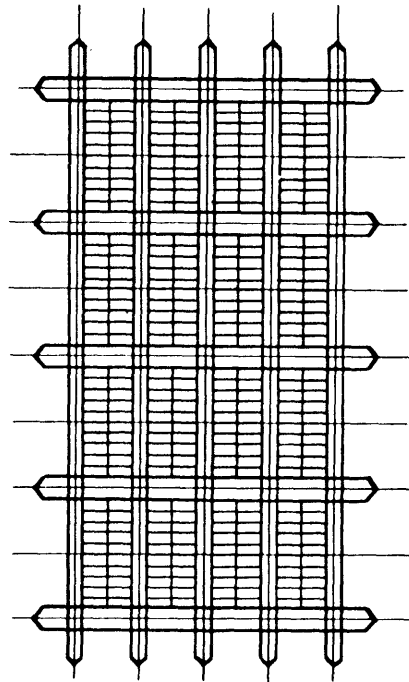


13.

was that owners often extended their property walls, encroaching on the street space or other unused and unclaimed space.

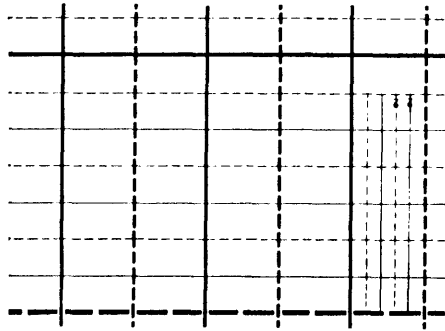
Three elements in the built environment of the traditional city, the street, the building--whether a mosque, a market or a house--and the urban space continue to be the organizing framework in the fabric of new towns. Now, however, these elements are given different physical and spatial qualities rendering them unfamiliar and alien to the users.

Due to economic constraints, the introduction of modern modes of transportation and industrial specialization, the street, the building and the urban space have taken a proportion and scale different from that of the traditional city. Available modern technology but limited economic



14.

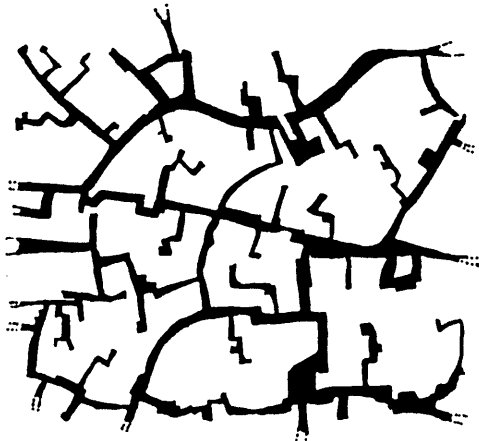
resources have produced design solutions for new towns influenced primarily by a drive to maximize land utility, both spatially and economically, and impose efficient circulation. Land speculation evolved as a result of attaching value to the land; for example, an important location for commercial use may induce an owner to further subdivide the property into smaller plots to maximize the benefit. The central development authority of a new town has a similar point of view; to maximize economical benefits and make connecting to infrastructural services more efficient, plots of land are often arranged with the absolute minimum street frontage and maximum square footage area possible. These plots are repeated throughout the plan resulting in a predictable systematic pattern. In fact, based on economic and financial inputs, computer models have



15.

been used to determine plot layouts and street patterns for new communities.

The result of the systematic approach to maximize utility produces built environments that lack variety and articulation. Streets become similar baring no qualities which differentiate their use. The hierarchy is less distinguishable in both the town center and the neighborhood. The main street, for example, may be similar to the peripheral or throughway street.



16.

THE STREET

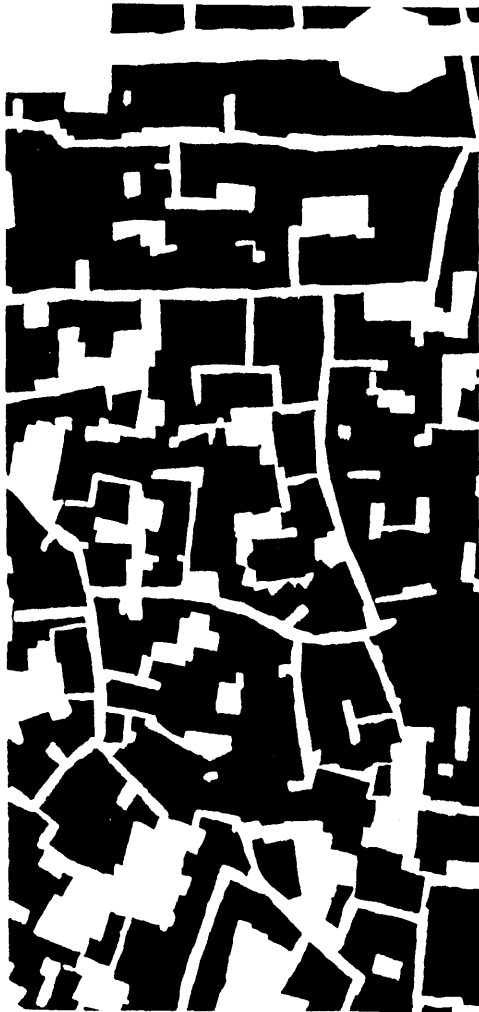
Street space in the traditional city was an urban space where many activities occurred. The distinction made between street space and urban space is associated with new towns. Spaces in new towns are often isolated from the



17.

street--a source of activities and life of the city; the street serves a singular purpose--a transportation system.

The time necessary for the traditional city to achieve its "rich fabric" produced a simple hierarchy of street patterns. The hierarchy of the circulation network usually consisted of three major elements: a throughway, a main street and a secondary street. The throughway was usually a "main" street that connected the city's various parts; stretching from one city "gate" to another or connected quarters or haalis--neighborhoods. Throughways were usually intersected by narrower and shorter main streets. The transition from the throughway to the secondary streets was allowed via the main street which ran into the haras--smaller neighborhoods. Major public facilities, like mosques or markets clustered along the main street. Secondary streets radiated from the



18.

main streets at irregular intervals; and could have been either a narrow circulating street within the haras (also called "zangha") or a cul-de-sac (dead end street).

The hierarchy of streets in the traditional city was not always clearly distinguishable by looking at the plan. Since streets tended to increase and decrease in width they did not necessarily accurately reflect their use and type of activities. Nevertheless, this irregularity in use and in pattern created visual variety and identifiable places. For example, at certain points a neighborhood street may have resembled a main street containing commercial activities, increasing or decreasing in size or spatial treatments.

The neighborhood was defined by social boundaries more than by physical ones. For example, a cul-de-sac may

have been a public space at one point, a semi-private space at another and a private space at yet another. A stranger ending up at that space may have felt uneasy if not socially related to those who live there. Quarters were often characterized by a concentration of houses belonging to the extended family (5). In some instances, quarters were named after the family's name--ghabila's name--and often were represented by an appointed leader or shaykh.



19.

THE BUILDING

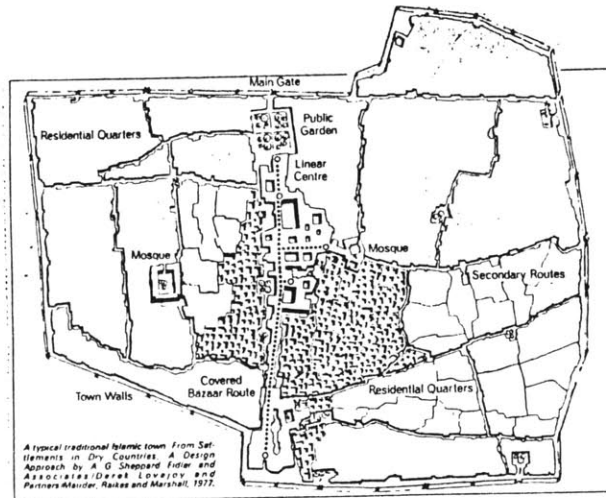
Beyond the traditional neighborhood, major urban buildings provided the physical focal points for the whole. Within the traditional urban fabric, especially along the main street, a mosque or a suq (open or covered markets) stood as an integral part of the street pattern.



20.

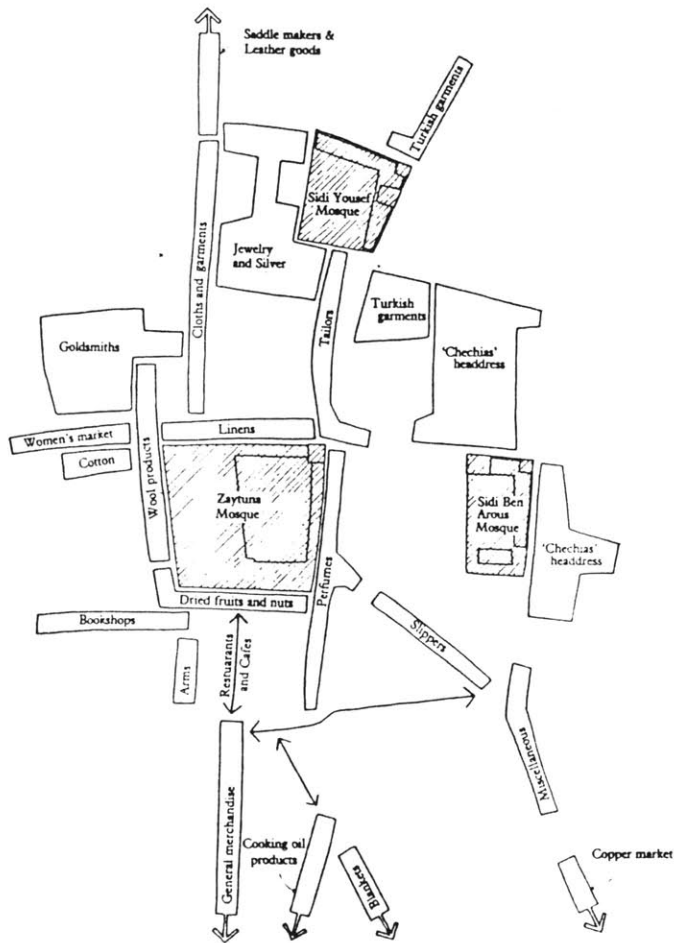
Wherever such a focal building occurred, its spatial arrangement--its relationship to adjacent buildings and to the streets--made places different and thus, created physical and spatial variety from one place to another.

Since the overall organization of the plan was around a major focal point such as a mosque, a market or public space, the sense of organization and continuity was reinforced by dwellings which tended to increase in grandeur as one approached a mosque or other building of importance (6).



21.

The overall plan of traditional city has been interpreted to exhibit a sense of logic, order in the land uses (7), and even an informal zoning plan (8), despite the occasion of a poorly articulated and irregular structure of circulation pattern



and land use. The traditional city consisted of quarters; some were living quarters, others grouped commercial and living together, and others were mainly commercial. Although there were commercial activities scattered throughout the urban fabric (quarters), the bulk of them were located in the suq where a broad range of businesses and crafts were represented. Within the suq, segregation of commercial activities was, for the most part, confined to a particular section rather than outside it. Noisy and offensive smelling trades were clustered with similar trades along a separate axes. Blacksmith and tannery trades, for example, were secluded from those of clothing, fabric, butcher, or grocery. Other trades, however, like wholesalers, occupied space at the edges of the city, and sometimes beyond its walls. (9)



23.

Building types were limited to few and often served more than one purpose. The mosque served both religious and educational activities and often provided a temporary shelter for a stranger; the house often incorporated a shop or a place for crafts. The limited building types provided for a clear and expressive city fabric. Buildings may have contained ornaments or textures meant to be viewed from various points, other times those features were minimized because the space was only intended to be passed through.

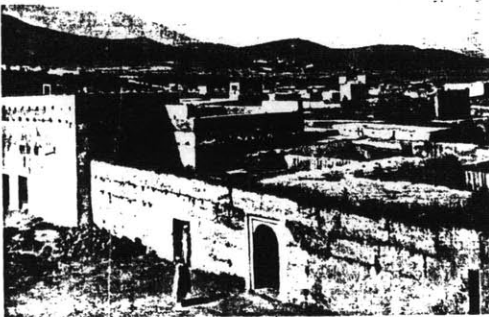
Buildings were "mostly low due to the constraints of technology and often crowded together"(10) except for the mosque whose spatial and religious character dominated the traditional city form. The mosque, with its high minaret, was seen from a great distance and was a focal



24.

point in both the physical and spiritual sense. The suq was usually located in the vicinity of the mosque to benefit from the mosque's visibility and congregation.

The traditional city got its physical "nodes" and character from the major building types and their distribution in the plan. "Nodes" such as an urban space surrounding a mosque or a market was interconnected with the seemingly random street pattern. Streets converged through urban spaces, becoming part of them and interacting with building edges--interconnected walls--creating a cohesive urban fabric.



25.

The wall in the traditional city was an integral part of the urban fabric. In addition to being an element for defense at the city perimeter, it acted as an edge defining both the street wall and the space it enclosed within the city. The streets,

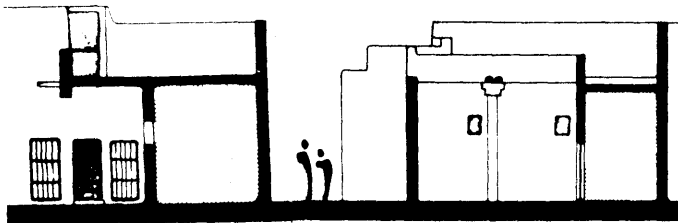


26.

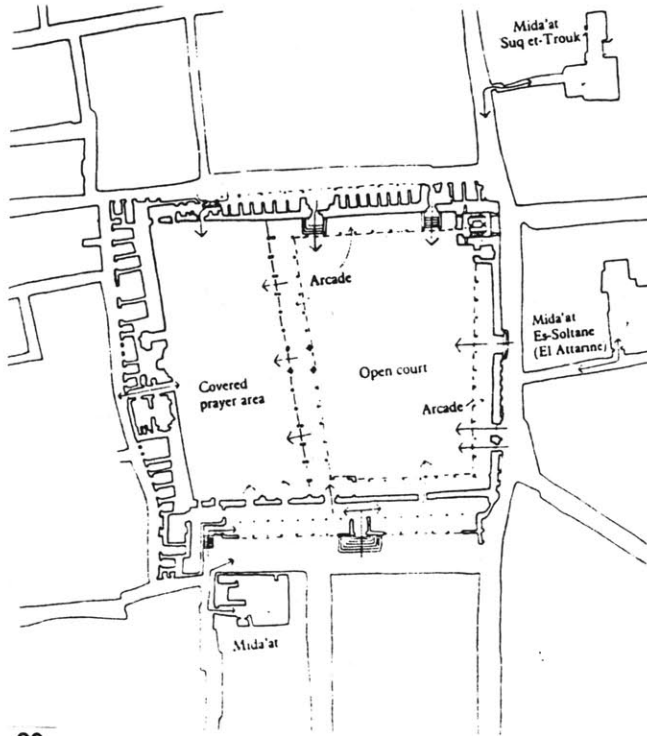
buildings and urban spaces were interconnected through walls creating an organic and continuous pattern. The wall also served as a physical boundary providing privacy as well as differentiating land uses; different land uses were often separated by walls rather than by distance. Working and living spaces were often incorporated within the same structure--grouped together to reflect mixed land uses.

THE URBAN SPACE

Urban spaces in the traditional city offered identity and character to their settings; a quality linked to human scale. The scale of the street reflected spatial qualities similar to the private court yard--the proportion and scale of the street space were intimate. Space did not just surround a building, rather, interacted with it to produce an identity and character unique to that place and associated only with it.

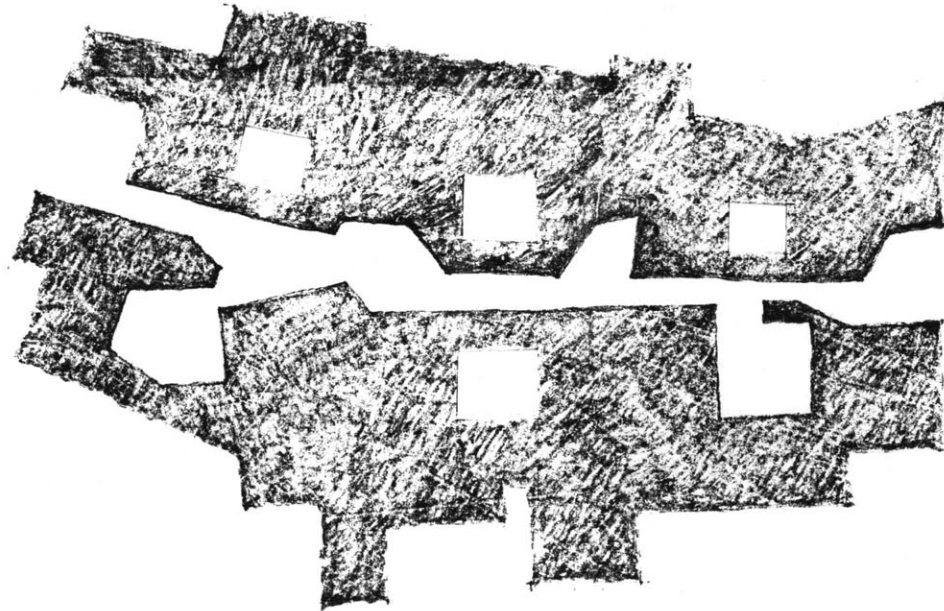


27.



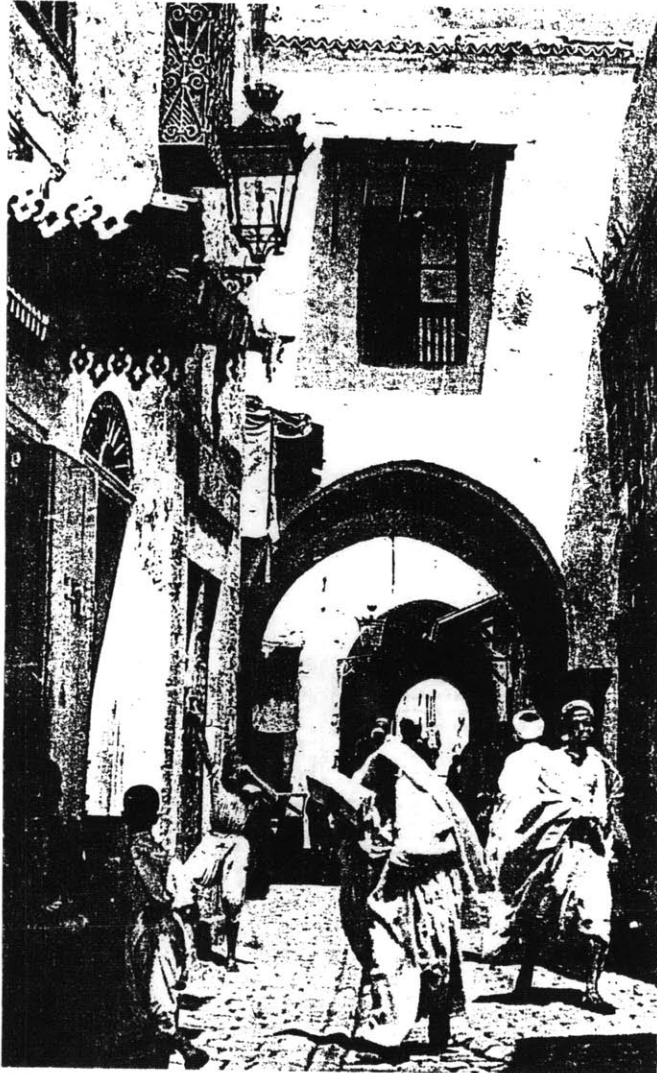
28.

Urban space was part of the overall fabric as if carved from a solid element—the building—or molded from a path of space—the street. The mosque, for instance, provided an enclosed space for social gathering before and after the prayer. An open space in front the mosque was part of the street providing an extension of the street. This space interacted with the urban fabric creating a sense of urbanity.



29.

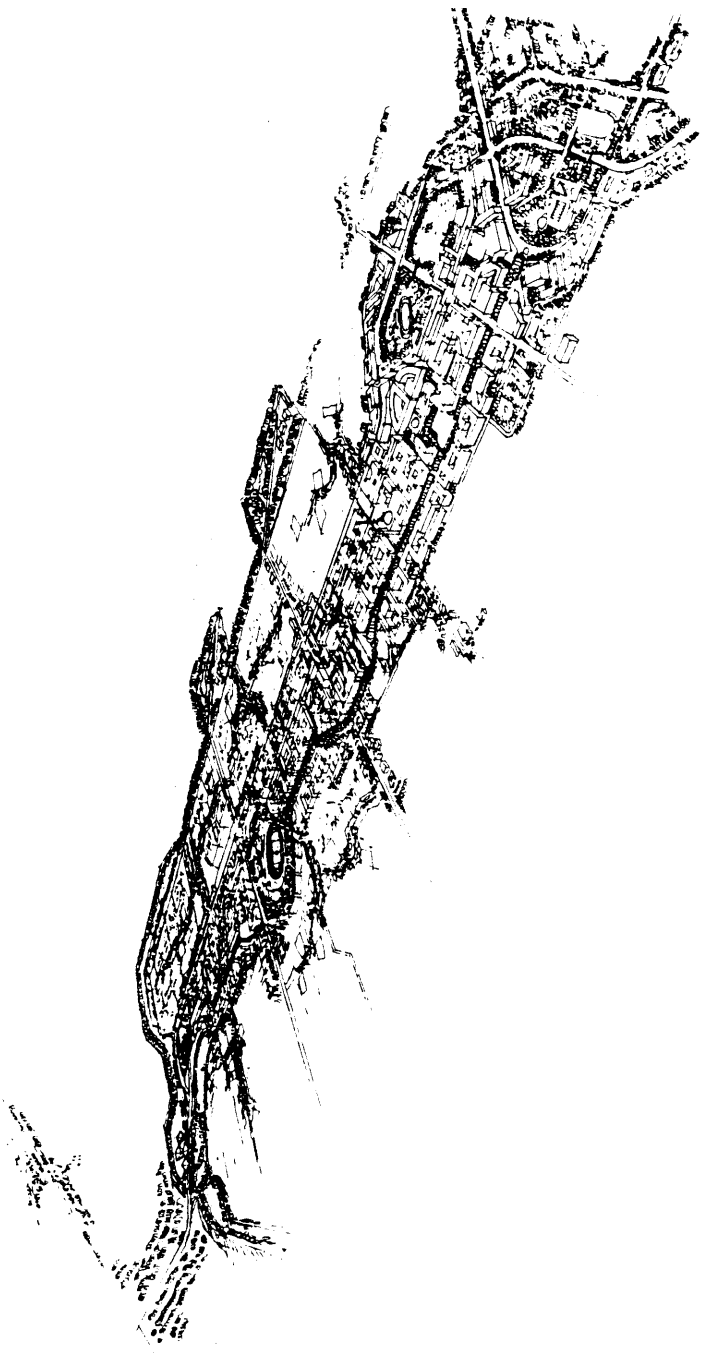
27



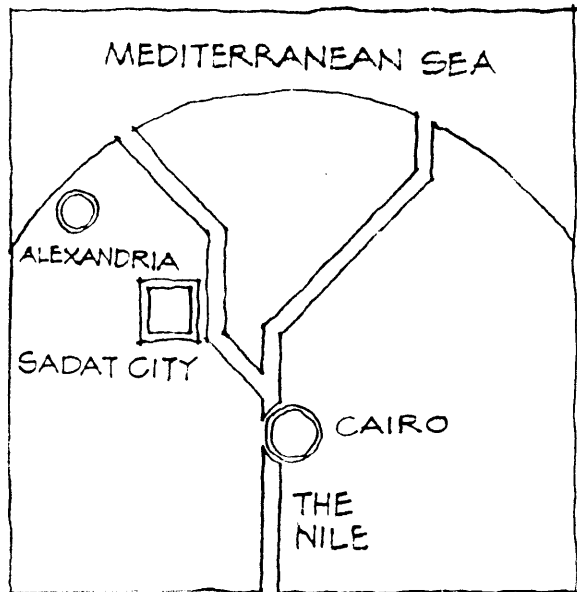
30.

A space in the traditional city was defined by the articulated mass and the physical features of the building. The uniform height of buildings provided a sense of physical continuity to the street space, and allowed the diverse character of buildings to be visually comprehended.

The space in the traditional city was also defined by cultural and commercial activities; this meant that some spaces derived their character and identity through the type of activities or social interaction that took place within them. For example, some commercial transactions did not require a predetermined physical space, instead, they occurred wherever people were. Accordingly, space in the traditional city derived its quality--purposefulness and vitality.



PART II : SADAT CITY



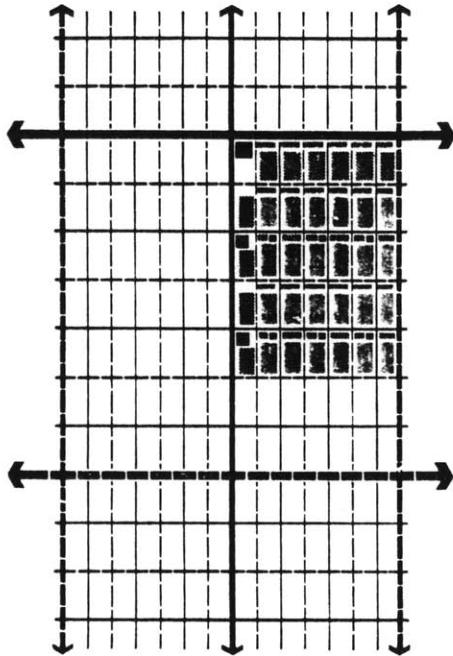
32.

BACKGROUND

In an effort to decongest the overcrowded cities of Cairo and Alexandria, Sadat City, one of Egypt's most ambitious new town projects was undertaken in the mid-seventies. Located in the desert, northwest of Cairo and along the major regional Desert Road, Sadat City was planned for a target population of 500,000 over a 25 year period with future expansion of 1 to 1.5 million anticipated. Proposed primarily for "social planning" purposes, the city was described by the Sadat City Planning Group as :

part of national development strategy to save agricultural land, to further Egypt's growth, and to provide jobs and housing away from the overcrowded cities of Cairo and Alexandria. (11)

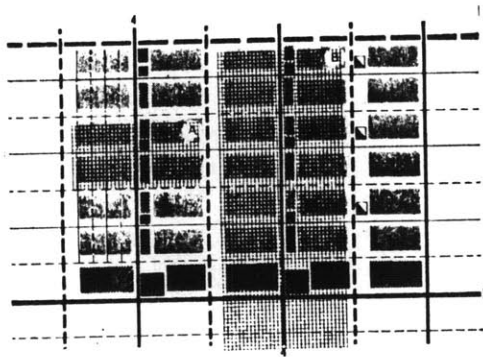
Industries and small manufacturing businesses will be the source for employment and is the economic base for the city's future survival.



33.

The application of modern planning methods in new towns like Sadat City has introduced modern elements to the urban fabric that make it merely an abstract expression of the movement systems and distribution of land uses within it. Now, movement of the automobile and public transit system competes with the notion of the pedestrian-city characterized in the traditional city. In some instances, where qualities of the pedestrian city have been incorporated in the design of a new town, its application is weakened by an overriding concept of a specific plan layout, such as the linear form of Sadat City.

The distribution of mixed-uses in the city is another characteristic of the traditional city incorporated in the built environments of new towns, sometimes successfully other times not. Zoned-uses in the design of new towns have

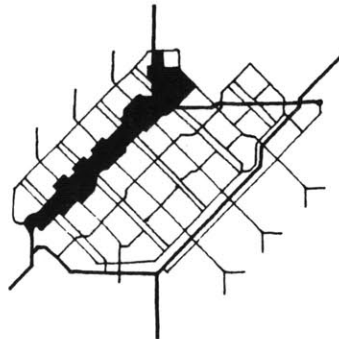


34.

produced areas lacking the vitality of the traditional city, leaving some places without people or activity.

Why should the design of the built environment of new towns be just a functional solution ? And why is this quality of functionalism in the built environment a source of alienation and disorientation for inhabitants?

CENTRAL SPINE

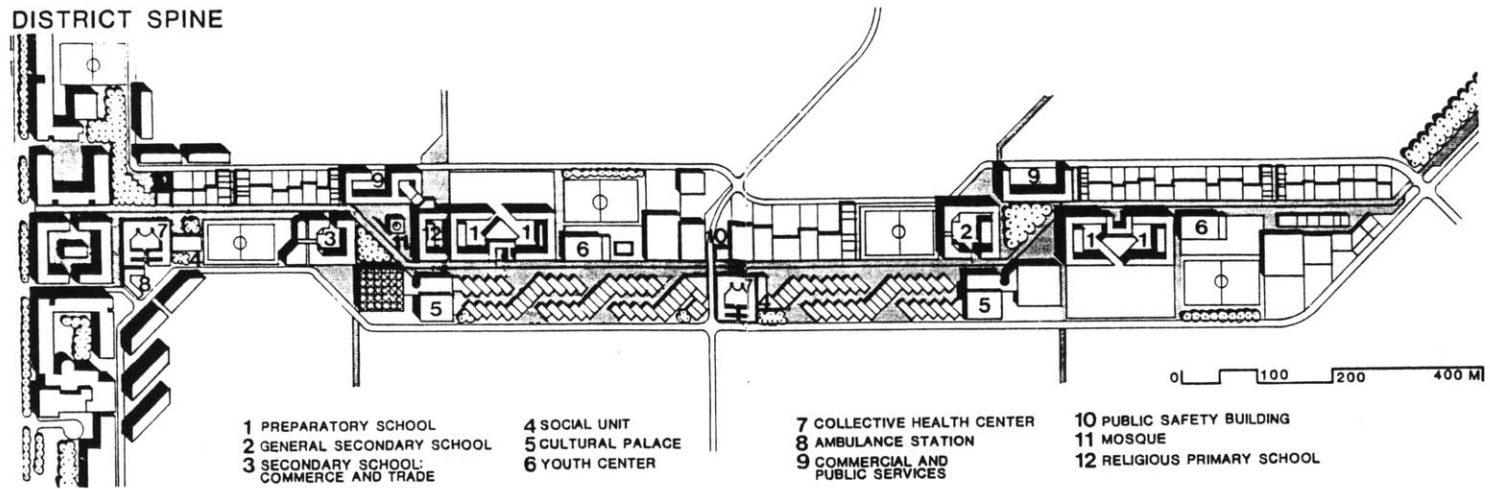


35.

THE PLAN

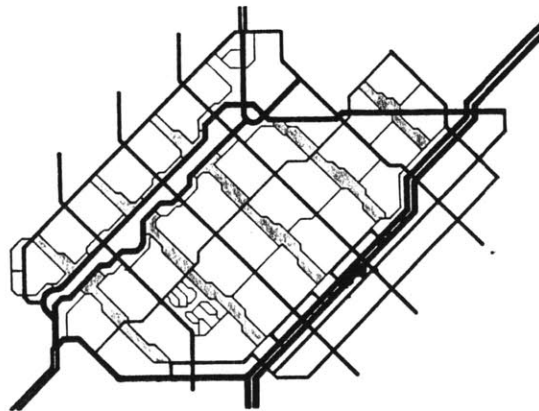
The Sadat City Plan is organized around a linear town center called the central spine. The central spine--grouping national, regional and local government facilities; major commercial, institutional and recreational facilities--is intersected at equal intervals by primary and secondary streets. The primary streets forming the district spines include district centers along their axes with the following facilities:

DISTRICT SPINE



- | | | | |
|--|-------------------|----------------------------------|-----------------------------|
| 1 PREPARATORY SCHOOL | 4 SOCIAL UNIT | 7 COLLECTIVE HEALTH CENTER | 10 PUBLIC SAFETY BUILDING |
| 2 GENERAL SECONDARY SCHOOL | 5 CULTURAL PALACE | 8 AMBULANCE STATION | 11 MOSQUE |
| 3 SECONDARY SCHOOL: COMMERCE AND TRADE | 6 YOUTH CENTER | 9 COMMERCIAL AND PUBLIC SERVICES | 12 RELIGIOUS PRIMARY SCHOOL |

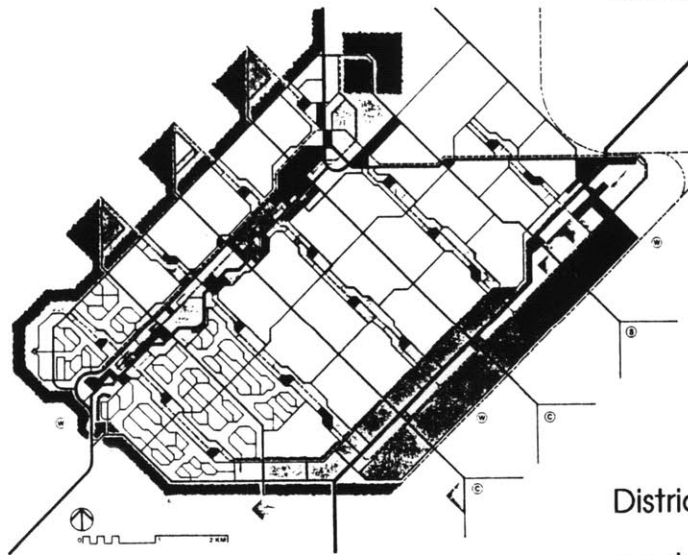
36.



37.

- Educational facilities--secondary school
- Health care facilities
- Public safety
- Religious and cultural programs
- Commercial and retail services
- Workshops
- Apartment blocks
- Light industry

Residential areas are situated along the development corridor and connected by district spines. The district spines are intersected by neighborhood spines serving the neighborhood community through three neighborhood centers. Each center contains the following:



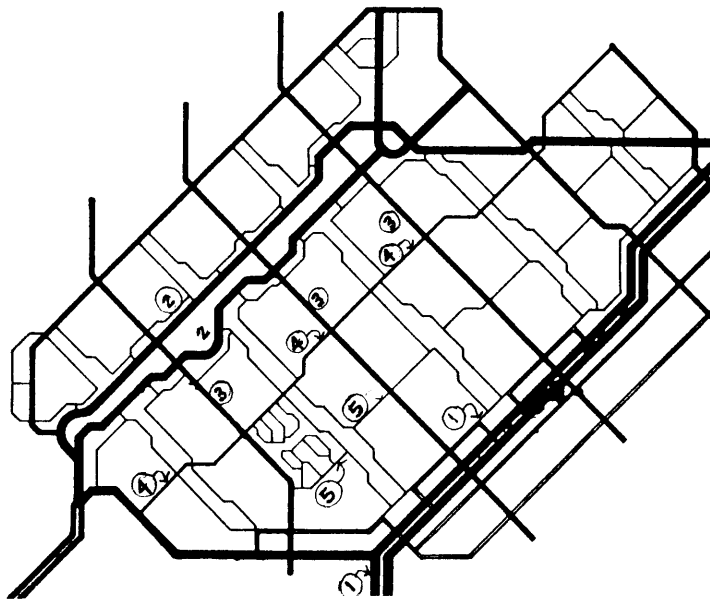
- Primary school
- Social services
- Communication facilities
- Sports area
- Mosque
- Commercial and professional services
- Small workshop industry and apartment blocks.

District spines serve as primary arterials connecting the central spine to the industrial corridor to the southeast, and are the major route for public transit and pedestrian

38.

movement interconnecting the district centers and their neighborhoods to the central spine.

Like that of the central spine, the distribution of facilities along the district and neighborhood spines is in a linear rather than cluster form, and form sub-town centers within the overall plan. This produces two features that contrast with the traditional city. The first is the sub-center which comprises facilities typically located in the town center of the traditional city but in scale with the needs of its catchment area within the district or residential neighborhood. The second is the urban form of the sub-center which duplicates the linear form of the overall plan.



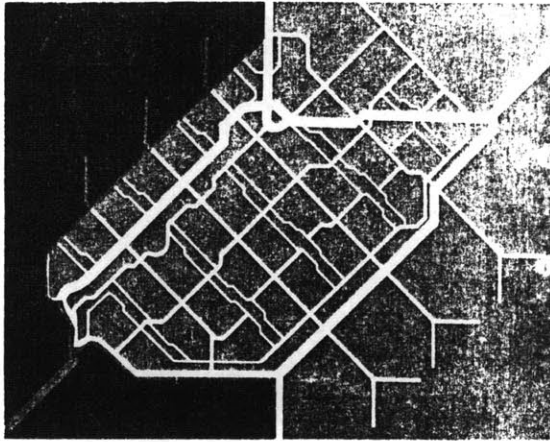
39.

1. THE REGIONAL HIGHWAY
2. THE PRIMARY STREET
3. THE SECONDARY STREET
4. THE NEIGHBORHOOD STREET
5. THE LOCAL STREET.

THE STREET

One of the design elements in the plan of Sadat City is the street. The plan consists of a hierarchy of five types of streets:

1. The regional highway, 2. The primary street--central spines and boulevards, 3. Secondary streets--district spines, 4. Neighborhood streets, and 5. Local streets--each with a different width, right of way, and predetermined traffic capacity. In an effort to increase pedestrian use, arcades are provided along the central spines and the primary arterials; however, the linearity of the plan works against this effort. The linear quality produces an elongated rather than enclosed plan layout which may not be favorable for walking--a crucial activity to the familiarity and association with the environment



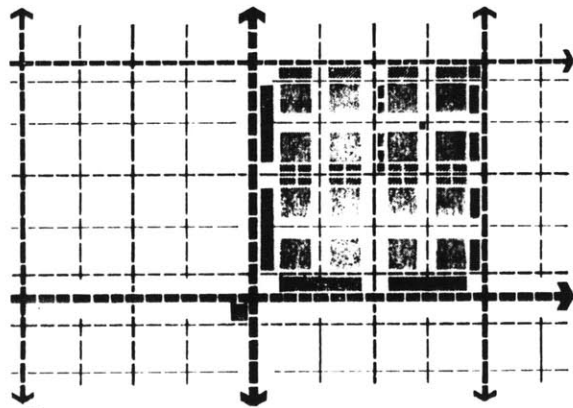
40.

The city pattern of Sadat City is characterized by the repetition of a stratified system of streets. For every street type there is another identical one arranged in the same order of placement throughout the neighborhood. This pattern is the result of an approach to accommodate the complex movement system of transportation modes: the automobile, public transport or bicycles in a systematically ordered grid-like pattern to allow for order and efficiency of movement.

With this quality of a repetitive system of identical streets, a pattern arrangement of identical neighborhood modules emerged, reducing the opportunity for visual variety. Physical differences between neighborhoods become difficult to discern because neighborhood character is lost. In the traditional city, on the other hand, one way



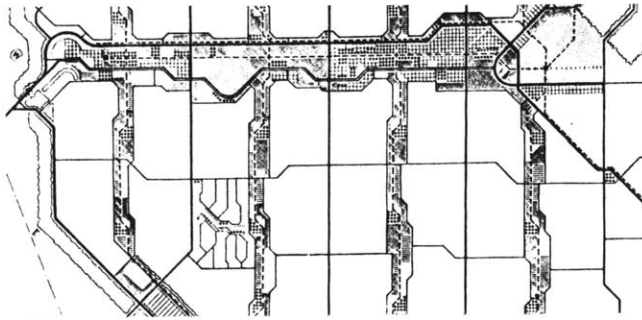
41.



42.

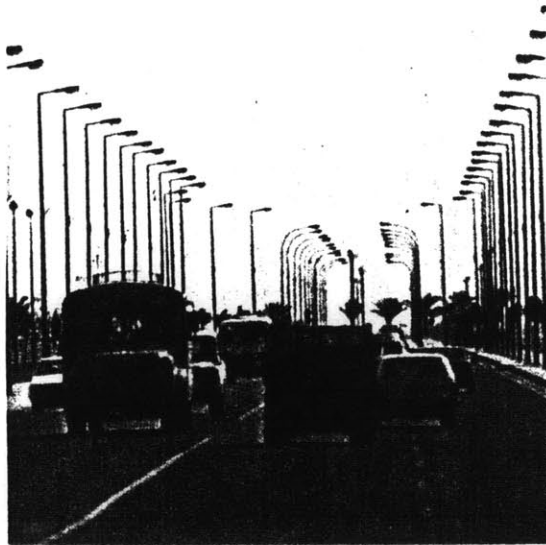
neighborhood quarters were differentiated was through street space. Despite common technology and materials used in producing buildings similar in height, form, texture and color, visual variety was made possible through irregularities and convexities in the street space.

If we place an imaginary square at the appropriate scale on a plan of the traditional city, we frame an area not necessarily representative, in physical qualities, of the overall plan. Within the imaginary square we will include a maximum variety of street types or building types—a market or a mosque, or perhaps both. In contrast to this, a square placed on a plan of Sadat City will, with minimal adjustment, frame a module representative of the whole—with exact physical qualities of street and building types. For example, consider the two neighborhood modules shown. Each of



43.

the identical neighborhood modules not only contains identical streets and buildings but is also defined by an identical spatial relationship to the other. One can easily imagine the difficulty in differentiating neighborhoods, which is further magnified by buildings having similar architectural treatments.

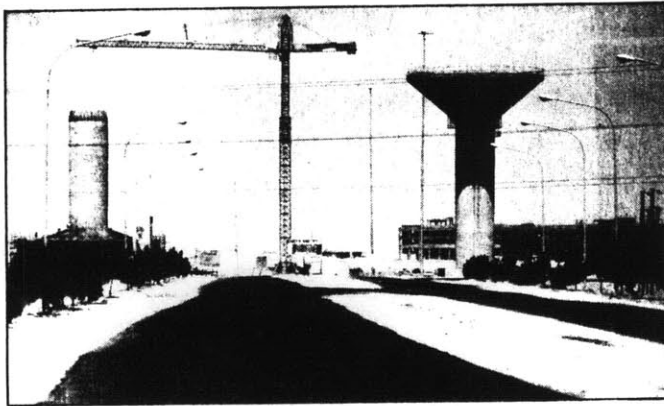


44.

The visual experience for the pedestrian along the long wide street is different from the visual experience of those riding in motorized vehicles. The long and wide street, while convenient for bus or automobile traffic, does not provide the pedestrian with articulated spaces to break its linearity.



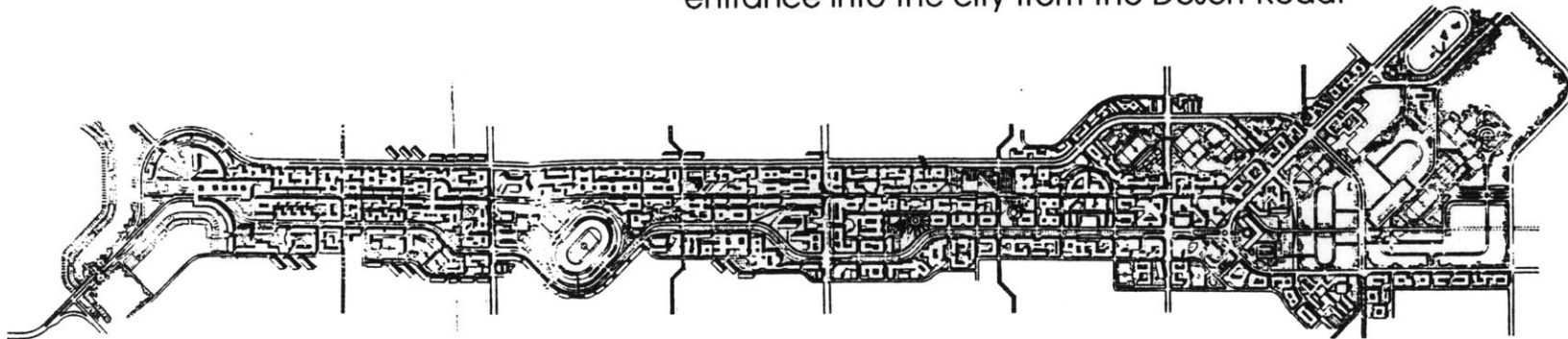
45.



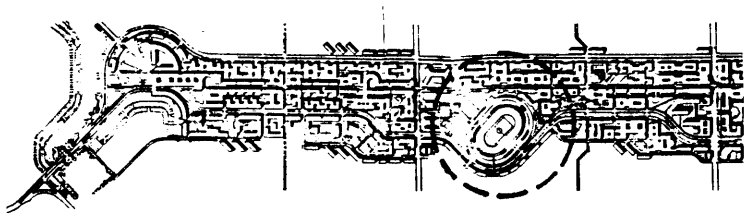
46.

THE BUILDING

Articulation of the linear spine can be visually interesting for the passers-by and creates a character and an identity for the city. According to the proposed plan, the passenger experience along the central spine is perhaps enhanced by its variety and diversity. Movements from one place to another give the passenger a definite sense of change and progression. Different public buildings encountered along the way provide points of reference and orientation. Two water towers, for example, form a symbolic gateway entrance into the city from the Desert Road.



47.

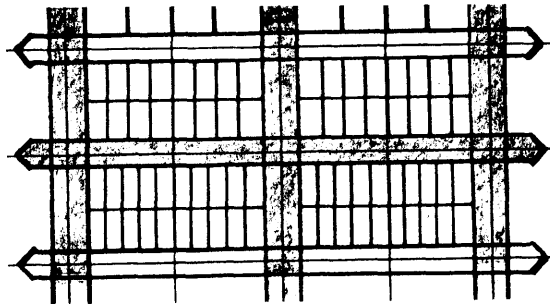


48.

The stadium in the Sports Center, proposed for a future phase of the plan, provides a physical landmark in the pattern of the city and enables the automobile driver or passenger to identify their location in the city. However, these "nodes" are probably better experienced while moving in an automobile because it takes less time to travel by automobile from the city entrance--the water towers gateway to the Sport Center and thus, creates an opportunity for more nodes to be experienced in a shorter period of time. In other words, the extreme visual variations experienced in the circulation pattern provide the passenger with a sense of cohesiveness and give character to the spine.

For the pedestrian, the visual experience is different. Visual variations or dominant "nodes" along the spine are

introduced at intervals not likely to be reached by the pedestrian in an average walk. Since it takes a greater amount of time to reach "nodes" they are less likely to be encountered and thus, visual variations within the fabric are not experienced. The emphasis in the design of Sadat City has been on generating an urban pattern that allows and facilitates movements and the distribution of functions. Major town facilities, typically found in a cluster form in traditional cities, are now distributed in a linear form along the spine.



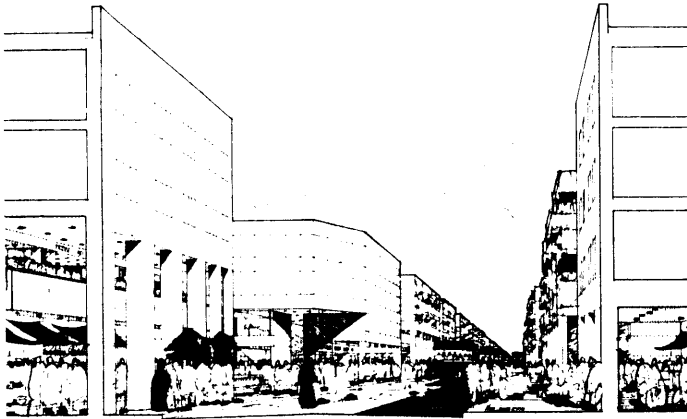
49.

In contrast to the concentric-like form of the traditional city and its pedestrian orientation, the urban form of Sadat City is determined by the transportation system and is suited more for the automobile. As discussed, the linearity of Sadat City impedes the number of focal points the pedestrian can experience. Its central spine is bisected by equally spaced

secondary spines and arterials serving equal functions and zones on either side. The absence of a town center--where major services can cluster within a compact diameter--is a quality which elicits the use of the automobile. Due to the linear form of the city, pedestrians are compelled to use motorized vehicles rather than walk; further decreasing contact with the built environment and thus reducing the familiarity with it.

URBAN SPACE

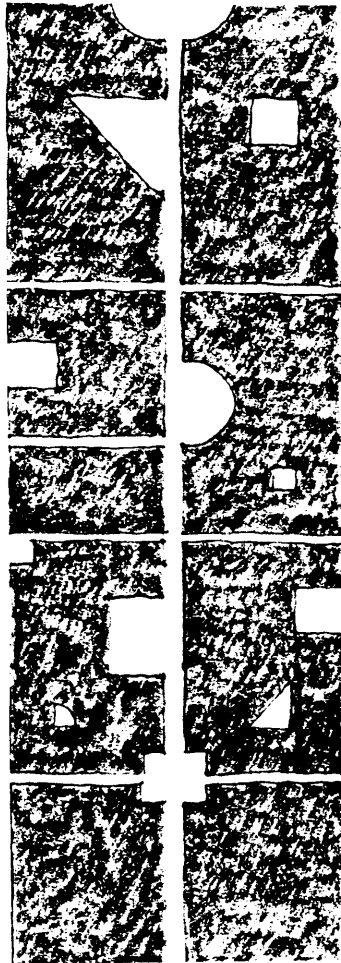
Alienation and disorientation have been associated with urban spaces in new built environments. The system of urban spaces in Sadat City is fragmented by the circulation pattern and the many specialized building types. According to the proposed plan of Sadat City, the interaction of urban spaces to building masses is not established. Along the



50.

central spine of the city, urban space is not articulated to reinforce variations and diversity. Although the pedestrian arcade incorporated along the spine is a desirable quality, for the most part buildings proposed for this area stand as objects in space rather than part of an overall fabric. There exists no spatial relationship to an overall structure of urban space. For example, spaces offered to the Cultural Complex and the Science Center appear to be arbitrary and secondary to the proposed buildings of the linear street.

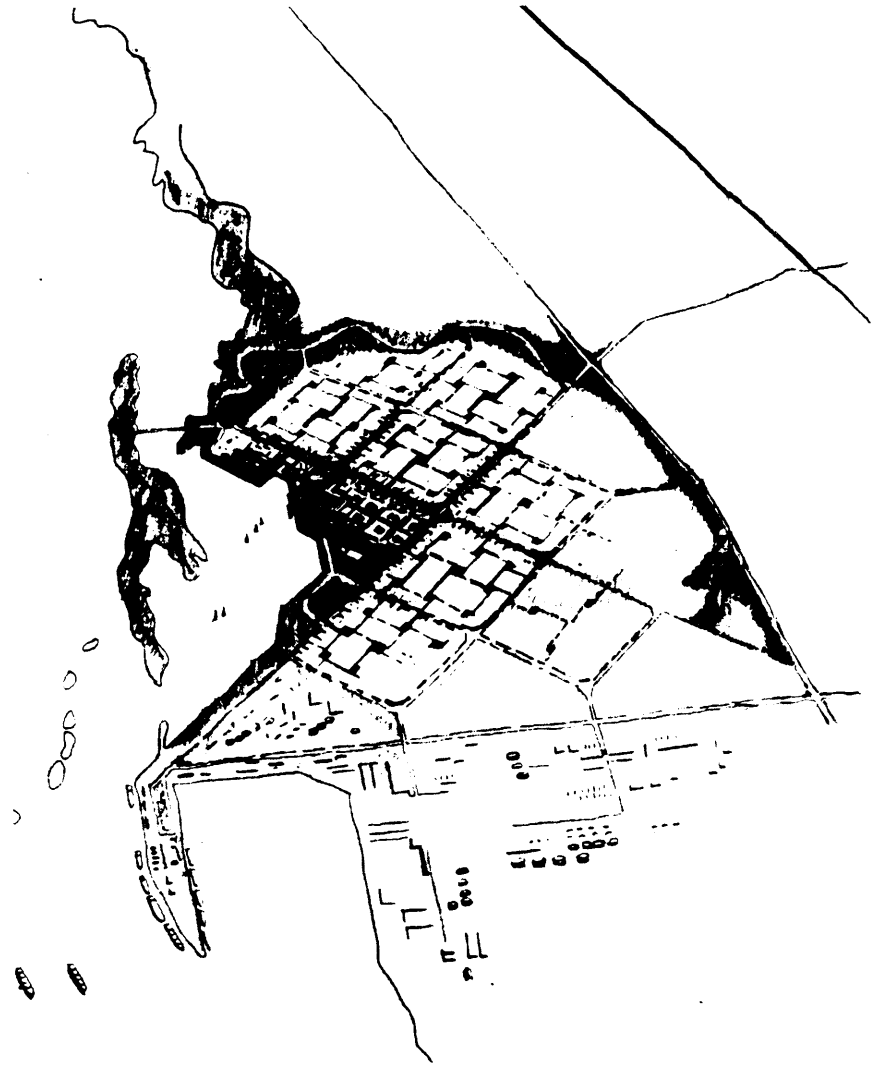
Consequently, the urban spaces in the city are fragmented by the hierarchy and repetition of the street pattern. This pattern produces island-like blocks resulting in generic open spaces rather than urban spaces.



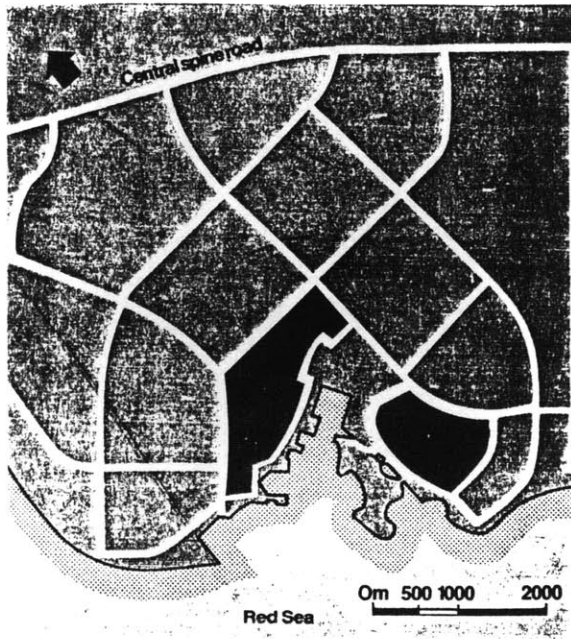
51.

For Sadat City, the system of urban spaces can be brought to interact with the city's various parts--streets and buildings--through well designed urban spaces--spaces that are part of the streets and the buildings. This implies that urban space as well as street space be continuous and proportionate to the street wall--the buildings; but does not suggest designing narrow streets to resemble traditional cities. Rather, suggests using some proportion of scale at the city level as well as its individual parts.

Spatial character and association with the context can be created by a clear hierarchy of urban spaces, appropriate street to building proportion, and differentiation in street patterns and urban space relationships, and thereby "humanize" the systematic approach.



PART III : YANBU



53.

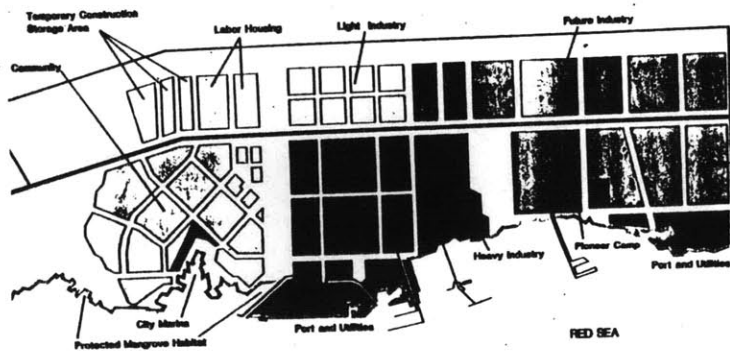
BACKGROUND

Yanbu is a new industrial town in Saudi Arabia, located on the Red Sea 11 kilometer southeast of the original settlement of Yanbu. It is the second industrial town after Jubail in Saudi Arabia but the first in the region (outside Saudi Arabia) in terms of target population (150,000) and scale of its industrial production. Yanbu was planned as an industrialization strategy to diversify the economic base of the country over a 30 year period. Its immediate goal was to accommodate the petrochemical industry and provide residence for the Saudis who will work in the industrial complex (as well as temporary residences for foreign workers).

Yanbu's city form was determined by factors unprecedented in the traditional city. Its rationale is best

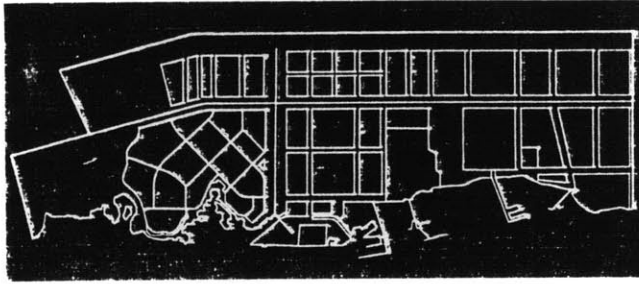
expressed by those who were involved in its design.

Howard McKee and William Denke, planner and consultant from Skidmore Owings & Merrill and R.M. Parson Co. wrote about Yanbu:



54.

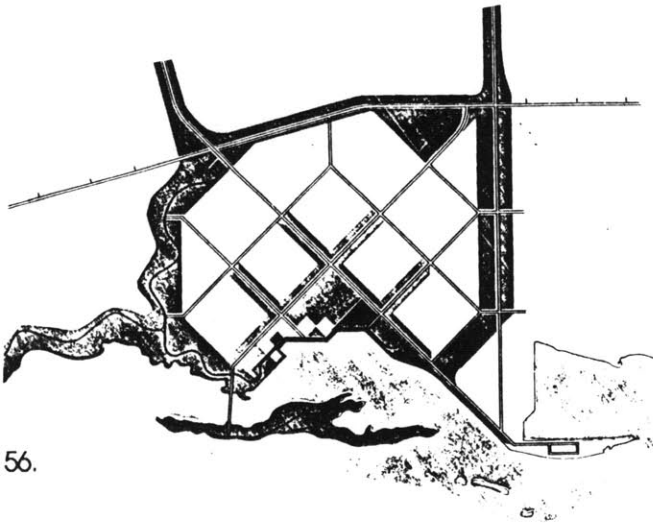
The chosen form of Yanbu arose directly from a set of functional and organizational principals at the outset: One, locate industrial uses to coordinate efficient port facilities. Two, reserve infrastructure corridors that can develop incrementally to respond to phased build-out of industry. Three, reserve buffer zone around industry to ensure environmental protection of adjacent uses particularly residential. Four, locate community upwind of industry and take climatic factors into account. Five, incorporate cultural and social factors into the design. Six, provide flexibility within the community plan in order to easily adopt to changing population mixes and alternative methods of development. (12)



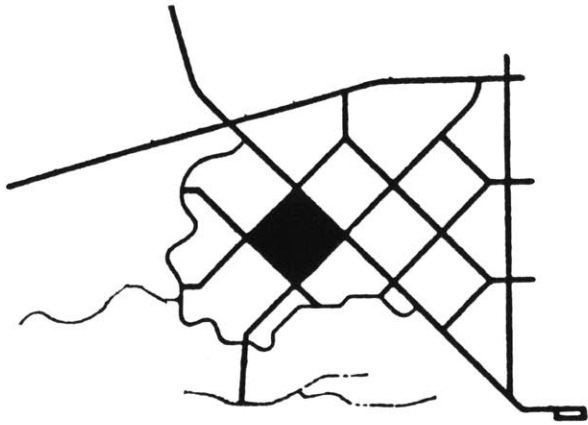
55.

THE PLAN

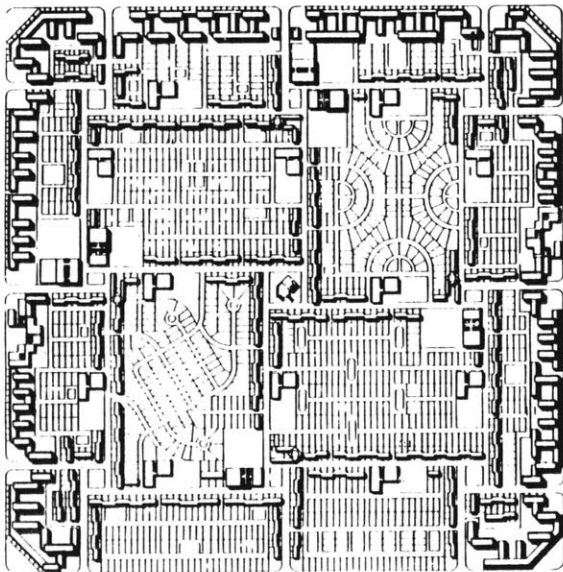
The Yanbu Plan incorporates both modern and traditional design elements in its new built environment. The Plan is divided in two distinct areas--the community area and the industrial complex separated by a large green belt of land (buffer)--each with a specialized use incompatible with the other. The industrial complex consists solely of industry and its related activities. There are no residential, commercial, public or governmental services in this zone; its land is for purely utilitarian purposes. That being the case, the purposes of this thesis will best be served if the focus in this section (Yanbu) remains primarily on the community area and its related functions and activities as a representation of the potential city fabric.



56.



57.

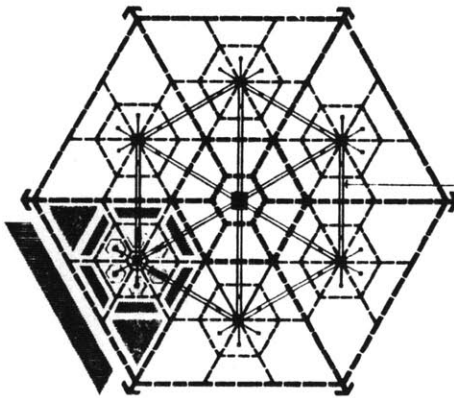


58.

The community area lies northwest of the industrial complex and encompasses the town center--commercial, institutional and cultural facilities. The planning grid systematically divides the space into identical neighborhood modules measuring 1.4 x 1.4 kilometer; each neighborhood module is subdivided into smaller modules within which land is separated into individual plots varying in size. The circulation pattern within each module is somewhat varied. The larger module's layout includes facilities similar to those proposed for the town center and make each module an independent unit with its own sub-center. Each module consists of the following functions:

- Elementary and secondary school
- Mosque
- Commercial
- Municipal services

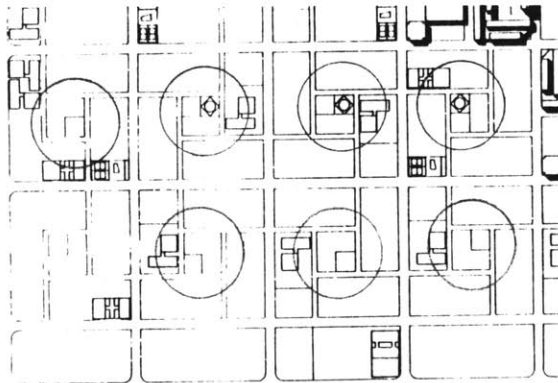
- Social welfare and medical clinic
- Cultural center
- Open space
- Villas, townhouses and apartment buildings



59.

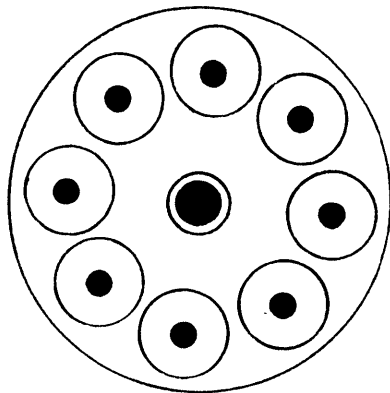
The division of the overall plan into smaller equal neighborhood modules, each with identical independent facilities--sub-centers--is a clear contrast to the traditional city and diminishes the significance of the town center as the focal point for the city as a whole. In the traditional city, the area from which the town center drew its population--catchment area--encompassed the entire city. The catchment area of Yanbu's town center is either equal to or smaller than the catchment areas of other modules in the plan.

As a result, the town center of Yanbu may lose prominence in the urbanscape due to its rival, the sub-center. Although conveniently located for inhabitants and commercial enterprises, the sub-center reinforces divisions--separating people from interacting in their daily activities with people other than those using the same sub-center. Because each module contains facilities similar to those of the town center--differing only in the scale of services--inhabitants are inclined to use them as their primary source for services.

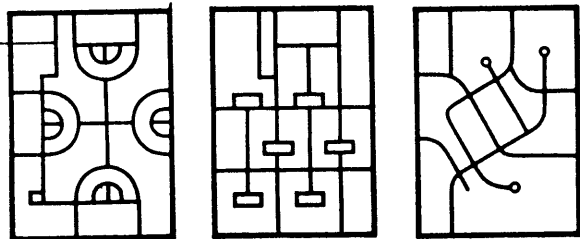
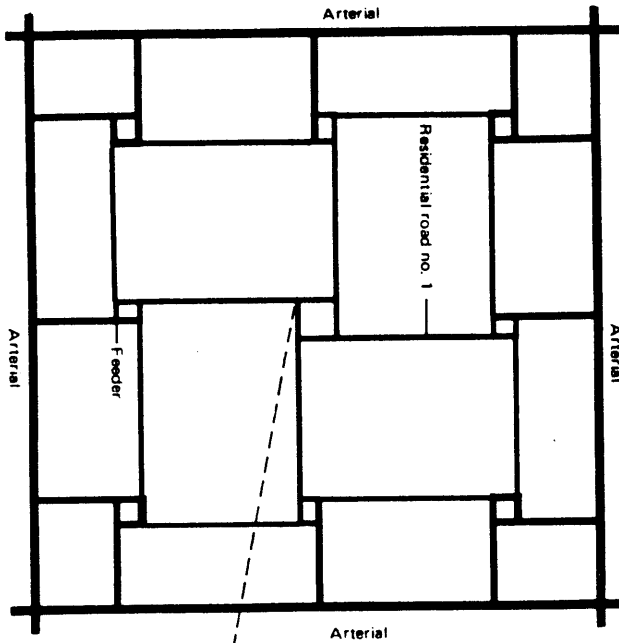


Consequently, instead of acting as a supplement to the town center, the sub-center detracts from and competes with the town center; they might be more appropriately termed mini-town centers. For example, the Jumma Mosque (the central mosque) in the town center no longer has the same prominence in the urbanscape. The

systematic distribution of mosques throughout the neighborhood modules diminishes the quality of prominence that Jumma Mosques possessed as well as the sense of orientation toward the town center typical in the traditional city. Walking to the town center for a prayer in the Jumma Mosque may be replaced by a prayer at the mosque within the neighborhood sub-center. These unresolved tensions between the prominence of the town center and sub-centers in the neighborhood modules may decrease the users association with the town center. As individuals' use of the town center decreases so does their familiarity with one another, further reducing social contacts beyond the neighborhood.



61.



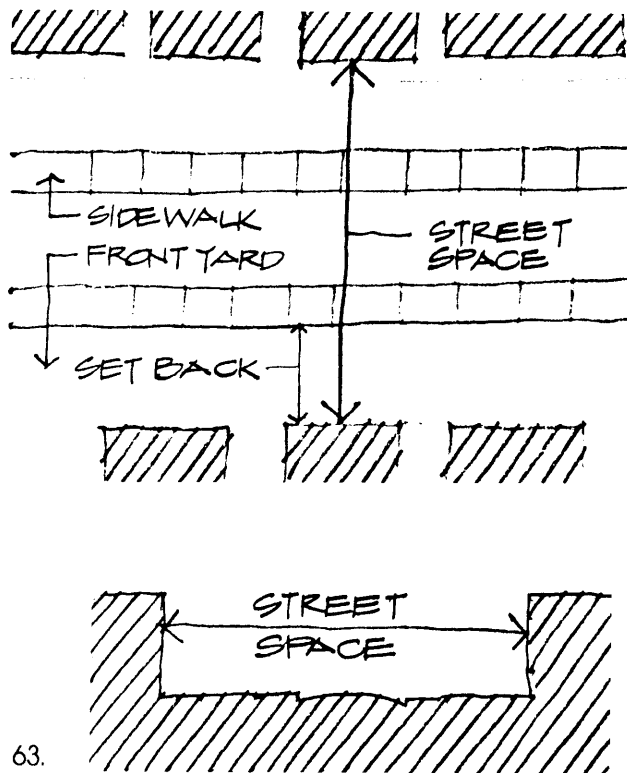
62.

THE STREET

The scale and proportion of the streets in Yanbu reflect modern qualities of automobile use rather than traditional qualities of pedestrian circulation. The community plan of Yanbu is characterized by a complex circulation hierarchy. The major street pattern consists of the Jeddha-Yanbu Highway--the major spine connecting the community and industrial complex; the coastal road along the waterfront; the arterial roads defining the residential modules; the residential streets through the residential modules; and cul-de-sacs.

Although the hierarchy of streets is clearly distinguishable for automobile users, it is confusing to the pedestrian due to similarities in street widths. For example, the arterial streets in the periphery of neighborhoods have the same width--right

of way and are repeated throughout the plan. The width of these streets is often exaggerated because it is based on predicted future traffic volume rather than current traffic volume.



63.

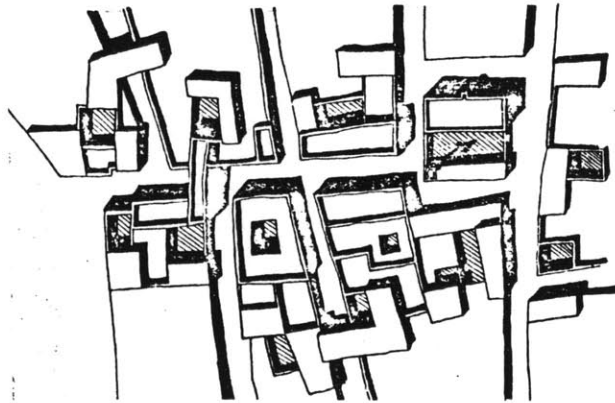
The proportion of these streets is exaggerated by the width of sidewalks and the setbacks of buildings from the property lines. In addition to the already wide streets, sidewalks along the street are often wider than needed; in fact, some sidewalks in Yanbu are wider than some streets in the traditional city. This quality of width is further amplified because buildings do not abut the street space forming its "edge" as they did in the traditional city; instead, they are set back each at an equal distance from the edge of the sidewalk--pedestrian walk--forming a front yard setback space. For instance, if a street--its right of way--is 16 meters

wide, added to that the sidewalk width and setback distance, its width may increase two-fold.

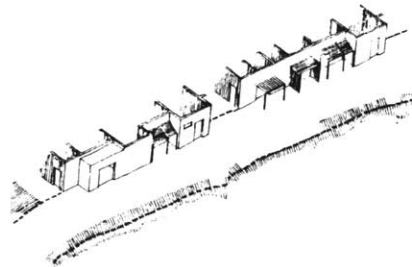


64.

The street in Yanbu is not an organizing element for the major buildings. The street becomes: "... a traffic machine; ... a sort of factory for producing speed traffic". (13) Instead of major buildings clustering around a common circulation element--the street, they stand as objects alone in the urban landscape separated by the streets rather than unified by them. In contrast, major buildings such as mosques or markets in the town center of the traditional city, though loosely distributed within the fabric, related to a common movement system--the street, and therefore, to each other.



65.



66.

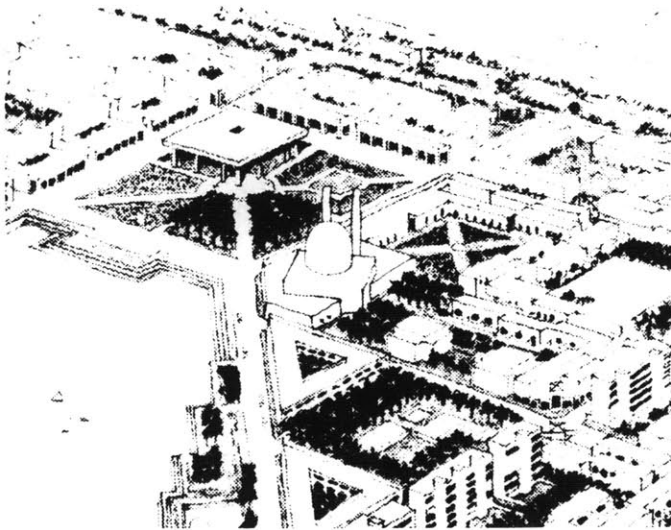
THE BUILDING

As previously discussed in Part I, at the larger scale, the layout of the traditional city contained no modules with similar physical qualities. Though haras or residential quarters may have contained the same building types or some mixed uses, the physical fabric of haras was not usually the same. For example, dissimilarity between neighborhoods resulted, in part, from building encroachment on street space. Since there were no rules dictated by a formal authority to limit the encroachment on street space (absence of setbacks regulation), neighborhood walls, buildings and widths of streets varied from street to street--creating visual variety and character.

The distribution of major buildings in the town center of Yanbu is similar to the distribution of major buildings in the town

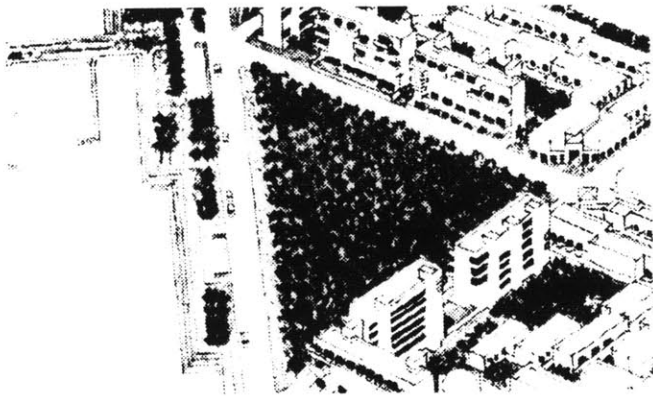


67.



68.

center of the traditional city, but different from it in two aspects; the first is the degree of physical and spatial importance of buildings; the second is the structuring element in the plan. In the traditional city the structuring element of the plan was usually the street space. In Yanbu's town center, however, the building is the structuring element. The Royal Commission Headquarter building appears as an important element in the plan of the town center—defined by the circulation pattern and with the natural edge of the man-made harbor. The Jumma Mosque, on the other hand, while visually prominent in scale and height, is spatially undefined. The spatial organization around the mosque—the urban space—is not interactive with the mass of the Mosque. The Mosque's location is not within the fabric, rather, it is at its boundaries.



69.



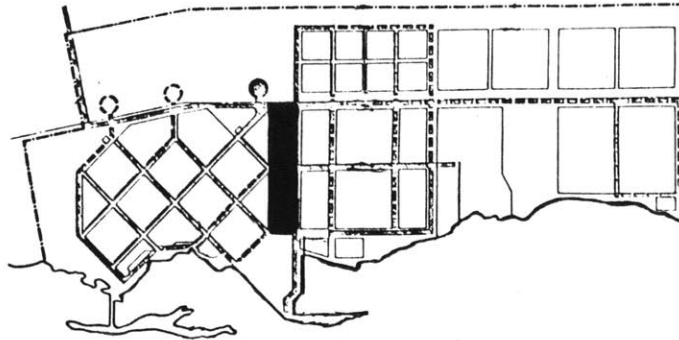
70.

THE URBAN SPACE

Spaces are either open or enclosed--a space without a sense of enclosure or a space enclosed by walls or defined by objects. A town surrounded by mountains, for example, will have a sense of space different from a town located in an open field.

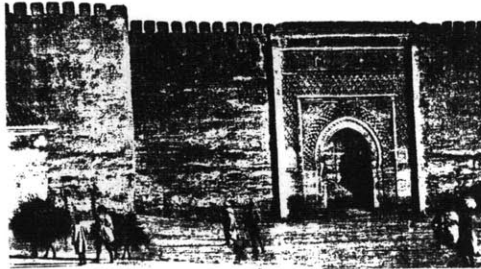
In the traditional city, openness was either beyond the city walls or separate green areas that acted as green belts around the urban mass. (14)

In Yanbu spaces along the coastal road and the town center are open spaces. The grid pattern intersecting the waterfront edge and the coastal road creates triangular shaped spaces surrounding the urban fabric of the city. Though they are desirable as green areas, they are not



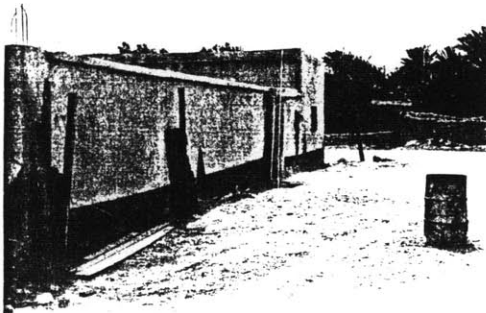
71.

interactive elements and act more as a visual recess from the coastal road than a spatial definition of the city form.



72.

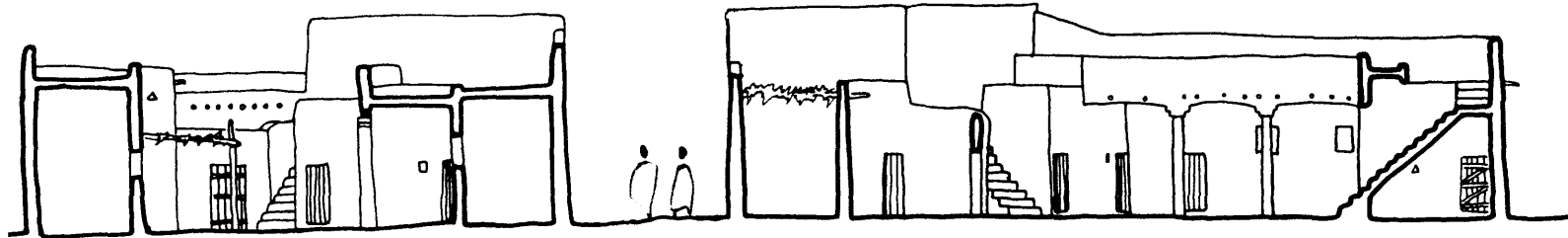
The green area or buffer zone in Yanbu is a space which serves more as a symbolic wall than an open space. Like the wall which surrounded the traditional city, the buffer zone separates the community from an incompatible use--the industrial complex--protecting it from potential harmful effects.



73.

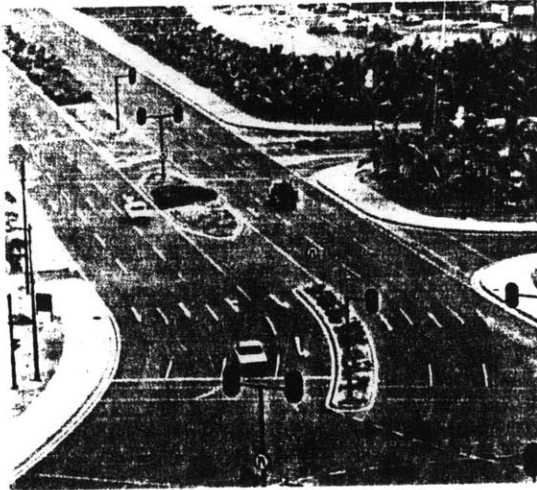
One major source of discontent with the modern built environment is the lack of a well designed system of open spaces, especially urban spaces. With new towns came the element of untreated space--void of any spatial or physical treatments. To those who adapted themselves to the

closely woven fabric of the traditional city, such an openness is discomforting and alien.



74.

Because the streets were so narrow and the buildings most often formed its "edge", social interaction in the street was inevitable. An individual moving in the traditional city street was part of the immediate surrounding fabric, not just moving through it. The scale of the street wall forming the "edge" of the traditional city street reflected the scale of the courtyard wall and as such, created for the pedestrian a sense of



75.

familiarity and cohesiveness. The street provided a common urban space where people converged or gathered to socialize as well as providing a means to get from one place to another. By contrast, the wide streets with wide sidewalks and spatial setbacks in Yanbu create physical distance that separates people and places rather than connecting them. The street is used primarily as a means of travel—a traffic route—rather than an urban space.

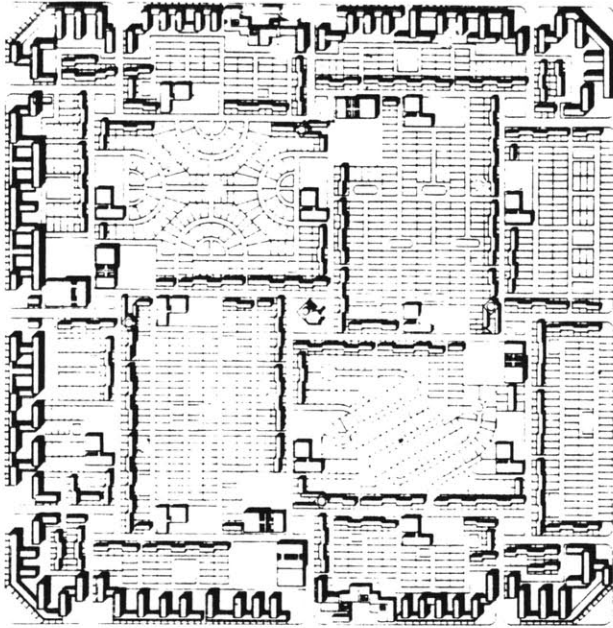


76.

Discontent with untreated spaces—those having no association with activity—is often reflected in the way inhabitants use them. Spaces with no sense of purpose, undesignated or untreated spaces, often times reflect undesirable uses. For example, spaces between housing blocks or along street space may be used as a refuse location or a storage space. These spaces are not,

however, as critics often suggest, the result of incorporating modern elements and the failure of the transformed built environments of new towns. Rather, they result from the failure to recognize that spaces have three-dimensional qualities, just as the buildings surrounding them, but are often not manipulated to interact with other physical elements such as the streets or the buildings.

The urban structure of Yanbu offers an opportunity to provide a clear urban form. Its concentric-like town form can increase pedestrian familiarity with the town center and its neighborhood modules. This, however, suggests that a clearly established spatial order to the buildings needs to be incorporated in the town center. The modules generated by the grid also allow each module the opportunity to achieve an identity and character. The uniform height of

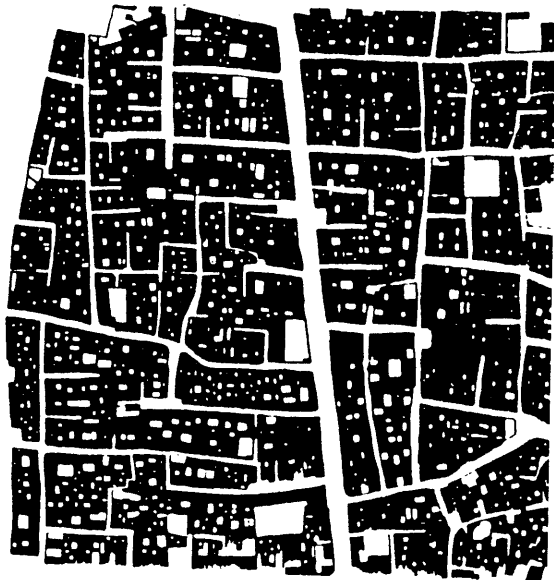


77.

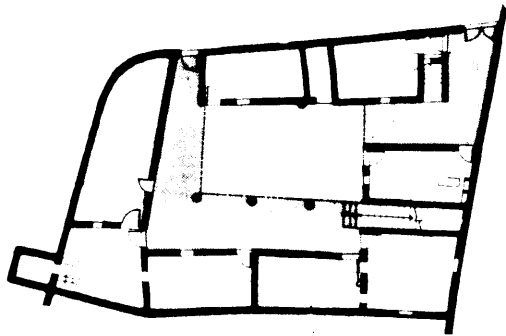
buildings at the perimeter of the modules and along the residential roads creates an "edge" defining the street in a way similar to the quarters of the traditional city. Since these buildings are relatively higher than the other buildings within the module (except for the mosques), a symbolic wall is loosely formed around the neighborhood module--providing visual variations within it. This characteristic of the neighborhood module in Yanbu resembles the quarter of the traditional city.



CONCLUSION



79.



80.

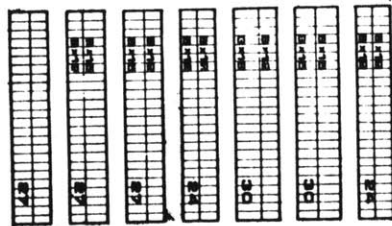
In designing new towns for the region, as planners and architects, we need to examine the traditional city and learn from its qualities. To use Sigfried Giedions's advice:

" . . . uncover for our own age vital interrelations with the past. . . by searching out aspects which are significant concerns of our own period and thus offer insights into the moving process of life".(15)

The traditional city had distinct physical qualities associated with it. Through time, the street, the building and the urban space of the traditional city were molded to fit the needs and lifestyle of those who inhabited it. The overall city form of the traditional city resembled its individual parts. To use the analogy of a house: like a house, the traditional city was enclosed by walls; like a house, it was separated into rooms--the buildings; like a house, the rooms are connected by corridors and organized around a court yard--the streets and the urban spaces.



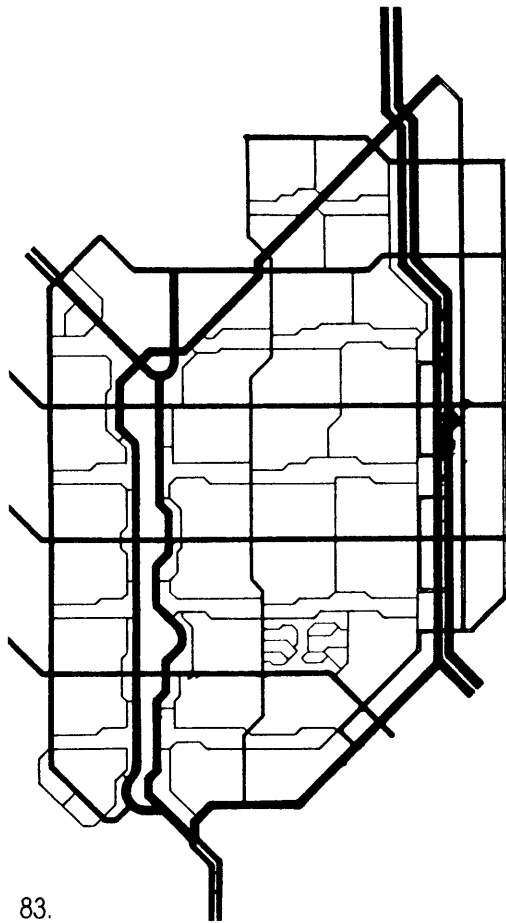
81.



82.

Because of such responsiveness, these elements achieved qualities that related them to the human scale and experience.

From the previous parts I have shown that planners of the new towns, Sadat City and Yanbu, have not necessarily heeded Giedions's advice and incorporated physical qualities of the traditional city into the Plans. The design of these towns, more often than not, has been executed through a problem-solving approach; one that only resolves functional and programmatic issues. For example, in resolving the movement pattern--transportation channels--in the design of Sadat City, the transportation system becomes the sole determinant of the town structure with little or no regard for the pedestrian experience. And when attempts intended to incorporate qualities of the traditional



city in the design of these towns are made, they are often compromised for the sake of other overriding concepts, such as the linear or the grid plan in the design of Sadat City.

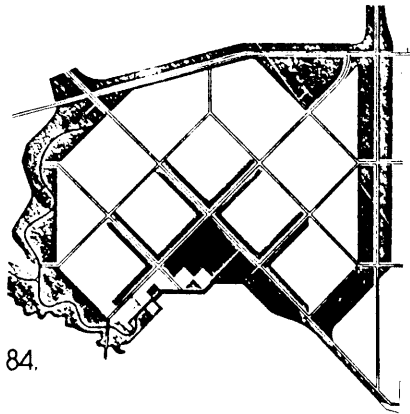
SADAT CITY

Sadat City has been designed based on a linear concept. The central spine of the city forming the town center accommodates the major town facilities. Two problems result with the use of this concept; the first is the lack of a compact town center. The second is the lack of focal points appropriate for the pedestrian. The linear form lacked the necessary spatial articulation for the pedestrian scale. Focal points, when introduced, were at regular intervals and were either too far apart or did not contribute any visual variation to the spine.

Lack of variation in the neighborhood modules of Sadat City was also discussed. Systematically arranged along the central spine, the neighborhood modules are identical in size and character. They contain facilities similar to those of the town center and the district spines, and therefore reduce the prominence of the town center.

YANBU

The overall plan of Yanbu has achieved qualities that both contribute to and diminish the town center's prominence in the urbanscape. Contributing to the quality of Yanbu, the new elements of the man-made harbor and the waterfront complement the concentric-like plan. Instead of an internally oriented town center, as existed in the traditional city, the town center of Yanbu opens up toward the landscape--the Red Sea. The harbor, therefore, provides a

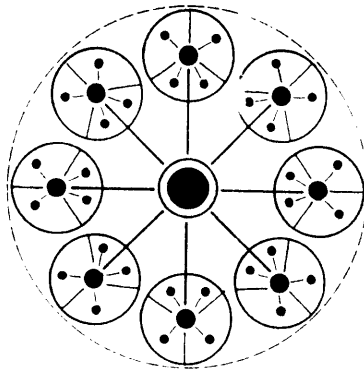


84.



85.

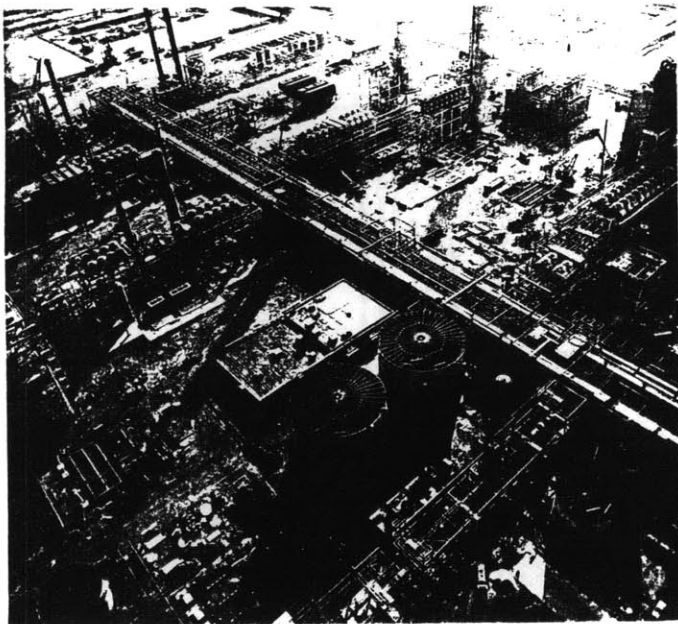
focal point for both the town center and the community as a whole.



86.

Yanbu's plan is more sympathetic to the pedestrian scale. The concentric-like plan is self-contained and allows for maximum flexibility to accommodate pedestrian circulation and movement. Because of such a quality, the plan of Yanbu, specifically the town center, has the potential to bring about familiarities and association to its fabric. However, such assets to the overall plan and the town center are undermined by Yanbu's independent neighborhood modules which compete for a prominence with the town center.

An important difference between the urban structure of new towns, especially that of Yanbu, and the urban structure of



87.

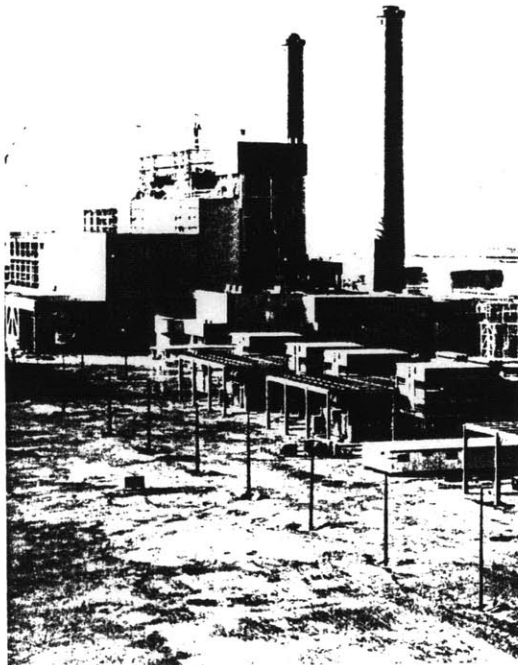
the traditional city is the predetermined purpose of the town. Different purposes generate different city form. The traditional city evolved as a result of unplanned but informally coordinated efforts of its inhabitants over many generations. There was usually no predetermined purpose or fixed plan for the city and therefore, its form is considered natural. For Yanbu, on the other hand, the priority set was geared toward developing a specialized industry which demanded order different from that of the traditional city. In the traditional city, specialization was by product. Light industry such as shoe makers or craftsmen were able to operate and produce their product in buildings within the urban fabric. Furthermore, simple production facilities or shops within the neighborhood arose from a need for the community to have such facilities, rather than as a result of a planned action by an outside authority. For example,



88.

individuals of a particular neighborhood, remote from the town center, may recognize a specific community need and establish a specific enterprise--i.e. commercial enterprise such as a bakery shop or grocery store--to serve the needs of that particular neighborhood. The catchment area of such an enterprise was usually smaller than the catchment area of the town center and thus never undermined the prominence and the commercial vitality of the town center. On the other hand, the high degree of specialization in process rather than in product resulted in a segregation of uses. Specialization of some new towns like Yanbu makes it necessary to segregate land uses which are incompatible with the living environment.

Specialized industry is a modern element that needs to be accommodated for in the design of an overall structure of



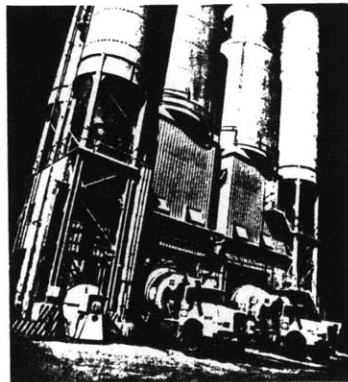
89.

new towns. The urban structure--i.e. the grid and circulation networks--needs to be flexible to accommodate light and heavy industry; the same structure must also have a built-in adaptive capacity for other uses. Light industry can be integrated within the overall fabric if it is compatible with living conditions. Heavy industry, however, should be segregated from the living areas, but still part of the overall urban structure.

The urban structure of the new town needs to anticipate the possible future disappearance of heavy industry (in favor of a different economic base) and be capable of absorbing future changes of use and expansion and growth of the new town. History has shown that economic transition is possible. In time, Saudi Arabia may shift from the industrialization phase toward a post-industrial phase perhaps rendering

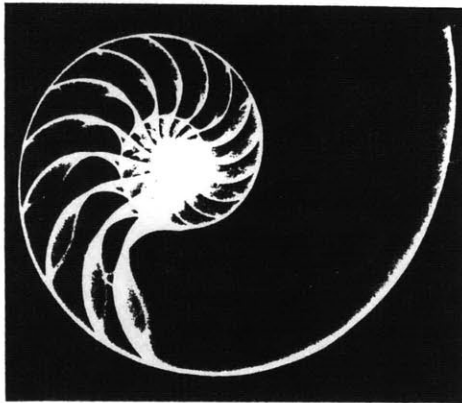
heavy industry obsolete and demanding a different urban structure.

The use of the automobile is another modern element that needs to be accommodated for in the design of the urban structure of new towns. The urban structure of new town needs to strike a balance between planning for the automobile and designing for the pedestrian experience. It is this kind of balance that re-establishes the long forgotten architect-planner role in designing cities.



90.

Specialized industry, segregated land uses and the introduction of automobile resulted in the application of a functional and systematic approach in the design of new towns. For that reason, there is a need to apply a different approach.

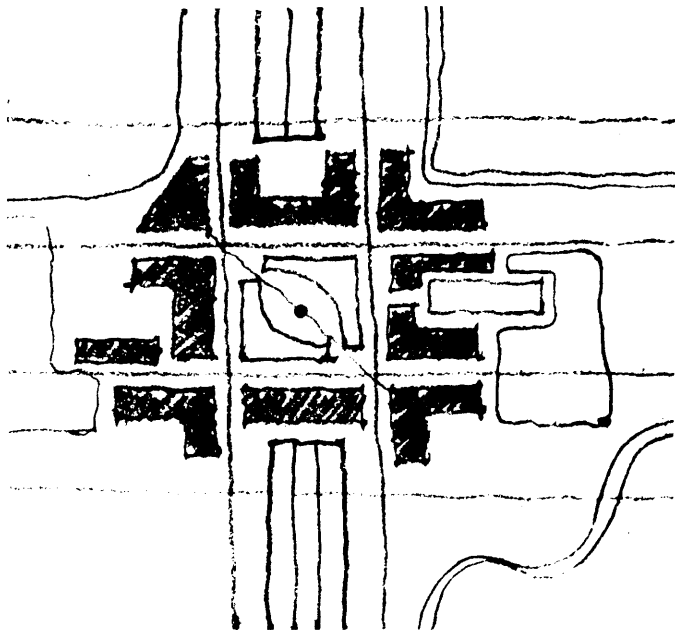


91.

THE APPROACH

A responsive approach to bring qualities of the traditional city to new towns does not suggest an application or use of historical precedents, nor does it imply a style pertaining to some architectural revivalism or compromising practical standards--i.e. safe circulation, ease of access, etc. of the modern city. Rather, it is an approach that relates the built environment of new towns to the human scale and experience. In this respect a responsive approach needs to deal with the design of new towns at two levels; at the larger scale, the city as a whole, and at the smaller scale, the city's individual parts--i.e. neighborhood module or its urban space.

At the larger scale, the design approach needs to consider the appropriate plan concept and the appropriate

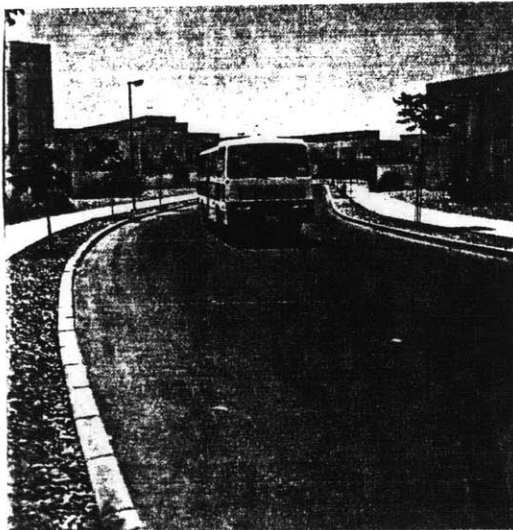


92.

treatment for that concept. The concentric-like plan generally represents a suitable solution for a town plan in the region. The linear city, in contrast, will not survive and remain linear in form, the dynamic forces of growth and expansion will favor one focal point along the spine at which maximum stress will be experienced resulting in a concentric form of city. (16) The concentric-like form is easily comprehended and therefore more familiar to the users. The compactness of the plan promotes pedestrian circulation and movement. For example, major facilities in the town center are within walking distance and cluster around each other allowing movement from one place to another on foot. As a result, there is more contact with the environment and thus, familiarity with it. Since the central focus of the plan is the town center, the streets can converge and diverge to constitute the structuring element for the surrounding

neighborhoods. Such a plan forms a clear urban profile expressive of the building hierarchy of the town--a lower profile at the perimeter and gradually stepping up toward the town center.

At the smaller scale, a responsive design approach needs to consider the design of the street, the building and urban space in the planning of new towns.



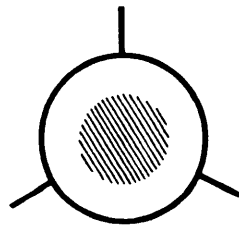
93.

THE STREET

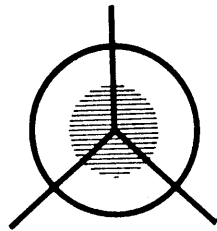
Unlike the street in the traditional city, the street of the new town needs to accommodate the widespread use of the automobile. Because of this widespread use, streets in new towns have often been oversized to meet estimated future traffic volume. Accordingly, the automobile's width, its size and speed dictated the scale of the modern street and

resulted in transforming the traditional street into a different street space-- a space with, seemingly, no dimension or physical qualities.

Recognizing the implication of the automobile on the street in the new town, a responsive approach needs to reconsider the street design. To maintain pedestrian quality of the urban fabric associated with the traditional city, the automobile must be confined to the perimeter roads. For example, neighborhood parking spaces would branch out from these perimeter roads. Means of travel to and from the residential units would be on foot or bicycles. Also, to control the automobile impact on the street, measures to regulate the volume of traffic and automobile use must be considered, rather than simply oversizing the street to accommodate future traffic volume. There needs to be two

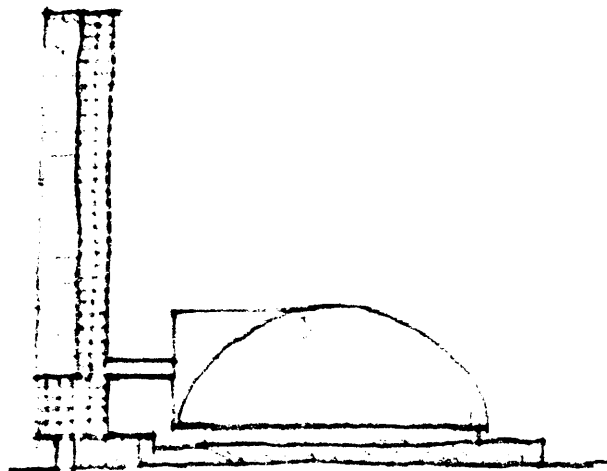


94.



95.

types of streets. The first type would be confined to the perimeter of the town--a highway or throughway--that would accommodate current and future traffic volume. The second type would be minimally sized to accommodate current traffic volume. This type would be used for main and neighborhood streets where maximum pedestrian circulation occurs.



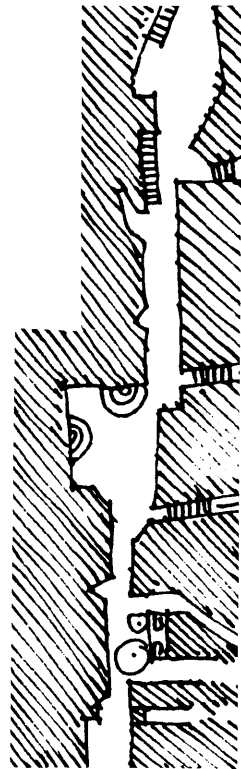
96.

Neighborhood streets also need to have qualities of street wall--the buildings--that visually link sides of the streets to each other.

THE BUILDING

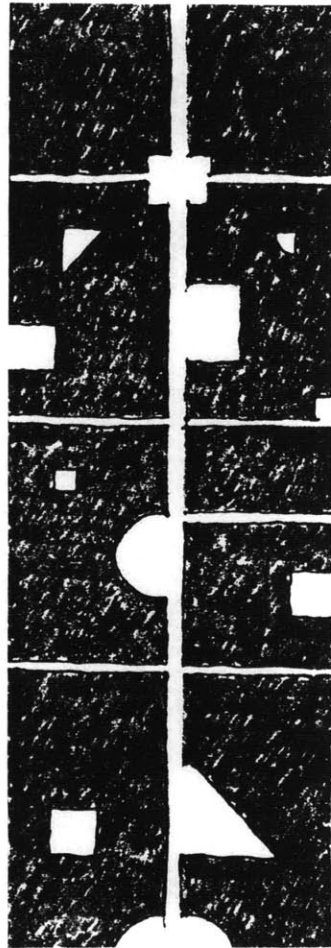
A responsive approach needs to create a clear urban form, readily identifiable with a particular new town. In the town center, major buildings--whether institutional or religious--

need to establish form hierarchy and provide identifiable focal points. Spaces and buildings in the town center need to be organized in order of prominence so to allow familiarity with the place.



97.

The urban fabric of new towns needs to have qualities of the traditional fabric. One element of that fabric is the buildings. The buildings in new towns need to be part of the city rather than isolated fragments. The building's interrelation with the rest of the fabric is important because it confirms the physical connection and thus, the form and spatial continuity of the fabric. Whenever possible, buildings should form a continuous but articulated wall for visual variety; the building wall should vary from one lot to another. Buildings' fenestration and facade treatment would also give a sense of a clear and articulated "edge." The height of this wall

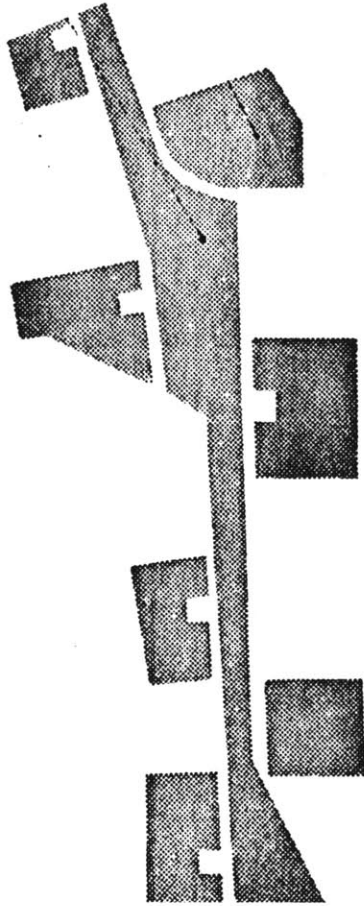


98.

needs to be relatively uniform and proportionate to the width of the street. Variations in the height of buildings may occur when buildings of prominence are introduced into the fabric; the buildings' spatial treatment needs to acknowledge this prominence so to relate the street wall--the building--to the street space.

THE URBAN SPACE

Once a concept for the overall plan has been established, urban space needs to be incorporated from the start to establish its purpose as part of the urban grid as well as the overall structure of the plan. Programmatic issues of adequate parking space and separation between parking and pedestrian would be considered in the process of designing the space.



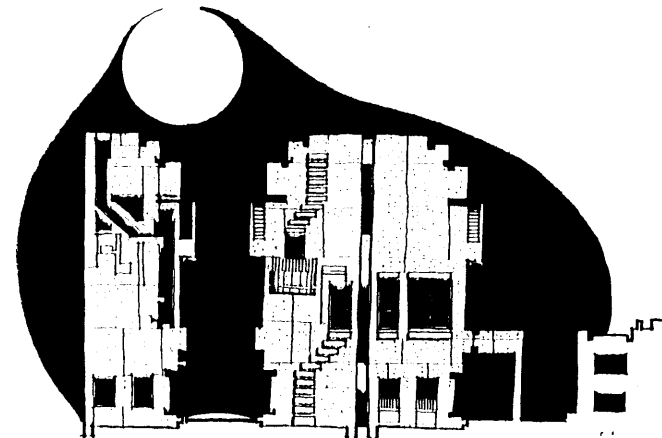
99.

An urban space can serve new towns' dual functions if designed properly. A compact city plan can be dismantled by open spaces between its buildings used for automobile surface parking. The open space can become urban space that serves the pedestrian at the street level through a green space and accommodates automobile parking below street level.

The design approach also needs to incorporate variation and diversity throughout the city. One way of achieving this quality is to provide a coherent design for urban spaces--one that is intentionally planned to link the fabric of the city to a system of urban spaces. For example, urban spaces within the fabric would correlate to each other by introducing commercial activities along pedestrian routes leading to these places. Therefore, urban space must be

considered and included during early stages of design--
when conceptualizing the overall structure of the plan.
Urban space must be thought of as an essential physical
element and designed accordingly.

All three elements discussed, the street, the building and the
urban space should be reconsidered when designing new
towns. In this way, new towns will provide a medium for
discovery and innovative solutions to new problems of the
modern city.



100.

ILLUSTRATIONS:

- (1)TAVOLE DELLA MEMORIA (DETAIL) BY ARNALDO POMODORO. SOURCE: URBAN STRUCTURE.
- (2)MAP OF THE REGION. SOURCE: MARY MULLER
- (3)NEW TOWNS BUILT IN THE REGION REFLECT MODERN ELEMENTS UNPRECEDENTED IN THE TRADITIONAL CITY. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO.
- (4) & (5) THE TRADITIONAL CITY FABRIC VS. THE MODERN CITY FABRIC. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO.
- (6) THE PHYSICAL QUALITIES OF THE TRADITIONAL CITY. SOURCE: THEORIES AND PRINCIPALS OF DESIGN IN THE ARCHITECTURE OF ISLAMIC SOCIETIES.
- (7)THE INTERCONNECTED FABRIC OF THE TRADITIONAL CITY. SOURCE: THEORIES AND PRINCIPALS OF DESIGN IN THE ARCHITECTURE OF ISLAMIC SOCIETIES.
- (8)ARABIC DESIGN. SOURCE : THEORIES AND PRINCIPALS OF DESIGN IN THE ARCHITECTURE OF ISLAMIC SOCIETY.
- (9)THE TRADITIONAL STREET. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.
- (10)EXPRESSION OF MODERN QUALITY. SOURCE : K. MOGASSABI
- (11)THE URBAN FABRIC OF THE TRADITIONAL CITY. SOURCE: EL MADINA EL ARABIA.
- (12)THE RICHNESS OF FORM: THE TRADITIONAL CITY. SOURCE: EL- MADINA EL ARABIA.
- (13)THE STREET, THE BUILDING AND THE URBAN SPACE. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO.
- (14)THE SYSTEMATIC PATTERN. SOURCE: NEW AMERIYAH CITY.
- (15)THE SYSTEMATIC GRID. SOURCE : URBAN STRUCTURE.
- (16)THE STREET HIERARCHY. SOURCE : ARCHITEKTURE UND STADTGESTALT IN KAIRO
- (17)"THE RICH FABRIC" WITH SIMPLE HIERARCHY OF STREET. SOURCE: L'URBANISME ET ARCHITECTURE.
- (18)THE STREET AND URBAN SPACE ARE ONE ELEMENT. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO.
- (19)THE TRADITIONAL STREET. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.
- (20)APPROACHING THE MOSQUE. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.
- (21)QUARTERS IN THE TRADITIONAL CITY. SOURCE: SETTLEMENT IN DRY COUNTRIES.
- (22)SEGREGATION OF THE COMMERCIAL ACTIVITIES WITHIN THE COMMERCIAL QUARTERS. SOURCE ARABIC ISLAMIC CITIES.

(23)THE MOSQUE AS FOCAL POINT. SOURCE : EL- MADINA EL ARABIA.
(24)THE STREET AND THE URBAN SPACE.
(25)WALLS: THE TRADITIONAL CITY. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.
(26)BUILDINGS AND URBAN SPACES WERE INTERCONNECTED THROUGH WALLS.
SOURCE: RIYADH, EXISTING CONDITIONS.
(27)STREET SPACE REFLECTS THE COURTYARD SPACE. SOURCE : EL- MADINA EL ARABIA.
(28)THE URBAN SPACE OF THE MOSQUE. SOURCE: ARABIC ISLAMIC CITIES.
(29)STREET SPACE REFLECTS COURTYARD SPACE. SOURCE : K. MOGASSABI
(30)PURPOSEFULNESS AND VITALITY OF THE STREET. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.
(31)SADAT CITY. SOURCE: THE PLANNING OF SADAT CITY.
(32)LOCATION MAP. SOURCE : K. MOGASSABI
(33) &(34)AN ABSTRACT EXPRESSION OF MOVEMENT SYSTEMS. SOURCE: URBAN STRUCTURE.
(35)THE LINEAR FORM. SOURCE: THE PLANNING OF SADAT CITY.
(36)DETAIL PLAN OF DISTRICT SPINE. SOURCE: THE PLANNING OF SADAT CITY.
(37)THE PLAN OF DISTRICT SPINES. SOURCE: THE PLANNING OF SADAT CITY.
(38)DISTRICT SPINES WITH SUB-TOWN CENTERS-DISTRICT CENTERS. SOURCE: THE DEVELOPMENT OF SADAT CITY.
(39)THE STREET HIERARCHY; THE REGIONAL HIGHWAY, THE PRIMARY STREET, THE SECONDARY STREET, THE NEIGHBORHOOD STREET AND THE LOCAL STREET.
SOURCE: THE PLANNING OF SADAT CITY.
(40)THE REPETITIVE SYSTEM OF STREET. SOURCE: THE DEVELOPMENT OF SADAT CITY
(41)&(42)AN IMAGINARY SQUARE ON TRADITIONAL CITY VS. NEW TOWN.
SOURCE: RIYADH, EXISTING CONDITIONS (MODIFIED).
(43)IDENTICAL DISTRICT SPINES CREATE IDENTICAL MODULES. SOURCE: PLANNING OF SADAT CITY.
(44) &(45)THE LINEAR TOWN CENTER; MAJOR NODES ALONG THE SPINE. SOURCE: THE PLANNING OF SADAT CITY.
(46)WATER TOWERS AS A SYMBOLIC ENTRANCE. SOURCE: MIDDLE EASTERN CONSTRUCTION.
(47)&(48)THE LINEAR SPINE WITH MINIMUM NODES RELATED TO PEDESTRIAN. SOURCE: THE PLANNING OF SADAT CITY.
(49)URBAN FORM DETERMINED BY THE TRANSPORT SYSTEM. SOURCE: NEW AMERIYAH.

(50)PEDESTRIAN ARCADES NEED SPATIAL ARTICULATION. SOURCE: THE DEVELOPMENT OF SADAT CITY.

(51)CLEAR HIERARCHY OF URBAN SPACE TO HUMANIZE THE SYSTEMATIC APPROACH. SOURCE: K. MOGASSABI

(52)THE URBAN FORM OF YANBU. SOURCE: NEW TOWNS WORLD WIDE

(53)THE TOWN CENTER WITH MAN-MADE HARBOR. SOURCE: MIDDLE EASTERN CONSTRUCTION.

(54)&(55)THE PLAN OF YANBU. SOURCE: YANBU ANNUAL REPORT.

(56)THE COMMUNITY AREA. SOURCE: YANBU INDUSTRIAL COMPLEX.

(57)THE NEIGHBORHOOD MODULE. SOURCE: NEW TOWN WORLD WIDE.

(58)DETAIL OF NEIGHBORHOOD MODULE. SOURCE: NEW TOWN WORLD WIDE.

(59)SUB-CENTERS COMPETING WITH THE TOWN CENTER. SOURCE: URBAN STRUCTURE.

(60)DISTRIBUTION OF MOSQUES WITHIN THE FABRIC. SOURCE: NEW TOWNS WORLD WIDE.

(61)SUB-CENTERS REDUCE SOCIAL CONTACT BEYOND THE NEIGHBORHOOD. SOURCE: TOWN CENTERS, PLANNING AND RENEWAL.

(62)VARIATION OF CIRCULATION PATTERN. SOURCE: NEW TOWNS WORLD WIDE.

(63)STREET PROPORTION IS EXAGGERATED BY STREET WIDTH , SIDE WALK AND SET BACKS. SOURCE: K. MOGASSABI

(64)THE STREET IS NO LONGER AN ORGANIZING ELEMENT. SOURCE: YANBU ANNUAL REPORT.

(65)VARIETY IN QUARTERS DUE TO BUILDINGS ENCROACHMENT. SOURCE: RIYADH, EXISTING CONDITIONS.

(66)BUILDING ENCROACHMENT ON STREET SPACE. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.

(67)THE BUILDING IS THE STRUCTURING ELEMENT IN THE PLAN. SOURCE:YANBU ANNUAL REPORT.

(68)THE SPATIAL ORGANIZATION IS UNDEFINED. SOURCE: NEW TOWNS WORLD WIDE.

(69)OPEN BUT NOT AN URBAN SPACE. SOURCE: NEW TOWNS WORLD WIDE.

(70)OPEN VS. URBAN SPACE ALONG THE COASTAL ROAD. SOURCE: NEW TOWNS WORLD WIDE.

(71)THE GREEN SPACE OF THE BUFFER ZONE ACTS AS A SYMBOLIC WALL. SOURCE: YANBU INDUSTRIAL COMPLEX.

(72)THE STREET WALL: THE TRADITIONAL CITY. SOURCE: CRISIS OF THE BUILT ENVIRONMENT.

(73)UNTREATED SPACE. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.

(74)THE STREET SPACE REFLECTED THE HOUSE COURTYARD. SOURCE: ALBENA 5

(75)THE STREET AS A MEANS OF TRAVEL. SOURCE: YANBU ANNUAL REPORT

(76)UNTREATED SPACE:NEW TOWNS. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.

(77)A SYMBOLIC WALL LIKE IS LOOSELY FORMED AROUND NEIGHBORHOOD. SOURCE: NEW TOWNS WORLD WIDE.

(78)TAVOLE DELLA MEMORIA (DETAIL) BY ARNALDO POMODORO. SOURCE: URBAN STRUCTURE.

(79)DISTINCTIVE PHYSICAL QUALITIES OF THE TRADITIONAL CITY. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO.

(80)THE CITY AS A HOUSE. SOURCE: EL- MADINA EL ARABIA.

(81)THE RESPONSIVE ENVIRONMENT. SOURCE: CRISIS IN THE BUILT ENVIRONMENT

(82)THE FUNCTIONAL SOLUTION. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO.

(83)THE LINEAR CONCEPT OF SADAT CITY. SOURCE: THE PLANNING OF SADAT CITY.

(84)THE TOWN CENTER OPENS UP TO THE HARBOR. SOURCE:THE PLANNING OF SADAT CITY.

(85)YANBU'S PLAN IS MORE SYMPATHETIC TO THE PEDESTRIAN SCALE. SOURCE TOWN CENTERS, PLANNING AND RENEWAL.

(86)THE CONCENTRIC PLAN BRINGS FAMILIARITIES AND ASSOCIATION. SOURCE: TOWN CENTERS, PLANNING AND RENEWAL.

(87)SPECIALIZED INDUSTRY. SOURCE: YANBU ANNUAL REPORT.

(88)SHOPS IN THE URBAN FABRIC DID NOT COMPETE WITH THE TOWN CENTER: THE TRADITIONAL CITY. SOURCE: CRISIS IN THE BUILT ENVIRONMENT.

(89)THE URBAN STRUCTURE NEEDS TO ANTICIPATE FUTURE DISAPPEARANCE OF THESE INDUSTRY. SOURCE: YANBU INDUSTRIAL COMPLEX.

(90)SPECIALIZED INDUSTRY. SOURCE: YANBU ANNUAL REPORT.

(91)A HARMONIOUS APPROACH. SOURCE: THE CITY OF TO-MORROW.

(92)CONCENTRIC-LIKE PLAN REPRESENT A SUITABLE SOLUTION TO NEW TOWNS IN THE REGION. SOURCE: K. MOGASSABI

(93)THE MODERN STREET. SOURCE: YANBU ANNUAL REPORT

(94)THE AUTOMOBILE NEEDS TO BE CONFINED TO THE PERIMETER FOR A PEDESTRIAN CITY. SOURCE: TOWN CENTERS, PLANNING AND RENEWAL.

(95)TWO TYPES OF STREETS ARE NEEDED IN NEW TOWN DESIGN. SOURCE: TOWN CENTERS, PLANNING AND RENEWAL.

(96)THERE NEED TO BE A FORM HIERARCHY OF BUILDINGS IN THE TOWN CENTER. SOURCE: K. MOGASSABI

(97)THERE IS A NEED FOR VARIATION BUT WITH SPATIAL CONTINUITY. SOURCE: ARCHITEKTURE UND STADTGESTALT IN KAIRO

(98)URBAN SPACE NEEDS TO BE A PRIORITY IN THE DESIGN OF NEW TOWNS. SOURCE: K. MOGASSABI

(99)THE DESIGN APPROACH NEEDS TO INCORPORATE VARIATION AND DIVERSITY THROUGHOUT THE CITY. SOURCE: RIYADH, EXISTING CONDITIONS.

(100)SOURCE: K. MOGASSABI

REFERENCES:

- (1) Ervin Galantay, *New Towns: Antiquity to the Present* (New York: George Braziller Inc.,1975) p. 2.
- (2) Ibid., p.1.
- (3) Id.
- (4) Lewis Mumford, *The City In History* (New York: Harcourt, Brace and World, Inc. 1961) p. 87.
- (5) D. I. Scargill, *The Form of Cities* (New York: St. Martin's Press, 1979) p.194.
- (6) Ibid., p. 192.
- (7) Id.
- (8) Id.
- (9) Ibid., p. 193.
- (10) Ibid., p. 183.
- (11) The Sadat City Planning Study Group, *The Development of Sadat City* (Cairo: The Ministry of Housing and Reconstruction, 1978) p.1.

- (12) Howard Mckee and William Denke "*The Realities of a Planned Industrial City-Yanbu, Saudi Arabia*", *New Towns World Wide*, E. Y. Galantay and A.K Constadse and T. Ohba (The Netherlands: International Federation for Housing and Planning, 1985) p. 279.
- (13) Le Corbusier, *The City of To-Morrow and Its Planning* (Cambridge: M.I.T. Press, 1971) p. 131.
- (14) F. Verliuz, "*Traditional Architecture of the Desert*", *Albeena*, Vol. 4, No. 23/24, 1985 June/Sept., p. 90-104.
- (15) Sigfried Giedion, quoted in *New Towns: Antiquity to the Present* (New York : George Brazillier, Inc., 1975) Preface.
- (16) C. A. Doxiadis, "*On Linear Cities*," in *Urban Structure* , David Lewis (New York: John Wiley & Sons, Inc., 1968) pp. 49-51.

BIBLIOGRAPHY:

Akbar, J., *Crisis In The Built Environment Environment*, Concept Media Pte Ltd., Singapore, 1988.

Constandse, A. K and E. Y. Galantay and T. Ohba, *New Towns World-Wide*, International Federation For Housing and Planning, The Netherlands, 1985.

Galantay, Ervin Y., *New Towns: Antiquity to the Present*, George Braziller, Inc., 1975.

Lapidus, Ira M., *Middle Eastern Cities*, University of California Press, Berkeley and Los Angeles, 1969.

Le Corbusier, *The City of To-Morrow*, (English Translation) M.I.T. Press, Cambridge, 1971.

Lawless, R., *The Middle Eastern Village*, Croomhem, New York, 1987.

Lynch, Kevin, *The Image Of The City*, M.I.T. Press, Cambridge, MA, 1972.

Michelson, William, *Man and His Urban Environment: A Sociological Approach*, Addison-Wesley Publishing Co., MA, 1970.

Mumford, Lewis, *The City In History*, Harcourt, Brace and World, Inc., New York, 1961.

Sadat City Planning Study Group, *The Planning of Sadat City*, Ministry of Housing and Reconstruction, Advisory Committee for Reconstruction, Egypt, Vol. I Feb. 1977, Vol. II Sept. 1977.

Sadat City Planning Study Group, *The Development of Sadat City*, Ministry of Housing and Reconstruction, Egypt 1978.

Saudi Arabian Parsons Ltd., *Yanbu Industrial Complex*, Executive Summary of Master Plan, 1977.

Scargill, D. I., *The Form of Cities*, St. Martin's Press, New York, 1979.

The Aga Khan Program For Islamic Architecture, *Theories and Principals of Design in the Architecture of Islamic Societies* Cambridge, MA, 1988.