The planning and development of the city of jeddah1970-1984

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THE PLANNING AND DEVELOPMENT OF THE CITY OF JEDDAH

1970-1984

George Orr Duncan

Submitted to the University of Durham
for the degree of Doctor of Philosophy

Department of Geography, 1987

DECLARATION

The content of this thesis is the original work of the author (other people's work included is acknowledged by reference). It has not previously been submitted for a degree at this or any other University.

Where necessary, the individual acknowledgement of others is made in the text, but the writer wishes to emphasise the contribution made, under his direction, by George B Jamieson on transportation and highway engineering, and by the late Harold Caustin on the socio-economic surveys and regional plan.

The writer also acknowledges the contribution and co-operation of H E The Mayor of Jeddah - Engineer Mohammed Said Farsi, the Deputy Mayor for Technical Affairs - Engineer Barakat Bajneid and, as leaders of the Saudi technical team, first Dr Abdulaziz Hussain Felemban, then Engineer Zaki M A Farsi.

In conclusion the writer wishes to express his personal appreciation for the interest and advice of his supervisor, Roy Gazzard, formerly Director of the Centre for Middle Eastern and Islamic Studies in the University of Durham.

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THE PLANNING & DEVELOPMENT OF THE CITY OF JEDDAH, 1970-1984

George Duncan

ABSTRACT

For centuries Jeddah has been the principal entrepôt to western Arabia and the gateway to the Holy Cities of Mecca and Medina.

This work covers the period 1970-1984 during which, under the writer's personal direction on site in Jeddah, the city's first comprehensive development plan was formulated and implemented. In narrative style, this thesis describes the preparation and monitoring of the original plan and its subsequent review by others.

With the benefit of hindsight and personal experience, the writer offers an explanation for the successful realisation of the development plan despite an unforeseen four-fold growth in population over this fifteen year period.

It can be concluded that this was due principally to the active and harmonious participation of a locally appointed composite Saudi technical team with the Consultant's British planning team and the inspired leadership of Engineer Mohammed Said Farsi, Mayor of Jeddah.

The flexible philosophy and format of the plan enabled it to be modified in consequence of unforeseen changes to the Kingdom's base economy arising from the increased demand for petroleum products in 1973. This approach to city planning is identified as making a major contribution to the successful realisation of the original objectives of the plan.

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PRELIMINARIES

TRANSLITERATION

The transliteration and spelling in English of Arabic names of places and people can be a matter of debate, even disagreement, by expert translators. Over the last fifteen years spent in the Arab world, the writer has listened to many discussions by experts on this subject. One is tempted to adopt the approach used by T.E. Lawrence in his work "The Seven Pillars of Wisdom" where, in an exchange of letters with his publishers, he states that he used different spelling at different times for the same person or place throughout the book.

The source for place names which has been adopted in this work is twofold:

a The series of Reports prepared by Robert Matthew, Johnson-Marshall and Partners (RMJMP) for the Saudi Ministry of Municipal and Rural Affairs over the period 1971-1984. The English spelling set out in these Reports was as approved by the Ministry in 1971 (see Figure One).

b The reference map of Saudi Arabia (Figure Two) in the Saudi Ministry of Planning Third Development Plan, English edition.

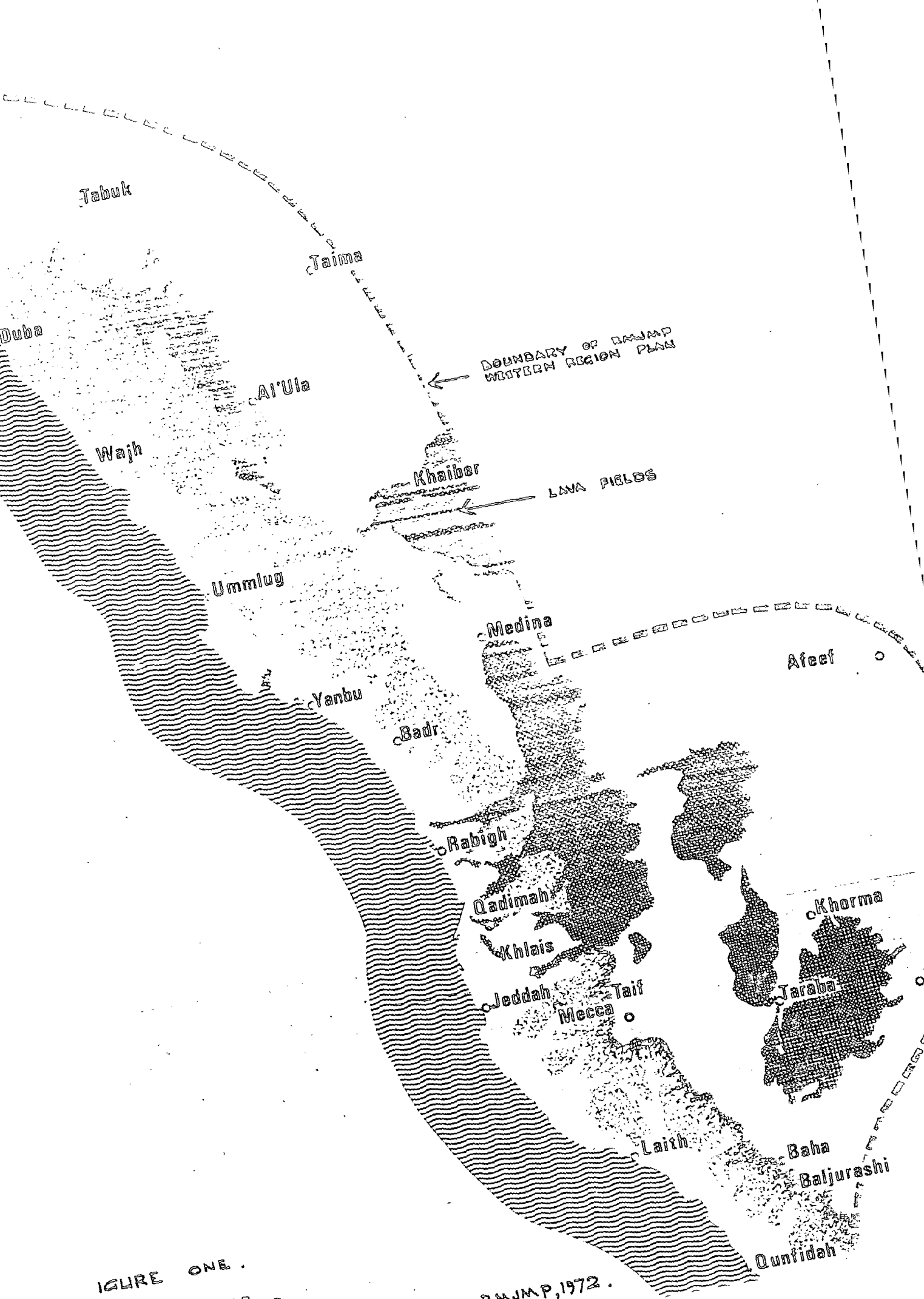
These two sources, for example, adopt the identical spelling for the cities of Jeddah, Mecca, Taif and Medina.

DATES

The year dates used in this work are Gregorian unless the source used quotes the Hijra date. Appendix E sets out, for reference purposes, Hijra Year Dates and their Gregorian equivalents.

METRICATION

Sauda Arabia follows the Metric System. Thus all linear and area dimensions are given in metric rather than Imperial units.



IGURE ONE.

Reference Map

FRAMEWORK REPORT - RMJMP, 1972.

KINGDOM OF SAUDI ARABIA

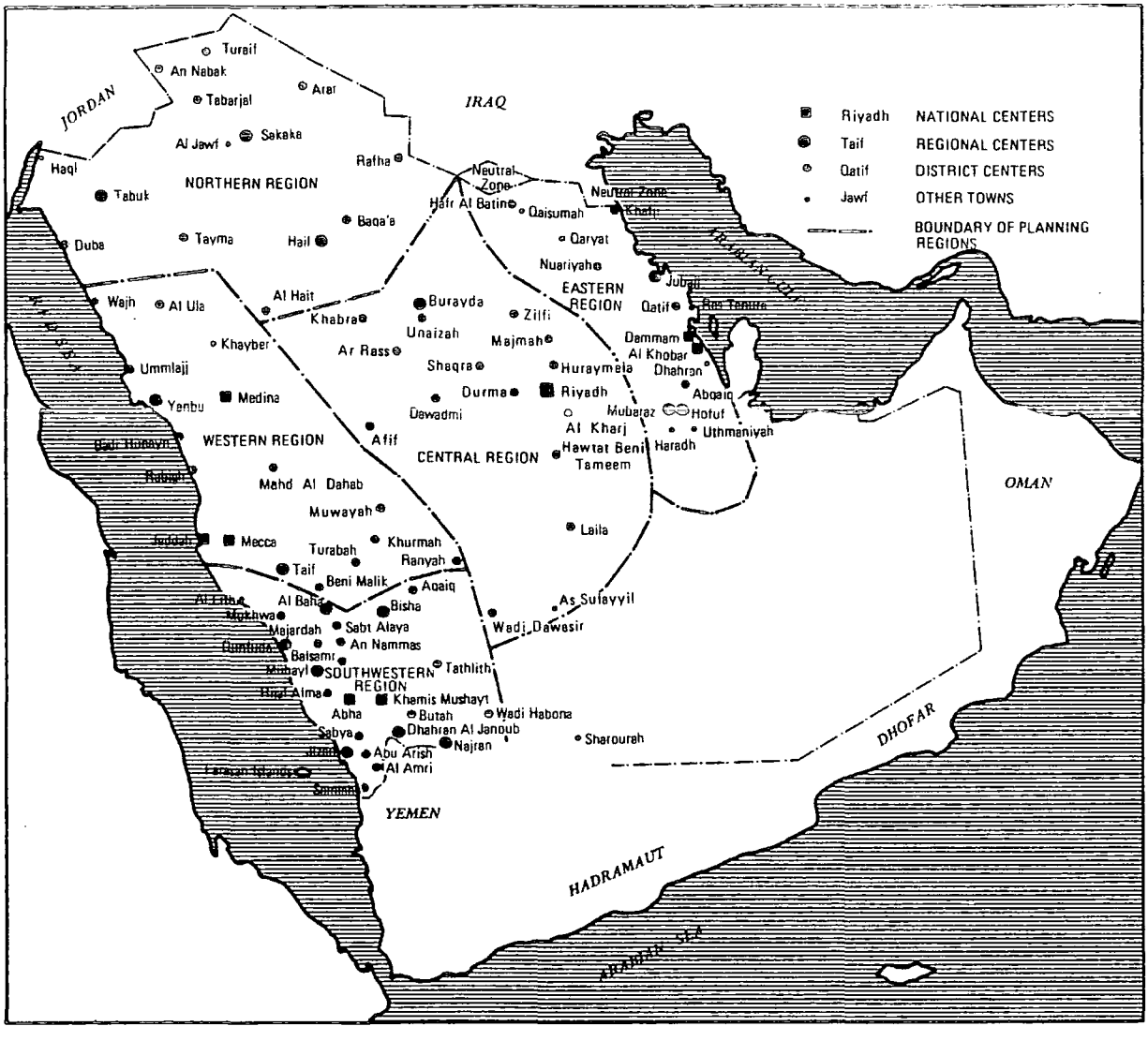


FIGURE TWO

SOURCE : THIRD DEVELOPMENT PLAN - 1980-1985
MINISTRY OF PLANNING, KINGDOM OF SAUDI ARABIA .

GEOLOGY

An understanding of the striking physical nature of the Arabian Peninsula can be derived from its geological origins. Originally, when it formed part of a gigantic continent conjointly with Africa and south-west Asia, the western part was composed of a great variety of rocks, both sedimentary and igneous. These geological deposits were subsequently altered by great heat and pressure, shattered by faults and traversed by intrusions of magma over hundreds of millions of years. They now form the Arabian Shield - the Arabian counterpart of the African Basement Complex.

In Palaeozoic periods the sea spread across the old landscape and laid down the sedimentary deposits which remain today as the sandstone of the Nafud Basin outcropping in the northern part of the western area of the Arabian Peninsular. Later the area was arched up over what is now the Red Sea and the sandstone cover was eroded back to its present extent revealing the older Shield beneath.

During the Oligocene period (Tertiary) great movements of the Earth's surface were taking place with the break up through continential drift of the proto-continent. Great fissures or tensional faults appeared and outpourings of basic lava covering many thousands of square kilometres

occurred. This vulcanicity was to continue up to the thirteenth century AD.

At the end of the Oligocene or in the early part of the subsequent Miocene period the earth movements reached a climax and the land between Arabia and Africa was fractured into a rift so that the central block sank to become the depression subsequently filled by the Red Sea. The edge of the eastern wall of the rift was gradually worn back by erosion to the point where the escarpment now stands.

About 90km to the west of the escarpment, the coastal plain (Tihama) was then built out by a process of deposition and the upward movement of the land relative to the sea.

In the pluvial periods associated with the great Ice Ages of the Pleistocene, deep river valleys were cut to a sea level far below the present datum. Sharm Obhur, a narrow bight of deep water at right angles to the coast, 30km north of the centre of Jeddah was formed in this way. The raising of the land relative to the sea during the last ice age 40,000 years ago left large banks of coral above the high water mark where it subsequently became fossilised forming much of the foundation of present day Jeddah.

The Arabian Peninsula is shown in Figure 1.1 and Figure 1.2 illustrates a composite section of the western part of the peninsula.

PHYSICAL SETTING

The coastal plain on which Jeddah is located is only 12km wide and the general area on which the city stands is almost completely flat and featureless. Within the built up area of Old Jeddah the land rises to a maximum of approx 13m. This could, in part, be due to repeated overbuilding on earlier settlements throughout the past centuries. To the east of the coastal plain are the foothill outliers of the southern extremity of the Hejaz mountains. The Holy City of Mecca lies 73km inland from Jeddah and the ancient route which connected these two settlements winds through a gap in these hills.

This gap is the Wadi Fatima - one of a number of ancient river courses which intersect the coastal plain in the vicinity of Jeddah. With the exception of the Wadi Fatima and the Wadi Beni Malik, all have relatively small catchment areas. However, due to the nature of the subsoil and the intensity of the intermittant rains in the inland foothills beneath the escarpment, flash flooding can occur. Mecca is particularly prone to to severe flooding in which, formerly, loss of life and damage occurred. To a lesser degree, Jeddah can also suffer flooding, but the construction there of an encompassing storm water channel in 1970-72 and later extensions now minimise this danger. The most recent period of heavy rain and thunderstorms occurred in Jeddah over several weeks in 1979, the first time since its construction that the stormwater channel was required. It then justified its existence.

The water table, which is uniformly high throughout Jeddah, varies from one to three metres below ground level. The run off gradient is low and is characterised by three drainage axes: Wadi Qawz, Wadi Ashir and Wadi Mashwab. The location of these wadis in relation to Jeddah is shown at Figure 1.3. Local variations in the water table occur due to construction works and varying permeability. The presence of high concentrations of soluble salts, mainly chlorides and sulphates, necessitates the use of salt resistant materials and careful detailing if foundations are to be secure.

SUBSOIL CONDITIONS

Much of Jeddah is built on made-up ground or naturally variable deposits of mud, sand and shell debris. In the porous coralline limestone beds that underlay much of the old city, solution cavities filled with sand occur. Standard tests carried out prior to the construction of the public utility routes in these areas indicated a very low bearing capacity of below 0.2 kg/sq cm for the former and 2 kg/sq cm for the latter.

CLIMATE

Due to its location within the Tropic of Cancer, Jeddah has a tropical-desertic climate characterised by long hot, humid summers which, before the advent of modern air-conditioning, had a debilitating effect on both residents and visitors. In effect, the climate is a cross between the mild climate of the Mediterranean Basin and the

Monsoon climate of the Indian Ocean.

Mean monthly temperatures in Jeddah vary from a maximum of 43°C during the summer (May - August), to a minimum of 14°C during the winter (December - February). The mean annual temperature is approximately 25°C. During the summer months, diurnal temperatures may exceed 20°C. June and July are normally the hottest months, January and February the coldest.

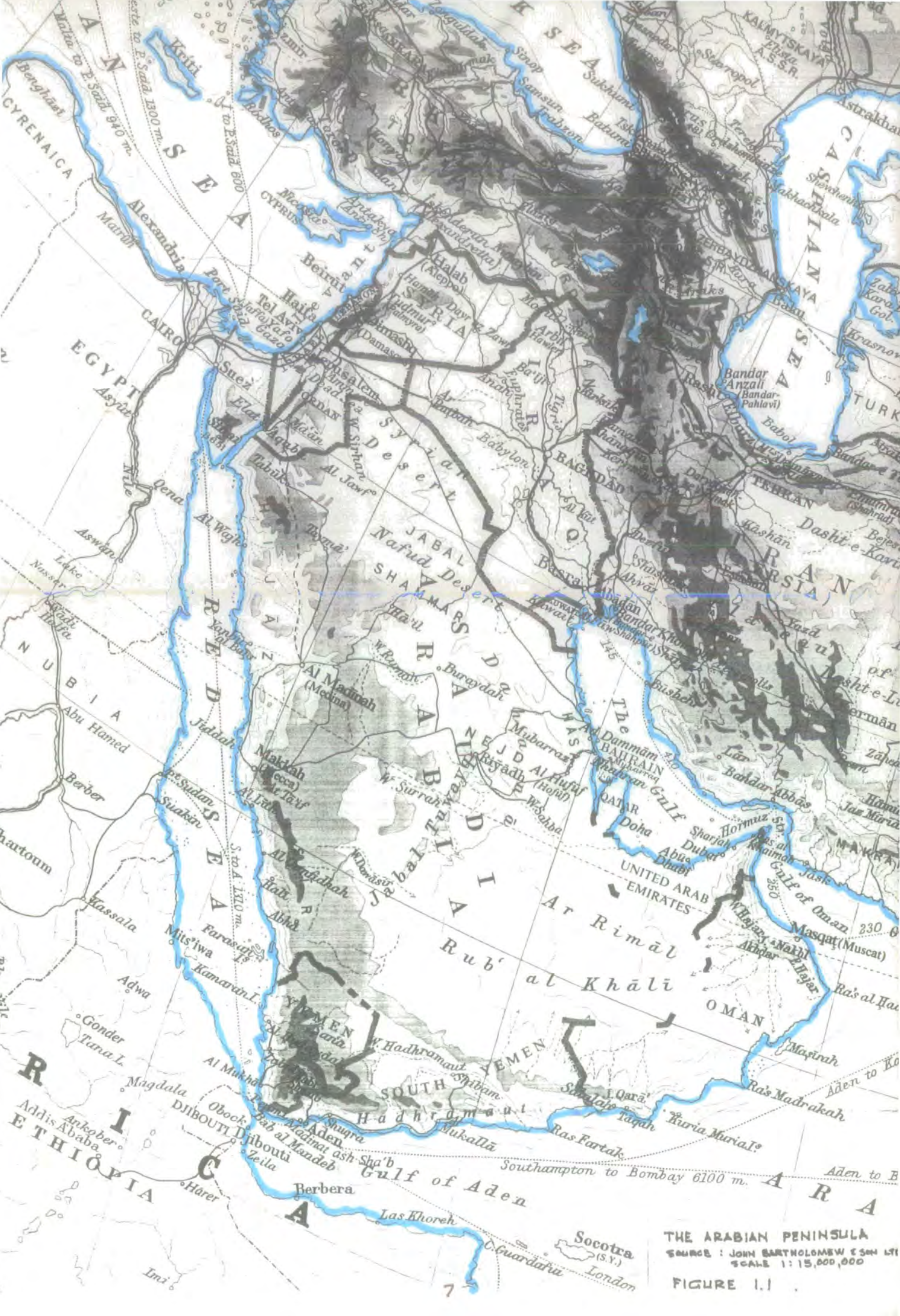
Rainfall is spasmodic and may not occur for several years at a time. Rainfall that does occur is often intense. Mean annual rainfall for Jeddah is approximately 40mm. However, there have been years in which this figure has been greatly exceeded, for example, 1968 (173mm), 1969 (128mm) and 1971 (106mm). December is usually the wettest month.

The Red Sea influences the level of Relative Humidity throughout the year. The mean annual humidity exceeds 60%. Mean monthly levels vary from less than 20% (May) to 100% (August). The diurnal range can be as high as 75-80%. Evapotranspiration occurs during the summer if the surface and ground water is high.

Similarly, the Red Sea brings cooling winds, the prevailing wind direction being north-north-west on at least one day in three (36% of the year). However, there are dust storms on an average of 30 days in the year, and in one day in six the prevailing wind direction is east-

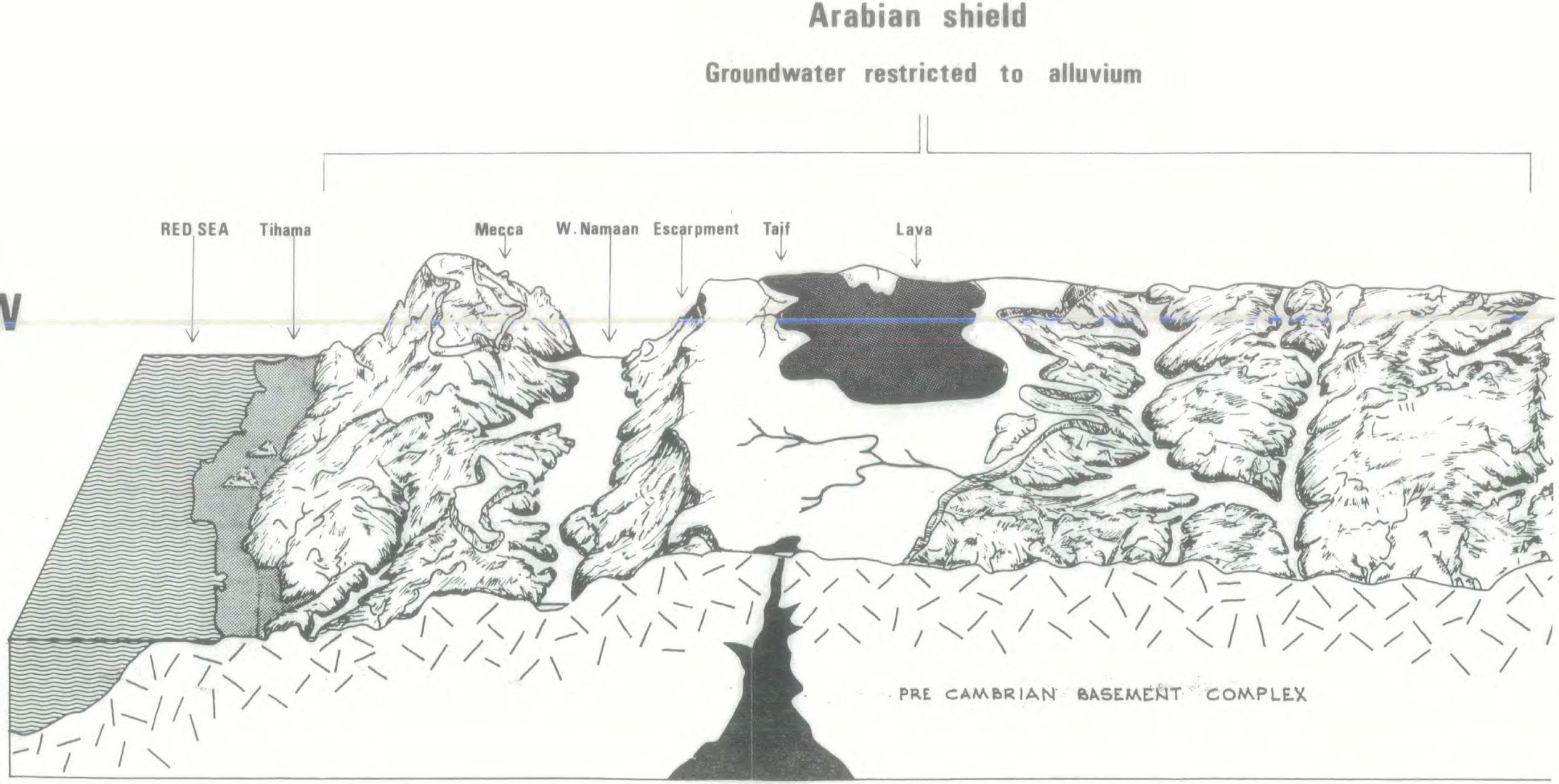
north-east (17% of the year).

Climatic conditions recorded over the period 1955-1970 are set out in graphic form in Figure 1.4.



THE ARABIAN PENINSULA
SOURCE: JOHN BARTHOLOMEW & SON LTD
SCALE 1:15,000,000

FIGURE 1.1



COMPOSITE SECTION OF THE WESTERN PART OF SAUDI ARABIA

FIGURE 1.2
SOURCE : REGIONAL FRAMEWORK REPORT - RMJMP, 1972.

0 50 100 150 KM.

GEOSCIENCE MAP GM-107 B
SHEET 21D
INTERNATIONAL INDEX NF-37-11

EXPLANATION


Town

Village

Facility location: C. Camp; I. Industrial site; H, Harbor; CG, Coast Guard Station

Isolated building


Area with vegetation, gardens

Paved road

Dirt road or track


Ancient working, mine, or prospect; named where known

Quarry or pit, active

Abandoned quarry

Communication tower

Airfield

Landing strip

Water pipeline, with pumping station

Wadi

Watershed (divide)

Well (Bi'r), Spring ('Ayn)

Dam

Sabkhah, Khabra'

Reef


Lava field, Ḥarrat(t), edges generalized


Volcanic vent, cone

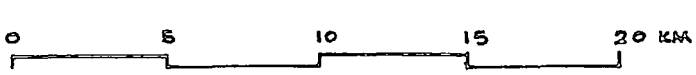
Escarpment

Spot elevation (approximate)

Horizontal and vertical control point

FIGURE 1.3

SOURCE : UNITED STATES GEOLOGICAL SURVEY FOR THE KINGDOM OF SAUDI ARABIA, 1985.



SCALE : 1 : 250,000

Ra's Ubhur
CG
H
Jabal
Buraymān
63
Buraymān
45
Ra's al Jahnāz
Jiddah
CG
Quwayzah
Jabal
al Hamrā'
Jabal
'Ajlsā'
Umm
as Saiam
Jabal
Banī Mālik
Jabal
Tandūb
Jabal
Murayyakh
367
529
306
252
214
Jabal
at Tawilah
266
Jabal
al Kuthnah
Khumrah
Ar Ra's al Aswad
Jazirat
Ghurāb
C
CG
WĀDĪ
TIHĀMAT AL
Bür Abū al Akhdar
91
Şarūm
CG
Al Bayādah
141
Al Qa'rā'
123
Jabal
al Qurayn
226
168
Jabal
Hashaf al Qu'ūd
Jabal
Abū Ghurltah
196
186
253
323
214
430
569
Jabal
Miqwad
Jabal
Abū Baqar
753
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Jabal
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Ad Dawh
Al Kidwah
Harrat
an Nahhāmīyah
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'Ayn al Husayniyah
Abū 'Urwah
Al Haniyah
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Shumaysī
Wādī
ash Shumaysī
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Hanash
Jabal
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MAKKAH
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al Jūd
At Tan'im
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Jabal
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Shu'ayb
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Abū Şafar
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Daff
Zayni
Nuzhah
Daff
Khuzā'ah
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Rawdah
Ju'rānah
Barānah
Matiyah
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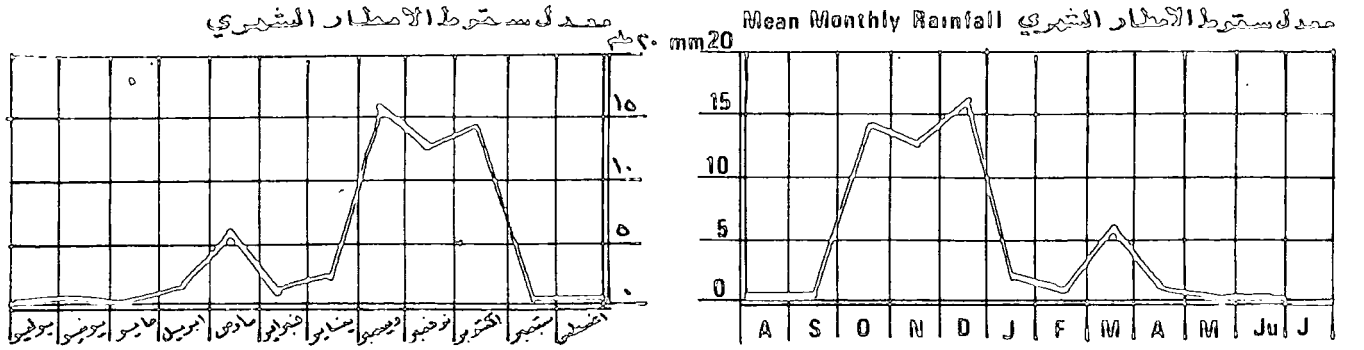
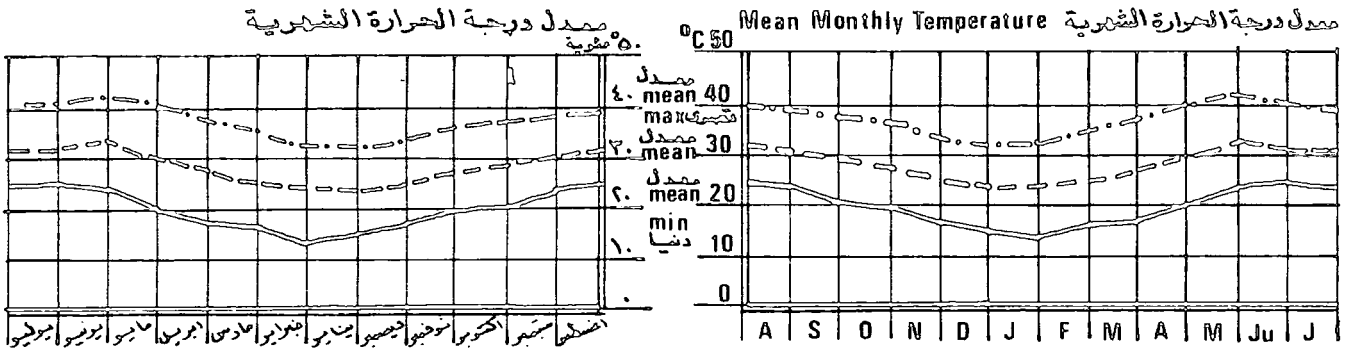
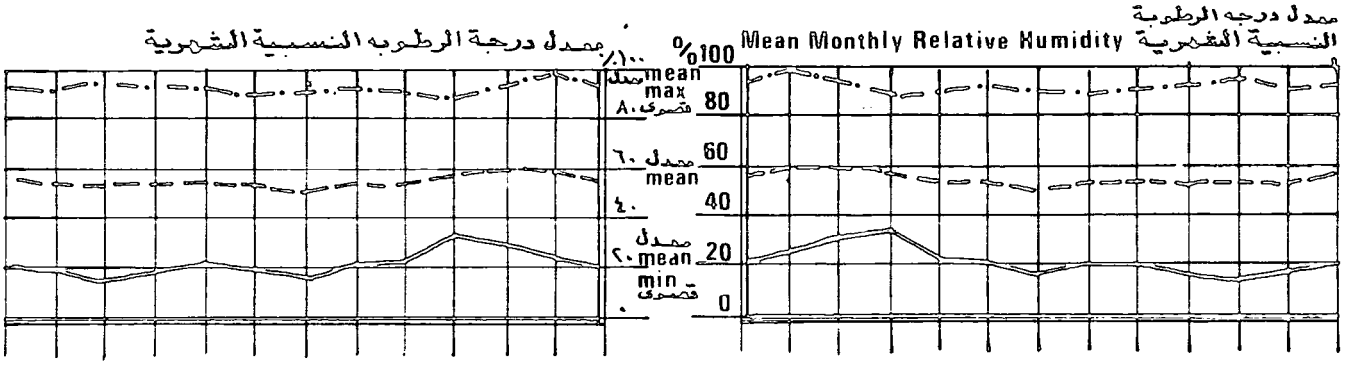
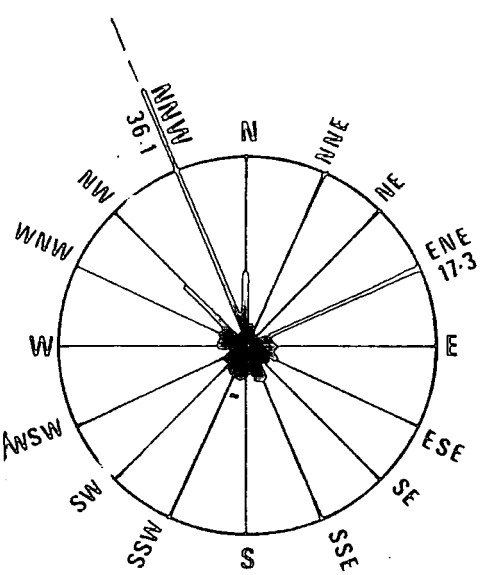
Jabal
al Hamrā'
Ash Sharā'i
al Mujāhidīn
723
849
965
Ar Rawdah
ash Shi'āl
Al Khulāşah
Ad Dabir
Ad Duhayl
Muna
814
Jabal
an Nūr
606
Al Muzdalifah
755
Jabal
Thawr
431
Arafāt
Jabal
Sa'd
Jabal
'Arafāt
605
482
466
407
Darb al Jimāl
Wādī al Aydiyah
363
Al Husayniyah
Jabal
Abū Şafā
210
Jabal
al Qash'ah
286
237
224
241
452
Jibāl
al Qush
177
193
346
Jabal
Thūr
482
544
582
Jibāl
Kassāb
Jabal
Kubaydah
Al Maqrah
Al Mudawwarah
516
552
426
Malakān
609
Jabal
Marbā'
Jabal
as Sahrān









وردة الرياح
Wind Rose

الأحوال المناخية

Climatic Conditions 1955 - 1970

FIGURE 1.4
SOURCE : ALTERNATIVE URBAN STRATEGIES - RMJMP 1972 .

PRE-ISLAMIC

Variations of the place name Juddah, Djuddah, Djudda, Djadda, Jiddah, Jeddah, Djeddah, Jedda remain in use. This uncertainty as to both spelling and pronunciation allows doubt as to derivation and meaning. A widely held view is that Jeddah is derived from jaddah, (grandmother). According to tradition, the Tomb of Eve, the universal grandmother, was located near the city (see Figures 2.1 and 2.4). A more scholarly interpretation is that Jeddah derives from juddah (seashore). This opinion was supported by the early Arab geographer al-Makdisi[1] who wrote in the 10th Century:

> "Juddah is a coastal town and its name is derived from its position in relation to the sea".

Another Arab geographer, al-Bakri[2], writing in the 11th Century noted:

> "Juddah is the name given to a coastal town near Mecca named thus because it is on the sea. The juddah of a sea or of a river is that part of the land adjacent to it".

The Tomb of Eve is not a fiction. Sir Richard F. Burton, visiting Jeddah en route to Mecca (in disguise as a Muslim pilgrim) in 1853, sketched and described the Tomb. The earliest reference to it was made by Hamdani in the 10th Century:

> "It has been related that Adam was in Mina when he felt a yearning to see Eve ..., that Eve had come from Juddah and that he knew her on Arafat."

There are historical references to the Tomb of Eve[3], and to the fact that barren women came to offer a prayer for motherhood. Although the cemetery in which the Tomb stood remains the Tomb was demolished in 1928. The shrine was domed with two long low parallel walls extended on both sides in a north-south orientation.

The fact that Jeddah is a settlement of antiquity, and has a significant location on the Arabian Peninsular is not in doubt.

The eastern coastline of the Red Sea is notorious for its impassible savage reef formation. One of the few navigable gaps in these triple reefs occurs at the point where Jeddah is located on the coastal plain. About 80km inland, the foothills and outliers of the barren Hejaz mountains give way to the Hejaz-Azir-Yemen mountains. The principal feature of the Azir-Yemen range is an escarpment rising dramatically from an elevation of 400-500m to more than 2000m. From a position almost due east-north-east of Jeddah the escarpment runs in an unbroken sweep southwards for over 1000km to the south-west corner of the Arabian Peninsula.

This natural setting bears evidence of very early settlement. The south-west part of Arabia saw the growth of an early civilisation of almost equal importance to that of the Nile and Fertile Crescent. This was the ancient Kingdom of Saba and the later period of dominance by the tribe of Himyar. Known today as the North and South

Yemens (the Yemen Arab Republic and the People's Democratic Republic of the Yemen respectively), this was the "Arabia Felix" of the Romans (see Figure 2.2). A fertile interior, fed by the monsoon rain of the Indian Ocean, allied to a strategic trading location - the Nile and the Fertile Crescent to the north and the Indus Valley and the spice trade of the Indies to the east - combined to give rise to this early civilisation.

Jeddah and an inland settlement called Macoraba, now the Holy City of Mecca, were links in a chain of settlements on the caravan route from Arabia Felix to the civilisations of the north (Figure 2.2).

By the 6th Century AD, the strategic importance of Jeddah attracted the interest of the Persians. They fortified the city and constructed underground conduits and cisterns to bring water from the fertile Wadi Fatima to Jeddah. The water supply of this wadi promoted growth at this arid coastal location. The only remaining evidence of Persian occupation is the course of this conduit[4], together with the remains of wells and open circular walled inspection/access points on its route[5] and large underground water storage chambers still extant beneath the old city of Jeddah[6]. No significant archaeological excavations have yet been undertaken within the historic core of Jeddah or in the Wadi Fatima to cast light on early settlements.

ISLAMIC

A Roman expedition attempted, but failed, to conquer Arabia in the 1st Century BC. The importance of these early trade routes declined with the fall of the Roman Empire and the fortunes of Mecca and Jeddah were similarly affected. There matters may have rested but for the advent of the Prophet of God - Mohammed Ibn Abdullah - in the 7th Century AD. Thereafter Islam and the rapid growth and expansion of the Muslim Empire became a momentous event in world history.

As the centre of Islam, Mecca derived vast wealth and importance. Simultaneously, Jeddah became a flourishing trading centre. Supplies from Egypt, the north Mediterranean countries, Africa, India and the Far East channelled through Jeddah to Mecca as the message of the Prophet Mohammed was spread throughout the world.

Even when the secular capital of Islam moved north, first to Damascus under the Ummiyad Caliphs and then to Baghdad under the Abbasids, Mecca remained the religious capital and Holy City of Islam and, as required by the Fifth Pillar of Islam, the place of pilgrimage for Muslims. The decline in trade which had accompanied the transfer of the Caliphate from the Hejaz ended with the collapse of security in the Abbasid domain in Mesopotamia at the time of the Mongol invasions in the 13th Century. Goods from India and the Far East which had previously been taken overland from the head of the Arabian Gulf to the Levant

and Europe were now brought to Jeddah and transhipped from there to distributive centres throughout the Red Sea.

Thus, before the end of the 13th Century AD and with the Abbasid Caliphate transferred to Cairo, the survival and prosperity of Jeddah was assured. This led to the Mamluk Sultans casting acquisitive eyes on the Hejaz, with its Holy Cities of Mecca and Medina and its main port of Jeddah.

The rulers of Mecca, the Sharifs, were able to resist outside dominance until the middle of the 15th Century when an internecine conflict between Sharif Barakat I (1404-1452) and his brother allowed the Mamluks, under the pretext of establishing order, to station a permanent garrison in Mecca. Subsequently, they took over the collection of customs duties in Jeddah. Simultaneously, exorbitant duties began to be applied by the Emir ruling in Aden, which by that time had become a busy and prosperous entrepot. This led to Aden being by-passed by trading ships which, encouraged by the Governor, Kirkmish, started to use Jeddah as their main Red Sea port of call. A further boost to the growing prosperity of Jeddah occurred when Constantinople fell to the Turks in 1453, thus closing off the spice trade to Europe through the Black Sea from the Asiatic overland routes. The Red Sea route became the only safe and practical route for this trade.

Great political importance was attached to the post of

Collector of customs dues. In the later 15th Century, one-third of the cargo unloaded had to be pepper and the dues collected on cargoes arriving at Jeddah were between 5% and 10% of their value[7]. Also at this time pilgrims and traders started to settle in Jeddah, establishing the city's cosmopolitan composition and outlook, which remains to this day.

The growing power of 15th Century Portugal and its savage dominance of the rich spice routes and trading stations from Europe to the Indies, posed such a threat to Jeddah that the city wall, which had lain in ruins for the previous 500 years, was reconstructed to encompass the city.

This reconstruction occurred during the early years of the 16th Century[8]. These fortifications saved Jeddah from a Portuguese invasion in 1516 when the Portuguese leader, Lopo Soares de Albergaria, realised that the combination of the dangerous reefs and powerful guns in strategic emplacements made punative action impossible. Figure 2.3 shows the fleet of Lopo Soares de Albergaria before the city. This is the oldest existing view of Jeddah.

However, this strength and prosperity was relatively short-lived. The growth of the Ottoman Empire saw the Holy Cities and Jeddah fall under Ottoman rule in 1517. The Ottoman rule in Arabia was stifling and cruel and by the 17th Century, the English and Dutch navigators, to avoid areas of Muslim dominance and thus danger to their fleets, started to use the longer Cape passage round

Africa. In 1631, the Turkish Governor of the Yemen brutally pillaged Mecca. Jeddah, having refused to submit, suffered the same treatment. Merchants were tortured to reveal the hiding places of their hoards of wealth.

An unstable period ensued in which the Sharifs of Mecca, too weak to overthrow the Ottomans, attempted to profit from intermittent periods of Ottoman neglect or vacillation. This situation continued until 1813 when the Hejaz fell to the armies of Mohammed Ali. This led to the establishment of close ties with Cairo.

The reawakening of European interest in the Arabian Peninsular led to British and French Consulates being established in Jeddah in 1825. The British, both as a means of containing the Ottomans and to support their interests in India, began to establish their influence on the ports of southern Arabia and the Arabian Gulf.

During the last years of his life before his death in 1849, Mohammed Ali attempted to assert direct authority over Arabia against the suzerainty of the Sublime Porte (the Turkish imperial government's chief office at Constantinople). On the death of Mohammed Ali the harsh Ottoman regime was reintroduced. Riots and violence ensured, fuelled by a local feeling of interference with trade by the growing number of European trading houses. In June 1858 the British and French Consuls were assassinated. Typically, the British responded by sending a fleet to bombard Jeddah. Subsequently, with the payment

of indemnities by the Porte and the execution of the assassins, this incident was closed forever. As an aftermath, the Porte strengthened its garrison in Jeddah and reorganised the Government of the Hejaz.

The opening of the Suez Canal in 1869, together with the measures taken to ensure a greater stability in the region, saw the re-emergence of Jeddah as the dominant trading centre of the Red Sea. It is from this period that the magnificent merchants' houses, many of which still exist, were constructed. A British Admiralty Chart of July 1859 shows the approaches to the harbour through the reefs and also a sketch plan of the city at that time (see Figure 2.4).

THE EMERGENCE OF THE KINGDOM OF SAUDI ARABIA

The origins of Saudi Arabia lie in the history of the ibn-Saud family. This family originated from Anazia, a settlement on the edge of the Great Nafud Desert. About the beginning of the 18th Century, the family had settled in Diraiyah in the Wadi Hanifa, a fertile valley in the desert heartland of Arabia. In this area - the Najd - a religious reform movement began which led to the establishment of a powerful state based on the orthodox adherence to the teachings of Islam. This movement founded by Mohammed ibn Abdul Wahab is known as Wahhabism. Ostracised by the severity of his preaching in his home town of al-Uyaynah in the Najd region and forced to flee, Mohammed ibn Abdul Wahab took refuge with Mohammed ibn

Saud in Diraiyah about 1740. Ibn Saud thereafter embraced this interpretation of Islam and, combining spiritual and temporal strength, they began to spread the message of religious revival. By about 1786 all the Najd, from the Great Nafud southwards to the Empty Quarter, was subdued.

In 1803 the Wahhabi captured Mecca, enforced their austere ways, and laid seige to Jeddah where a Turkish garrison was stationed. The city wall withstood the efforts of the Wahhabis and they retreated to their homeland, leaving a small force in Mecca. This was forced to surrender to the Sherif Ghalib. However, Mecca was recaptured by the Wahhabi in 1806 under the leadership of Saud ibn Saud, the grandson of Mohammed, who consolidated their power and authority over the Hejaz and much of the Arabian Peninsular.

In 1810, a Wahhabi raid on Damascus forced the Porte to recognise the growing strength of the ibn Saud/Wahhabi combination and the Sultan encouraged Mohammed Ali, his viceroy in Cairo, to crush this movement. Mohammed Ali invaded the Hejaz in 1811 and, by 1813, had completely repulsed the forces of Saud ibn Saud. Saud died in 1814, leaving to his son, Abdullah, the task of continuing the war. But, by 1818, defeat for the ibn Saud family was complete. Diraiyah was razed to the ground; Abdullah was deported to Constantinople and subsequently beheaded.

The resulting power vacuum in the desert interior of Arabia, allowed the emergence and dominance of the Shammar

tribe, which was centred in Hail, and led by Mohammed ibn Rashid. In 1891 an alliance was formed with the Porte and, with the help of the powerful Harb tribe, Mohammed ibn Rashid proceeded to destroy the last remnants of the ibn Saud family. The leader of the house of Saud, Abdul ar-Rahman, was forced to flee to exile in Kuwait. With him went his eleven year old son, Abdulaziz[9], who was destined to become the conqueror and first ruler of the Kingdom of Saudi Arabia.

Abdulaziz left Kuwait in the autumn of 1901 at the head of a column of forty men resolved to recapture the homeland of his family or perish in the attempt. On the 15th January 1902 in an intrepid action, he recovered the city of Riyadh. This was the starting point of a series of military victories which ultimately achieved the unity of the country. On the 23rd September 1932, Abdulaziz ibn Abdul ar-Rahman Al Faisal Al Saud was able to proclaim that the Arabia he had united was henceforth to be known as the Kingdom of Saudi Arabia.

NOTES

1. al-Makdisi. Descripto imperii mostemica. ed. by M J de Goeje; in Bibliotheca Geographorum Arabicorum, + 111. Leyden 1960 p.79.

2. Mujam ma Istajam - Das Geographische Worterbuch des Abu 'Obeid 'Abdallah ben Abd al-Aziz el Bakri. ed. by F Wustenfeld, Gottingen - Paris 1877 p.234.

3. (i) Ibn Jubayr (Late 12th Century), writing from experience of a visit to Jeddah, states that in Jeddah:

> "... is a place having an ancient and lofty dome, which is said to have been the lodging place of Eve ... when on her way to Mecca".

(ii) Ibn Khallikan (13th Century)

Wafayat al-azan wa anba abna az-zaman

(iii) 19th-20th Century descriptions of the tomb (other than Sir R F Burton) by Saleh Soubhi (1894), Nawab Sultan Jahan Began (1931), H St John Philby (1922) and others.

4. Observed by writer during a helicopter flight along the Wadi Fatima in 1972.

5. Observed by writer traversing the Wadi at various times during 1971-75.

6. Inspected by writer during detailed study of Historic Area of Jeddah 1978-79.

7. British Admiralty - Naval Intelligence Division. Western Arabia and the Red Sea, Oxford 1946.

8. Rebuilding of City Wall. Sources:

(i) Portuguese

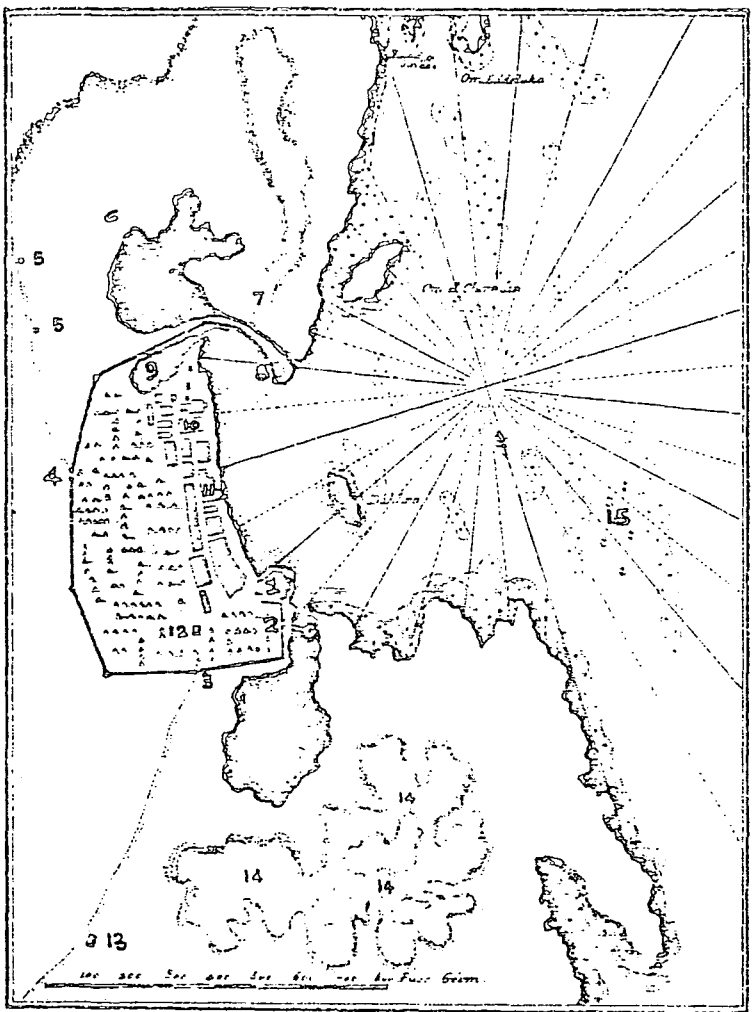
Barros, a Portuguese historian, makes reference to the wall being built by Husayn al-Kurdi at the same time (1514) as Alfonso d'Alboquerque built the fortress of Calicut.

(ii) Arabic

Husn al Kira fi Awdiat Umm al Kura

(Translation - The good hospitality in the valleys of Mecca). A 16th Century geographic work in which the author states that the fortifications were built in 912AH (1506-1507).

9. The exact date of his birth is unknown, but it was probably in November or December 1880.



LEGEND

1) *The house of the Pasha*
2) *Bab ash-Sharif*
3) *Bab al-Jadid*
4) *Bab Mecca*
5) *Watchtowers on the Mecca Road*
6) *Salt flat, where salt is collected when the seawater evaporates*
7) *Christian Cemetery*
8) *An entirely destroyed tower with battery*
9) *The so-called Port of the Galleys*
10) *Niebuhr's house*
11) *The Customs House*
12) *The house of the Kiaya (the Pasha's lieutenant)*
13) *Eve's Tomb*
14) *Large hills of coral-rock and shells*
15) *Anchorage of India and Suez ships*

FIGURE 2.1
PLAN OF JEDDAH IN 1762 BY C. NIEBUHR.

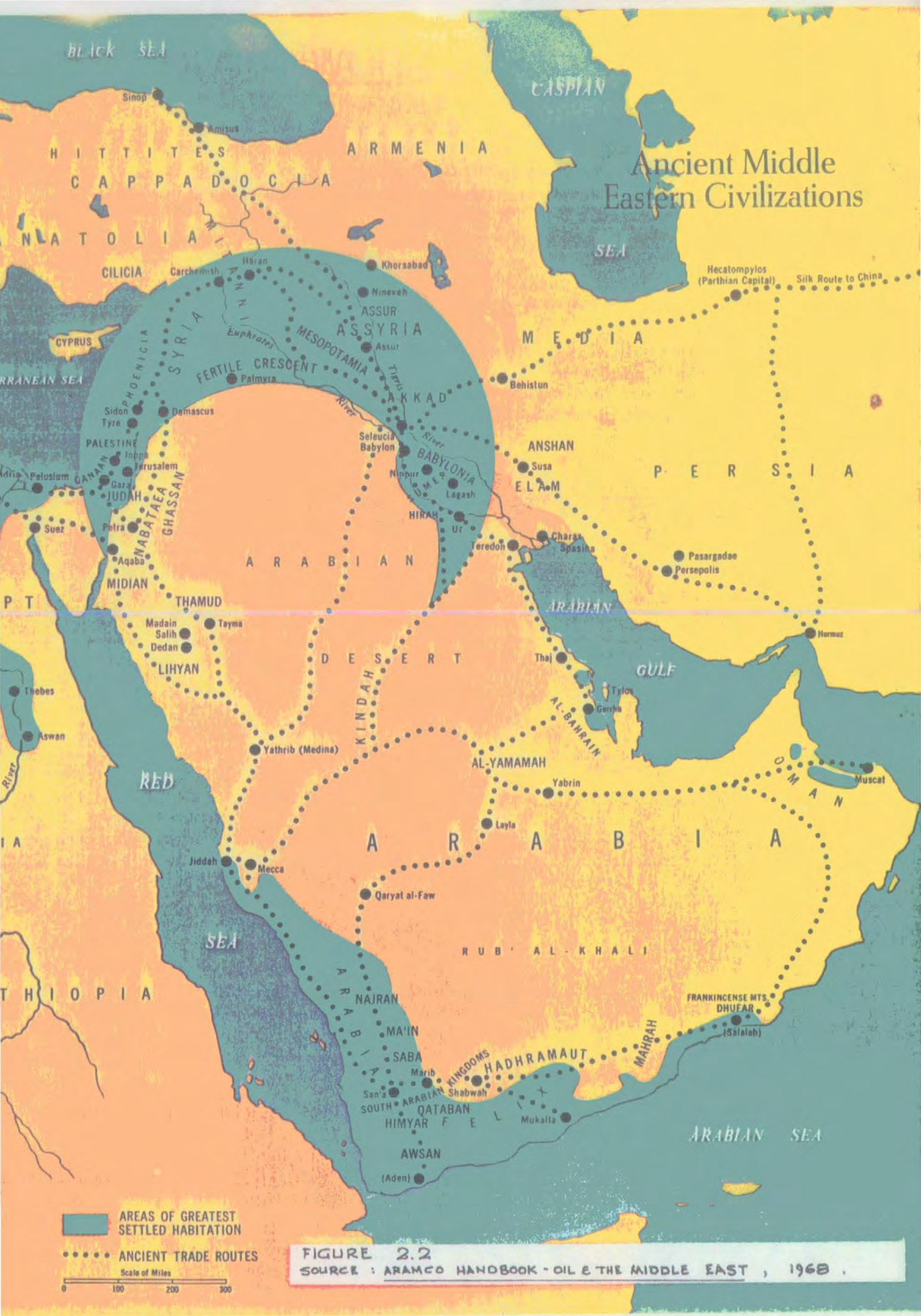
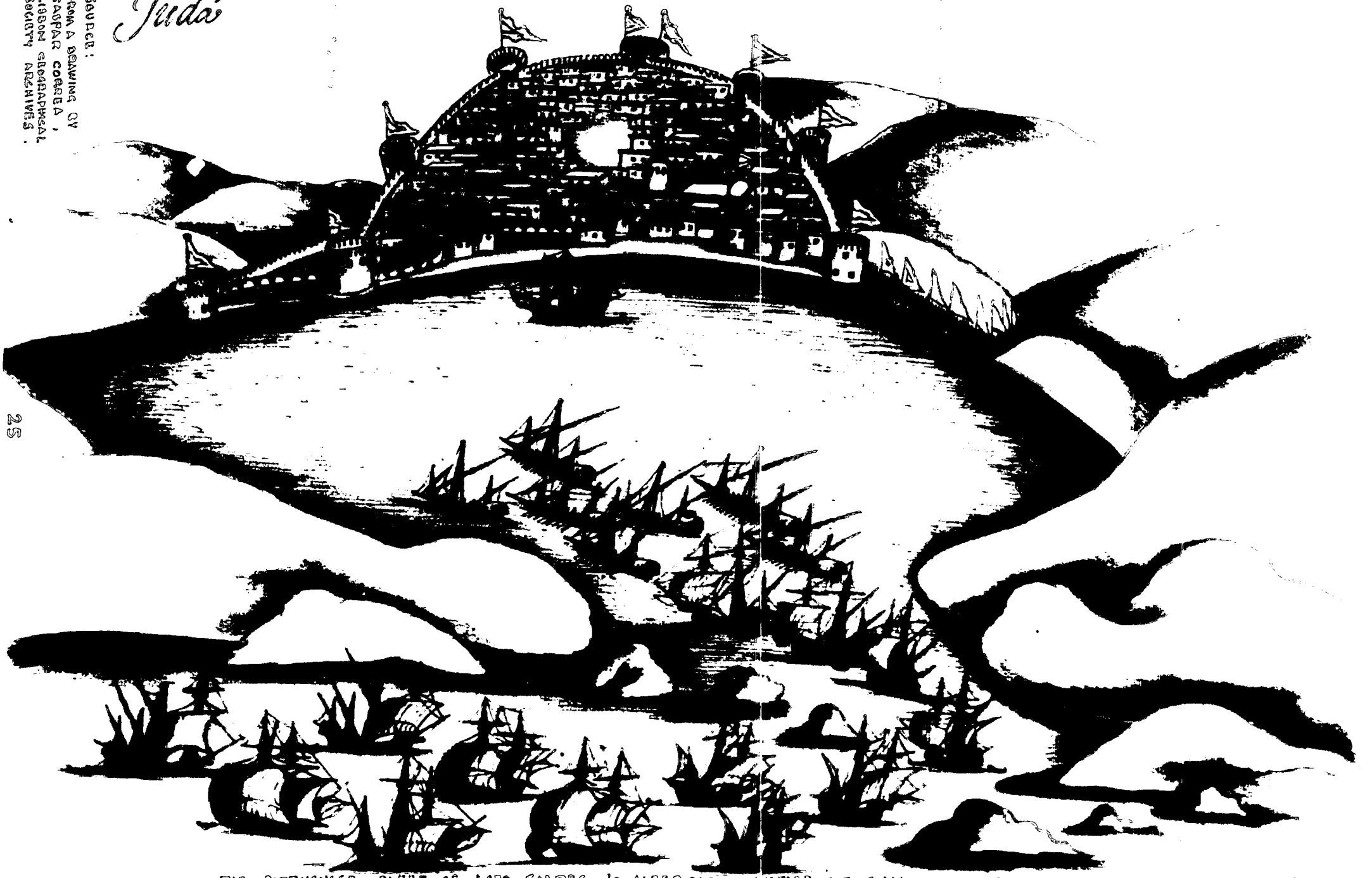


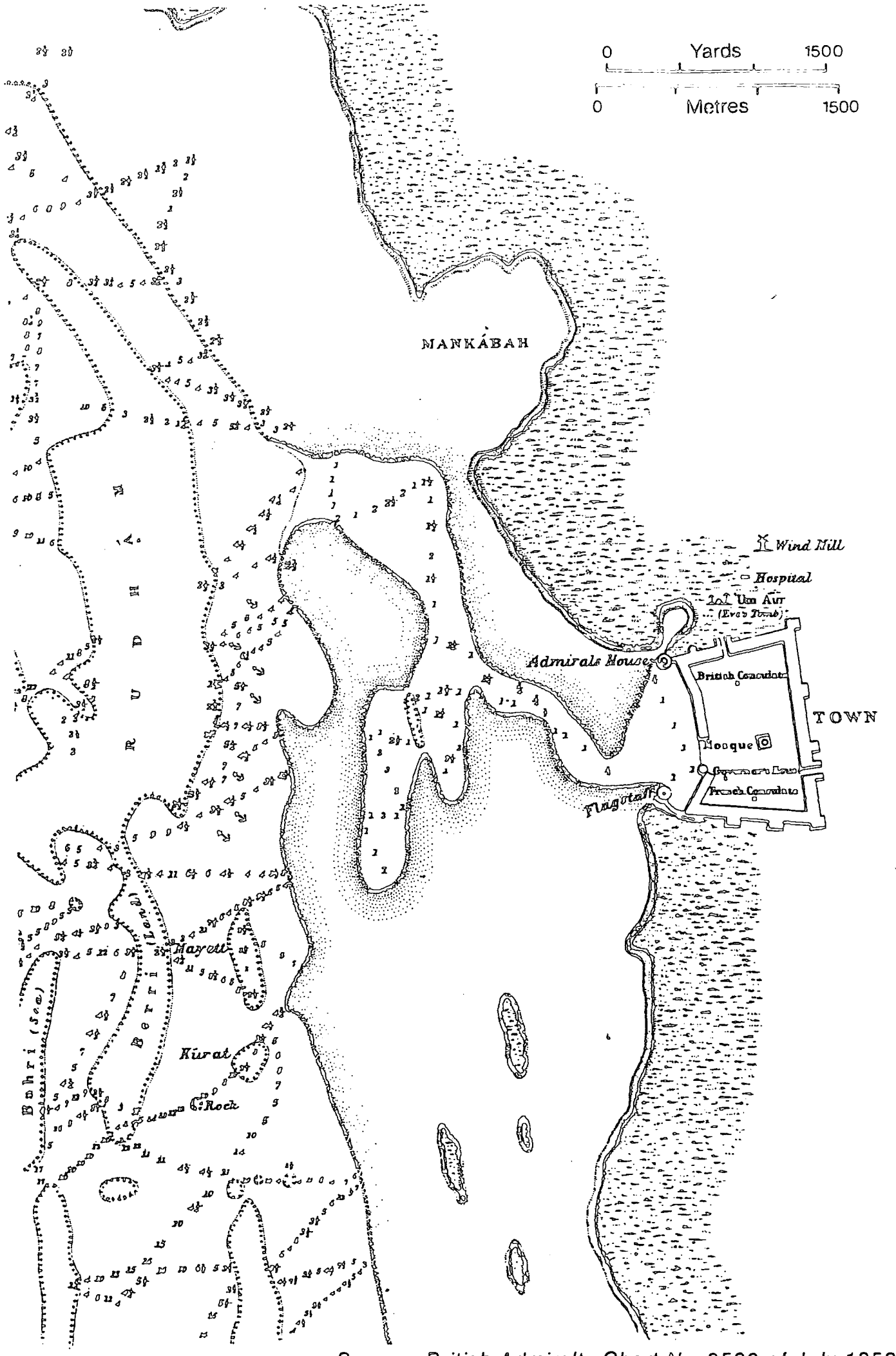
FIGURE 2.2
SOURCE : ARAMCO HANDBOOK - OIL & THE MIDDLE EAST , 1968 .



SOURCE:
FROM A DRAWING BY GASPAR CORREA, LISBON GEOGRAPHICAL SOCIETY ARCHIVES.

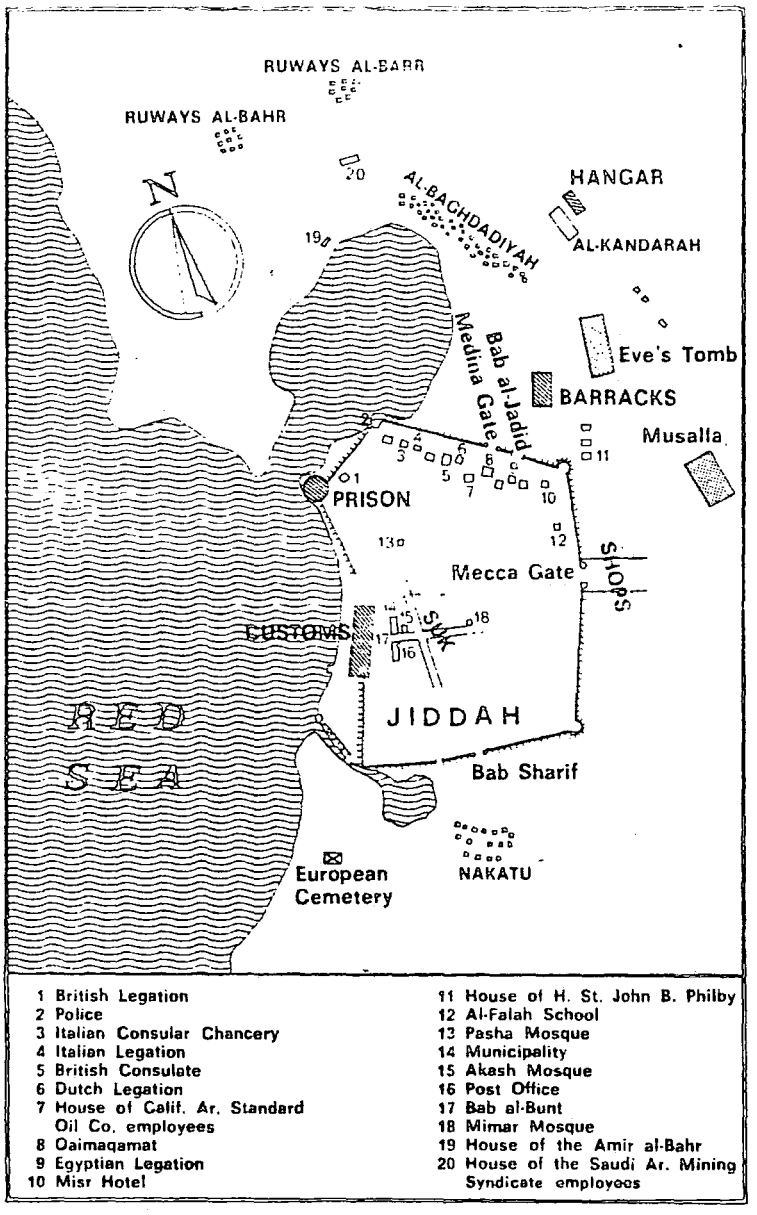
THE PORTUGUESE FLEET OF LOPO SOARES DE ALBERGARIA BEFORE THE CITY OF JEDDAH, 1517.

FIGURE 2.3.



Source : British Admiralty Chart No. 2599 of July 1859

Figure 2.4.



Plan of Jiddah in 1938, *redrawn from* C.A. Nallino L'Arabia Saudiana *ed. by M. Nallino, Rome* 1939, *p.* 305.

FIGURE 2.5.

SOURCE : JIDDAH, PORTRAIT OF AN ARABIAN CITY
ANGELO PESCE, 1977

NATIONAL PLAN CONTEXT

Jeddah is the principal point of entry into Saudi Arabia. With a population of about one and a half million, it ranks second to Riyadh, the Capital City. As part of the Jeddah-Mecca-Taif corridor Jeddah is an integral part of the most populous area of the Kingdom. Together, these three cities and their surrounding areas contain about one-quarter of the total population of the Kingdom[1].

In the Ministry of Planning Third Development Plan for the Kingdom, 1980-1985, for planning purposes the country was divided into five regions - Northern, Western, Eastern, South-Western and Central[2]. The Plan considered that regional disparities existed in the structure of economic activity and employment. For example, the distribution of the labour force by region in 1974 was as follows:

Table 3.1: Distribution of Labour Force by Region

PLANNING REGION	% OF TOTAL LABOUR FORCE
Western	34.6
Eastern	11.9
Central	23.1
South-Western	20.0
Northern	10.4

Source: Central Department of Statistics (CDS) Population Census (1974)

By comparison to the other regions, the Western Region has

also a much more diversified economic structure, being almost totally indirectly dependent on the oil industry. The Ministry of Planning quantified this as follows:

Table 3.2: Distribution of Regional GDP

PERCENTAGE DISTRIBUTION OF REGIONAL GDP 1396-97AH (1976)					
Activity	Western	Eastern	Central	South-Western	Northern
Oil & oil taxes	0.8	90.7	0.3	-	-
Non-oil	99.2	9.3	99.7	100	100
Composition of non-oil GDP					
Agriculture	3.1	4.9	5.6	33.2	32.2
Manufacturing, mining & utilities	6.7	6.5	6.2	3.1	2.6
Construction	25.9	26.5	25.1	16.3	16.7
Distribution	26.6	21.7	21.7	11.8	8.0
Transport & communications	4.9	8.8	4.3	4.3	8.3
Other services	22.7	21.7	24.5	15.5	16.5
Government services	10.9	9.8	12.6	16.0	15.8

Source: Third Development Plan, Table 2.21, p.60

In so far as the Western Region was concerned, the sustained economic growth of Jeddah, the religious significance of the Holy Cities of Mecca and Medina, combined with the massive investment being made, by the Royal Commission for Jubail and Yanbu[3], in Yanbu was likely to result in the Western Region retaining its economic ascendency.

One of the main thrusts of the Third Five Year Plan was to achieve a better balance of regional and, additionally, rural/urban distribution of growth and provision of services. In particular, a major objective of the Third Plan was to avoid over concentration of resources in a few urban centres. Thus, the regional strategy was designed around the following key elements.

> "(1) The coordination of activities, projects and programs of ministries and other development agencies having regional or district geographic responsibilities. This coordination will strengthen the provision of services to the individual and enable more efficient use of manpower;
>
> (2) The more equitable distribution of socio-economic opportunities and wider access to public services in line with the promotion of productive activities and individual initiative;
>
> (3) The provision of a development framework, for the design and implementation policies and programs in all regions, especially the rural areas. Such a framework will pay critical attention to the availability of the resources, including manpower and water, of the Kingdom."
>
> (Third Plan, p.108)

In their Plan for the Western Region[4], RMJMP examined the advantages and disadvantages of rural versus urban growth and how to achieve a balance. In doing so, they concluded that improved mobility, education, employment opportunities and the aspiration for a higher standard of living would result in a drift into the major urban centres. To counteract this, an equivalent infrastructure at local level required to be developed. Realising that it would not be possible to spread services evenly over such a vast and sparsely populated region, RMJM&P

advocated the development of a hierarchy of service centres. The first level was the major cities of which Jeddah was to be one. Three levels of centres were thereafter proposed[5]:

a) Town (primary centre) servicing a population of 30,000-40,000

b) Rural town (secondary centre) servicing a population of 10,000-20,000

c) Village Centre (tertiary centre) servicing a population of 1,500-2,000

This was comparable to the approach adopted in the Third Plan which was set out as follows:

> "3.7.1.2 Policies The policy to achieve the regional goals and objectives is to introduce a system of national, regional and district centers, spread throughout the Kingdom, for the provision and effective coordination of development services. This system of development service centers is deemed the best method of both stimulating development activities, and aiding the most deprived sections of the population. The development centers are arranged in a hierarchy according to whether they are judged to be of national, regional or local significance. The ranking of a particular area will be changed if it later demonstrates greater potential than currently realised. The three types of centers are defined as follows:
>
> (1) District Center, the location of the institutions and services needed frequently, but not daily, by a given population which is termed a district (which can be delineated according to both accessibility to the particular services and the capacity of the services);
>
> (2) Regional Center, the location of various specialized economic, welfare and administrative institutions, which can reasonably be shared by a number of districts;

(3) National Center, fulfilling various economic and administrative functions for the whole country, providing very specialized service, and a growth pole of national significance."

(Third Plan, p.109)

Jeddah stands as an established 'National Centre' within this hierarchy. As an indication of its national importance, approx 30% of the government's project expenditure during the Second Five Year Plan was invested in Jeddah.

The primary function of Jeddah is that of the Kingdom's most important sea and air communications centre. Some 80% of the foodstuffs imported into the country arrive through the seaport and the combination of international and domestic passenger/freight traffic make Jeddah's King Abdul Aziz International Airport the busiest in the Kingdom[6]. Because of its long established role as a seaport and trading centre; the strength of its mature commercial activities and its growing industrial base, Jeddah is less dependent on government investment and funding than are other regions or cities in the Kingdom. Between 1986 and 1987, the Ministry of Foreign Affairs and the Embassies of all foreign countries will have moved from Jeddah to Riyadh. Thus Jeddah will have lost its status as the diplomatic centre for the Kingdom. However, it will still be necessary for most countries for reasons of business or the Hadj, to retain a Consulate in Jeddah. The Government's current policy is that banks and other major institutions should locate their headquarters in Riyadh but, notwithstanding this, Jeddah should remain

pre-emininently the business and commercial centre of the Kingdom.

Therefore, although for historical reasons the seat of the Governorate of which Jeddah forms part is located in Mecca, most Government Ministries will continue to have a regional office in Jeddah. Jeddah also remains the health centre for the region as well as the centre for defence and national security. King Abdul Aziz University in Jeddah, one of the first universities to be founded in the Kingdom, with its staff and student population of 10,000 in 1978 is planned to increase to 40,000 by 1990.

JEDDAH WITHIN THE NATIONAL STRATEGY

The principal objective in the development of Jeddah was to have been for the city to continue to make an effective contribution to the economic and social growth of the Kingdom. To achieve this, development was seen as proceeding within a framework which would seek to minimise the effects of social and economic change to the religious and cultural values of a Muslim country. The possibility of creating a North American or European style city would be totally inconsistent with this approach.

With this as the basic objective, the role and function of Jeddah at both national and regional level can be summarised as follows:

1. As a centre of sea, air and land communictions.

2. As a commercial and business centre, for the Western

Region and the Kingdom as a whole.

3. As a manufacturing and service centre.

4. As an educational, health and cultural centre.

5. As the arrival and departure point for non-Saudi pilgrims during the Hadj and also for the Umra or visit to Mecca outside the Hadj period.

NOTES

1. Precise information on population or its distribution is not made public in Saudi Arabia. In 1971, the RMJMP social survey enumerated the populations of Jeddah, Mecca and Taif as 381,000, 301,000 and 106,000 respectively. Surrounding villages (e.g. in the Wadi Fatima and Wadi Khulais) added about 60,000 producing a total of about 850,000 people. At that time it was likely that the population of the Kingdom was significantly less than 4,000,000. Today, because of the dramatic increase in population in Jeddah, Mecca and Taif, it can be stated that this sub-region maintains a comparable proportion of the Kingdom's total population.

2. See Figure Two, Preliminaries

3. "The Royal Commission for Jubail and Yanbu was created by Royal Decree M/75, dated 16 Ramadhan 1395. The organization is directly responsible to the Deputy Prime Minister. It is the sole and controlling authority responsible for planning and implementing the basic infrastructure necessary to transform the two regions of Jubail and Yanbu into industrial areas. The authority for controlling the development of the regions of Jubail and Yanbu is also vested in the Royal Commission".

   (Third Five Year Plan, p.240)

4. RMJMP. Regional Physical Plan and Development Programme, Jeddah 1973.

5. The list of these centres, as set out in the RMJMP "Regional Physical Plan and Development Programme" (approved 1973) was as follows:

Primary Centres:

Al Ula

Afif

Taraba

Baha

Bajurashi

Qunfidah

Secondary Centres:

Duba

Al Wajh

Ummlug

Taima

Khaybar

Rabigh

Khlais

Khorama

Ranya

Tertiary Centres:

To be defined as part of more detailed follow-up sub-regional studies.

6. A press release by the Presidency of Civil Aviation in 1984, stated that Jeddah Airport, in the first quarter of 1984 had a total domestic traffic of 1,100,000 passengers and international traffic of 851,000 passengers. During the same period traffic at King Khalid International Airport, Riyadh was 1,300,000 domestic passengers

and 392,000 international. Total air cargo during this period amounted to 37,100,000 kilos at Jeddah Airport; 22,000,000 at Riyadh and 23,100,000 at Dhahran (the third of three International Airports in the Kingdom).

INTRODUCTION

It is not possible to describe the recent history of Saudi Arabia, and thus of Jeddah, without referring to the role of the Kingdom as one of the world's leading oil producers. Without oil it is possible that Saudi Arabia might have remained a predominently harsh and barren country of vast size and scattered population, inward looking and with the custodianship of the Holy Cities its only significant international function. Certainly, its oil wealth, from the end of the Second World War onwards, has produced a very different situation.

Before 1944, oil production averaged less than 20,000 barrels per day (bpd)[1],but by 1948 this had increased to almost 400,000 bpd. In 1950 world demand for petroleum suddenly took an upward curve, due principally to an upsurge in post-war international industrial reconstruction and growth and also as an outcome of the Korean War. Oil production then began to increase dramatically, from 546,703 bpd in 1950 to 1,247,140 bpd a decade later.

In 1950 when the total oil income amounted to SR56,000,000 this was said by King Abdulaziz Al Saud to be "fabled wealth". In 1972, Abdulaziz Al Suleiman (the son of the King's Treasurer) told the writer that, in 1930,

> "the entire treasury of Saudi Arabia was packed, in gold pieces, on the back of one camel and was in the

custodianship of my father, Abdullah Suleiman, the King's Treasurer."

The steady increase in oil production continued and, by 1970, production, at 3,548,865 bpd topped the three million mark for the first time. Subsequently, production peaked in 1980 at 9,631,366 bpd and, in 1982, stood at 6,327,220 bpd.

Saudi Arabia, in 1982, was the world's third largest oil producing country (USSR and USA being first and second). In terms of proven oil reserves, Saudi Arabia has more than any other country. In 1982, these reserves stood at 167,920 million barrels.

Of even greater significance was the dramatic increases in crude oil prices over this post-war period. In 1950, Saudi Arabian crude was marketed at $1.75 per barrel. This price remained constant through the '50s. In 1960, the posted price[2] was $1.80 per barrel. The first OPEC "show of strength" in the mid 70s increased the posted price to $24 per barrel by 1979. Saudi Arabian crude peaked at $36 per barrel in 1981. The 1984 posted price was $29 per barrel.

The total oil revenues can be set out as follows:

Table 4.1: Oil Revenues

	Barrels per day	Posted price ($)	Revenue per day ($)
1950	546 703	1.75	956 730
1960	1 247 140	1.80	2 244 852
1970	3 548 865	1.80	6 387 957
1979	9 251 097	24.00	222 026 328

Sources:
(i) Aramco Handbook - Oil & The Middle East, 1968
(ii) Third Development Plan, Chapter Four, 1975-80

Note: These totals do not reflect the amount of oil exported compared to domestic use. Indications are, however, that about 93% of crude oil production per annum is exported[3].

This outline description on the subject of oil and Saudi Arabia places in perspective the wealth of the Kingdom, and the extent to which such revenues could allow a very large and rapid rate of investment to be made by the public sector in all aspects of development.

JEDDAH : 1947-1970

While Jeddah participated in the skirmishes and Middle East power struggles during World War One, little, mention is made of Jeddah in the annals of World War Two. Presumably, the neutral attitude evinced by King Abdulaziz implied that, as long as Turkey remained neutral and the Axis powers failed to capture the Suez Canal, the Arabian Peninsular was sufficiently well removed from hostilities. It is recorded[4], however, that Italian planes bombed Dhahran on October 19, 1940 when only very slight damage was done.

Saudi Arabia maintained a position of benevolent neutrality towards Britain and USA during the Second World War until March 1945, when the Kingdom entered the war on the Allies side. Meanwhile the country as a whole continued its evolution from a tribal and regional society into an established modern state. In 1953, a month before he died, King Abdulaziz Al Saud established a Council of Ministers. Ministries and government agencies were subsequently set up to advance the Kingdom's economic and social develoment.

Thus Abdulaziz Al Saud paved the way for a change from his personal and direct rule towards a broad based national government administration. The Council of Ministers, in an expanded form, remains the nation's governing body.

During the period between the First and Second World Wars, Jeddah saw little significant change and remained a compact town encompassed by its protective wall - the same wall which had been built by Husayn al-Kurdi, early in the 16th Century and strengthened by the Ottomans in the 19th Century.

A vivid description of Jeddah at this time is given by T E Lawrence in the "Seven Pillars":

> "... It was like a dead city, so clean underfoot, and so quiet. Its winding even streets were floored with damp sand solidified by time and as silent to the tread as any carpet. The lattices and wall-returns deadened all reverberation of voice.... Everything was hushed, strained even furtive. There seemed no life in it. It was not burning hot, but held a moisture and sense of great age and exhaustion such as seemed

> to belong to no other place ... a feeling of long use, of the exhalation of many people, of continued bath heat and sweat. One would say that for years Jidda had not been swept through by a firm breeze ..." (5)

Within the city wall, the lofty elegant merchant palaces, town houses, mosques and caravanserais were closely packed together in an informal, unplanned layout. Streets were of varying length and width; narrow ways linked one irregular open space to another. The largest of these spaces was by the seafront adjoining the Turkish built Customs building which, together with a rather smaller area in the north-east corner of the city, functioned as an open air market. A photograph taken in the 1920s looking from the landward side of the Customs building eastwards towards the main souk appears at the end of this chapter (Figure 4.2). This illustration gives an excellent impression of the compact urban form and character of Jeddah at that time.

Commercial life was centred on the souk and the harbour. In the souk, open-fronted shops, screened by palm leaves and canvas awnings shielding them from the effects of the sun, opened directly onto the two main streets : Shara Qabil and Shara al-Kharratin. Itinerant traders and pilgrims both found refuge in the port's caravanserais and khans. At night, the gateways to the city were barred and guarded.

A number of extra mural settlements became established in the vicinity of Jeddah. Nakatu, which consisted of a

sprawl of reed huts to the south of the port, housed an East African community providing labourers for the port. To the north there were two local villages, Ruwais and Bani Malik.

Jeddah was graphically described by the architectural critic and writer, J M Richards, in an article in the 'Architectural Review' of August 1947. At that time, the walls were extant and Jeddah had a well defined, clear cut urban form and magnificent groups of traditional buildings. The following quotations provide a comprehensive description of this historic city:

> "Jedda, nevertheless, still preserves evidence of its old position on the India trade-route. There is virtually no timber in the whole of the Hedjaz, and the timber superstructure of Jedda's towering houses - mostly teak - came from as far away as the East Indies. The elaborate carving, moreover, with which porches and balconies, and the characteristically Arab mushrabiyah windows, are ornamented is said to be done by Javanese craftsmen, descendants of craftsmen who came, perhaps centuries ago, from the East Indies. Jedda, as befits a trading port, has a markedly cosmospolitan population, which includes many Indians and Javanese, a proportion of whom have stayed behind after coming to make the Pilgrimage, for Java is a Moslem country - numerically the biggest outside the Arab world."
>
> "Inside the walls the town is one of closely packed buildings, arranged on no regular plan; there are few streets of any length, the tall buildings giving the impression of having been stacked inside the town walls like flowering stalks into a vase. They are separated by narrow alleys that open out here and there into little squares. The only large open spaces are an oblong one behind the docks, containing such public buildings as quarantine and customs offices, and a wide roadway immediately within the walls on the north and north-east sides, separating them from the outer row of houses. There is no paving - since there is no durable stone. These open places and the courts and small squares are all floored with a fine sand, trodden hard, but with a dusty surface that glistens

whitely in the sun. It makes Jedda a city of silent traffic; the rare wheels of carts grate dreamily as they pass, and the padding of bare feet is pleasantly muffled."

"The streets and squares are clean; in fact the cleanness of Jedda is one of the surprises in store for the visitor accustomed to the dirt and smells of other Middle Eastern cities."

Figure 4.3 illustrates an aerial photograph of Jeddah taken in 1948 and shows the compact nature of the old city. This photograph was taken just after the city wall had been demolished.

The principal features of post-1947 Jeddah were created during the first oil 'boom', which induced unrestrained investment in roads, installations, royal palaces and large villas. The Quarantine Hospital, the Petromin refinery, the new harbour, the original airport, and the Khozzam Palace were all either completed or started between 1947 and 1956. Medina Road, Airport Road, and the Baghdadiyah-Airport-Palace-Seaport Ring Road were also completed, and many main roads were asphalted for the first time. At the same time, as a consequence of the increase in employment and population, virtually the whole area within the Ring Road was developed to provide urgently-needed accommodation. As a result of this expansion, the city wall and its gateways were demolished in 1947[6].

The closure of the Suez Canal in 1956 caused cutbacks to be made in investment and development was mainly confined to public works such as the new harbour and the airport.

In 1968-69 King Faisal Road was cut through the heart of the old city to alleviate the growing traffic problems within the city centre.

The growth of Jeddah was renewed when King Faisal ibn Abdulaziz assumed power in 1964. Thereafter the pace was slower and more controlled than during the earlier post-1947 period of growth. During the period 1964-1970 the airport was extended, the harbour modernised and considerable building operations took place. A desalination plant was constructed in 1968 to augment the city water supply which, until then, had relied upon piped water from aquifers in the Wadi Fatima to the east and the Wadi Khlais to the north. New factories were built and existing factories extended. An air defence system was installed and the crude oil refinery located SE of the Seaport was extended. Residential development continued, but with a shift of emphasis to the northern, Medina Road area as opposed to the eastern, Mecca Road, axis, which had been the trend in the post-1947 period. Uncontrolled "squatter" development coalesced on the southern outskirts of the city. New development and redevelopment continued within the city itself. The introduction of advanced construction techniques led to changes in the built form. Instead of horizontal outward growth, tower blocks began to appear in the commercial areas of the city centre. To a great extent, this reflected the unrestrained growth in land values which began to occur during this period. Precise information on this subject is unobtainable, but

to the writer's knowledge, land values in the city centre increased from a few hundred Saudi Riyals per square metre in the early '60s to over four thousand Saudi Riyals in 1970. Using the 1970 conversion rate of SR10.6 to £1, this amounted to approx £400 per square metre.

Figure 4.1 presents a generalised picture of city growth up to 1971.

Thus, by 1970, Jeddah had extended outwards from its historic core, principally along the two main road arteries, towards Mecca to the east and towards Medina to the north.

NOTES

1. The barrel, which is the standard unit of measurement for oil, equals 34.9726 imperial gallons or 158.984 litres.

2. The posted price is the official market rate within the OPEC price control agreements. It can vary from the actual price realised.

3. The Third Development Plan, Chapter 4, p.168.

4. Aramco Handbook p.120

5. Lawrence, T.E. Seven Pillars of Wisdom. First published edition, London, Jonathan Cape, 1935.

6. At the time the city wall was demolished and dumped into the sea by the American company Bechtel in 1947, the five gateways were:

   a. To the north

      Bab al Medinah
      Bab al Jadida

   b. To the east

      Bab Makkah

   c. To the south

      Bab al Sherif

   A corner tower is all that survives of the city wall. It is located in the south-east corner of the old city and is built into the structure of the Bab al Sherif Hospital.

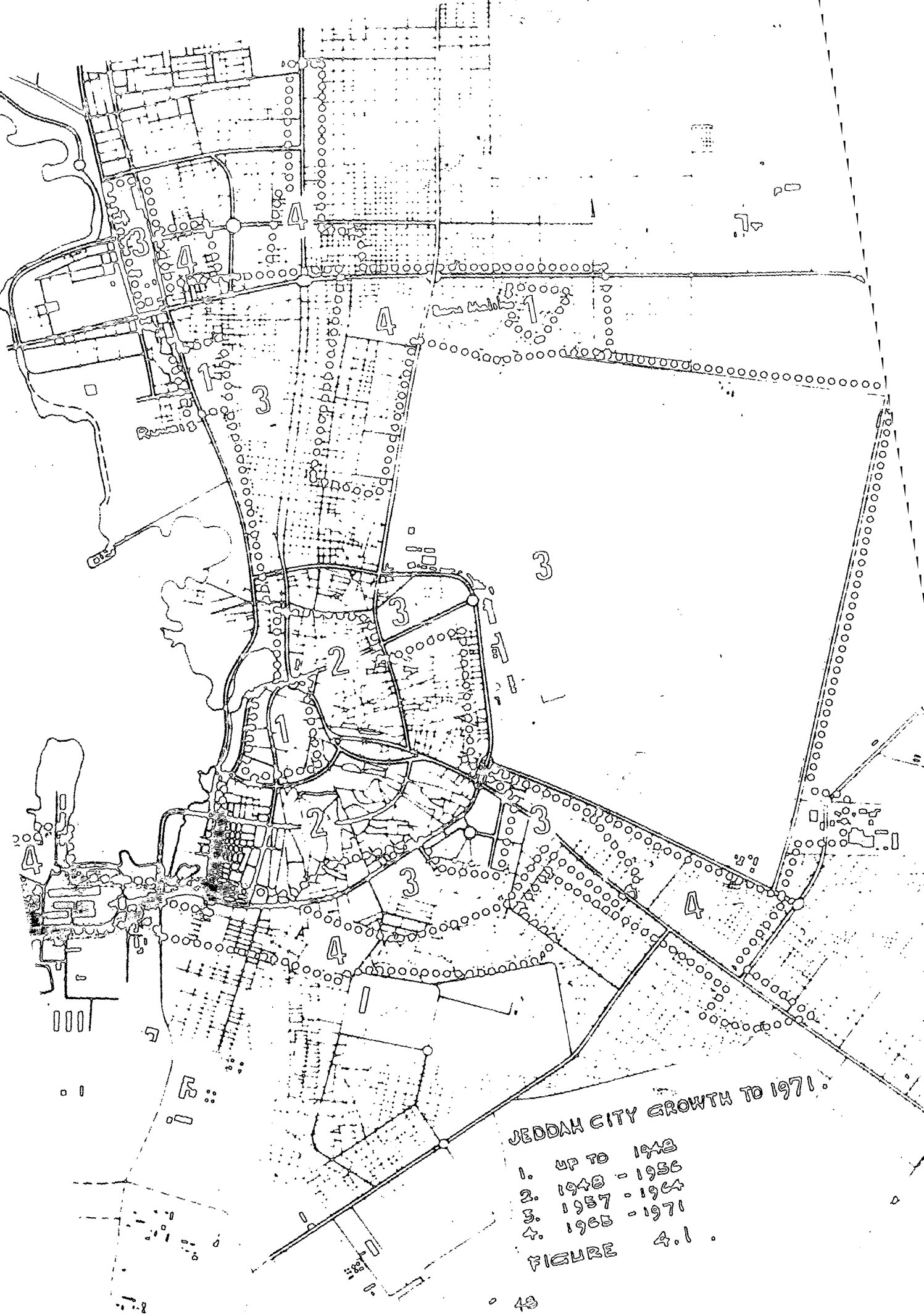
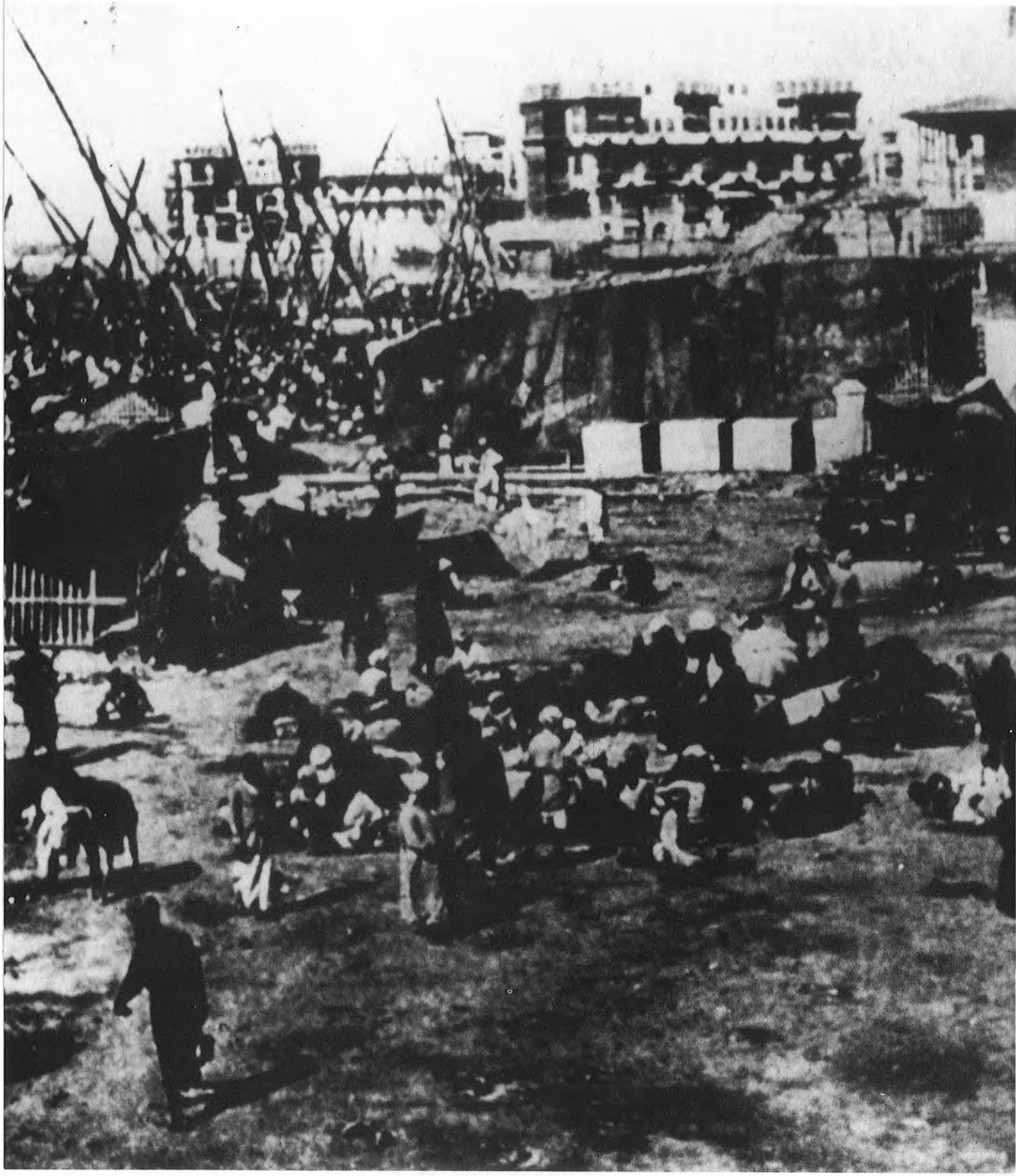

JEDDAH CITY GROWTH TO 1971.
1. UP TO 1948
2. 1948 - 1956
3. 1957 - 1964
4. 1965 - 1971

FIGURE 4.1.



A VIEW OF JEDDAH IN THE 1920^{s}
(HARBOUR & CUSTOMS HOUSE - BEIT BAGHDADI IN BACKGROUND)
SOURCE : MUNICIPALITY OF JEDDAH ARCHIVES

FIGURE 4.2 .

AERIAL PHOTOGRAPH OF JEDDAH - 1948

SOURCE : MUNICIPALITY OF JEDDAH ARCHIVES

FIGURE 4.3 .

INTRODUCTION

In 1968 the Government of Saudi Arabia, through the Ministry of Interior, Department of Municipal Affairs, requested the United Nations to advise them on how to prepare a programme of regional and city planning for the Kingdom. The UN set up a committee, chaired by Dr Omar Azzam (head of the UNDP Mission in Beirut) with members from several Arab, European and American countries. The British member of this committee was the late Professor J R James, who was the Chief Planner in the British Ministry of Housing and Local Government from 1961-1967 and subsequently Professor of Town & Regional Planning at Sheffield University.

The Committee realised that Consultants would be required to initiate and carry out such a major programme of regional and city planning. Based on a pioneering study on planning by a Saudi, Abdulaziz Hussein Felemban, in Kuwait University, (see Appendix B for an extract from this work), the Kingdom was divided into five regions:

1 The Central Region
2 The Western Region
3 The Eastern Region
4 The Northern Region
5 The Azir Region

Consultants of international stature were shortlisted and, with Members of the Municipal Affairs Department under Senior Planner Eng. Saud Lingawi, the Committee visited their offices. Several consultants were then invited to Riyadh to discuss how they would approach tackling regional and city planning in Saudi Arabia.

In 1969-70 the Committee recommended that the British practice of Robert Matthew, Johnson-Marshall and Partners (RMJMP) be given the first appointment and that this should be for the Western Region. RMJMP then spent over a year drawing up an Agreement with the Ministry to prepare:

> "A Regional Physical Plan and Master Plans and Detailed Plans of the Major Cities - Mecca, Medina, Jeddah, Taif and Yanbu - in the Western Region of the Kingdom of Saudi Arabia."

This Agreement subsequently formed the basis on which consultants were appointed for the other four regions.

BACKGROUND TO THE PREPARATION OF TERMS OF REFERENCE

Experienced planning consultants know that such is the complexity of major planning projects that, no matter how precise or detailed the Terms of Reference, much will remain to be resolved as the work proceeds. It is thus important, to establish a "modus vivendi" with the client so that clarification and agreement on the meaning, methodology or purpose of the project can be maintained during the progress of the work. If this relationship can be achieved, a productive and positive outcome to the project is likely.

Planning projects are service rather than product orientated. Contracts in Saudi Arabia carry heavy financial penalties for delays[1]. Thus, adherence to the agreed programme is vital. Also, as consultants incur heavy initial setting up costs, fee payment by stage of work is essential. This conflict, of the nature and scope of a planning study on the one hand and of financial pressures and cash flow problems on the other, is a far from ideal way to carry out a major planning project; yet, it is in this way that consultants are appointed. A better understanding of the nature of planning studies on the part of the client and the demonstration of proficiency by the consultant is perhaps the way in which this gap can be bridged.

To this end, a consultant must study the project brief with great care. If he finds that it is generalised or inappropriate, then he should seek to achieve more pertinent terms of reference otherwise he will place himself and the project at risk. This important matter and how it is resolved could be regarded as the first test of the future client/consultant relationship. If both pass the test, then, given continued dialogue, proficiency on the part of the consultant; interest and support by the client; then a positive outcome should be achieved. It is also important that the consultant is clear as to the client structure he is dealing with. Where the client lacks experience of the scope and nature of a major planning project, the consultant should exercise diligence

in informing the client on how such projects can best be carried out. The "business" approach of first securing the contract then asking questions is not the way for a planning consultant to proceed - neither in technical terms, expection of reasonable financial equilibrium, nor in building a positive relationship with a client.

In the case of the Western Region, the preparation of the Terms of Reference and the Programme, then reaching agreement on staffing and fees took fifteen months of joint effort to accomplish.

THE TERMS OF REFERENCE

Agreements in Saudi Arabia, whether for consultants or contractors (indeed, in 1971, no difference was seen between the two by the Government) are formidable documents. When signed, the consultant is irrevocably committed to complete his tasks to the client's total satisfaction.

The major item of an Agreement is the Scope of Services to be provided. This is, however, only one of eighteen to twenty Articles. Non-technical Articles deal with matters required under Saudi Government Regulations such as the Labour Laws, Tender and Contracts Regulations and taxation matters[2]. A standard arbitration clause[3] allows disputes of a technical nature to be settled by an arbitration commitee of three members, one appointed by each of the two signatories to the Agreement and a third member to be agreed mutually. Non-technical disputes must be referred to the Diwan Al Mazalim - in effect the equivalent of a

British High Court Judge.

Agreements are prepared in Arabic, the language of Saudi Arabia. Normally, an English translation is also provided, but Arabic remains the legal basis of interpretation of the Agreement. Arabic is also the required language of communication. All matters, letters, reports, files, maps, etc. must be in Arabic. However, English is the second language of the Kingdom and is spoken and understood by almost all trained Saudis. In practice, all non Arab consultants and contractors adopt a dual Arabic-English approach to all written material.

Total confidentiality of all information was insisted upon by the Ministry. Thus, all maps, documents, reports, etc. were exclusively the property of the Ministry and could not be made available to any other source unless written approval was granted by the Ministry. Specific mention was made, however, that use of information for professional and educational purposes would be permitted. As this requirement remains in force even after the termination of the Agreement the writer received permission from H E Eng Mohammed Said Farsi, Mayor of Jeddah, to prepare this work[4].

The scope of services consisted of five stages:

1 Preparation of mapping.

2 Evaluation of existing conditions of the Region and its main cities (Mecca, Medina, Jeddah, Taif

and Yanbu) and making recommendations for dealing with all aspects requiring immediate action.

3 A framework for a Regional Physical Plan and Development Programme for the Western Region.

4 Master Plans and Reports for development of the major cities of the Region, Mecca, Medina, Jeddah, Taif, Yanbu and a village cluster.

5 Action Areas requiring detailed plans where specific and immediate development is required.

This work is concerned with the City of Jeddah. The point must be made, however, that the scope of services embraced regional, urban and local planning.

The Western Region covers a land area larger than the United Kingdom (381,000 sq km compared to 244,000 sq km). Most of the Western Region is uninhabitable, being either desert, rock or lava and, in 1971, the total population was approx 1.6 million. Thus, while physically, socially and economically, Saudi Arabia's Western Region is totally different from, say, a region in Europe, the need for planning at first regional, then city level, remains valid. Indeed, as a city of any magnitude is a recent phenomenon in Saudi Arabia, it is even more necessary to view the wider picture in order to identify matters such as the patterns of population movement; the nature, distribution and interaction of activities or the growth and development of communications by road, sea and air

between settlements. Only within such a perspective does it become possible to identify the role and function of the city and, from this knowledge, to create a supportive, rather than competitive, whole.

Within this overall context, the technical specification for the preparation of the Master Plan for Jeddah contained the following elements:

General

a) The relationship and implications of the city to regional policies.

b) The city's main functions: administrative, commercial, industrial, cultural, etc.

c) Historical growth of the city and architectural and aesthetic values, character of the city

d) Structure of the city. Description of existing structures (type, height, use, services, etc). Land ownership.

e) The principal problems of physical planning.

f) The major purposes of the Plan and the relationship of the Plan to more detailed local plans.

Population and Housing Needs

a) Population projections for the town as a whole and distribution by neighbourhood.

b) Housing needs derived from population increase,

rehousing and redevelopment programmes.

c) Obsolescent housing, housing policies for improvement and replacement.

d) Residential density policy.

e) Land requirements for five, ten and twenty year periods.

f) Distribution of new residential areas, direction of future growth and overspill arrangements.

Employment

a) Composition of employment, future trends.

b) Distribution of employment centres, office, shopping, industrial etc. within the city.

c) Broad distribution of incomes.

d) Employment needs.

e) Industrial location policy.

f) Skills and training.

Civic, cultural and commercial centres

a) The Hadj and religious centres.

b) Areas of special historic, architectural and cultural quality where special measures are required for conservation and development.

c) Distribution of functions in central areas and sub-centres.

d) Growth and location of shopping and office centres.

e) Growth and location of other community services, including health and education.

Education and conservation areas

a) Policy for recreational development.

b) Policy for tourism.

c) Major recreational areas.

d) Preservation of coastline.

e) Conservation areas.

f) Development control on the outskirts.

Primary communications

a) National and regional routes, including motorways, connections from these to urban centres.

b) Major urban and rural routes (other than (a) above).

c) Development of port and dockyard facilities.

d) Railways and other forms of communications.

Transport

a) Land use/transport study, summary of changing demand.

b) Locational policies, redistribution of main traffic generators.

c) Traffic control policy.

d) Primary road network.

e) Public transport.

f) Environmental management policy.

g) Pedestrian movement.

h) Car parking policy.

i) Investment needs for five, ten and twenty year periods.

Power supplies and utilities

a) Location and distribution of existing services and population served.

b) Proposed facilities and services.

Land Use

a) Existing land use map showing all major land uses and communications.

b) Development plan map showing proposed land uses.

c) A central area map where indicated by the scale of change.

d) An implementation map.

e) A written statement summarising the major policies.

f) Proposals for future action area plans. Existing and proposed town planning legislation and regulations.

These Terms of Reference were the result of a joint effort by the Ministry, its advisers and the consultants. The consultants were appointed at the end of the selection process mentioned earlier in this Chapter subject to the proviso that agreement would be reached on the Terms of Reference before a contract would be formalised. The consultant's fee, which was negotiated on the basis of staff and overhead costs, was also agreed during this post "appointment-in-principle" period.

NOTES

1. Delay Penalties

Government regulations require the application of financial penalties to Consultants and Contractors for the late submission of reports or plans or completion of work. This applies to each stage, or sub-stage of the work in the following manner:

1 week's delay	1% of the value of that stage
1-2 weeks' delay	1.5% "
2-3 "	2% "
3-4 "	2.5% "
Any period more than 4 weeks' delay	3% "

These delay penalties are rigorously applied. Thus, the consultant HAD to keep to his programme or be penalised. In practice, the weakness of this system was that it led to an approach of submitting reports on time whether or not a proper job of work had been achieved.

2. The constitution of Saudi Arabia is based on the Holy Qur'an and the Sunna (Tradition of the Prophet). Islam is held to be a way of life and to provide a practical legal system, laying down precise rules of behaviour in private, social and business life. Saudi Arabia thus follows the Sharia', or religious law, in regulating the Kingdom's affairs.

3. Arbitration

A standard Article on arbitration reads as follows:

Disputes and Differences

If and when technical disputes arise between the two parties to this AGREEMENT, these disputes shall be referred to arbitration by a committee formed by three members (technical engineers of good experience) as follows

> delegate chosen by the MINISTRY
> delegate chosen by the CONSULTANT
> delegate approved and selected by both parties in writing. In case the two parties do not agree on the selection of this delegate within a period of one month, the delegate shall be named by the Diwan Al Mazalim.

The above mentioned delegates shall have no direct or indirect connection with the work which is the subject of the dispute, and their decision shall be final and binding on both parties and shall not be subject to any appeal. The decision or judgment shall be made by majority.

Other disputes which are not technical shall be sent to the Diwan Al Mazalim in Saudi Arabia and his decision shall be final.

Each party shall pay the costs of their own delegate and share the cost of the third delegate equally. Work under this AGREEMENT shall if

reasonably possible continue during the arbitration proceedings and payments of fees due to the CONSULTANT for work other than the subject of the arbitration shall not be withheld by the MINISTRY because of such proceedings.

4. Copyright and Security

Letter from H.E. Eng Mohammed Said Farsi, Mayor of Jeddah, giving permission to prepare this work is attached as Appendix A.

THE PROGRAMME AND TEAM, INCLUDING THE SAUDI SECONDED STAFF

CHAPTER SIX

BACKGROUND

In the negotiations prior to their appointment, RMJMP were requested to introduce a training element into the scope of work. This was due to the wish of the Saudi authorities to create a cadre of experienced planners. Also, in the sensitive matter of planning the Holy Cities of Mecca and Medina, local Muslim professionals could be used.

RMJMP welcomed this approach for three reasons. First, it would make a signal contribution to the cultural and language problem. Secondly, even though rich with oil wealth, at that time Saudi Arabia did not have enough trained and experienced technical personnel to manage its affairs. Thus, training indigenous professional and technical manpower was accepted by RMJMP as a useful step towards attaining manpower self-sufficiency. The third reason relates to the effectiveness of planning consultants. It has often been the case that consultants' reports, though they look and read well, have failed to have their proposals and plans implemented. This could be because the proposals were inappropriate to the needs or mechanisms of plan implementation; or because after the departure of the Consultant on completion of the plan-making stage, the translation of report to reality was beyond the capacity of the client.

Thus, to have an indigenous team participate fully in the plan making processes would strengthen the likelihood that the implementation of the plans would be achieved.

Accepting the validity and need for a training programme, however, left many matters of a practical nature which were of concern to RMJMP. Wherein would lie the responsibility for the direction of the work? With an extremely tight work schedule, would training be compatible with the speed and rate of work required? In other words, would a demanding work programme allow sufficient time to ensure the success of a training programme? And, could a Christian team of expatriate British professionals merge with an inexperienced team of Muslim "trainees" into a homogeneous and harmonious whole?

Answers to these questions could not be resolved prior to actually starting the work. From the contractual point of view, however, it was made clear by the Saudi authorities that leadership and responsibility would lie with the consultants.

THE PROGRAMME

The overall scope of work, programme and team was for the purpose of preparing a Regional Plan and detailed plans as well as Master Plans for five cities, of which one was Jeddah.

Five months was required to prepare new mapping. This, the initial stage of the programme, required a special

arrangement to allow work to start on map preparation in advance of signing the Agreement. This was necessary because aerial photography is possible only during the few cool winter months. In summer, the heat haze makes it impossible to obtain clear photography.

The four planning stages which followed the preparation of the mapping were programmed for completion in thirty months. The start date specified in the Agreement was the 5th May 1971.

Stage Two, Existing Conditions and Immediate Action Proposals, occupied the first year of the programme. This stage included carrying out four major primary surveys - socio-economic, transportation, natural resources and basic land use.

Stage Three, the Regional Plan, was in three parts. First, the Regional Framework, produced at the end of month ten. This was a key document as it established the statistical base and context for all future work at regional and city level. The Regional Plan, first as a draft and then a final report comprised the following two parts of this Stage. This work was to be completed by month twenty.

Stage Four consisted of the preparation of the five Master Plans for Mecca, Medina, Jeddah, Taif and Yanbu. This started in month eight (i.e. an overlap between each stage took place) and was again in three parts. First, an

Existing Conditions and Alternative Urban Strategies Report for each city (to be completed by month fourteen), followed by a draft and then final Master Plan and Report. Completion date for this stage was month twenty-seven.

Stage Five required the production of detailed 1:1000 scale Action Area Plans and Reports. An initial stage, to be submitted at the end of month sixteen, was to recommend the selection of the areas to be studied. Work was programmed to start in month twenty (which coincided with the submission of the Draft Master Plans), with the draft and, subsequently, the final submissions to be completed by month thirty.

Monthly progress reports were to be submitted at the end of each month. Including these progress reports, a total of seventy-nine reports and plans were to be submitted during the thirty month study period. These were all to be in Arabic and English. A list of the reports relevant to Jeddah is set out in the bibliography (Appendix G) to this work.

As the Ministry had to give written approval to each submission a one to two month consultation and review period separated each part of each stage of the programme. All final reports were to be submitted in draft form, which, when approved (including amendments as required), allowed the printing of the final report.

Authority for approval of the plans and reports was vested

in a High Committee supported by a Technical Committee, which were established for this specific purpose. In the case of Jeddah, the committee membership was as follows:

High Committee

HRH The Governor of Mecca, Chairman
HE The Deputy Minister of Interior for Municipal Affairs
HE The Deputy Governor of Mecca
HE Dr Omar Azzam, Town Planning Advisor
HE The Director General of Town Planning
The Director of the Town Planning Office, Jeddah
HE The Mayor of Jeddah
The Chairman of the Municipal Council, Jeddah

Technical Committee

HE The Deputy Minister of Interior for Municipal Affairs, Chairman
HE Dr Omar Azzam
The Director General of Town Planning
The Director of the Town Planning Office, Jeddah

The study thus progressed from an intensive survey stage to collect information on such essential fields as transportation, land use, population and employment (paralleled with a first evaluation of the existing conditions in the cities and recommendations for immediate action), to strategic forecasts and plans at regional

level and then to Master and detailed plans at urban level.

THE PLANNING TEAM

A wide range of skills was required. Over the three years of the programme the emphasis changed from broad based natural resources, socio-economic, transportation studies at regional level to more detailed urban studies. Thus the contribution of the regional planner, sociologist, regional geographer, economist[1] and transportation planner[2], gradually was replaced by that of the architect-planner, urban geographer, highway and infrastructure engineer. Of necessity, this change in emphasis took place within a consistent thread of thought, evolution and development of the planning process.

The UK element of the team comprised five full time members supplemented over the first twenty months by five senior visiting experts. During the last fifteen months, three senior architect-planners replaced the regional planner, geographer and economist. This professional team was supported by three Arabic-English speaking local technicians and an administrative staff of ten. A key member of the administrative staff was the translator who, because of the volume of work, was one of the hardest pressed members of the team. The writer was the full-time resident director of the project.

Initially, the Saudi seconded team consisted of a geographer-planner (Abdulaziz Hussain Felemban, the

planner whose thesis had helped to initiate regional planning in the Kingdom), three architect-planners, a civil engineer and three draughtsmen, i.e. a total of eight Saudis. At the end of the first year, the training programme was considered so successful that these numbers were doubled.

The Ministry designated a liaison officer to supervise the work of the Saudi seconded team and to support the consultants' project director. The architect appointed to this post was Eng. Mohammed Said Farsi, at that time the head of the Western Region Planning Department, but later to be appointed the Mayor of Jeddah. Eng. Farsi helped considerably to bring together the British and Saudi staff into a creative, effective and harmonious team. He was also a tower of strength in facilitating access to information, securing of visas and permissions and, generally, supporting the team in every way.

NOTES

1 The consultants RMJMP socio-economic team members were supported by the expert assistance of the late Harold Caustin OBE, a former UNDP Head of Mission to Libya.

2 The Highway engineering/transportation planning input was provided by the consulting practice of Jamieson Mackay and Partners (JMP) under the overall direction of RMJMP. The senior partner of JMP, George Jamieson, was personally involved as a visiting expert.

> "The stewardship of the planner is of a higher degree than the stewardship of the owner. To the planner has been entrusted the oversight of all the lands in the community ... It involves a love for God who gave the land, a love for the community and for each individual in it, no matter how unlovable."
>
> David Craig, in "Planning" 1960, Chicago

Planning, as seen in this light, places a heavy burden of responsibility on the planner.

Planning deals with today in the context of yesterday and tomorrow. It is a means to an end. That end being to secure order, regulation and a degree of control over the changing face and nature of man and his environment and to do this in a way which improves the function and the beauty of the whole and each of its parts. The future cannot be predicted within narrow or accurate limits; to different people or groups it can mean different attitudes, priorities or aspirations. To a nation or a government, local or central, it should mean the wise allocation of resources towards the achievement of coherent, sensible and affordable objectives. Within this, often changing, often ill-defined, remit the planner has to find a broad consensus; identify needs; promote order and method to achieve goals and objectives; be prepared to review and reconsider both objectives and plans in the light of their continuing relevance to society and the locus to which

they apply. It is also likely that the planner will be involved in the conflicts which occur between the needs of today, as seen or required by the public, and his views on the longer term, but nonetheless essential, needs of tomorrow.

In all of this, the planner needs to be creative, to retain a sense of strategy and to direct tactics towards and not tangential to the attainment of the longer term strategy. This requires wisdom, experience and leadership. Without such attributes, planning can become a negative and bureaucratic system out of touch with the society and community it serves.

In his address to the Municipality of Jeddah, as part of a training seminar for Engineers[1], Roy Gazzard expressed his views on the subject of growth and change as it relates to the responsibility and attitude of the planner. He considered that in Arab society, today, there are five distinct areas of change. A slightly edited version from the tape recording of this address is as follows:

> "First - philosophical change. How we relate to the secular and religious world around us. The extent to which the Islamic structure can accommodate change in science and technology and yet still retain its integrity. Second, the area of scientific change. Scientists have been instrumental in changing the basic concepts of what man thinks about himself and the world about him. Third, technological change - an offshoot of scientific change. Technology will continue to advance at an ever-increasing rate bringing dramatic changes in the pattern of life itself. Against the evolving technological background development has to be viewed as a continuum which does not begin or end within the period of plan-making and implementation. We inherit from the past but we also

> borrow from the future. The moral imperative therefore is to leave this world a better place than we found it and, as such, a worthy future inheritance. This is why we retain old buildings. A town without old buildings is like a man without a memory. We need the buildings of the past to serve as signposts to the future and as markers against which we can measure progress. Fourth - social change. How will people continue to live together in harmony and accord in a period of rapid change. Finally, the all important changes in sensory experience. The way things are packaged and presented. The emergence of fads, styles and simulated forms. A good example is Jeddah's highly representational metal sculpture simulating the natural plant form of papyrus. In course of time natural planting has developed around it so that now we view the sculpture not as an isolated art object but as part of a more satisfying and creative entity. Sensory change in our towns and cities is concerned with the quality of design and creativity - something which is self-evident here in Jeddah. In the British new town of Killingworth is a sculptural form which is a replica of the Horns of Minos - some 4,000 years old. The fact that it is plastic rather than stone and serves as an extractor for cooking fumes and admits daylight to a works canteen does not detract from its value as a work of art. It introduces humour and humanity to the townscape. Less worthy perhaps is the standard deformed American supermarket deliberately designed to shock and scandalise."

Planning a city starts with an awareness of its history and traditions; its particular characteristics, problems, needs and aspirations; its healthy and developing institutions and way of life. This does not imply that change is unnecessary or undesirable. But continuity between yesterday, today and tomorrow should be maintained, particularly in the social and cultural customs of the people and in the physical manifestations of its history as expressed in the city's built environment. Links to the future should be evolutionary and positive and stem from existing roots and functions.

Jeddah is an ancient Arab city which has withstood the

vicissitudes of history. The Plan for such a city should be built upon these qualities and should not be the vehicle for their destruction, debilitation or decay.

To reinforce the concept of how almost impossible it would have been to foresee what the Region and the City of Jeddah would be like in twenty years time - the period for which the Master Plan was to span - it is relevant to look back twenty years - to 1951 - and to describe the situation which pertained then.

Jeddah had just started to expand outside its city wall, which had been demolished only a few years earlier. About 50,000 people lived within an area of not more than three sq km. The motor car had not yet replaced the camel and donkey as the principal means of transport of people and goods. Water was a limited and precious commodity and air conditioning still a future luxury. Sailing ships as well as steamers plied their trade, but many wrecks highlighted the dangers of navigation through the reefs that guarded the Quay. The Turkish built Custom House still commanded sea trade and the reception of the pilgrims en route to the Holy City to perform Hadj. The number of foreign pilgrims arriving at Jeddah in 1951 was about 100,000[2], probably at that time regarded as a great influx, but small compared to twenty years later when the number of foreign pilgrims had grown to almost half a million.[2] In 1951 the pilgrimage involved long and often arduous journeys by sea or land and the 73km journey from Jeddah to Mecca was measured in days, not hours. No asphalted

roads existed.

Because of the great size of Saudi Arabia and the poor communications the journey to Riyadh, or northwards to Tabuk and the neighbouring countries of Jordan and Iraq took weeks. Thus, Jeddah had an almost entirely self-contained economy and was, to a large extent, isolated from the other provinces of the Kingdom. A few single or twin engined aeroplanes made use of the desert landing strip to the north-east of the city, often bringing King Abdulaziz, who still ruled, or members of the Royal Family or important visiting guests to the city. The outside world was still recovering from the effects of the Second World War.

Saudi oil production was in its infancy. Wealth was calculated in gold and silver, with the English Sovereign and the Austrian Maria Theresa Thaler the main trading currency. Day to day life was not appreciably different from that of previous generations.

If we compare this situation to that of twenty years later, it is evident that a plan prepared in 1971 could not aspire to remain unchanged throughout the following two decades.

One example of the impact of technology on a hot dry climate such as that of Jeddah illustrates the changes which can take place to city growth, social improvement and economic development. Without water, urban growth is not

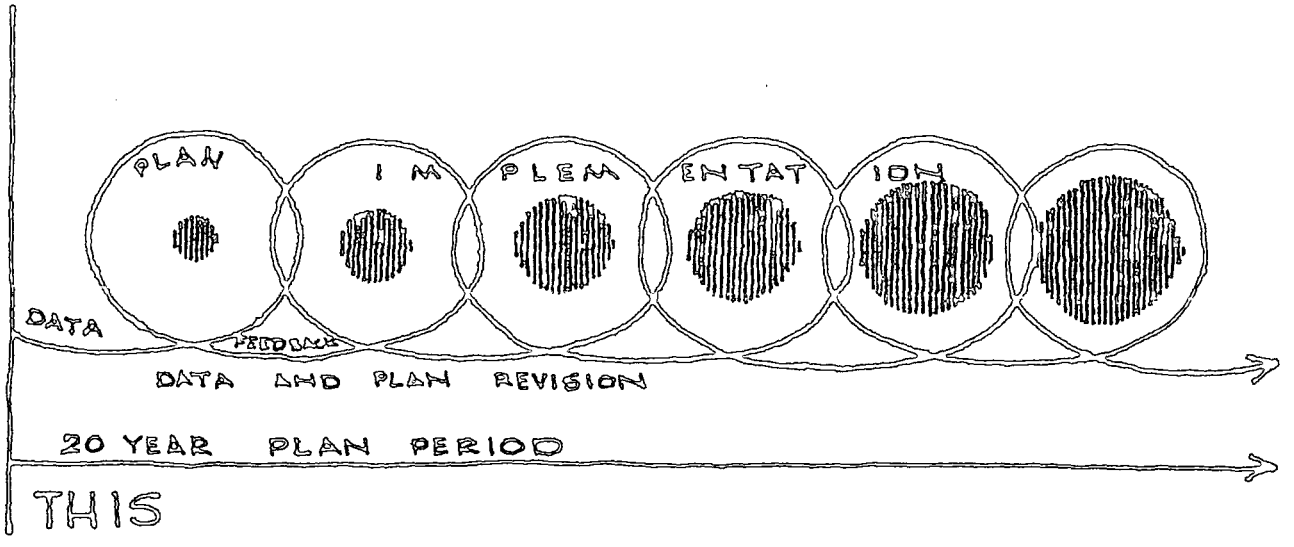
possible. During their occupation of Jeddah, at the turn of the 20th Century, the Ottomans installed a sea water condensation plant which was noisy, inefficient and produced only a modest amount of potable water per day (this plant introduced a new "arabic" word into the vocabulary of the people of Jeddah - 'kindasah'). Oil revenues allowed Saudi Arabia to apply the rapidly growing technology of desalinating sea water to provide potable water. Under the leadership of HRH Prince Mohammed ibn Faisal Al Saud, first as a Deputy Minister in the Ministry of Agriculture and then as Minister for Desalination Affairs, a massive desalination programme was initiated in the early 70s to provide abundant water for the City of Jeddah. This thus secured a fundamental requirement for urban growth.

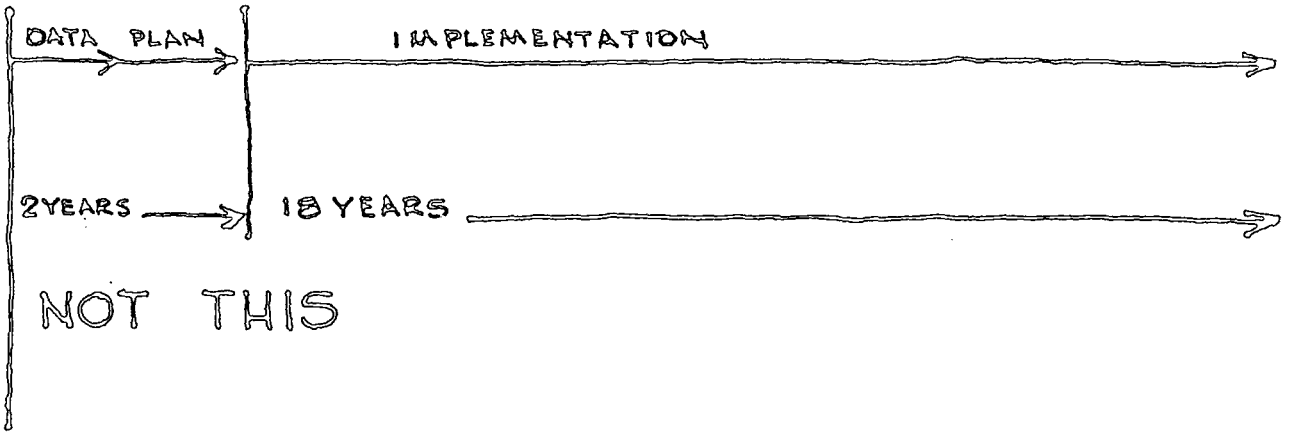
The approach adopted in the preparation of the Master Plan for Jeddah aimed at flexibility and continuity; more the setting up of a process of planning, than the production of a plan. In this way, the process would be able to respond to growth and change. Hopefully, the minimisation of waste, in terms of both human and financial resources, would also be possible. The process adopted is shown diagrammatically in Figure 7.1. Within this philosophy of planning, the methodology of the plan process is set out in sketch form in Figure 7.2.

NOTES

1 Municipality of Jeddah: Training Seminar for Engineers 13-15 February 1984. Report published by the Centre for Middle Eastern and Islamic Studies, University of Durham.

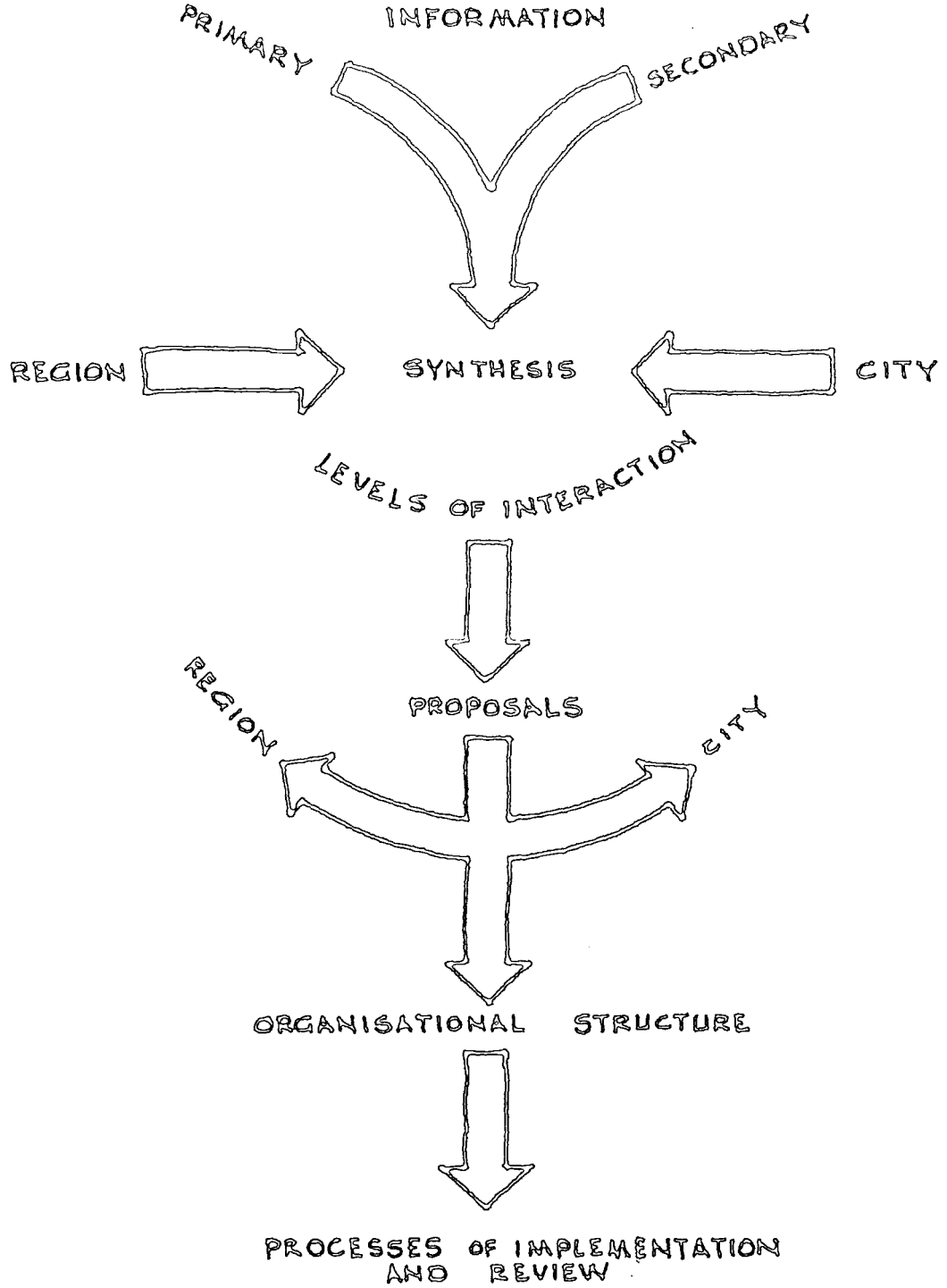
2 Estimates derived by RMJMP in The Hadj - Special Action Area Study, September 1972, Chapter 8, Figure 8.1 and Table 8.1





THE PLANNING PROCESS: ONE.

FIGURE 7.1.



THE PLANNING PROCESS: TWO

FIGURE 7.2.

BACKGROUND

When RMJMP commenced their planning studies for the Western Region and its major cities, no accurate information was available on two subjects which were basic to the plan making process. Thus, primary surveys had to be carried out to obtain, first, socio-economic/housing data which would yield information on the existing situation and from which predictive modelling of future levels and characteristics of population and employment would be based, and, second, data on transportation and highways This, again, was essential in understanding and analysing the existing situation and thereafter for plan making purposes.

THE SOCIO-ECONOMIC SURVEY

The socio-economic survey was based on a 5 per cent random sample. Such a small sample frame requires the application of a rigorous and consistent methodology. With the assistance and approval of the Central Department of Statistics (whose observers maintained a close scrutiny on all stages of the survey), this was achieved. The survey methodology and the questionnaire used are set out in Appendix C.

The results of the survey established that, in 1971, the population of Jeddah was 381,000. The salient demographic

features of Jeddah at that point in time are summarised in the following Tables.

Table 8.1: Sex

	%
Male	54.31
Female	45.69

Table 8.2: Age Group

	%
0 - 4	17.67
5 - 14	28.52
15 - 24	15.27
25 - 44	27.36
45 - 64	8.83
65 and over	2.35

Table 8.3: Marital Status

	%
Married	36.47
Single	59.88
Widowed/divorced	3.65

Table 8.4: Place of Birth of Head of Household

	%
Same house	3.52
Same Hara	3.29
Same city	4.97
Other	88.22

Table 8.5: Nationality

	%
Saudi	57.94
Non-Saudi	42.06

Source: RMJMP Social Survey, 1971

From an analysis of aerial photography which had been taken in 1948 and based on discussions with selected Saudi heads of households, Jeddah's population in 1948 was placed by RMJMP at approx 50,000, thus giving a total increase of about 330,000 people over the period 1948-1971, i.e. an average growth rate of approx 9% compound per annum. Table 8.4 indicates that, with 88% of heads of households born outside Jeddah, immigration was a major factor in this population growth. Of these immigrants, about 60% were born outside Saudi Arabia. This concentration of immigrants, both Saudi and non-Saudi, is understandable when it is appreciated that Jeddah is the port of entry for the great majority of foreigners. Also, the rapid growth of Jeddah's economy meant that jobs were available to both Saudis and foreigners. This admixture of indigenous and foreign workers echoed the manner in which previous periods of growth occurred.

The significantly higher percentage of males to females as well as the near 60% single status of the population can be explained by the large proportion of foreign immigrants. When compared to an age group distribution of over 46% fifteen years or under (Table 8.2), the rather low average household size of 5.06 is a further reflection of the large amount of non-Saudi households.

Of the heads of households in the social survey sample, 88% were born outside Jeddah, and 29% had moved into Jeddah in the 5 years preceding the survey. Most of the

immigrants were foreigners. About 60% of those born outside Jeddah were also born outside Saudi Arabia and 58% of those who had moved into the city within the last 5 years had lived in foreign countries at the beginning of the period. About 47% of the heads of households and 42% of total population did not state Saudi nationality and Jeddah had rather more than half (53%) of the total number of non-Saudis in the Western Region urban sector. Since male foreign immigrants outnumbered females, the population of Jeddah contained a rather high proportion of males. In one respect, however, Jeddah's population structure followed a norm established throughout the Western Region : its age structure was heavily biased towards young people with 46% under the age of 15 and only 2% aged 65 or over.

Despite its strong specific economic functions as the Kingdom's commercial capital, diplomatic centre and main port, Jeddah in 1971, did not differ appreciably in employment structure from the rest of the Western Region urban sector (see Table 8.6). A slightly higher proportion of the workforce was engaged in the transport/communications industry and the proportion engaged in government services was actually lower than in the other cities. The concentration of the Western Region's manufacturing industries in Jeddah did not appear to make much difference to the relative size of the city's basic economic sector. In other words, establishments such as the port, airport, diplomatic complex, wholesaling

trade and other industries which cater for regional, national and international markets, were relatively small in employment terms and almost submerged by the local service sector which consisted of industries such as small shops, garages and cafes. Since the composition of this general local sector was fairly similar in each city of the Region - reflecting a general uniformity in technology, tastes and income levels - its large size provided a levelling influence which made their economies very similar to one another.

Table 8.6: Employment Structure: Jeddah and the Urban Sector*

	Jeddah %	Western Region Urban Sector %
Primary Industry	3.4	2.1
Manufacturing and Handicrafts	3.6	2.1
Construction	10.4	10.0
Distribution	17.8	17.8
Transport and Communications	12.6	9.8
Electricity and Water	2.0	1.7
Education	2.6	4.3
Other Government Services	15.5	23.5
Other Private Sector Services	32.1	28.7

Source: RMJMP Social Survey, 1971

* The Urban Sector is the aggregate of the five main Western Region cities (Jeddah, Mecca, Medina, Taif and Yanbu)

This similarity was also reflected in the occupation structure. The proportion of workers in professional and higher

managerial occupations was only slightly higher in Jeddah than in the whole urban sector and the proportion in all non-manual occupations was only slightly lower. Personal incomes were rather lower in Jeddah than in the whole urban sector, but because a higher proportion of the population was in employment, per capita and household incomes were similar to those in the urban sector (Table 8.7). However, Jeddah households had a rather better provision of vehicles: 25% owned vehicles against the urban sector average of 22%.

Table 8.7: Household Income: Jeddah and the Urban Sector

	Jeddah %	Urban Sector %
Less than SR 400 per month	46.4	45.9
SR 401 - SR 1000 per month	35.9	37.1
Over SR 1000 per month	17.7	17.0

Source: RMJMP Social Survey, 1971

The housing survey indicated only a very small proportion of detached villa style houses. Villas, shanties and apartments were all more prominent in Jeddah than the Urban Sector, as would be expected in a metropolitan centre with higher land values (giving rise to apartments), large numbers of immigrants (giving rise to shanty housing) and a sizeable affluent middle class (giving rise to villas). The proportion of households who rented accommodation was also higher in Jeddah, largely because of the prominence of foreign immigrants, who are

not allowed to own land, as indicated in Table 8.8.

Table 8.8: Type of Accommodation: Jeddah and the Urban Sector

Dwelling type	Jeddah %	Urban Sector %
Detached	4.3	3.1
Non-detached	51.1	61.6
Apartment	28.3	23.4
Shanty	15.7	10.1
Others	0.6	1.8
Percentage of households which rent accommodation	64.6	57.0

Source: RMJMP Social Survey, 1971.

The highest residential densities occurred in the city centre (the historic core) where 82% of the dwellings were apartments and the density was 450 persons per hectare. Other densities of over 170 persons per hectare were confined to the southern part of the city. A middle density category of 80 to 170 persons per hectare occurred in the remaining part of the city within the Bagdadiah-Airport-Harbour Ring Road and in the outer southern suburbs. The remaining parts of the city (the northern and eastern suburbs) averaged 61 persons per hectare or less. The proportions of the population living within the three density categories were as follows:

Table 8.9: Population/Density Categories

	%
Over 170 pph	42.5
80 - 170 pph	36.8
Less than 80 pph	20.7

Source: RMJMP Social Survey, 1971

Thus, the main lines of socio-geographic differentiation were South against North and East as opposed to Inner against Outer. In this respect, Jeddah conforms more closely to Hoyt's model of the "sectoral" city than Burgess's model of the "concentric" city. An explanation would seem to have been as follows:

a The Mecca and Medina Roads were the first roads outside the old city walls to receive metal surfaces. 'Living near the asphalt' had always conveyed a certain social prestige which was still evident in 1971. (Land prices are higher for plots which front onto asphalt roads and they drop sharply as one moves further away.)

b In the same period that the Mecca and Medina roads were improved the Sebeel area to the south of the old city was released by King Abdulaziz specifically to be occupied by low income immigrants to the city.

c At an early stage in the city's development the Northern and Eastern areas came under the ownership of speculatively orientated large landowners. In order to maximise their returns they divided their land into

large grid iron plots, initially for villa development - although as land values rose the more central plots were used for high status apartments.

Because of the difficulty of tracing such events back in time it was difficult to say whether the third factor was independent of the other two. Were the landowners simply reacting to a pattern which had already been set or did they help to determine this pattern? Whatever the answer, it was clear that by the end of the 1960s the essentials of Jeddah's social geography had been decided. The 'images' of the south, east and north were finally set; high income residents were unlikely to consider dwellings in the south and low income residents were barred from settling in the north or east (except in a few enclaves) by high land prices and a lack of unappropriated land.

THE TRANSPORTATION SURVEY

The transportation/highways survey comprised five types of surveys:

1. Roadside interviews
2. Traffic counts
3. Home interviews
4. Journey time
5. Parking

The purpose of these surveys was twofold. First, to obtain comprehensive and compatible information on the existing situation. Secondly, to create a data base from which computer modelling techniques could be applied to examine and test the highway/transportation requirements

of future urban growth alternative population and employment distributions.

As with the socio-economic survey, pilot surveys were carried out to test the feasibility and methodology of the survey. The Jeddah Traffic Police Department, whose participation was essential, assisted the survey teams. The methodology adopted for the transportation surveys is set out in Appendix D.

The Roadside Interview and Traffic Count surveys comprised an external cordon survey (to obtain information on inter-city traffic movements) and 'screenline' surveys inside the city at selected points from which all traffic movements from one part of the city to another could be measured. Traffic counts applied to all traffic from which a sample was stopped and interviewed. This survey collected information on the origin, destination and purpose of traffic journeys.

During the 24-hour period of the external traffic movement survey, a total of 41,457 passenger car units (pcu's) entered or left the city. The flow during the morning and evening peak periods represented 12% and 14% respectively of the total daily traffic. The internal traffic counts gave the following totals:

Table 8.10: Internal Traffic Flows

24-hour Period	Morning Peak Period (0700 - 0900 hours)		Evening Peak Period (1700 - 1900 hours)	
	Flow	% of daily	Flow	% of daily
205,706 pcu's	22,099 pcu's	11	26,585 pcu's	13

Source: RMJMP Traffic Census, 1971

The roadside interviews indicated that during the morning and evening peak periods the amount of 'through traffic' (having neither origin nor destination within Jeddah) amounted to 1% of the total traffic crossing the external cordon. The computer analysis of the origins and destinations of the traffic crossing the external cordon indicated that the main traffic movements to and from Jeddah were: Locations near Jeddah 46.0%; Mecca 33.7%; Taif 8.1%; Central and North Region 4.0%; Baljurashi 1.9% and Medina 6.3%.

From the roadside interviews, the purpose of journeys was found to be:

Table 8.11: Individual Purpose of Journey (%)

Work	Shop-ing	Educ-ation	Social	Goods	Enter-tainm't	Home	Personal
49	3	0	4	5	8	29	2

Table 8.12: Individual Purpose (%) during Peak Hours

Work	Shop-ing	Educ-ation	Social	Goods	Enter-tainm't	Home	Personal
54	6	1	4	2	2	28	3

Source: RMJMP Traffic Census, 1971

For subsequent computer analysis, trips were combined into four purposes, as shown in Table 8.13. In this Table, a 'home based' trip is any journey which has one or both ends of the journey starting or finishing at home. A 'non home based' trip is any journey with neither end at home.

Table 8.13: Combined Person Trip Purposes
(Figures are percentages)

Home based trip purpose			Non-home based
Work	Shopping	Other	
40	9	45	6

Source: RMJMP Traffic Census, 1971

The Home Interview surveys were designed to collect information on the travel characteristics of different types of household, e.g. car owning or non-car owning households, and frequency and purpose of car journeys. A total of 973 valid home interviews were recorded. The findings of this

survey are set out in the following Table.

Table 8.14: Vehicular Types

Households owning vehicles						
% of total households	Private Vehicles	Taxis	Light Goods Vehicles	Heavy Goods Vehicles	Motor Bikes	Buses
55	446	14	22	3	75	4

An average of 6.5 trips per day was made by each vehicular owning household i.e. an average of 1.29 trips per person.

Source: RMJMP Traffic Census, 1971

Length of time of journeys, which was obtained from the Home Interview Survey, was found to be as follows:

Table 8.15: Trip Length in Minutes

Accumulative Percentage of Trips			
0 - 5 mins	0 - 10 mins	0 - 15 mins	0 - 30 mins
20	62	79	98

Source: RMJMP Traffic Census, 1971

The Parking Survey identified the locations of 'on street' and 'off street' parking in the Central Area of Jeddah. During the morning peak period 1,060 of a total of 1,433 street parking places were occupied and in the evening peak 827 places were occupied. A total of 1,042 off street parking places were counted of which 652 places were occupied during the morning peak and 763 taken up during the evening peak.

The road network within the central urban area of Jeddah

in 1971 is shown in Figure 8.1. The main network comprised 10.3km of dual carriageways; 6.4 km of 3 or 4 lane roads; 14.8km of two lane roads and 7.0km of unpaved roads. Thus, relative to the existing population in the main urban area of the city (230,000), there was 1km of paved road per 7,302 residents. However, although 82% of the main road network was surfaced, because of no apparent programme of maintenance work and proper reinstatement of road openings many of the surfaced roads were in poor condition.

Public Transport services were also surveyed as part of the Transportation Survey. In 1971, there was no organised comprehensive Public Bus Service. Small buses were permitted by the Traffic Police Department, but there was no set time schedule. The frequency and convenience of this service varied according to the attempts of the drivers (usually owners) to meet demand. Taxis were therefore an important element of public transport. Two taxi 'stations' catered for external trips; the larger station for Mecca/Taif or Medina and the smaller for the sea ports of Yanbu and Rabigh.

SEA AND AIR TRANSPORT

In former times all deep sea freight arriving at Jeddah was lightered by sailing dhows through the reefs to the Customs Quay. In 1951, the first pier, 658m in length and carrying an 8m road, was built. The pier could take two freighters simultaneously. A major expansion of the sea port was started in 1967 and, by 1971, was operational. This development increased the capacity to nine berths and, in addition, provided all ancillary equipment such as storage areas, an administrative complex, lighthouses and approach beacons through the reef. Vessels up to 36 feet draft and 650 feet length could now be accommodated. Cargo unloaded at the Seaport in 1969 was as follows:

Table 8.16: Cargo Unloaded at Jeddah, 1969

		TONS		
Timber	Iron	Cement	Other	Total
36,972	13,962	22,760	710,048	783,742

	ANIMALS		
Cows	Sheep	Camels	Total
47,744	1,293,585	25,661	1,366,990

Source: RMJMP Survey Reports, 1972

The Seaport also functions as the arrival and reception point for pilgrims coming by sea. In 1970, 86,137 pilgrims arrived at the Seaport en route to Mecca.

Jeddah International Airport developed on the site of the first runway built for King Abdulaziz in the late 1940s. At that time it was about two kilometres outside the city

wall in a north-easterly direction. By 1971, however, city growth surrounded the airport perimeter, and thus landing flight paths were over built-up areas. However, the writer knows of no other national and international airport which was as conveniently located for the majority of the residents of the city .

The amount of air passenger traffic using the Airport in 1969 was as follows:

Table 8.17: Total Passenger Arrival/Departures, 1969

International Passengers	Hadj Passengers	Domestic Passenger Arrivals	Domestic Passenger Departures	Total
392,890	130,000	102,952	103,614	729,456

Source: RMJMP Survey Reports, 1972

ESSENTIAL URBAN SERVICES

Essential urban services or, as they are sometimes termed, public utilities, comprise water, electricity, foul drainage and stormwater. Gas distribution in Jeddah was, and still is, by bottled gas and no plans exist to provide a piped gas service.

Of these essential services, for Jeddah, the most critical was water.

Figure 8.2 indicates that, in 1971, there were three sources of water to serve the city's needs. Underground water reserves in the Wadi Fatima and the Wadi Khlais provided a

total of 14 million cubic metres of water per year (Mm^3/yr) and a further 6 Mm^3/yr was provided by a desalination plant on the coast about 10 km north of the city centre. Two service reservoirs had a storage capacity of 85,600m^3, which represented 1.5 days of average demand for the entire city.

Piped water was available only in the Mecca Road and the Medina Road suburban areas fed by the Wadi Fatima and Wadi Khlais pipelines respectively. The central area within the Airport Ring Road and outlying areas to the north and south of the city were supplied by public standpipes or tankers (or, within the Historic City, donkey carts) which, in many cases, supplied individual underground storage tanks. The Social Survey quantified methods of provision as follows:

	% of population
Piped water available	46
Public stand pipe	34
Tankers/donkey cart	20

The Socio-economic Survey also indicated that, in 1971, 42% of households had one or more flushing water closets, while 35% had either a bath or shower.

Three main power stations, with a total installed capacity of 116 Megawatts, served the electricity needs of the city. The socio-economic survey showed that 68% of households were connected to the public supply and that slightly under 2% had their own generator. From this it can be deduced that, in 1971, 30% of households were

without electricity.

In 1971, the disposal of water and foul sewage from properties within Jeddah was achieved entirely by means of cesspit drainage. However, work had commenced on the installation of a city-wide foul drainage system and, by 1971, the major trunk and the main lateral and branch sewers were almost complete and a sewage treatment works, located 14 km to the south, had been nearly completed. House connections to the main system were about to start. Due to the flat nature of the terrain, some 23 pumping stations were required to collect and forward the flow from various parts of the city to two area pumping stations which, in turn, passed the flow of the entire drainage network to a main forwarding pumping station (situated near the Seaport) which pumped the flow south to the treatment works.

By 1971 the construction had started of two open storm water channels which would encircle the built-up area of the city. The purpose of these channels was to intercept and deflect storm water during the rare occasions when heavy rain storms occur in the hills to the east of the city. Proposals to construct a storm water drainage system within the city were in hand as a follow-up stage to the building of the storm water channels.

Refuse collection, a further essential public service, was the responsibility of the Municipality of Jeddah, which employed about 800 labourers with barrows plus 14 mechani-

cal rubbish trucks. Goats, which roamed through the side streets of the city, performed a valuable scavenging service. The collected rubbish was tipped on the southern outskirts of the city and burnt - an unsatisfactory and unsightly system.

CIVIC, CULTURAL AND COMMERCIAL FACILITIES

As part of the overall land use survey/data collection and assessment of the existing conditions in Jeddah in 1971, the provision of civic, cultural and commercial services and the facilities provided for these services such as mosques, schools, hospitals and clinics were studied and assessed.

With respect to civic facilities, Jeddah, as the Diplomatic Centre of the Kingdom, accommodated 41 embassies as well as the Saudi Ministry of Foreign Affairs. This Ministry was one of the few newer buildings of architectural distinction and character. For the most part, embassies were located to the north of the city in the Medina Road area.

Due to Jeddah's importance as a regional centre, 32 Governmental and Ministerial Departments were located within the City, mostly within the Mecca Road area. The Ministry of Information building complex included radio and television broadcasting studios. The headquarters of Saudi Arabian Airlines, a major tower block landmark, was another major government building located in Jeddah. Near this building was also sited the High Court - a building

inadequate for its dignified function and soon to be replaced by new purpose built Courts.

The Government provides free medical services for the city in the form of hospitals, clinics and dispensaries. Emergency ambulance and first aid services are provided by the Red Crescent Society. Private hospitals also function and, in 1971, Jeddah possessed five government and five private hospitals, with a total of 119 doctors (including specialists) and 904 bed spaces. During the Hadj period a further 1,300 bed spaces were made available at the Government's Isolation Hospital. Nine clinics/dispensaries were in operation providing general health services to the community.

With regard to cultural activities, the predominant feature in Jeddah, as in the Kingdom, is that of religion. A total of 72 mosques plus an Eid Prayer Ground served this need in convenient locations throughout the city.

Educational facilities, provided free by the Government, supported a full range of services, from basic primary, intermediate and secondary schools to teachers' training colleges, university and specialist institutions. At all levels, boys and girls have totally separate facilities. The educational services provided for girls and boys in Jeddah in 1971 is summarised in Table 8.18 overleaf.

Table 8.18 Education Services in Jeddah - Girls and Boys

GIRLS

NURSERY SCHOOL		PRIMARY		INTERMEDIATE		SECONDARY		T.T.C		DOMESTIC SCIENCE		COLLEGE/UNIV
Gov	Private	Gov	Private	Gov	Private	Gov	Private	Gov	Private	Gov	Private	
-	10	34	13	4	7	1	2	1	-	1	-	1a

BOYS

NURSERY SCHOOL	PRIMARY	INTERMEDIATE	SECONDARY	T.T.C	SPECIAL EDUC.	INDUSTRIAL EDUCATION	ADULT LIT.	COLLEGE/ UNIVER.
-	31	11	5	1	1	2	31	1a
		9b			1c			

Notes:
a King Abdul Aziz University
b Private Day Schools
c Many private Institutes for typing

Source: RMJMP Surveys, 1972

In terms of commercial and retail development, four main types of development were distinguishable : city centre, ribbon develoment along the Mecca and Medina Roads, local shopping centres and markets. The city centre contained most of the regional and specialised level of commercial/shopping activities including banking, offices, service trades and administration. No pre-planned shopping centres were in operation, but five small and two large supermarkets provided shopping focii around which smaller shops clustered. The most important market was the main souq in the city centre. A fish and a vegetable market were located on the fringes of the central area.

The principal manufacturing industry comprised the Petromin enterprise, which consisted of the Petroleum Refinery and Steel Rolling Mill, located close to the seaport and deep water tanker berth in the southern sector of the city. An industrial estate, which provided 109 plots of land available for rent, had just been established, again in the southern part of the city. The first industries were scheduled to be in operation by mid 1973. This estate was designed to encourage small and medium sized enterprises and included central facilities such as a Mosque, shops, bank, canteen and fire station.

In the service industry sector some of the establishments were port orientated and proximity to the harbour and its main communications network within the city and the region made an ideal location for these facilities. A small part

of the central area was given over to industrial activities of mixed category. Bab Shariff and Bab Mecca contained a large proportion of the light industries dealing mainly in metal working and repairs.

The third aspect of industrial activity was construction which, in its widest sense, included contracting firms constructing roads and buildings, others handling the installation of plumbing and electrical equipment and woodwork and joinery. These uses were dispersed throughout the urban area.

THE NEED TO UNDERSTAND THE QUALITY AND SENSE OF PLACE

Planning is not simply about gathering and learning how to use data, maps and statistics. To this disciplined element has to be added less tangible matters. Patrick Geddes, the progenitor of town planning as practised today, described this as 'genius loci' - a sense of place, the specific and individual qualities of a community and its location.

The writer lived with his wife and children in Jeddah throughout the preparation of the Plan. If the planner of a city wishes to understand the nature and quality of the city for which he accepts the responsibility of planning, then he should be prepared to do this. Again, living as a family rather than a 'worker' allowed a much greater participation in the social life of the Saudi community. This involvement opened up many insights into the dif-

ferent way of life of the people of Jeddah and provided a a fuller understanding of the social and cultural customs, values and attitudes of the people whom the Plan was to serve.

To ignore or ascribe little value to this aspect of planning could lead to a mechanistic rather than organic attitude to this initial stage of plan preparation.

THE ANALYTICAL AND PREDICTIVE PROCESSES

In examining the patterns of change likely to take place over the twenty year period of the Plan (1971-1991), it was necessary to place Jeddah within its regional context. The evidence of the regional and city surveys had already pointed towards an increasing imbalance in urban as opposed to rural growth. In the preparation of the Regional Development Plan - which preceded the urban Master Plans in its preparation - considerable thought was given as to how to obtain a more equitable distribution of opportunities for growth and how to direct investment towards this objective.

Thus the analytical and predictive stages of the plan were prepared on the basis of a regional, and not individual city, framework.

In estimating population growth, trends in such factors as the natural increase of the existing population, activity rates, household formation and migration require to be co-

related. The most striking features of the existing population structure - features which could be anticipated to be also present in the future - were the large proportion of young people and the high rate of natural increase. The future size and structure of the population however would not be determined by these characteristics alone, but also by the numbers of expatriates required to complement the indigenous labour force. In turn, the size of this expatriate element would be governed by the rate at which economic development took place.

Whatever the overall rate of increase which took place, certain areas would grow faster than others. Within the Western Region, Jeddah, on the evidence of past trends and from the assessment of its economic base, faced the highest growth rate.

Due to the ambitious Government development programmes, Jeddah would continue to have a very substantial proportion of expatriates.

Jeddah also possessed an emerging industrial base, and with its pre-eminent access to imported raw materials or semi manufactures; its fast developing transport links by road and air to the Region and the Kingdom; its role as a Diplomatic and service centre, and as the point of arrival of sea and airborne pilgrims, it was evident that, even within a distributive growth policy, Jeddah's location and opportunity for economic activities would result in the

city having the fastest growth rate of any centre in the Western Region.

With the assistance of the University of East Anglia Department of Geography and advice on population and employment predictive modelling from the UNDP Middle East office in Beirut, estimates of population growth and distribution were prepared. As mentioned in Chapter Seven, it was evident that rigid plans based on a single population figure for twenty years ahead were unsuited to the needs of the Western Region and its cities. Thus a range of estimates were made, based on a high or a low growth rate. This resulted in the following overall population growth estimates for the region:

Table 8.19 Population Growth Estimates

		Low Estimate	High Estimate
	1971	1991	1991
Mecca	301,000	550,000	950,000
Jeddah	381,000	800,000	1,650,000
Medina	137,000	250,000	450,000
Taif	106,000	175,000	250,000
Yanbu	19,000	55,000	100,000
Tabuk	41,000	100,000	100,000
Sub-Regional Centres (2)	-	60,000	100,000
Rural Areas (incl. small towns)	620,000	80,000	

Source: RMJMP Regional Framework Report, 1972

The writer remembers vividly the presentation of these

projections to the High Committee responsible for the approval of the Consultants work. The thorough and reasoned methodology which had led up to the preparation of these projections was appreciated. However, with such a vast difference between the high and low prediction, inevitably the question was asked 'why has it taken so long to reach such an imprecise conclusion?'. Had a single estimate of population been tabled for the year 1991, backed up by an impressive array of statistics and computer print-outs, there is no doubt that the High Committee would have been more impressed. But a discussion on how misleading such a conclusion would have been, did much to make the Committee Members more aware of the nature of planning and that any specific estimate which spans a 20 year forward time period would inevitably be wrong. From this discussion emerged a better understanding of how planning should be seen as a process rather than a finite 'once and for all' answer to city - or regional - growth and change. This was an important step forward.

TRANSPORTATION/HIGHWAY NETWORK - COMPUTER ANALYSIS TECHNIQUE

Specifying the highway network for computer analysis comprises the determination of the existing vehicle running speed for each length of road between junctions and for new links a speed appropriate to the class of road. Traffic Zones are connected into the network by a

series of "dummy links" and a set of minimum time-paths obtained for each possible zone to zone movement. The minimum time-paths are often referred to as 'trees' because the tracing of minimum time path routes produce a patern similar to the branches of a tree. This is shown schematically in Figure 8.3. Routings are printed out by the computer and the results checked against reality.

Trip generation is the prediction of the number of trips with origins or destinations in each zone by mode. This is calculated from planning data and trip characteristics derived from the external cordon roadside survey, the screenline roadside cordon survey and the transportation home-interview survey.

Having derived the total number of origins and destinations, by mode in each zone, the next procedure is to distribute them between zones. This is known as trip distribution and in this study the procedure was based on the gravity model concept. Formulated after Newton's classic statement of the Law of Gravity, the gravity model expresses the trip interchange between successive pairs of zones as a function of the land use characteristics of the two zones and a suitable measurement of the spatial separation between them. Therefore although one zone may have a large number of origins for a particular purpose/mode combination, another zone a large number of destination opportunities, if the distance between them, in terms of travel time, is high, some trips will be

attracted to nearer zones even though they have individually a smaller total number of attractions.

Mathematically the formulae is expressed as follows:

$$T_{ij} = P_i \cdot \frac{Aj \cdot Fij \cdot Kij}{\sum_{j=1}^{j=n} Aj \cdot Fij \cdot Kij}$$

where

T_{ij} = Trips produced at zone i which are attracted to zone j

P_i = Total trips produced at zone i

A_j = Total trips attracted at zone j

d_{ij} = Driving time from zone i to zone j

b = Empirically determined exponent to account for the effect that zone separation has on zone to zone movement

K_{ij} = Socio-economic or topographical factor influencing trip interchange between zone i and zone j

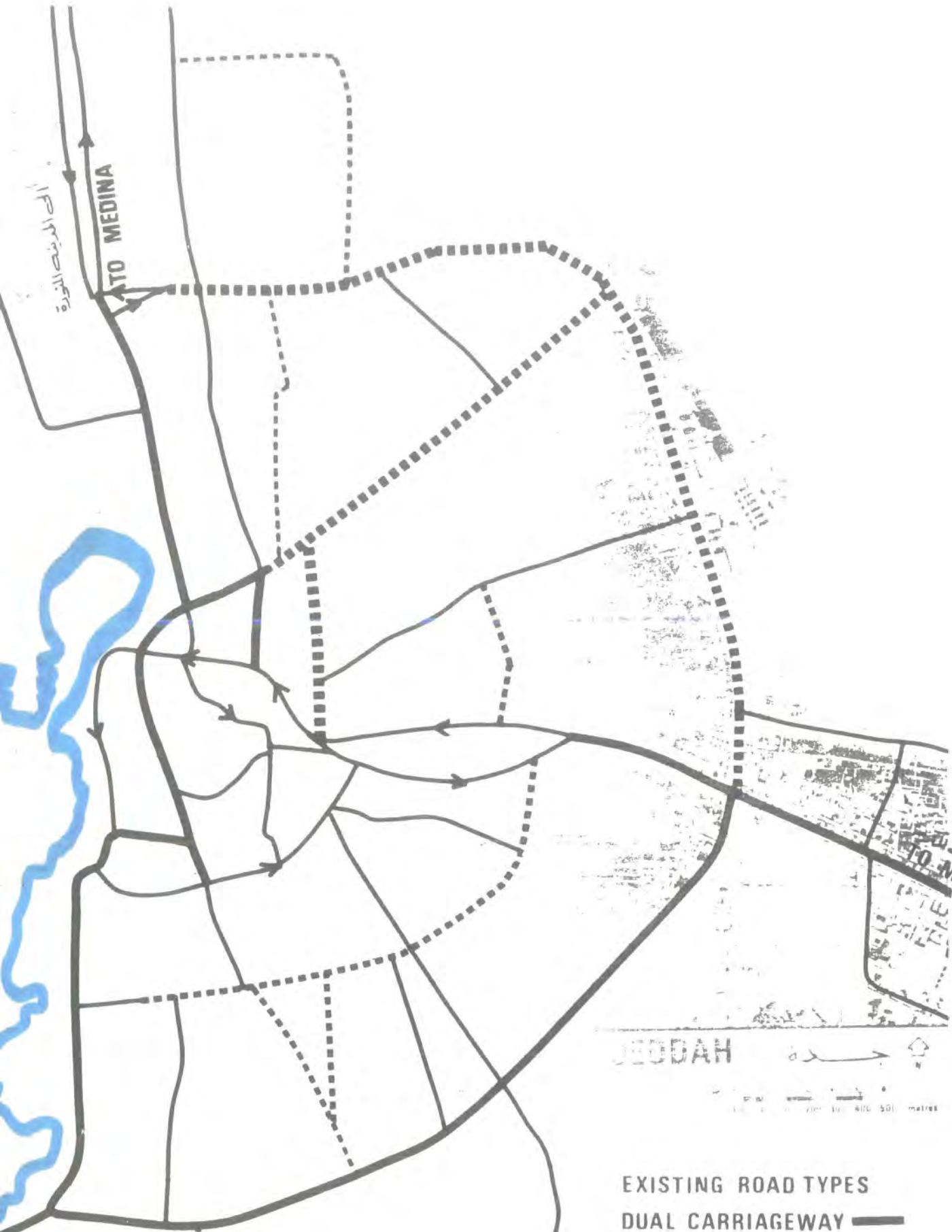
F_{ij} = 'Friction Factor equal to $\frac{1}{(d_{ij})^b}$

An example of the Gravity Model concept is illustrated in Figure 8.4.

Having determined the total trip interchange between any pair of zones at the distribution stage, the computer allocates these trips to the appropriate minimum time path for each zone to zone pair. Trips are accumulated per link and the results given in the form of link loadings and turning movements at junctions.

When the assignments have been plotted the results must then be evaluated in terms of desirability and feasibility. From the initial assignments conclusions can be made about the form of the future network and the widths of the transportation corridors. These preliminary assignments also indicate whether radical revisions are

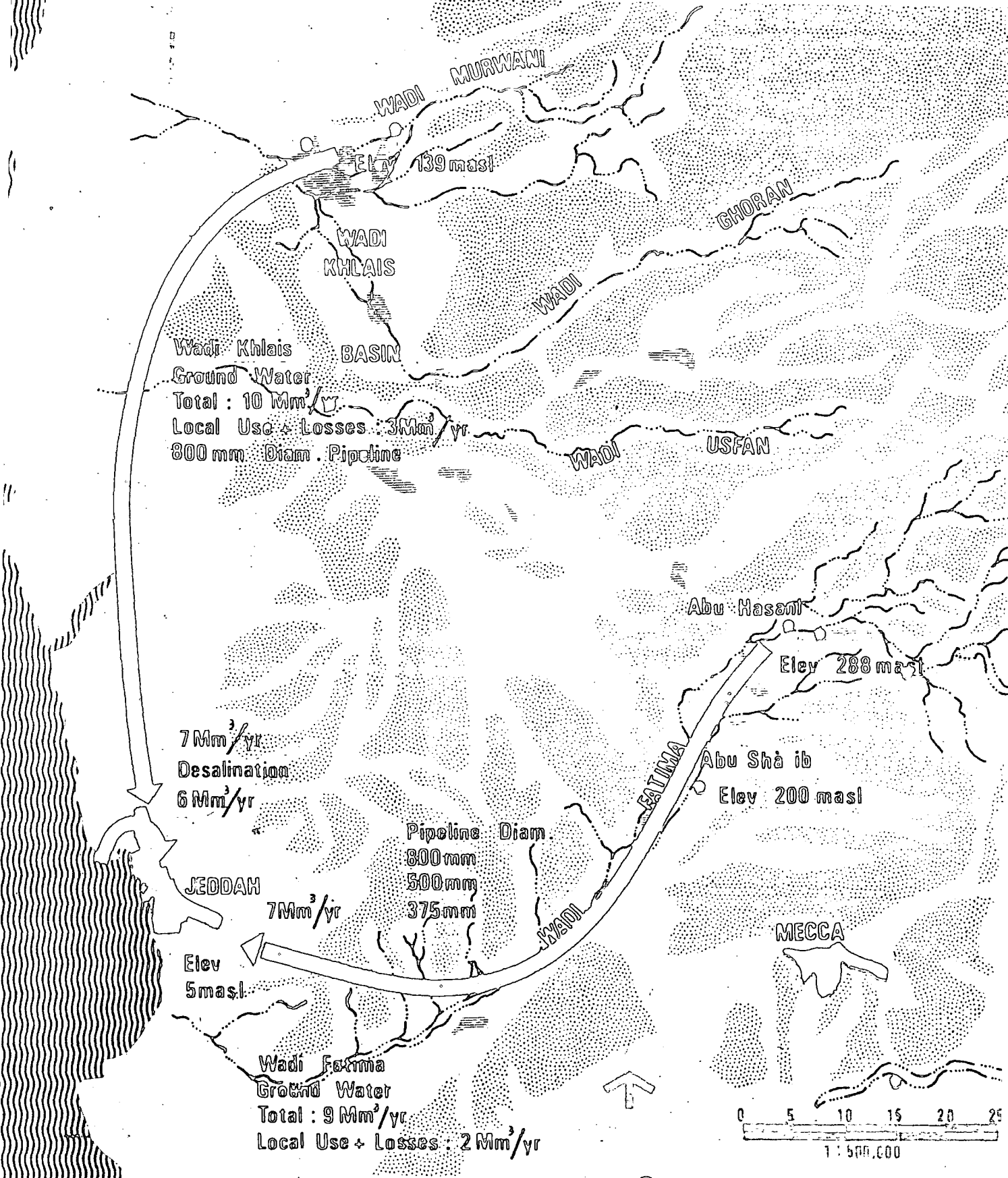
necessary in either the land use structure or the proposed highway network, or both. Finally, the modal split between Private and Public Transport is examined and where necessary adjusted to achieve a satisfactory total transportation system.



JEDDAH :
HIGHWAY NETWORK - 1971.

SOURCE: ALTERNATIVE URBAN STRATEGIES REPORT - RMJMP 1972.

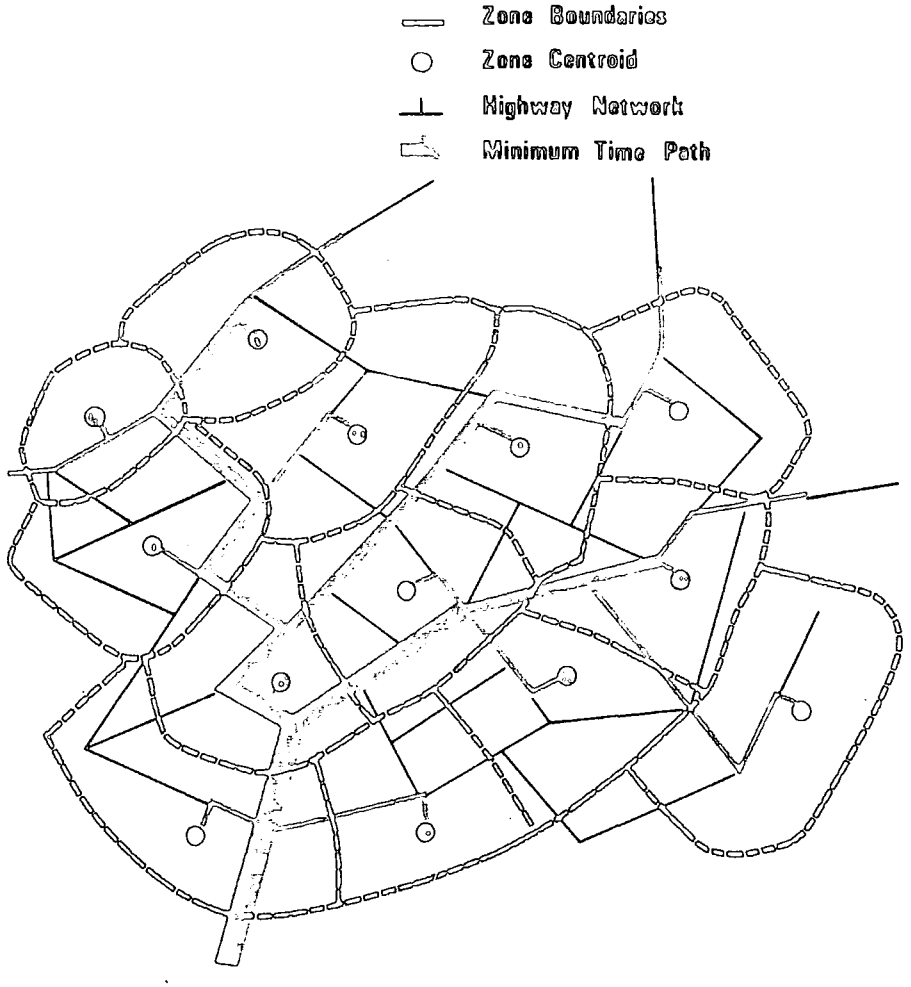
FIGURE 8.1



JEDDAH :
WATER RESOURCES, 1971-1972

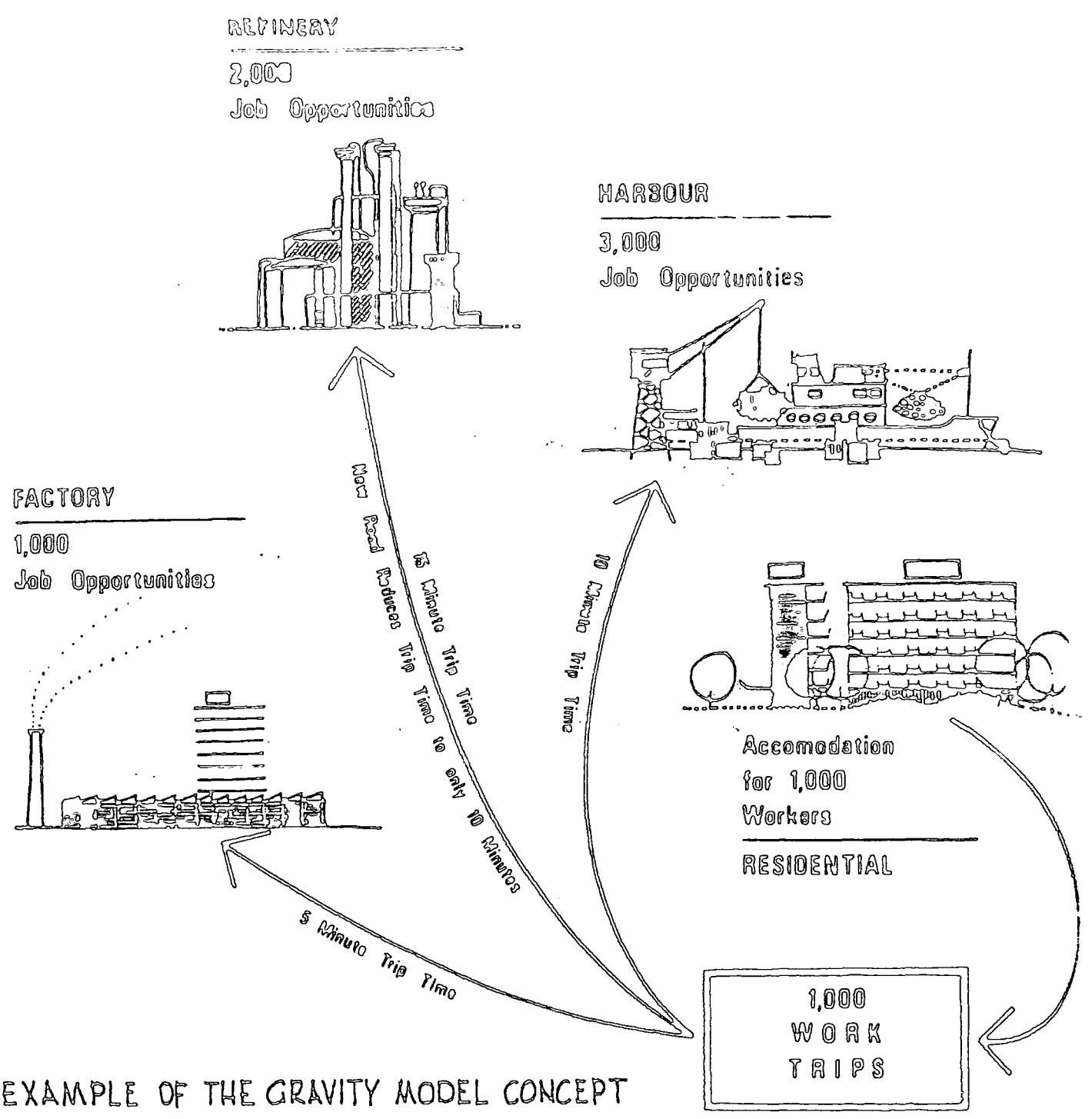
SOURCE : ALTERNATIVE URBAN STRATEGIES REPORT • RMJMP 1972.

FIGURE 8.2.



MINIMUM TIME PATH TREE (SCHEMATIC)

FIGURE 8.3 .



EXAMPLE OF THE GRAVITY MODEL CONCEPT

JOB SPLIT BEFORE NEW ROAD

Job location	Attraction based on journey time	Percentage of total attraction	Number of work trips per 1000
Harbour	$3,000/10^2 = 30$	38.0	380
Factory	$1,000/5^2 = 40$	50.7	507
Refinery	$2,000/15^2 = 8.9$	11.3	113

JOB SPLIT AFTER NEW ROAD

Harbour	$3,000/10^2 = 30$	33.3	333
Factory	$1,000/5^2 = 40$	44.5	445
Refinery	$2,000/10^2 = 20$	22.2	222

Source: RMJMP Transportation Analysis, 1972

FIGURE 8.4.

CONTEXT

The Master Plan and its accompanying Report synthesised a series of wide ranging but interrelated studies. At regional level, Jeddah was considered together with the other five major cities (The Holy Cities of Mecca and Medina, and the cities of Taif, Yanbu and Tabuk) as an integral part of the overall plan for the Western Region. Basic planning factors such as population and employment growth and distribution and the role of Jeddah in the Region were defined within the overall objectives, needs and priorities of a framework for regional growth and development.

Within this context, Jeddah's strategic location sustained, as it had done for centuries, a thriving port and trading centre. The city was well placed to enjoy a full and beneficial share of national growth. The Regional Plan asserted that Jeddah, with its national and international sea port and airport, would emerge as the dominant trading centre for the Western Region with its influence and commercial activities spreading throughout the Kingdom. Future prospects for economic and industrial development would be such as to sustain a high and continuous level of growth in these sectors. As Jeddah is the point of arrival for foreign pilgrims coming by sea and air to perform the Hadj, this annual activity would

further sustain the total economy of the city.

ALTERNATIVE STRATEGIES

A comprehensive survey and review of existing conditions in Jeddah was carried out in 1971. From this, potential growth to fulfil the population targets predicted for 1991 was analysed. Taking both the low and the high growth estimates, i.e. 800,000 and 1,650,000 respectively, the order of magnitude of future housing demand was estimated as follows:

Table 9.1: Future Housing Demand

	High Estimate	Low Estimate
1 Estimated population 1991	1,650,000	800,000
2 Estimated Saudi population 1991	610,000	540,000
3 Estimated non-Saudi population 1991	1,040,000	260,000
4 No of Saudi households	130,119	115,168
5 No of non-Saudi households	290,746	81,941
6 Total households 1991	420,865	197,109
7 Allowance for vacancies (2.5% of 6)	10,522	4,928
8 Total dwellings required by 1991(6+7)	431,387	202,037

Source: RMJMP Alternative Urban Strategies - Jeddah, 1972

Allowing for improvement in future standards of residential density, an average gross residential density (i.e. including the local roads, schools, mosques, open space, shops, etc required within a predominantly residential area) of 75 persons per hectare (pph) was assessed to be an appropriate standard for calculating land use needs for population growth. When this average was applied to a 100,000 population unit of growth (this unit had no signi-

ficance other than that of a manageable total on which to examine alternative population distributions) each unit of 100,000 population required 1,744 hectares of land as follows:

Table 9.2: Average Land Requirements per 100,000 New Population

Land Use	Area : ha
Gross residential area (75 pph)	1334
Open space	200
Main highways	170
Main centres	40
TOTAL	1744 ha

Density = 57 pph gross city density

Note: This calculation makes no provision for industry, public utilities, cemeteries or major land uses other than open space.

Source: RMJMP Alternative Urban Strategies - Jeddah, 1972

It was thus possible to make a broad assessment of the amount of land required to meet the high and low population forecasts. This assessment was made in two stages. First, it was necessary to calculate the amount of vacant land within the existing developed or partially developed areas of the city. Unlike local governments in the United Kingdom, Jeddah Municipality does not have a 'statutory' boundary. Thus the 'city' in this context was taken as the total area within which existing development had taken place. Freed of such administrative boundaries, forward planning could take place without manmade constraints as its area of search. Figure 9.1 shows the extent of the

built-up and partially developed areas of Jeddah in 1971. Within this area, approx 1,600 hectares of land was found to be available for development, but part of this would be required to rectify deficiencies in the provision of educational, recreational and highway requirements for the existing population. A realistic figure of the population capacity of the existing built-up area was estimated to be approx 470,000 i.e. 89,000 more than the existing figure of 381,000. Thus, taking the high growth estimate of 1,650,000, 1,180,000 people would require to be accommodated outwith the existing urban area. At an average of 1,744 ha per 100,000 people, 206 sq km plus land for major land uses would be required to accommodate this population growth. Similarly for the low population growth to 800,000, 57.5 sq km of land would be required plus major individual uses.

From this assessment of land requirements, alternative growth strategies could be examined within a consistent framework.

Constraints to the growth of Jeddah were much less complex than, for example, would be found in assessing constraints to such a magnitude of growth in a British city where agricultural, environmental, existing adjoining communities, local authority boundaries and so on would require careful and detailed appraisal. Also, as Jeddah is a seaport rather than a inland city, only a 180, rather than a 360 degree, arc of examination was available.

Because of the irregular configuration of the inland foothills of the Hejaz mountains, their difficult barren rock and soil conditions and the possibility of flash flooding inundating the wadi formations, this area was not considered suitable for urban development.

Thus the most suitable terrain for development was the coastal plain. Varying from about six to twelve kilometres in width and without limit in a north and south direction, in physical terms this area was capable of supporting unlimited growth. However, large areas of the coastal plain were liable to flooding from the wadi run off to the sea. A storm water channel was under construction to protect the city from this hazard. If future development was to take place outside this channel, it would require protection and a means found of conducting storm water run off to the sea.

The dominant natural feature of the coastal plain was Sharm Obhur or the "creek", an ancient river indentation, some thirty kilometres north of the city centre. Already partially used for recreation - sailing, fishing, swimming, water skiing - and with a mass of deep coral reefs, it would obviously be a major recreational attraction for a growing, prosperous city.

This natural beauty was threatened by the Ministry of Defence and Aviation's proposal, initiated in 1967, to relocate the existing airport on a site immediately south of the creek, i.e. between the creek and the existing city

built up area. As a final decision had yet to be made, a major factor, in considering alternatives, would be the evaluation of the suitability of this location.

To summarise, the major factors, in addition to the physical factors already described, which conditioned the preparation of alternative growth strategies were:

a. The Stormwater Channel
b. The Airport
c. The Creek (to which was added the protection and enhancement of the entire coastline)

In all cases, alternatives had to satisfy the high population growth requirement with capacity for further expansion. Land use studies demonstrated that, including infill to the existing urban area, 600,000 people could be accommodated within the Stormwater Channel if the Airport remained in its existing location. If the Airport was relocated, this total increased to 800,000.

Eleven alternative growth strategies were then identified. Five of these assumed the Airport remained on its existing site and the remaining six assumed that the Airport would be relocated during the Plan period.

These eleven alternatives are shown in diagrammatic form on the accompanying illustrations (Figures 9.2-9.4) and a brief description of each option is as follows:

OPTION ONE

This option proposed a large, mainly self-contained, second city growth centred on Sharm Obhur with a population rising to 950,000. Additionally, a 100,000 community, served by its own district centre, but dependent on the existing city centre for higher level facilities, was located to the south of the existing developed area.

OPTION TWO

Essentially as described for Option One but with a redistribution of population to the north and south involving a larger planned growth to the south served by a city centre. Options One and Two thus exemplified a policy of dispersal rather than concentration of major activities.

OPTION THREE

Substantial growth to the north of the present city was planned on a broad front from the northern boundary of the existing city. A modest development for 100,000 people was represented as a separated planned growth to the south. Growth implied full reliance upon the existing city for central area facilities.

OPTION FOUR

Similar to Option Three, but differing in the relative distribution of population to the north and south of the existing city. The large growth, proposed to the south, would ultimately extend to and link with the existing city. No separately defined centres were assumed in asso-

ciation with growth outside the Stormwater Channel.

OPTION FIVE

Option Five was similar in population distribution to Option Four, except that in this case separate city centre facilities were indicated, serving the new development to the north and south of the existing city.

OPTION SIX

In Options Six, Seven, Nine and Ten, the airport was moved to its proposed new site north of Jeddah. Option Six proposed a linear growth following the coastline from the northern stormwater channel to Sharm Obhur. Development to the north of Sharm Obhur would be served by a district centre. The linear growth along the coast would be serviced by its own city centre, which would be strategically related to the new airport site. Provision for a further 250,000 people was made to the south of the existing city, served by its own central area.

OPTION SEVEN

Similar to Option Six, but with a greater population proposed to the north of the existing city. A community of 100,000 was located to the south which would be served by a district centre.

OPTION EIGHT

This examined a variation of the current proposals for relocating the site of the present airport. Moving the site approximately 3 km eastwards, two significant advan-

tages emerged:

a new development from Sharm Obhur south to the existing city could utilize a broader coastal strip reducing, in consequence, the extent of development required north of Sharm Obhur

b the flight paths would move eastwards and thus away from Sharm Obhur. This point was particularly important as the new airport site blanketed most of the creek with a severe noise level due to aircraft departure flight patterns.

OPTION NINE

In Options Nine and Ten the airport was shown on its proposed new site to the north of Jeddah. Option Nine indicated a linear growth on two axes to the north of the existing city - one along a coastal strip and the other to the east, along the line of the foothills. The wedge area between these strips would contain a city centre serving and linking them both. The developments to the north of Sharm Obhur and south of the existing city would be served by their own district centres.

OPTION TEN

Similar to Option Nine, except that, in redistributing population, the development to the south of the existing city, beyond the floodwater ditch, would cater for 200,000 people and support its own city centre.

OPTION ELEVEN

This option proposed an entirely new location for the airport to the south of Jeddah. Three "city-centre served" developments to the north and south of the existing city were further suggested. The airport in this location would have the considerable advantage of eliminating all noise and nuisance effects on the existing or future urban development. This option could not be compared to the others, as no conclusive evidence existed to demonstrate whether or not an airport could be located in this area. Such being the nature of the coastal plain, however, there seemed no obvious reason why this would not be possible.

In the evaluation of the options, particular regard was paid to the following criteria:

1 The opportunity for creating a pollution-free, high quality environment, through the conservation of historic areas and areas of natural physical significance, as well as through the planned development of areas such as the coastal strip and Sharm Obhur.

2 The opportunity for planning industrial and commercial growth which could offer a wide choice of employment within reasonable distance of residential areas.

3 The opportunity to develop, from the existing

transportation network, systems to meet the need of both dispersed and centralized growth whilst maintaining high environmental standards and economic viability.

4 The opportunity to expand existing, and economically develop new, public utility services.

It was concluded that Options Three, Four and Five were variously in conflict with these criteria, particularly with regard to the environmental problems which would arise as a result of the massive traffic interaction to the north and south of the existing city, where growth on a broad front was envisaged as contiguous with the existing city. The remaining options represented more practical solutions.

A basic problem which arose in evaluating the remaining options was that, at that point in time, no final decision had been reached as to whether or not, and when, the airport would be relocated. However, as it would take five to six years to build and commission a new airport, it would be only at that time that the present airport could close. Therefore, if the airport moved, its site would not be available for development before 1979. By then, in accordance with the high population growth, the population of Jeddah would be approx 600,000.

During the preparation of the alternatives, the Airport Consultants were requested to investigate the possibility

of moving the new airport site to the east of the present main Jeddah-Medina Road. However, no conclusive results emerged and thus Option Eight, which had considerable advantages from an environmental point of view, could not be pursued.

As the final decision on the location of the airport remained to be made, the Consultants decided to assume that the airport would remain on its present site, but that the option chosen for development should not preclude the possibility of the airport being relocated on a new site at a future date. Thus the proposed new site, and the possible site to the south, were not considered for future urban development.

In practical terms this meant that 600,000 of the low population estimate of 800,000 could be accommodated within the Stormwater Channel leaving a balance of 200,000. Options One, Two and Six to Eleven had a reasonably common ground in that population growth was shown to both the north and south of the present built-up area. It was therefore proposed that, for the low population estimate of 800,000, 600,000 could be distributed within the area of the Stormwater Channel and the remaining placed as two 100,000 units, one north and the other south of the existing city. When related to the high population estimate of 1.65 million, if this high growth rate were to be achieved, it would not be until after 1982 that the total of 800,000 would be passed. This gave sufficient time to

allow a decision to be made on the airport, and, if it were to be relocated, to have it operational.

Thus, the selected strategy for growth to 800,000 people allowed flexibility to choose an option for growth to the high estimate of 1.65 million. This decision was in accord with the approach outlined in Chapter Seven as it would make it possible to modify and refine the Plan as information increased and options therefore became clearer.

THE MASTER PLAN

During the preparation of the Master Plan, following a series of meetings with officials of several Government Ministries and Departments, the Ministry of Defence and Civil Aviation decided to proceed with the new Airport on the site to the north reserved for this purpose. Thus what had been a major imponderable during the Alternative Strategies stage of plan preparation was resolved and the Master Plan could now incorporate this as a fixed major element[1].

The Royal Saudi Navy set out requirements for a base in Jeddah to the immediate south of the Seaport. This, again, became a fixed element of the Plan[2]. Also the large land requirements for Seaport and Industrial Area extensions were indicated to the Consultants. Other sensitive matters such as Defence requirements and safety zones were also obtained.

The point made earlier in this work that Consultants should work in the city they are planning makes practical, as well as theoretical, sense. The information on the above mentioned subjects was obtained and integrated into the Plan during its preparation, mainly because the Consultants, aware of the need to resolve such major issues, were able to convene the meetings required to make such decisions.

Two other significant matters were also dealt with at an early stage in the preparation of the Plan.

First, the Alternative Strategies proposal to site townships of at least 100,000 people to the north and south of the Stormwater Channel. In discussions with the client, the view emerged that it would not be realistic to pursue this policy because development control procedures would be inadequate to achieve its implementation. However, this debate was overtaken by the second matter. This was: was the Plan to be prepared for growth to 800,000 with capacity to expand to the high growth estimate of 1,650,000 or was it to be for the high estimate with phased growth, one stage of which would be the low growth of 800,000 people? This matter was resolved when the client decided that the infrastructure (including roads) must be able to serve the high growth rate. The Plan was prepared therefore on the basis of the high, rather than low, population estimate. This decision was one which needed the co-operation and support of the

planning team as it meant that considerable additional work would be involved without an equivalent increase in fees - and thus resources.

Such debates, within the team and with the client, are an integral part of the plan-making process. Planning is a dynamic process which requires that the individual and expert skills involved combine and synthesise their contribution during the important, and indeed exciting, period of plan gestation.

Within the overall objectives of the Regional Plan, which were:

(a) promote regional contribution to the Kingdom

(b) provide a reliable supply of essential services (water, food, energy, communications)

(c) ensure an equitable distribution of social services

(d) improve the man-made physical environment

(e) maximise the return on development projects

Thirteen key objectives to be satisfied in the preparation of the Master Plan were identified:

A : Provide sufficient information on which to base requirements to ensure an adequate and continuous supply of water and energy.

B : Promote the maintenance of public health at all levels.

C : Provide an adequate road network at city and local levels.

D : Encourage the development of appropriate public transport systems in order to assist in achieving a balanced choice between private and public transport.

E : Achieve, by the balance of residential density and housing types, an appropriate mixed distribution of high, medium and low income groups to maintain social cohesion and well being as part of city growth and development.

F : Provide sufficient religious, medical, educational, administrative and recreational facilities to meet the needs of the population according to recognised (international) standards taking into account special aspects of life in Saudi Arabia.

G : Encourage development of local industry and employment.

H : Support development of business and commercial activities at the same time as recognising the many inter-related aspects of city centre development.

I : Control city growth to the extent that is necesary to allow maximum benefit to all, at least

inconvenience.

J : Provide development controls to ensure the beneficial and balanced growth of the city.

K : Safeguard areas of buildings of outstanding architectural and historic value as part of the conservation of the Islamic tradition as reflected in the built environment.

L : Relate and develop planning techniques and methodology as part of a dynamic sequence of city planning which will be able to respond to the pressures of growth and change.

M : Establish an effective information and classification system for data storage and retrieval.

The process of preparing the Master Plan fell into five broad subject/study headings. First, socio-economic, which embraced aspects such as population and housing; employment; government, cultural and commercial functions; recreation and conservation. Secondly, transportation and communications, including road, sea and air transportation and public transport. Thirdly, public utility services, including public health. Fourthly, the manner in which all these elements were to be combined into a physical land use - transportation plan and, finally, the stages of implementation i.e. the development programme.

The principal element in these factors is the spatial

distribution of population and employment. Following the principles examined during the Alternative Strategies stage, this required the structuring of 600,000 population within the Stormwater Channel (including the existing population of 381,000). When the existing airport site became available for development, a further 200,000 people would be accommodated within the Channel, thus achiving the low 1991 population growth estimate. The concept of a new northern growth centre, sited approximately midway between the northern arm of the Stormwater Channel and Sharm Obhur was maintained and planned to initially accommodate 100,000 people. Growth, capable of accommodating approx 600,000 people, would subsequently proceed northwards to Sharm Obhur. Emphasising this northern growth "corridor" in the Master Plan accepted an already existing trend and, by following the coastline to the west of the new airport, took advantage of the potential high environmental quality of this area.[3] This northern development was separated from the existing built-up area by a wide arc of open space which followed the lower lying wadi outfalls from the foothills to the sea and would thus act as a floodwater course for the Wadis Bani Malik, al Hifnah and Daghbj.

This northern development area, plus the area within the Stormwater Channel (including the future development of the existing airport site) would accommodate approx 1,400,000 population. The remaining 250,000 population required to meet the high growth rate estimate was distri-

buted in new growth areas to the south and within the Mecca Road eastern arc of development.

This population/employment distribution was acceptable in transportation terms as it produced a linear structure in the form of a wide arc from Sharm Obhur southwards, thickening at the centre, and then eastwards towards Mecca. Jeddah's location, on a flat plain between the sea and the mountains, lent itself to a linear form of growth. From the point of view of open-endedness, one of the requirements set for the Master Plan to fulfil, a linear structure is more amenable to expansion without disruption to the existing than is a concentric form of growth.

In order to achieve an efficient population/employment spatial distribution relative to the highway network which would be required to serve this distribution, 78 zones or sub-divisions of the total plan area were established. Computer analysis techniques then tested the traffic generation and distribution patterns arising from different population/employment assignments to these zones which, in turn, can be represented as road structures. Preliminary analyses of the first model led to refinements in the land use distribution. A second model was then computer analysed. Further refinements were introduced and the third computer testing and analysis produced the optimum land use/transportation balance. This skeletal structure then formed the basis of the development of the Master Plan.

A brief description of the main elements of the Plan - Economic Growth (including the Hadj and its effect on Jeddah), Open Space and Recreation, Communiciations and Utility Services - is as follows:

ECONOMIC GROWTH

Possessing a major seaport and airport and at the hub of the Region's communications system, Jeddah would inevitable enjoy a major role in the Region as a primary distribution centre. In 1971 Jeddah was also the diplomatic centre for the Kingdom. The main offices of SAMA (the Saudi Arabia Monetary Agency) were also situated in Jeddah. In employment terms Jeddah had therefore a high degree of specialisation in Professional and Scientific Services, Construction, Transport and Communications, Manufacturing and other services.

The total employment in Jeddah was estimated to grow from the 1971 level of 103,000 jobs to about 240,000 for the low population growth and to about 503,000 for the high. The main developments were forecast to be in utility services, health and education, construction and the provision by the private sector for the goods and services required by a society increasing in size and in affluence. Limited but significant growth was predicted to take place in manufacturing industry, particularly over the first decade of growth, as the large new industrial estate located to the south of the Central Area came into full operation.

The major identifiable employment centres were the seaport, the naval base to the south of the seaport, the industrial estate and the adjoining Petromin complex, King Abdulaziz University to the north of the Mecca Road and the new international airport. The Central Area would become the largest single employment centre and was planned to develop to provide a full range of commercial and business services at city, regional and national level.

In order to maintain a balance of employment location and accessibility, the Master Plan proposed the establishment of two major District Centres at strategic locations in relation to the future growth of the city. These centres would provide the opportunity to create modern well planned focal points efficiently located in relation to the new road network and future urban development. They would also prevent the over centralisation of functions within the central area to the benefit of both new and existing centres and the overall transportation system, including public transport.

In addition to these two district centres, local, or Hara, centres were proposed to meet day to day shopping and ancillary needs. The location of schools, mosques and other social services was recommended to be planned as an integral part of these centres as appropriate.

THE HADJ AND ITS EFFECT ON JEDDAH

The activity which has the greatest single impact on the city of Jeddah is the arrival and departure of pilgrims en route to the Holy Cities of Mecca and Medina. During the period 14 days before 9th Dhul-Hijjah and at least during the 14 days after 11th Dhul-Hijjah Jeddah is host to a population numerically larger than its resident population.

Jeddah's role in the Hadj is historic. Deep water access to the Red Sea and its proximity to the Holy City are the two major reasons why the city has always been the main reception point for pilgrims on their way to Mecca.

A new dimension was added to the city's Hadj role in the mid 1940s: that of catering for pilgrims arriving by air. In 1969, the airport handled approximately 130,000 pilgrims; in 1970 some 145,000 and in the 1971 Hadj 233,700 pilgrims. This represents a 77% increase over three years. A dramatic increase occurred in the 1972 Hadj when 320,300 pilgrims arrived and departed by air. This represented a 37% increase over the previous year. This increase in air transportation resulted in a decline in the number of pilgrims arriving by sea, although in absolute terms the numbers were still substantial. In 1965 the seaport handled 101,400 pilgrim passengers, but by 1969, the number had decreased to 91,000. This represented a 10% decrease over a four year period. In 1971 port arrivals amounted to 96,300 and, in 1972, the figure

was 134,600.

Overland pilgrims represent a substantial proportion of the total. The majority of Saudi pilgrims travel this way as do many pilgrims from the Arabian/Northern Arab countries land-mass. By 1990, foreign pilgrims by land could number some 350,000 while Saudi pilgrims by land could reach 800,000. It was anticipated that about a quarter of these overland pilgrims would spend some time in Jeddah.

The Hadj season cannot be defined precisely. The period of time between the arrival of the first pilgrim and the final departure of the last pilgrim can be as much as 5 to 7 months. The period of maximum concentration of pilgrims in Jeddah is the two weeks before the ninth of Dhul-Hijjah and after the eleventh of the same month. In the future, the time of arrivals and departures could become more concentrated resulting in a higher intensity of use of the facilities provided to accommodate pilgrims as well as a higher intensity of use of the essential urban services. The projected growth of foreign pilgrims using Jeddah as an arrival point is shown in the following Table:

Table 9.3: Growth of Foreign Pilgrims by Mode of Transport

Pilgrims by Type of Transport		1970	1990
Foreign pilgrims	: Air (Jeddah)	141,555	500,000
Foreign pilgrims	: Sea (Jeddah)	86,137	200,000
Foreign pilgrims	: Land (Jeddah)	17,033	80,000
All Foreign pilgrims	: (Kingdom)	398,023	1,180,000

Source: RMJMP Hadj Survey Special Report, 1972

The services Jeddah provides to pilgrims during their visit to the Kingdom range from documentation to welfare and accommodation. Health clinics are incorporated into the terminals. Pilgrims with contagious diseases are isolated immediately before transfer to the Isolation Hospital located to the south of the city.

In view of recent and future urban expansion, the relocation of the Isolation Hospital was under examination in 1971, but a new site had not yet been allocated. The Master Plan provided for such needs by designating for Special Government purposes a large area of land to the south of the seaport.

The Plan identified the three reception areas required for pilgrims as follows:

A: The new airport Hadj facility. This would accommodate 50,000 pilgrims assuming a rapid turnover in numbers from the time of arrival to departure for Mecca or Medina. However, this total had been based on projections made in 1966 which, in the event, were much

lower than the actual increase which had taken place. It was therefore recommended that this figure be re-examined by the Airport Consultants. As approx 1,000 ha of land north of the airport had been set aside for a Hadj village, adequate space was available for expansion.

B: The existing terminal buildings at the seaport. These would require expansion to accommodate the projected increase in numbers referred to earlier. Reclamation of a large area of land available to the east of the present centre could provide the additional land required to accommodate this increase.

C: In order to rationalise the arbitrary camping and parking arrangements used by overland pilgrims, new Hadj rest and replenishment stations were recommended to be established at the main entry points to the city. Two special areas were designated in the Plan for this purpose adjoining the Mecca and Medina Roads. If required in the future, a third Hadj transit camp could be created by using the pilgrim facilities at the present airport which otherwise would become redundant when the airport moved to its new location.

OPEN SPACE AND RECREATION

The Red Sea is the dominant recreation element of the city. The cooling sea breezes, the coral reefs and the many kilometres of sandy beaches provide the city with a

major recreation and leisure asset. The protection of this coastline was thus a significant factor in the Master Plan. Of particular importance was Sharm Obhur and the area beyond this known as "Twenty-nine palms". It was proposed that the latter area and the adjoining coastline should be zoned as a public recreational area or national park for the city.

The inland Hejaz foothills provide another area of natural recreational potential. This would allow the tradition of families meeting and eating in the desert and foothill areas during the cooler times of the year to continue. The Master Plan proposals recommended that urban development should not take place in these areas and a large land area with interesting rock and sand dune formations was zoned as a natural park.

In 1971, in addition to the existing stadium, four major sports centres were being developed within the city. The main existing area for leisure activity was the Khozzam Palace gardens which had recently been opened as a public garden (this was the complex of palaces and gardens built for King Saud in the '50s and abandoned, following his abdication in 1964). The Plan proposed that three large additional areas be zoned as city parks. A northern park followed the confluence of low lying wadis to the sea. An area to the south was zoned for major agricultural and landscaped open space development. Thirdly, when the airport moved to its new location, part of the present air-

port site was zoned to be planned as a large park near the centre of the city. The entire coastline was zoned as a Corniche or special recreational area. Attractive recreational proposals were at an advanced stage of design for the sea lagoon immediately to the north of the central area. The large area in front of the Al Hamra Guest Palace was already being landscaped and attractively laid out as was the Al Ruwais (Old Port) area.

In addition to these large recreational areas, the Master Plan gave support to the ambitious programme of general landscaping, tree planting and beautification of the city which was already underway.

The Plan recommended the provision of 1 hectare per 1,000 people for local recreational space in new development areas. These spaces, which could be of a variety of sizes depending on their function and context, should be so located as to be within easy walking distance of all houses.

COMMUNICATIONS

In 1971, Jeddah had two asphalted road links, one northwards to Yanbu, Medina and the Middle East Countries and the other eastwards to Mecca, Taif and Riyadh. It was estimated that, over the next twenty years, the growth of traffic on these routes would be substantial. For example, a sixfold increase in non-Hadj traffic flows on the routes to Mecca and Medina were predicated at the low

population growth rate. At the high population growth rate the traffic flows would increase over the 1971 existing volumes by a factor of twelve.

Additionally, the further demands of the Hadj, which over the next twenty years was estimated to increase from about one and a quarter million pilgrims to over two million, would add to the volume of inter-city traffic. It was considered, for example, that a six lane capacity would be required between Jeddah and Mecca at Hadj times. The Plan thus proposed a new dual three lane motorway route connecting Jeddah to Mecca. In the longer term, it was also recommended that a rapid transit system would be required for Jeddah and to link Jeddah to Mecca. Provision was made for this in the Master Plan by safeguarding a route which linked the new Jeddah Airport, the Central Area and the University to Mecca and the Holy Areas.

The new primary road network proposed for Jeddah provided a very high standard of access and mobility in phase with the urban growth requirements. Basically linear in form, a network of high speed routes was located to respect existing community groupings and to allow the development of new communities free of major through primary traffic routes. Maximum use was made of the existing airport site to create cross city roads to urban motorway standard.

These measures, plus the longer term proposed rapid transit system, were required to ensure that the rapid growth

rate forecast for Jeddah and the Jeddah-Mecca-Taif sub-region would be served by a high standard of mobility as well as environment and amenity.

PUBLIC TRANSPORT

The analysis of the 1971 traffic surveys indicated that, whilst Jeddah had relatively high level of car ownership, buses and taxis accounted for 41% of the total traffic in the morning peak period. Relative to the low population expansion predicted growth of vehicle ownership, the preliminary analysis indicated that public transport services would be required to carry approx 104,000 passengers in the peak period by 1991. This would generate some 7,500 taxi and bus trips in the peak hour. The proposed road system was thus designed to accommodate these demands.

However, the problem remained of accommodating the growth in vehicular traffic required to transport the increasing number of pilgrims to Mecca and the Holy Areas. In particular, the rapid growth of pilgrims arriving by air and the increasing capacity of aircraft such as the "Jumbo Jet" highlighted the need to extend the public transport system. The Plan thus incorporated an overland mass transit system to transport pilgrims from the reception centres in Jeddah to Mecca and the Holy Areas. Such a mass transit system would have to operate along a 'segregated' route, free from conflicts with other vehicular traffic. Consequently, the final Master Plan analyses examined the travel demands within Jeddah on the basis

that the overall transport system incorporated a special public transport route linking the new Airport through the central area, to the University off Mecca Road and then eastwards to Mecca and the Holy Areas. Whilst the 13,000 passengers attracted to the public transport system did not have a significant effect on the vehicular traffic demands and highway requirements of the low population, when the total public transport demand of 67,000 passengers occured at the high population situation, a mass transit system would provide an effective means of serving the 500,000 people located in the Northern townships. In any event, it was considered that, in planning Jeddah to accommodate nearly two million people, provision should be made for the development of fast and efficient public transport services.

ESSENTIAL UTILITIES : WATER

The water supply for Jeddah is the sole responsibility of the Ain Aziziyah Administration. The three main water resources of Jeddah are the lower course of the Wadi Fatima, Wadi Khlais and the desalination plant on the north coast of Jeddah at Kubbat Asharah. In 1971 the total water delivered by these resources amounted to about 20 million cubic metres (20 Mm^3).

With regard to water consumption, it was calculated that gardening water demand accounted for about 5 Mm^3 of water per annum. Essential urban services accounted for about 55% or 11 Mm^3 per year and the remainder was taken up by

other uses and wastage through network losses.

The projections made in the Plan indicated that the urban water requirement could increase in total to some 84 Mm^3/yr for the low population increase and to 172 Mm^3/yr for the high. From previous studies of the water resources of Wadi Fatima and Wadi Khlais it was concluded that this demand could only be met by the desalination of sea water based on the expansion of the present plant, and in the future, the construction of new plants. Thus the Plan proposals recommended that a major programme be carried out to greatly increase the provision of water by means of desalination.

ESSENTIAL UTILITIES : ELECTRICITY

In 1971 about 70% of Jeddah's population was supplied with electricity provided by the Saudi National Company Limited for Electric Power. Three main power stations were in operation, one of which was part of the desalination plant complex.

It was estimated that by 1991, for the high population growth, there would be a need for an installed capacity of 1880 MW. For the low population growth this reduced to 810 MW. In view of the desirability of effecting economies of scale and the different peak load characteristics of Jeddah and Mecca, recommendations were advanced for considering a unified grid for the two cities. There appeared to be very good reasons to concentrate water production and energy generation in the same area, provided

that a site or sites were chosen which, as well as meeting the sea water extraction requirements, would not conflict with the recreational and amenity use of the coastline.

ESSENTIAL UTILITIES: PUBLIC HEALTH

The disposal of waste-water and foul sewage from properties within Jeddah until 1971 was achieved entirely by means of cesspit drainage. However, as part of an extensive programme of drainage projects being implemented across the Kingdom, the Ministry of the Interior had initiated work on a foul sewage disposal system for Jeddah.

By 1971, the installation of both the major trunk and the main lateral and branch sewers had been virtually completed. House connections were scheduled to be made within the next few years. The construction of the southern treatment works had been completed and the machinery installed, although, in 1971, it was not yet in use. When operational, the foul drainage system and the treatment works would be operated by the Municipality of Jeddah. The works, located 14 km south of Jeddah and 3 km from the sea, was designed to provide fully treated secondary effluent. The treatment works as constructed had a capacity for treating sewerage from a contributing population of 96,000 people, but this capacity could be increased to be capable of handling the flow from a population of 200,000 people. A series of some 23 local pumping stations were in the course of construction to collect and forward the flow from various parts of the

city to two area pumping stations located on the coastal fringe of central Jeddah. These in turn would pass the flow of the entire drainage network to the main forwarding pumping station situated near the port. The purpose of this station was to pump the flow out to the treatment works.

In 1970, work began on three contracts to intercept run-off coming from the hills outside Jeddah and prevent it from causing embarrassing conditions within the city. These contracts covered the construction of two storm water channels; one to the north-east and one to the south-east of Jeddah to carry storm run-off to the Red Sea and a dam in Wadi Mashoub behind the city to reduce run-off from hills. Storm drainage provisions were becoming increasingly necessary in Jeddah and the Plan recommended that the most sensible approach to this problem would be to rely upon graded, well kerbed streets (not major roads) to serve in the first instance as open collecting channels for storm flow and carry such flows to appropriate collection and/or discharge ponds from which the flows could be safely pumped to the sea or to public open spaces that could benefit from flood irrigation. It was not considered justifiable during the early stages of Plan Implementation to invest large sums of money in installing elaborate storm drainage networks that would rarely be used and require costly regular maintenance to ensure that they would be available and fully operational when needed.

The Municipality is responsible for refuse collection and disposal within the City of Jeddah. In 1971, a force of some 800 labourers was employed on this work.

In their forward planning for the extension of the sewerage and treatment facilities, the Consultants - Watson Saudi Arabia - recognised the need for a second treatment works site to be developed to the north of the city. They proposed a treatment unit which could accommodate the flow contributed by 200,000 people with a per capita water consumption yielding at the treatment plan a flow of about 180 litres per person per day.

DEVELOPMENT PROGRAMME

The final stage of Plan preparation was to establish a co-ordinated growth programme. This was developed in four five year phases to span the 20 year plan period - from 1971 to 1991. Two years of the first five year phase would elapse in the time taken to prepare and submit the Master Plan. In any case, the major works which could be completed during this phase had already been commissioned - such is the time scale involved in major developments. Following government approval of a development project proposal, a design contract has to be let; drawings, specifications and Bills of Quantities have to be prepared, approved and then put out to tender; a contractor has to be appointed and, finally, the work has to be executed.

Thus, the first phase of the Plan could be regarded as the phase of execution of committed development. It was essential, however, that as soon as the Plan was approved, land required for roads and other major developments would be safeguarded and all new development conform with its land use structure. The salient features of each of these five year phases of growth were as follows.

Phase One : 1971 - 1976

During this phase of the Plan, Jeddah's population was forecast to increase to about 410,000 persons i.e. an increase of 29,000 persons. Most of this expansion was phased to take place within the existing built-up area, with new development only slightly extending the 1971 urban boundary. The extensive programme of beautification would continue, including the asphalting of major and minor roads. Essential utility services and community facilities would also continue to improve. During this period, the new sewage network was planned to come into operation. Large developments included the expansion of the Industrial Estate and the Petromin Refinery and the new base for the Royal Saudi Navy. The stormwater channel was due to be completed. Development in the Central Area should be controlled in accordance with the strategy for growth. This strategy would be developed in detail in an Action Area study.

The physical structure of the city in 1976 would thus not have expanded greatly. Most of the development activity

was at policy level and concerned with establishing the framework for the implementation of the Master Plan and the formulation of development control procedures.

Phase Two : 1976 - 1981

The second phase of the development programme presented the first opportunity to incorporate major developments proposed in the Master Plan. As it was not too far into the future, events could be forecast with some degree of certainty. One purpose of this phase was therefore to set out a planning framework within which more detailed urban design work could be undertaken. During this period the population was expected to increase by some 90,000 from 410,000 to 500,000. Redevelopment and infill development would continue with new development directed to growth points such as the Naval Base to the south, the University area which included the development of a Regional Hospital.

New development areas, mainly to the north, would extend to the stormwater ditch and those to the south east would extend to the southern channel of the stormwater ditch. Improvements in essential urban services carried out in the first phase would mean that a reasonably high level of provision should be available to the new residents. New and improved provision of community facilities for religion, health and education were forecast.

An important feature of this period of the Plan was the

preparatory work to be undertaken in anticipation of the major growth during the next phase. This work involved major extensions to the power stations; implementing proposals to improve the city's water supply; major extensions to the city's primary road network; further improvements and extensions to facilities required for the Hadj; general improvements in the built environment and the safeguarding and landscaping of the existing agricultural areas and open spaces.

Although a fairly sizeable growth in population was anticipated during this phase, considerable major works would have to be undertaken to allow for the higher growth rate foreseen during the second decade of the Plan. As this rapid growth would not occur until later in the Plan period as this would enable the preparatory work to be undertaken in good time. In view of the time scale required to commission major new works - it could, for example, take five years to complete a major new primary road building programme - it was strongly recommended that these works should be given early consideration.

Phase Three : 1981 - 1991

During the second decade of planned growth the population was estimated to increase to 800,000 at the low growth rate, i.e. an increase of 300,000, and to 1,650,000 at the high rate of growth. Construction activity would peak during this period of the Plan. This growth would bring a greatly increased demand for roads and services, schools,

health centres, commercial and recreational facilities. The expansion of the University should be completed during this period.

It was considered essential however, that, as many changes would inevitably take place over the period from 1971 to 1981, follow-up and review studies should be carried out during the earlier phases so as to ensure that the Plan, and the estimates and projections it embodied, were in conformity. This was in accord with the processes recommended in the Master Plan Report.

Phase Four : Beyond 1991

This last phase of the Plan was concerned with the long term growth prospects for the city. In terms of population growth it was assumed that this phase would cover city growth from the low estimate of 800,000 to the high 1,650,000. The purpose of this phase was to describe the longer term strategy for growth and how this could be accommodated as a logical extension of the twenty year structure. In this respect it provided the distant perspective and long range planning goals within which shorter term developments could be evaluated. The importance of planning the infrastructure requirements of the city from the outset with sufficient future capacity to cope with the high population estimate was stressed in the Plan.

The Master Plan was prepared at a scale of 1:10,000 on

maps which accompanied the Master Plan Report and was approved by the Council of Ministers in 1973. A copy of the Master Plan to 1:50,000 scale is illustrated in Figure 9.5.

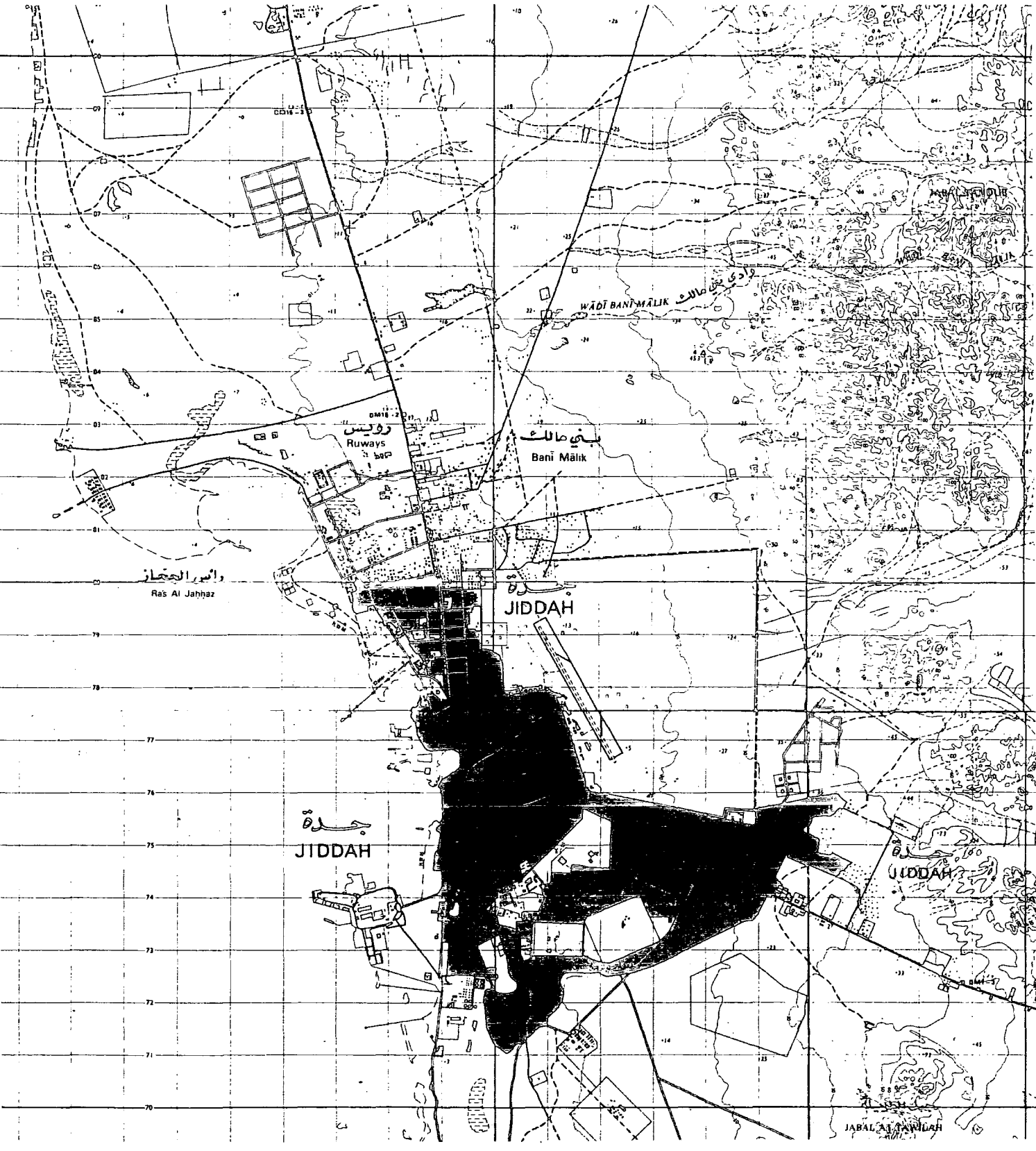
NOTES

1 During the preparation of the Master Plan, a series of meetings, chaired by H.E. Sheikh Hisham Nazer, Minister of Planning, took place in the Consultant's office in Jeddah. Although impressed by the reasons advanced for siting a new airport to the south of the city, after due consideration, the Committee decided that the commitment to the proposed site to the north and the views expressed by the Ministry of Defence and Civil Aviation in support of this site were such that this site should be developed as the new International Airport for Jeddah.

2 There is an interesting footnote to this decision - on which neither the Municipality nor the Consultants were consulted. When the Consultants appointed by the Navy visited the RMJMP office to obtain mapping and other information (and, incidentally, appraise RMJMP of this decision), RMJMP were able to point out that the site was within the Wadi Fatima flood plain and thus could be subject to flash flooding. The development of the Naval Base had to take this factor into account - no doubt at considerable cost.

3 In 1971, this area was blighted by the presence of a large cement factory located about 12 km north of the existing built-up area. When the

Master Plan was approved a resolution was passed that the Cement Factory should be phased out over the period 1973-78. In fact, it was only in 1985 that this factory ceased production - by which time it was surrounded by development.



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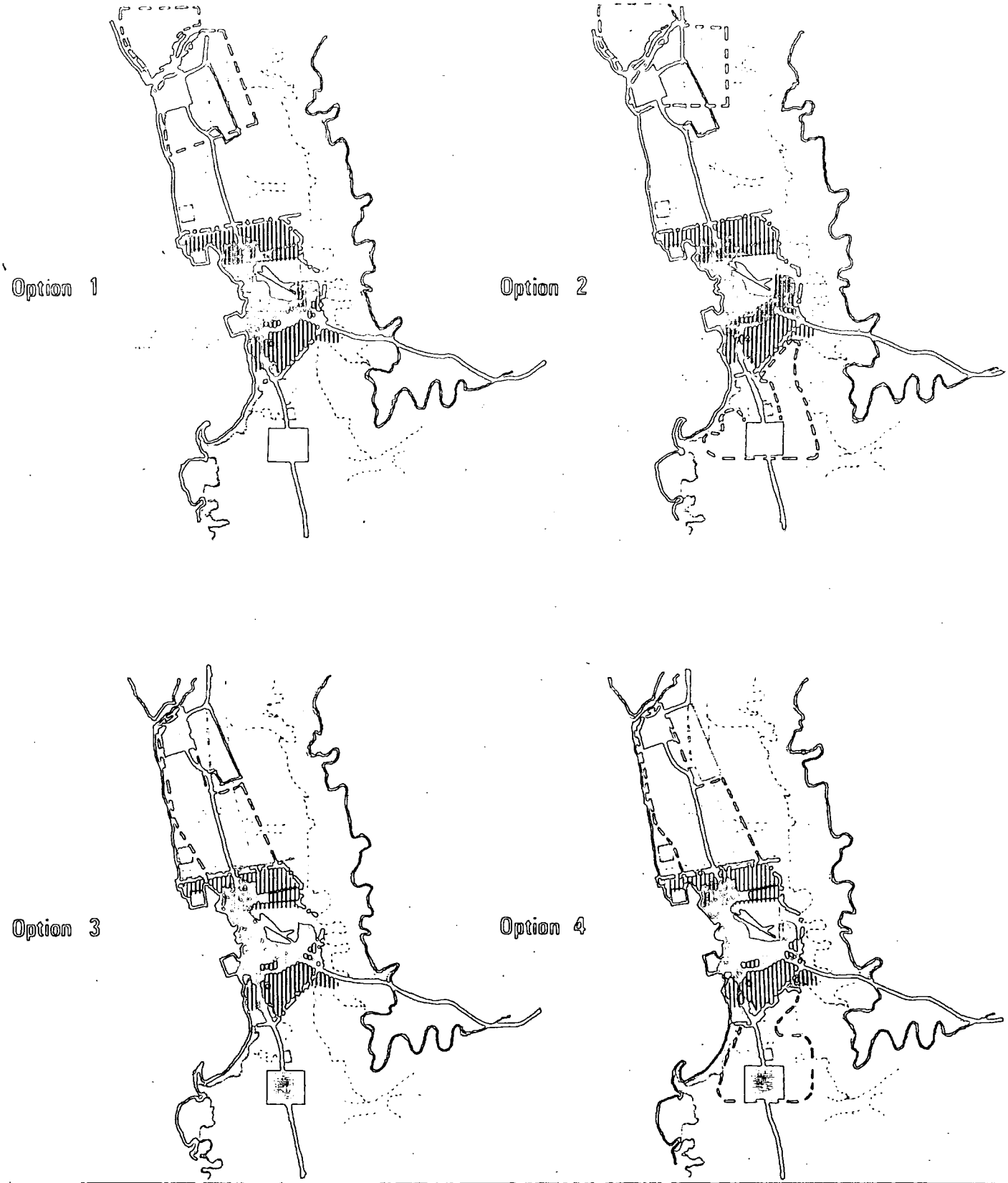
SCALE 1 : 100,000

JEDDAH : 1971 .

SOURCE : FAIREY SURVEYS .

FIGURE 9.1 .



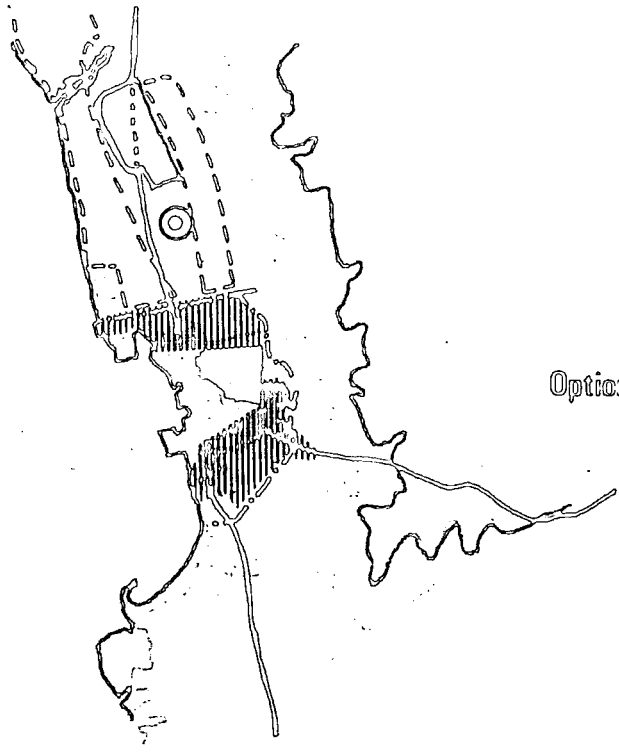
JEDDAH ALTERNATIVE GROWTH STRATEGIES FIGURE 9.2

SOURCE : ALTERNATIVE URBAN STRATEGIES REPORT - RAJMP 1972.

JEDDAH ALTERNATIVE GROWTH STRATEGIES FIGURE 9.3

SOURCE : ALTERNATIVE URBAN STRATEGIES REPORT - RMJMP 1972 .

Option 9



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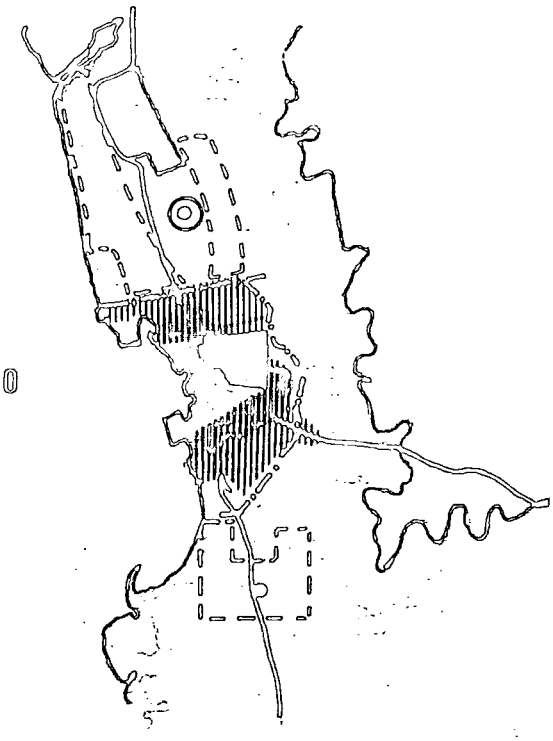
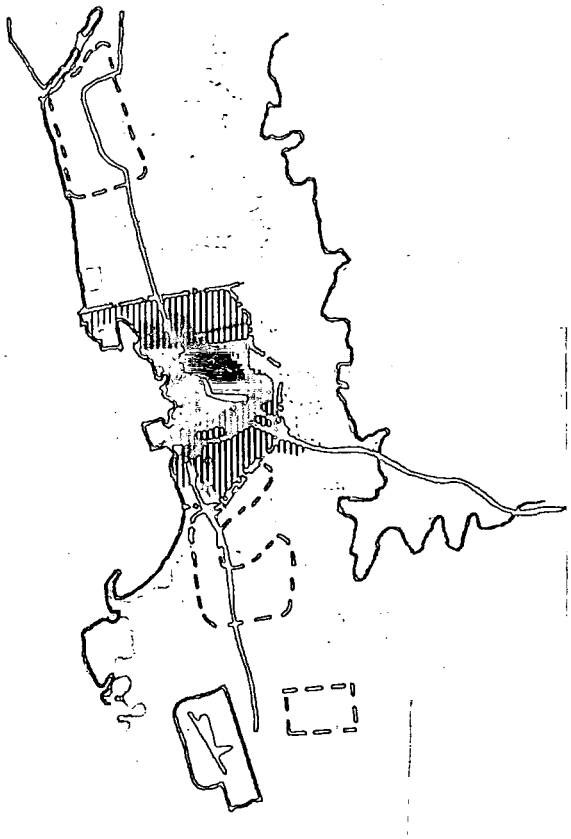
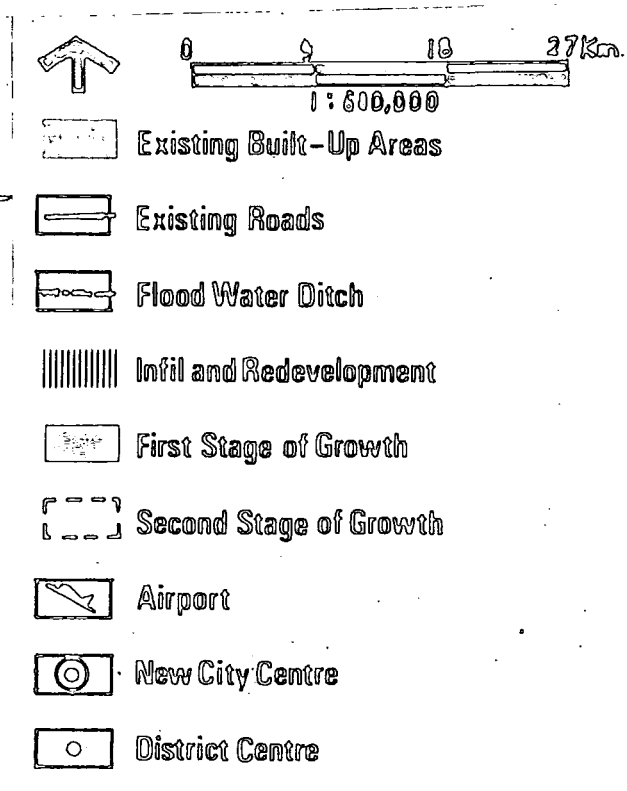


Option 11





JEDDAH ALTERNATIVE GROWTH STRATEGIES FIGURE 9.4.

SOURCE : ALTERNATIVE URBAN STRATEGIES REPORT - DMJMP 1972.

FIGURE 9.5.

المخطط الرئيسي جدة ١٩٩١

Jeddah Master Plan 1991

SOURCE : JEDDAH MASTER PLAN REPORT - RMJMP 1973.

FIGURE 9.5.

المخطط الرئيسي جدة ١٩٩١

Jeddah Master Plan 1991

١٦١ SOURCE : JEDDAH MASTER PLAN REPORT - RMJMP 1973.

INTRODUCTION

Institutional frameworks is a term which can be used to describe the overall structures and processes, private as well as public, through which decisions are made and actions taken in the course of urban development. It thus includes policies, plans, regulations and procedures. Some degree of authority and control to apply regulations to achieve, for example, the acquisition of land or power to control both public and private development is required to allow the implementation of a city plan to proceed.

The 1947 British Town and Country Planning Act has no equal in the sense of a legal commitment by a nation to invest planning with the broad sweep of powers necessary to secure the orderly and coherent control over the use of land by Statutory Planning Authorities. The owner of a piece of land, no matter how powerful, wealthy or otherwise; no matter the vastness of his ownership nor the value of his land, was no longer free to make use of it as he deemed fit, nor to prevent part or all of his land being acquired in the public interest. A singular feature of the '47 Act' was that the Planning Authority could prevent any development or change of use (with certain minor exceptions) without requiring to compensate the owner, provided that such prevention did not impair the con-

tinuance of the existing use of the land.

No such powers existed in Saudi Arabia in 1971; nor do they exist today.

NATIONAL AND LOCAL GOVERNMENT

The origins of the present system of local government in Jeddah can be traced back to the Ottoman administration of the Hejaz which, under Turkish laws of 1864 and 1871, established a Majlis (Council) and a Rais (Mayor) for the Vilayet (Province of the Hejaz). These men were appointed by the Sublime Porte in Constantinople and generally regarded the appointment as a profitable sinecure. Their duties were largely confined to the collection of extortionate customs duties, the regulation and protection of pilgrims arriving by land and sea, settlement of disputes between members of the Council and providing hospitality to visiting dignitaries and local officials. Their aim was inevitably to seek every opportunity to add to their private fortune. In discharging their duties and maintaining peace amongst the often factious sectors of the community and to protect the city from the occasional Bedouin sally against the city's encompassing wall, the Mayor and his Council relied on a permanent garrison stationed in Jeddah. This garrison was housed in the Ottoman built Kishla or barracks located on open land immediately north-north-east of the Bab Medina.

This state of affairs remained unchanged until the Hashemite family were expelled from the Hejaz by Abdulaziz

Ibn Saud in 1926. Despite the codification of the Saudi Constitution of the Hejaz in the same year and the appointment of Emir Faisal, the second son of Ibn Saud, as his viceroy for the Hejaz, few changes took place in local government until 1932, when King Abdulaziz established the Kingdom of Saudi Arabia. The years that followed, including the period of the Second World War, were devoted by Ibn Saud to the consolidation of his Kingdom. It was not until 1953, that the Council of Ministers was established and ministries and government agencies set up to replace the wise but autocratic rule of Ibn Saud. During this period, Emir Faisal controlled the affairs of the Hejaz. This period of stewardship contributed to his experience as an incorruptable leader and administrator and did much to equip him for sovereignty when his less capable older brother Saud was finally persuaded to abdicate in 1964.

The setting up of the Council of Ministers was the first stage of an evolutionary process which, in terms of national and local government, placed emphasis on two aspects: the unfolding complexity of development and, secondly, the ability of planning to set the pace for, and give direction to, complex development[1].

The history of the development of institutional frameworks in the Kingdom can be described in terms of the interaction of four basic trends. The first of these is the expansion of the administrative institutions for the

diverse functions of the state. The second is the contribution of the oil sector to development through exports and revenues. The third is the thrust of planned economic and social development. The fourth relates to the spontaneous response from society, including the private business sector, to the opportunities offered by development. The interaction of all four is mutually reinforcing; the higher the level of oil revenues, the broader the scope for development and institutional growth, and the greater is society's involvement in the process. The first three of these trends fall under government control and, therefore, can be considered as planning variables.

The turning points in the Kingdom's history of development were those times when adjustments were made to synchronise the different growth potentials of the three controllable planning variables. Both contractions and expansions of growth rates were used, depending on the nature of the preferred adjustment, to correct the underlying imbalances in the economy. Thus, in the period up to 1970, before the First Development Plan which covered the period 1970-1974, institutional expansion followed the growth in oil revenues. Later, in the first half of the First Development Plan, the rate of expenditure growth was reduced to correspond to the anticipated lower income flow. In the second half of the First Plan period, after the increase in the income flow from oil, the rate of feasible economic growth was determined by the narrow base of domestic resources and the slow increase in the Saudi

labour force. The Second Plan (1975-1979) which concentrated on building the infrastructure necessary for future development, aimed at maximizing absorptive capacity (including the immigration of foreign labour) to the extent that was compatible with an acceptable rate of inflation. In contrast, the Third Plan deliberately limited higher levels of expatriate employment, and relied for growth on the existing base of available manpower and on other elements, particularly improvements in productivity.

The year 1948 may be regarded as a turning point in the history of development in Saudi Arabia, since it marked the beginning of a period of historic innovation, and the start of the Government's new role in organizing and leading the process of economic development. Against the background of rising oil output and revenues, the first formal national budget was prepared that year. Modern port facilities were completed in Jeddah. The first local radio station began broadcasting in 1950. The first municipal electricity system was introduced in Mecca in 1951. By 1952 more than 20,000 students were undergoing formal education at all levels. Also in 1952, for the first time, a newspaper was published daily, though an official government gazette had been published weekly since 1932. At the same time the infrastructure for oil production was being completed in the Eastern Region. The Trans-Arabia pipeline was finished in 1950; the Ras Tanura tanker port came into operation, and a small refinery was built. Oil

production increased from about 1 million barrels per year in 1938 to just under 200 million barrels in 1950.

During the period 1952 - 1970 (when the First National Development Plan was prepared) the Government managed to sustain steady national development and economic growth at an impressive rate in this period between the first innovations and the First Plan. Statistical data for the early years of development is sparse and not always reliable, but during the period 1963 - 1970 the Gross Domestic Product grew at an average annual rate of 10.6% in current prices, and 9.5% in constant prices. Physical infrastructure was developed rapidly, the educational and health services expanded enormously, and manufacturing industry also demonstrated a healthy growth at an average annual rate of 11% after 1963. Furthermore, the demographic and social pattern was undergoing far-reaching changes. Riyadh, Jeddah, Damman, Mecca, Medina and Hofuf all emerged as substantial metropolitan centres.

Within this national framework, urban and regional planning was the responsibility of a department of the Ministry of the Interior - The Department of Municipal Affairs. In collaboration with the Central Planning Organisation (the department in which the National Development Plan was prepared), as mentioned at the start of Chapter Five, the Department of Municipal Affairs, initiated a programme of regional and city planning.

The Department of Municipal Affairs delegated day to day

matters to regional planning offices; that for the Western Region was located in Jeddah. However, final decisions were made in the Department's office in Riyadh.

This situation failed to resolve the historic division of responsibility between central and local government. Major cities such as Mecca and Jeddah had a say in their affairs only to the extent of the strength and personality of the Mayor. Municipality staff were generally lazy, incompetent and inefficient.

In 1976, the Department of Municipal Affairs was separated from the Ministry of the Interior and a new Ministry of Municipal and Rural Affairs (MOMRA) formed. An annual budget of SR15,000 million was granted to MOMRA.

McKinsey International Inc., an American firm of management experts, was commissioned in 1976 to advise MOMRA on how to reorganise and structure the relationship between central and local government. Whilst highly confidential, the writer was consulted during the preparation of McKinsey's recommendations[2]. One fact will be sufficient to underline the need and importance of this study. Despite the intention to meet the pressing need in every part of the Kingdom to upgrade municipal services and to keep pace with the enormous surge of growth, particularly in the principal cities, MOMRA's decision making machinery utilised only 40% of their annual budget.

One of the principal recommendations made by McKinsey's

was to delegate substantially increased authority to the three largest Municipalities in the Kingdom, one of which was Jeddah (the other two being Riyadh and the Damman-Dhahran-Al Khobar group of cities in the Eastern Region). This recommendation was accepted by the Minister, HRH Prince Majed Ibn Abdulaziz.

This decision revoked the traditional secondary role of the Municipality of Jeddah but, equally, placed new demands on the organisation. The Municipality was faced therefore with the challenge of assuming important new responsibilities and increasing the quality and quantity of services it had hitherto provided. At the same time, the continuing rapid growth of Jeddah would further increase the demands on the Municipality for new and existing services.

In order to meet this challenge, the King appointed the Western Region Planning Officer, Eng. Mohammed Said Farsi, as Mayor of Jeddah. How he responded to this challenge will be dealt with in a later chapter of this work.

LAND OWNERSHIP

The present systems of land ownership and tenure represent the outcome of many different influences including Koranic Law, tradition, Turkish Law, expedience and Saudi Royal Decrees, which have never been brought together into a codified system. To add to the complexity there is a geographical variation in the application of these practices so that a different set of rules applies outside the

municipalities from that which is followed inside municipality administered areas. Similarly, tribal rules of usufruct prevail in grazing areas and detailed conditional leaseholds cover government settlement schemes.

In all, about a dozen different forms of modern and traditional land tenure exist in the Western Region. These can be summarised as follows:

Crown Land: All land to which some form of private claim, of the types outlined below, has not been attached is considered as Crown Land; that is, land held in trust by the State. The purpose of creating such a category - which covers over 90% of the Western Region - is not to derive revenues for the State but to protect the land resources of the country from abuse.

Privately owned (urban): In the municipalities most land is already owned on the basis of a freehold title; many of those in the main cities being of Ottoman origin. Anyone wishing to establish a claim over a piece of unoccupied land must register his intentions with the court clearly marking and defining the limits of the land. The court will then advertise the claim for one month and, if there are no contestant or counter-claims, a deed is made over. To build on land, however, the owner must obtain a licence from the Municipality. It is also necessary to consult the Town Planning Office with reference to plans for the area in which the building plot is situated. Both authorities can prevent building if it is contrary to

existing plans or the public good. It is not uncommon, however, for the system to be bypassed and, once ownership to the land is established, to build on it; a practice which, although officially condemned, still takes place. All land claims and changes of ownership are registered centrally.

Privately Owned (rural): Outside the municipalities in areas where cultivation is practised, individual ownership to land is established through use. Thus the raising of crops over several seasons on a piece of land is sufficient to establish a witnessed claim before the court and to receive a title deed. Many farmers rely, however, on their claim being uncontested because their families have farmed the same area for generations and so they do not bother to formalise their claims before law since they can be easily substantiated by members of the community.

Renting: Outside the municipalities, renting is exceptional. Where it does occur it may take one of several forms e.g.

a Sharecropping: here part of the harvest is handed over to the owner of the land in lieu of a cash rent.

b Fixed Sum: the cultivation of wheat and barley on rented land is often on the basis of a fixed sum payable at the end of the year or harvest.

Heqr: Heqr land is privately owned but not occupied by the owner. The occupier has the right to build on the

land and the building remains the property of the builder not the landowner.

Waqf: This peculiarly Islamic form of land tenure allows the wishes of a landowner to pertain to his land generations after his death. The Waqf conditions apply as long as the stipulations of the Waqf statement apply and, when this ceases to be the case, the land reverts to the Ministry of Waqfs which uses the income from the land for religious or charitable purposes. The Ain Aziziah land in Jeddah, for instance, is a Waqf of the late King Abdulaziz Ibn Saud.

Lease: The Ministry of Commerce and Industry has introduced the system of leased property on its industrial estates in Jeddah and Riyadh where skeletal factory units are leased on a long term basis but remain the property of the Ministry.

Conditional Lease: On land classified as "Unexploited" (a category of Crown owned land), a form of short-term conditional lease has been introduced to ensure the development of scarce new land and water resources along approved lines.

Usufruct: In the tribal areas where grazing is the main form of land use the traditional form or customary land tenure obtains. Under this, control over the use of a recognised and agreed tract of land is vested in a tribe acting through its elected authorities. All rights under

this system are user rights and there is no recognition of individual ownership per se. These rights will gradually cease to have much relevance as the ancient system of nomadic or transhumant pastoralism disintegrates.

Hema: The Hema system is most commonly found in the Asir and the Hejaz and is a very ancient form of conservation and insurance. Under this practice tribes closed off areas of grazing so that they would form a reserve for the community's animals in times of drought. Although the system was abolished by a Royal Decree in 1953, its merits have caused it to persist.

Others: Mention must be made of squatters. Very often these are people too poor to purchase the land they require or want but who are anxious to live in, or around, built up areas. Often they hope that by establishing a position of occupancy they will gain rights over the land. On occasion, especially where Government land is involved, the squatters have been granted the rights to the land such as happened in the early 70s at the northern coastal town of Wajh and on one of the earlier sites of Jeddah's Industrial Estate, where the presence of squatters necessitated the acquisition of a new site. However, where private land is involved the situation is often one of conflict.

In the case of Jeddah, all the land in and around Jeddah is owned, that is if ownership is taken to mean an element of control over the use of the land.

Within the central area of Jeddah most of the land is privately owned on the basis of a freehold title, many of which are of Ottoman origin. Much of this privately owned land in the centre of the city belongs to family estates and the major portion of privately owned land in the urban area is developed and rented.

The structure of land ownership in the city is characterised by the large tracts of land belonging to Government Ministries: e.g. the seaport; the land bordering the sea to the south of the city which belongs to the Ministry of Defence for Royal Saudi Navy purposes; the radio and television stations belong to the Ministry of Communications; the Airport is owned by the Ministry of Defence and Aviation; and specific safeguarded sites owned by the Ministry of Defence.

To the south and south-east of the city, the Mecca Road area, the land tenure falls under the Waqf system (this is the Ain Aziziah land which, as has been mentioned, is Waqf of the late King Abdulaziz Ibn Saud).

The Ministry of Commerce and Industry has introduced the system of leased property and sites on its industrial estate on a long term basis but the land remains the property of the Ministry.

To the south of the city some of the land is occupied by squatters. These people are either, if Saudis, too poor to purchase the land or, if non-Saudis, not able to do so

but are anxious to live in or around the built up area of the city, because of the employment opportunity it provides and kinship ties which exist. Saudi nationals hope that by establishing a position of occupancy they will gain rights to the land.

A different situation prevails to the north of the city centre. Here the land falls into three categories of ownership:

1 Most land between the present urban limits and Sharm Obhur is privately owned and large areas have been marked and subdivided.

2 The Government has designated specific parcels of land between the city and Sharm Obhur for government purposes.

3 The site for the new airport, which lies 24 kms to the north of the city, belongs to the Ministry of Defence and Aviation. To the east, Government development, missile sites, coastguard and desalination plant occupy large areas of land.

LAND VALUES

Land values in Jeddah have a considerable influence on the way the owner seeks to use his land. A real estate market exists and is growing, but land values change constantly as a result of market forces of supply and demand. It is therefore never possible to obtain a precise picture of the patterns of value. In any case the value of land can

vary greatly according to such factors as location, access, services and size of plot. It is thus only possible to give a generalized view of land values and an indication of the rise in land values which took place during the '70s and early 80s.

The highest land values are to be found in the city centre and in this area values have increased dramatically. In 1972 land values stood at about SR4,000-SR10,000[3] per square metre. In 1984 it is reputed that values on prime site had risen to as much as SR250,000[4] per square metre. This value is reflected in the type and density of buildings being constructed, with heights often in excess of 20 floors.

In the ultimate analysis, the value of any plot of land is a reflection of the use (and the nature and intensity of that use) that the planning authority is prepared to permit.

The decrease in land values outward from the central area generally follows the radial pattern of the main roads. The long, finger-like extensions of high values, radiating from the centre, show the important role that the Mecca Road and, even more conspicuously, the Medina Road play in the city's structure.

To the north of the central area, along Medina Road, land values are rising rapidly. 1984 land values for sites fronting onto the north and southbound carriageways now

ranged from SR5,000 to SR6,000 per square metre. Behind the main frontages, values fell to SR1,000 to SR3,000 per square metre. To the north of Palestine Road, which in 1972 marked the edge of the desert and land values averages less than SR10 per square metre, prices vary. Highest values are in the Hamra Area - between the Medina Road and the sea - and can reach SR2,500 per square metre.

Land values are not so high in the area to the east of the central area, along Mecca Road towards the King Abdulziz University and beyond. To the south, in the vicinity of the Petromin Refinery, land values are low. Much of this area is used for surface storage of containers and bulk cargoes imported through the seaport.

Amortisation is usually calculated over a 4 to 5 year period, which is reflected in high rental costs. For example, in the newer mixed office/retail developments outside the central area, agents ask up to SR1,000/sq m/annum for office space, while within the central area small retail units of only 75 sq m are being leased for over SR1 million/annum.

Such high land values have had the effect of forcing a great deal of spasmodic development at isolated locations unrelated to the guidelines laid down in the Master Plan.

It should be noted that there are no local taxes in Saudi Arabia on either land or development. Thus Jeddah does not raise its own taxes but is entirely dependent on central

government funding for all its activities.

DEVELOPMENT CONTROL

The approval of the Master Plan for Jeddah meant that development could be controlled within an organised and consistent framework.

Development control stands in its own right as an essential part of the planning process. A major purpose of a Master Plan is to provide the vehicle within which development control can be carried out in an orderly manner. It is essential to ensure that the Master Plan requirements for such matters as parks/open spaces/recreational areas or new road corridors are safeguarded. An effective system of development control should minimise the risk of permitting new development which would subsequently be found to be in conflict with the Plan.

In order to provide the Town Planning Office with guidelines on how to organise a development control service, as part of their follow-up work on the Master Plan, RMJMP prepared a report setting out the procedures required to set up an efficient development control service. This service, would also have to be capable of coping with the future substantial increase in the applications for development likely to be received by the Town Planning Office.

The system set up was developed from the existing approach, but reflected the need for greater sophistication and method to achieve consistency in implementing the

objectives and proposals of the Plan, as well as interpreting day to day detailed problems. Stress was placed on a basic principle: that planning is concerned with land and its beneficial use in a planned context, and not with individuals. Development control, therefore, must reflect the impartiality of the Planning Authority in applying this basic principle.

The process of dealing with planning applications was set out as follows:

1 On submission the application should be checked to ensure the application forms are correctly completed and in accordance with the information required.

2 A reference number is then given to the application by the Town Planning Office and the site is located and plotted on a 1:2500 or a 1:1000 scale map.

3 The application is acknowledged in writing.

4 The application is referred to other authorities, departments or groups as required.

5 The application is passed on to the professional officer (i.e. architect, planner or engineer) for study and recommendation and from this the decision is made by the Planning Authority.

6 The decision, with any reasons or conditions (e.g. car parking provision) is made known to the applicant.

7 The decision is recorded on file and maps for future reference.

The Consultants also prepared a policy for car parking and traffic management. This was considered to be an essential element of plan implementation. The aims of this policy were:

1 To provide for efficient flows of traffic by deciding:

a) Where and when no waiting at all would be allowed (except for picking up and setting down passengers)

b) Where and when waiting would be allowed for loading and unloading of goods only

c) Where and when on street parking would be allowed and as necessary, controlled by time and price.

2 To provide off-street parking space by ensuring that:

a) Provision was made for private operational parking space in all new developments

b) Appropriate charging policies were adopted to ensure efficient use of public parking space when available.

In support of this policy, car parking standards to be met within the landowner's plot were established for the various use classes defined in the Master Plan, including residential and non-residential development.

REFERENCES AND NOTES

1 The source of this information is the Review of the Achievements and Main Issues of Development in Saudi Arabia set out in Chapter One of the Third Development Plan 1980-1985.

2 Improving the Management of Municipal Affairs, McKinsey International Inc., July 1976.

3 While of limited relevance, the exchange rate between the Saudi Riyal and the Pound Sterling in 1972 was SR10.6 = £1.

4 In 1984 the exchange rate averaged about SR5.7 = £1.

DEVELOPMENT CONTROL CONTEXT

The Master Plan was prepared and approved by the Council of Ministers during the period 1971-75. In order to ensure that applications for development were vetted, the Consultants were authorised to set up a Master Plan development control section to work in collaboration with the Jeddah Town Planning Office. The primary purpose of this team was to check applications against the approved Master Plan to ensure that new development would not be in conflict with the needs of the Plan.

If permission to develop was refused, no right of appeal was allowed. The landowner, having proved he had a legal title to the land, would receive the full current market value of his land in compensation. In the case of an owner's land being partially required (e.g. a building line for a new road or road widening), then the Planning Authority could take up to 30% of the land without requiring to compensate the owner.

In applying these controls, the 1:10,000 scale Master Plan was not sufficiently accurate, particularly in built-up or semi built-up areas, for such detailed purposes. Specific building lines or the investigation of local modifications to the plan to allow, for example, locating a road through a large land ownership parcel rather than many small land

parcels could not be defined from a 1:10,000 scale plan. Nor could such matters as the land take required at road intersections readily be determined.

Thus, even before the Master Plan was approved, the Consultants were retained to initiate a substantial programme of detailed 1:1000 scale Action Area Plans. The Consultants found that in a situation where there was no previous experience of the discipline of town planning, it was essential to demonstrate that there was a 'plan' to follow. This, as well as preventing irrational or contradictory decisions, convinced the people whose land was affected that it was because of the needs of the 'plan' and for no other reason. To generalise, the due production of a file (in this case a 'plan') carried weight and conviction, indeed a certain amount of awe and respect, to both authorities and public alike. Without such "officialdom" it would have been difficult to impose the needs of a plan on, in this context, a relatively unsophisticated community.

It says much for the patience and understanding of the Saudi Authorities that, having anticipated that the Master Plan would provide them with an answer to their problems, it was accepted that its production led to the need for a further, more detailed, stage of planning work in order to secure its implementation.

The early-mid seventies saw the start of dramatic increases in the price of oil and thus oil revenues.

This, in turn, led to development taking off at a much faster pace than could hitherto have been anticipated. The national projected annual average rate of growth of the Gross National Product[1] (GNP) had been fixed in the First Five Year Plan at 6.5% from 1970-1974 and 5.0% from 1975-1979. In fact, during this period, the GNP grew at an average rate of 12% per annum. The excess cash liquidity resulting from this increase in wealth began to fuel speculative land dealing and building development. This, in turn, placed severe pressure on the development boundaries and phasing programme set out in the Master Plan.

IMPLEMENTATION

The timescale required, from initiative to completion, of major development projects in the public sector is such that most of the major works to be carried out during this first period of the Jeddah Master Plan implementation were already either committed or in the course of execution. Thus the main objective of this first period of implementation was to integrate these commitments into a comprehensive pattern of growth and development and to ensure, wherever possible, that this would be the case. This operation is more important than perhaps might be appreciated. For example, until the Master Plan was complete, the planning of public utility services had been done on an empirical basis as regards the nature, density and distribution of development and thus the capacity required

and priorities of the service to be provided. This unsatisfactory situation had to be corrected and the many Consultants involved in their specialised fields of water, sewage, stormwater, electricity and telecommunications, given parameters of distribution and demand for these services. This information included population and employment densities, road alignments, major land users and the rate and location of growth envisaged over the plan period. Such is the enormous cost of the provision of essential services, that the benefit of a Plan which, by comparison, costs very little to produce, is incalculable.

The planned growth of population during this five year period had been estimated to increase from the 1971 base year figure of 381,000 to 410,000 at the low growth rate and 440,000 at the high rate of growth. Employed residents had been assessed to increase from 100,000 to 113,000 or to 125,000 at the high growth rate. No reliable statistical data on population and employment became available (i.e. post 1971 when RMJMP had carried out their socio-economic survey) until a second socio-economic survey was carried out in 1978. This placed the population of Jeddah at 916,000. In view of the overall surge in the national economy, it is likely that, by 1975, the population of Jeddah would have exceeded the high growth rate estimate of 440,000 by as much as 150,000 people. A large proportion of this population increase consisted of foreign immigrants,

principally as a result of the high labour demands generated by the National Development Plan. Thus, the start of the dramatic growth in the city's population was 'employment led' i.e. the number of jobs and the workers required to fill them was a principal factor in setting future population levels.

The evidence of this dramatic increase in population could be adduced from the increase in planning applications made and which were given consent, including those in areas which were not proposed, at this stage of growth, for development in the Plan. The most marked of these was the extensive development of apartments and medium cost housing on both sides of the Medina Road north of the stormwater channel and the start of large private land sub-divisions, particularly in the area west of the Medina Road (i.e. between the Medina Road and the sea) stretching north to the Cement Factory. This latter area became known as New Jeddah and emphasised the shift in axis of growth away from the Mecca Road corridor. The point made in the Master Plan that no stormwater protection was available in these new areas went unheeded, such was the growing demand for land for development.

A major development proposed in 1975 was to create a 'Crown Prince Mod - L Garden City' on the area between the new airport site and the sea, i.e. north of the cement factory. Had this development succeeded, it would have achieved the Master Plan concept of a self-contained com-

munity with a major centre for shopping, office and commercial development for over 100,000 people as a focus for planned growth in this area. The British Consultants for this development were aware of the Master Plan proposals. However, this development had to be abandoned when the Ministry of Defence and Civil Aviation decided to reserve a large part of this land for future airport staff accommodation. Thus, this well-conceived development, which would have done much to raise the quality of private community (as opposed to housing) development, did not materialise.

Another equally ambitious comprehensive development was however implemented. This was the Prince Fawaz University housing and community development on a location about 15km east of the city centre to the south of the Mecca Road. Co-ordination was achieved between the planners and the consultants for this project and the layout organised in such a way as to leave clear the alignment of the motorway to link Jeddah and Mecca which passed through the site.

Other large scale developments which started during the period 1971-75 included the expansion of Petromin (in part the result of a fire in 1972), the start of factory development on the Industrial Estate, where an initial site of 1.5 sq km was prepared and provided with utility services by the Ministry of Industry; the development of the new base for the Royal Saudi Navy on a site of over 8 sq km immediately south of the seaport, adjoining Petromin and

the Industrial Estate.

In the central area, the first high rise complex - the Queens Building - was completed. This comprised a basement car park, ground and upper level shopping floors, an office block and a separate apartment tower. For the first time in new development, internal shopping "malls" featured in this impressive complex. Its initial success did not last. The escalators soon ceased to work and, lacking an integrated air conditioning system, the individual air conditioners, usually placed above or at the side of the entrance to the shops, made the malls noisy, hot and sticky. Of its time, however, this building represented a major step forward by the private sector in large scale planning and design. It also made clear the need for maintenance and upkeep if such ventures were to remain commercially attractive and successful.

A 1974 air photograph (Figure 11.1) shows the Queens Building (the double curved block with the residential tower immediately to its east near the top left hand quadrant of the photograph), dominating the skyline. This photograph shows the many underdeveloped spaces adjoining the sea. Also visible, at the northern mouth of the Al-Manaqabah lagoon (easily identified at the bottom of the photograph) is the start of land reclamation. The British Embassy is the group of four buildings on the south side of the lagoon entrance channel. A noteworthy aspect of this photographic record is the small amount of

traffic using the roads. Unfortunately, the time of day is not recorded, but it is revealing to note the lack of congestion on the roads serving the city centre at that time.

During this period dramatic increases in land values placed heavy pressure on the Town Planning Office to relax the Master Plan regulations for plot coverage and building heights. The problems inherent in doing this were considerable; it would threaten the Plan balance of land use density: road framework and traffic assignments; utility network capacities. However, the unchecked escalation of land values and the rapidly growing demand for accommodation forced the Municipality to consider how far the Plan could be 'stretched' to meet these pressures. In other than two storey residential areas, amendments to the building heights, laid down in the Master Plan, were finally permitted.

These pressures highlighted the wisdom of the approach adopted in preparing the Plan - that planning is a process rather than a finite matter and that the Plan should be capable of responding to high as well as low rates of growth. A third, equally important factor was that the team which had prepared the plan was still functioning and that the officers in the Town Planning Department had progressed to their posts after taking part in the preparation of the Plan. Thus a compromise was achieved which, while permitting higher densities, particularly

where development would front on to wide roads, could be absorbed within the robust framework of the Plan. One aspiration which proved impossible to achieve was that of placing high density residential areas between, rather than along, major roads. The conflict, between fast moving vehicles and a safe living environment posed no dilemma to landowners. The wider and more impressive the road, the greater was the demand to erect high rise buildings. Perhaps it is only in a new town situation, where total planning can be achieved and where there is a strong authority (which is also the landowner), that this desirable planning theory, which separates the areas of maximum potential danger to families from where they live, can be applied.

During this first five year period, social services e.g. schools, mosques, hospitals and clinics tended to lag behind need. This was mainly because the providing authorities were still at a planning, rather than implementation stage, in their development plans. There was also, at that time, over centralisation of decision making by Ministries such as Health and Education. Consequently the time gap between centralised reviews of plans and programmes and actual implementation resulted in provision falling behind need. Such was the availability of funds, however, that once programmes did get under way, results were soon forthcoming. During this period, the Dar-al-Hanan, a girls' private school in Jeddah, raised to a new level the standards of girls'

education in the Kingdom.

In 1970, the King Abdulaziz University comprised four large converted villas sited in an open area to the east of the airport and north of the Mecca Road. In 1972, Consultants were appointed to prepare a Development Plan for growth to 20,000 students (including a self-contained women's faculty). Also, under the guidance of Major Mahmood Nassif, the buildings and projects manager of the University, a large new multi-purpose library and teaching building was completed in 1974. This heralded the first achievement in the development of the University.

During this first five year plan period a start was made on the implementation of the highway network. After competitive tendering, the Italian engineering consultants SAUTI were appointed in 1973 to start a major programme of road construction and urban beautification. For the most part, the early years of their work were taken up with road surveys, preparation of designs and contract documentation. Priority was given to the most congested traffic junction in Jeddah - the Kilo 2 Mecca Road intersection with the Airport Road/Mina Road ring road. By 1975 the first flyover in Jeddah was under construction and Airport Road in course of being widened into a dual three lane carriageway (see Figure 11.2).

To the north of the city centre, a start was made on the construction of Shara Settin (the 60m street, subsequently to be named Prince Fahd Road) as a parallel relief road

to Medina Road along the west boundary of the existing airport. One of the first secondary roads to be asphalted at that time was Shara Khalid ibn Walid, again parallel to the Medina Road, between it and Shara Settin in the district of Sharafiyah. Therein lies an interesting experience. Land acquisition was necessary to link Shara Khalid ibn Walid to Shara Palastine. To achieve the cross section requirement, together with junction sightlines, about 60% of a large land parcel was acquired, leaving, in the landowners' hands, two strips of land about 10m wide on either side of the new road. The junction was paved and when opened, with Khalid ibn Walid serving as a one-way road into the city centre from Palastine Road, an application for a parade of shops on both sides of the new junction (i.e. on the residual 10m strip of land) was submitted by the landowner. The Town Planning Office felt unable to refuse this application, and the shops were built - without adequate parking or servicing. Thus the highway requirements for safety at a busy junction were thwarted and a bad highway/land use interrelationship established. But the lesson was learned. Henceforth when faced with a similar situation, the Municipality acquired all the land or sufficient land to provide a landscaped, frontage-access free zone at junction intersections.

By 1975 urban growth had reached the former self-contained fishing village of Ruwais. This was the first northern settlement to lose its separate identity. Subsequently, as Ruwais was an irregularly planned community of narrow

winding alleyways with predominantly single storey housing, a new road (Hail Road) had to be pushed through this community to link the city centre with the northern coastal development. (Note: only in 1985 when the new Andalus high speed road - the Master Plan coastal expressway on reclaimed land to the west of Ruwais - was completed was Hail Road then able to revert back to a secondary shopping thoroughfare and Ruwais re-attain at least part of its village character).

The location of these highway improvements/new roads is shown in Figure 11.2.

The stormwater ditch was completed in 1974-75, but by then urban growth had overtaken its planned function - to contain the built-up area of the city. (Note: the northern extension of the channel was achieved eight years later when the new Airport Authorities insisted it be built to protect the airport from flash flooding.) The southern sewage treatment plant became operational, but could not be used for another five years until house connections were installed to the main and secondary sewage network.

This first five year period also saw the start of the vast desalination programme mentioned in Chapter Nine. During these early years, however, particularly in the summer, Jeddah was plagued by power cuts. This was in part due to urban growth overstretching the capacity of the power station and partly due to an argument between the electricity company (Jeddah Electric), which regarded itself as the

providing authority, and the Desalination Department of the Ministry of Agriculture as the desalination plant would be a dual water/energy type. The electricity company required assurances as to the timing, amount and dependability of the electricity supply from the desalination plant. These, at that time, could not be made specific, but the reluctance to embark on a duplication of energy supply meant that, until this common policy was established, Jeddah Electric did not receive the necessary funds to build new power stations.

To provide a forum within which all aspects of plan implementation could be viewed, in 1975, the Municipality set up a Supreme Co-ordination Committee. This committee was chaired by H.E. Eng. Mohammed Said Farsi, Mayor of Jeddah. Eng. Mohammed Said Farsi was an outstanding choice as Mayor. As the consultants RMJMP liaison officer, he had participated fully in the preparation of the Master Plan; as a trained architect, he had the experience and ability to understand technical matters; and, as a personality, he possessed the enthusiasm, drive and energy required to undertake the task of implementating a far-sighted and ambitious plan for city growth.

This "human" element i.e. the involvement at the right point in time of a team of responsible and dedicated professionals who share a commmon bond of trust, loyalty, indeed friendship towards a unified purpose, is perhaps

even more important than the "mechanics" of the plan in achieving its implementation.

Such were the growing pressures on the Coordination Committee that it was soon necessary to hold day long weekly meetings. Consultants and contractors would meet with the Municipality and other Government Department representatives and thrash out how to co-ordinate the complex art of city development.

Thus, during this first five year period of implementaion Jeddah began to show signs of dramatic growth and expansion. Modifications and updating of the Master Plan was already under way as well as a programme to detail and refine it. In general, apart from the beginnings of a higher growth rate than envisaged, the activities which took place during this period were in accord with the principles established in the Master Plan.

NOTES

1 Gross National Product (GNP): the total value of all final goods and services produced by a nation's economy. GNP is equivalent to Gross Domestic Product (GDP) minus the net factor payments abroad. GDP is the combined total for "value added" or "net output" in the economy domestically produced. It includes:

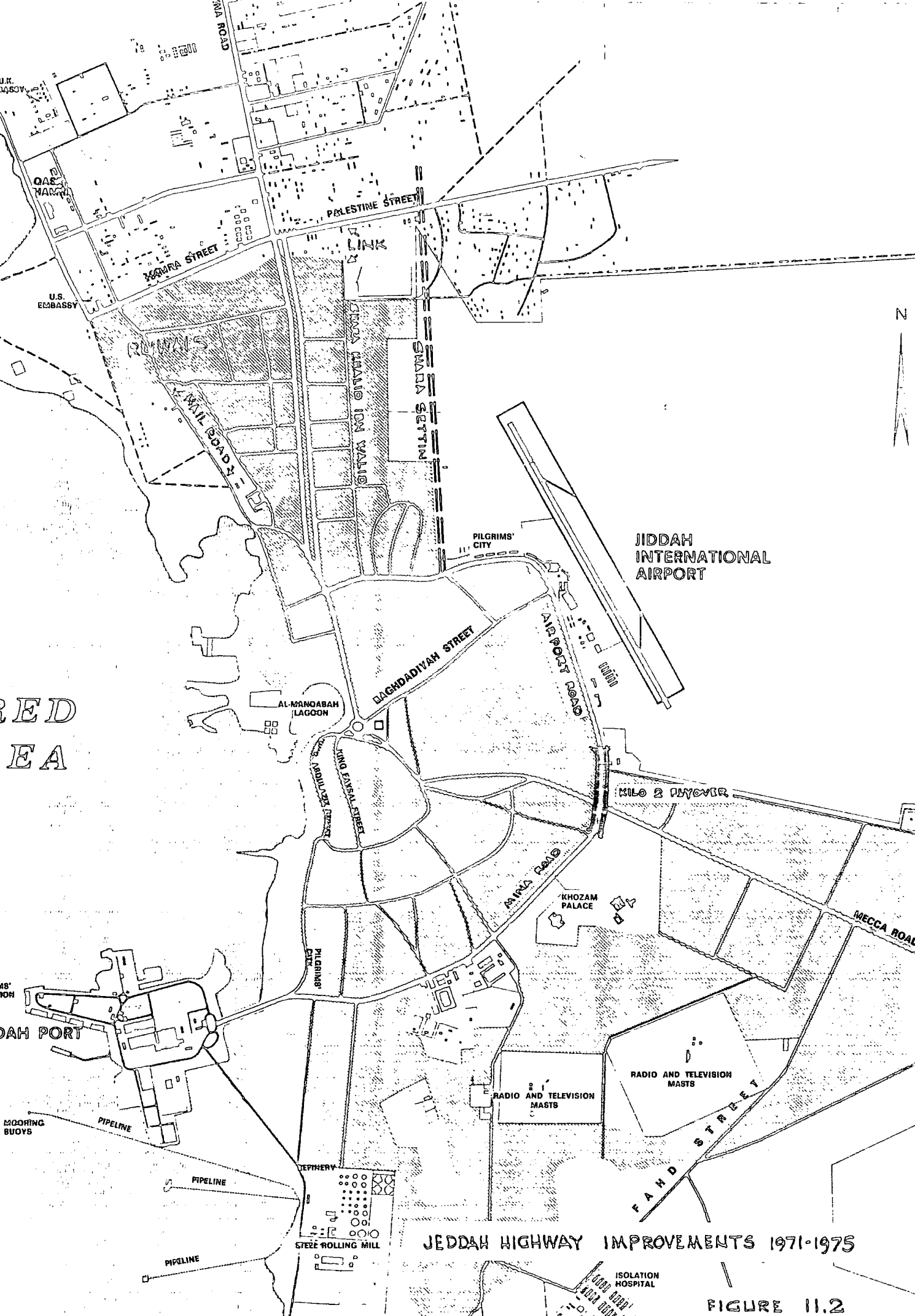
(1) employee compensation and operating surplus of enterprises (i.e. profits including depreciation)

(2) balance of indirect taxes and subsidies.

(Source:
Third Plan, Glossary of terms and abbreviations.)

JEDDAH :
CENTRAL AREA SEAFRONT , 1974 .
SOURCE : FAIREY SURVEYS .

FIGURE II.1.



JEDDAH HIGHWAY IMPROVEMENTS 1971-1975

FIGURE 11.2

INTRODUCTION

The Master Plan defined the overall planning objectives and policies and established the land use/transportation structure for the growth of the city. This framework provided the context for more detailed studies which were, in themselves, part of the implementation of the plan. In turn, these detailed studies led to revisions and amendments to the Master Plan. This interaction is an essential part of the planning process. The skill lies, particularly in built-up areas, in maintaining the principles of the overall plan, but accepting that local conditions may necessitate amending the Plan to achieve, for example, a more satisfactory route for a road corridor or the location of a local centre.

Local plans must conform to the Master Plan in terms of broad land use and intensity of development in order to maintain the land use/transportation balance of the Plan. The purpose of preparing local plans, as well as providing the discipline of a detailed physical form (e.g. type of permitted land use including school sites, open spaces, building lines), is also to set the standards and regulations to be applied in controlling the bulk and density of development. The attached table (Figure 12.1) gives an example of the zoning, bulk and height regulations which formed part of the 1:1,000 plan layout sheets prepared by

RMJMP for all areas for which they established detailed plans. Such specific regulations were considered by the Town Planning Department to be essential in controlling the height and intensity of any development. These regulations were incorporated into each 1:1000 scale plan so that when the plans were approved, so were the regulations; the one an integral part of the other.

During the preparation of the Master Plan, two specific subjects had been identified as requiring special study - the Historic City and the Seafront. Additionally, other aspects of city development which required study included the development of a public transport system and the naming and numbering of streets and areas. In the early 1970s neither Jeddah nor any other city in Saudi Arabia possessed street names or house numbers - much to the confusion of new arrivals, particularly when visiting friends for the first time.

These matters were part of the implementation of the Master Plan. It was also considered important that the people of Jeddah should appreciate that, even though living in a fast growing city, it was a city with purpose, order and organisation in its growth. A further dimension of this aspect of the work was the conscious effort by all involved in the planning and development process to retain the qualities of an Arab city, accepting that it was the 20th Century. Thus romantic or inappropriate visions of what this meant or how it could be interpreted were not an

answer.

Reality, in the form of the motor vehicle externally and air conditioning internally, were factors that could not be ignored. The impact of the motor vehicle meant that adequate road space and standards for car parking had to be achieved at both city and local level. In such a harsh climate air conditioning allowed a new and different approach to living and working. The need for natural ventilation - which had given rise to an expressive and functional style of architecture in the traditional buildings of the old city - was not longer paramount. Nor could the scale of new development be that of walking distances between buildings and from one part of the city to another. The car, it should be remembered, is also air conditioned, and its contained privacy could be considered as an extension of the home. The provision of an abundance of desalinated water would soon remove a cogent restraint to the lifestyle of the people and their environment.

The combination of technical innovation and great private, as well as public, wealth inevitably leads to dramatic changes in the aspirations of people and thus to the outward expressions of this in their lifestyle.

There is no simple answer as to how or in how far the plan and the planners should be able to, or could be expected to, control such a situation. The awareness of these matters was, at least, a start. What the planners also appreciated was that there were two stable and basic fac-

tors which technology would not change. First, the importance of the family in Saudi society and, second, an unshakable belief in the moral and religious precepts of Islam. The protection and, if possible, enhancement of these social values was an essential factor in the approach adopted by the joint Saudi-British team particularly in the preparation of local plans.

The next seven chapters (Chapters 13-19) set out, in the following sequence, a brief description of the follow-up studies which were carried out as part of the development and implementation of the Master Plan:

The Central Area

The Historic Area

The Corniche

Detailed Area Plans

Private Sub-divisions

Urban Public Transport

Street Naming and Numbering

Zoning, Bulk and Height Regulations — تحديد المناطق - الأنظمة المتاصة بالحجز والإرتفاع

المنطقة Zone	الاستعمالات المسموح بها Permitted Uses	عدد الوحدات السكنية في قطعة الارض No. of Dwelling Units / Plot	الحد الاقصى لعدد الطوابق Maximum Number of Storeys	نمط التنمية Pattern of Development	الحد الادنى لمساحة قطعة الارض / متر مربع Minimum Plot Area in sq.m.	الحد الاقصى لتغطية قطعة الارض ٪ Maximum Plot Coverage	الحد الادنى لعرض قطعة الارض بالمتر Minimum Plot Width in m.	الحد الادنى لعمق قطعة الارض بالمتر Minimum Plot Depth in m.	خط ارتداد البناء / متر Set back build line in m.			نسبة مساحة الطبقات الى مساحة قطعة الارض Floor area ratio index	الحد الاقصى للارتفاع الكلي بالمتر Max. total height in m.
									الواجهة front	الجانب side	الخلف rear		
R.3/c	شقق مع دكاكين في الطابق الارضي فقط	–	٥	متلاصقة	٢٥٠	٥٠٪	١٢	٢٠	–	–	٨	١٫٥	١٧٫٠
	Apartments with shops on ground floor only	-	5	Attached	250	50%	12	20	-	-	8	1.5	17.0
R.3/h	شقق مع دكاكين في الطابق الارضي فقط	–	١٠	متلاصقة	٦٠٠	٦٠٪	١٢	٢٠	–	–	٨	٣٫٠	٣٢٫٠
	Apartments with shops on ground floor only	-	10	Attached	600	60%	12	20	-	-	8	3.0	32.0
R.3	شقق مع دكاكين في الطابق الارضي فقط	–	–	تصميم خاص	١٠٠٠	–	–	–	–	–	–	٥٫٠	–
	Apartments with shops on ground floor only	-	-	Special Design	1,000	-	-	-	-	-	-	5.0	-
R.4	فنـــدق	–	–	تصميم خاص	١٠٠٠	–	–	–	–	–	–	٥٫٠	–
	Hotel	-	-	Special Design	1,000	-	-	-	-	-	-	5.0	-
C.3/c	دكاكين ـ مكاتب وسكنية .	–	٥	متلاصقة	٢٥٠	٥٠٪	١٢	٢٠	–	–	٨	١٫٥	١٧٫٠
	Shops, Offices and Residential	-	5	Attached	250	50%	12	20	-	-	8	1.5	17.0
C.3/h	دكاكين ـ مكاتب وسكنية .	–	١٠	غير متلاصقة	٦٠٠	٦٠٪	١٢	٢٠	–	–	٨	٣	
	Shops, Offices and Residential	-	10	Attached with 4.5 metre arcades	600	60%	12	20	-	-	8	3.0	32.0
C.2	دكاكين ـ مكاتب وسكنية .	–	–	تصميم خاص	١٠٠٠	–	–	–	–	–	–	٥٫٠	–
	Shops, Offices and Residential	-	-	Special Design	1,000	-	-	-	-	-	-	5.0	-
C.3	ســـوق	–	–	تصميم خاص	–	–	–	–	–	–	–	–	–
	Market	-	-	Special Design	-	-	-	-	-	-	-	-	-
S.1	مدرسة ابتدائية	–	–	تصميم خاص	–	٢٠٪	حسب المخطط	حسب المخطط	–	–	–	–	–
	Elementary School	-	-	Special Design	-	20%	As Plan	As Plan	-	-	-	-	-
S.2	مدرسة متوسطة	–	–	تصميم خاص	–	٢٠٪	حسب المخطط	حسب المخطط	–	–	–	–	–
	Intermediate School	-	-	Special Design	-	20%	As Plan	As Plan	-	-	-	-	-
S.3	مدرسة ثانوية	–	–	تصميم خاص	–	٢٠٪	حسب المخطط	حسب المخطط	–	–	–	–	–
	Secondary School	-	-	Special Design	-	20%	As Plan	As Plan	-	-	-	-	-
S.4	مركز تدريب المعلمين	–	–	تصميم خاص	–	٢٠٪	حسب المخطط	حسب المخطط	–	–	–	–	–
	Teachers Training	-	-	Special Design	-	20%	As Plan	As Plan	-	-	-	-	-
M.1	مستوصفات	–	–	تصميم خاص	–	٤٠٪	حسب المخطط	حسب المخطط	–	–	–	–	–
	Clinic	-	-	Special Design	-	40%	As Plan	As Plan	-	-	-	-	-

SOURCE : RMJMP ACTION AREA STUDIES, 1973 - 1976

FIGURE 12.1.

The Central Area had been defined in the Master Plan as an area of approximately 17 sq km contained within an encompassing road to be constructed to urban motorway standard (see Figure 13.1). The east and west flanks of this road required no demolition or disruption of existing development as they were located within the old airport site and in the shallow sea water respectively, as were the two extremities of the northern flank. The route of the southern flank passed through the disused Khozzam Palace Gardens and followed the line of a wide, existing road. Thus the difficult problem in urban areas of achieving a high speed road network within a built-up area was, for the most part, resolved by making maximum use of undeveloped and available land corridors. The use of the sea for the west flank was a deliberate decision as any alternative would have necessitated a major disruption to the historic core.

The principal components of this area were the historic core, the radial roads containing most of the commercial activities, mixed residential, shopping, business and office areas between the radials to the north and east and, in the southern area, a large enclave of irregularly laid out single storey block built low cost housing.

The Master Plan population and employment proposals for

the Central Area were as follows:

Table 13.1

DISTRIBUTION OF POPULATION AND EMPLOYMENT

A POPULATION Area	1971	1991 low	1991 high
City Total	381,148	800,000	1,650,000
Central Jeddah	189,672	152,900	165,250
Action Area	63,255	69,500	69,500

B EMPLOYMENT Area	1971	1991 low	1991 high
City Total	100,000	240,000	495,000
Central Jeddah	68,800	99,900	172,400
Action Area	19,465	24,490	42,000

Source: RMJMP Jeddah Central Action Area, 1975

These statistics highlight the relatively small change in the population to be accommodated within central Jeddah. However, expressed as a proportion of the total population of the city, the population resident within central Jeddah was planned to decrease from nearly 50% in 1971 to 19% of the 1991 low population and to 10% of the 1991 high population.

The Master Plan policy for dispersal of employment throughout the city resulted in the proportion of jobs to be located within central Jeddah reducing from 69% in 1971 to 42% of the 1991 low and to 35% of the 1991 high employment opportunities. However, the actual number of jobs within central Jeddah would increase significantly at the low growth rate and by nearly threefold at the high

growth rate.

The transportation analyses carried out during the Master Plan study highlighted that the peak period traffic flows within Jeddah would exceed 128,000 passenger car units (pcu's), for the low population and 260,000 pcu's for the high population. Provision was made for highway corridors and interchanges of adequate capacity to accommodate the traffic demands of the high population, which, when calculated, required the directional distribution of 59,500 vehicles entering and leaving central Jeddah in the 1991 peak hour. Six out of every ten of these vehicles would be generated to the north of central Jeddah.

The transportation analysis also identified that 70% of this traffic had a purpose in central Jeddah and consequently only 3 out of every 10 vehicles were making journeys across central Jeddah. Thus, the Master Plan proposals to accommodate these traffic demands were based on the adoption of a high capacity (1,500 pcu's per hour per lane) urban motorway routes.

This detailed examination of the Master Plan proposals for central Jeddah confirmed the feasibility of the policies for development, but indicated some practical modifications arising from detailed surveys of existing conditions and committed projects. In particular, the detailed engineering feasibility studies of several highway network options highlighted the planning constraints and opportunities and the environmental impact of alternative

routes and interchange locations. This developed primary road system is shown diagrammatically on Figure 13.1.

As in the case of the Master Plan, the specialised studies to determine the detailed design requirements of the rapid transit system were beyond the scope of this central area study. However, the proposals outlined in the Master Plan were reviewed in conjunction with the primary road system and three amendments were incorporated into the detailed plans. These were:

a In order to minimise the barrier effects of major transport corridors, the main line of the rapid transit system was located within the proposed urban motorway by widening the central reservation to 20 metres.

b In view of the engineering feasibility and planning constraints of incorporating any form of fixed track system within the central area, a more flexible busway system was adopted as a local transit system linking the main line system to the city centre.

c In addition to the busway system, provision was made to accommodate an extension of the main line transit system around the harbour area to serve the seaport and along the north and south corniche to serve the expansion of the urban developments along the coastal plain.

The general disposition of land uses which were developed

in parallel with the transportation system for central Jeddah is also shown diagrammatically in Figure 13.1.

The relatively modest increase in resident population proposed within the central action area was determined by the need to improve living conditions and associated community facilities such as schools, health centres and parks and to accommodate an increase in land area for central city facilities for civic, commercial and transportation purposes. This population increase was thus achieved by increasing net residential density from an average of around 200 persons per hectare (pph) in 1971 to slightly more than 250 pph. The resultant decrease in land area for residential development released some 43 hectares of land, most of which was occupied by poor quality housing, for improvements in community facilities. In total, therefore, the land area allocated for residential purposes would remain much as it was in 1971 and the increased provision for central city facilities was achieved through a more efficient utilization of the remaining space.

By 1974-75 the structure of the residential communities had produced considerable socio-economic and physical diversity. One of the aims of the Master Plan was that such areas should retain their separate identity in the development of the city even though physical change could be expected. In order to achieve this, the development of local centres was promoted at focal points within the com-

munities in order to improve the level of social amenities available to residents.

Employment opportunities within the central area were mainly concentrated in services and distribution with a very substantial increase in both private and government offices. The prodominance of employment in service trades (especially in the Mecca Road area) would be likely to continue but larger space using industries in the central area were relocated. The main centres of employment were proposed along Mecca Road and Airport Street and in the lagoon area. In addition, the Master Plan proposal to concentrate private office development in areas where it could be served by adequate car parking facilities with direct access from the primary road system was incorporated into the detailed plans.

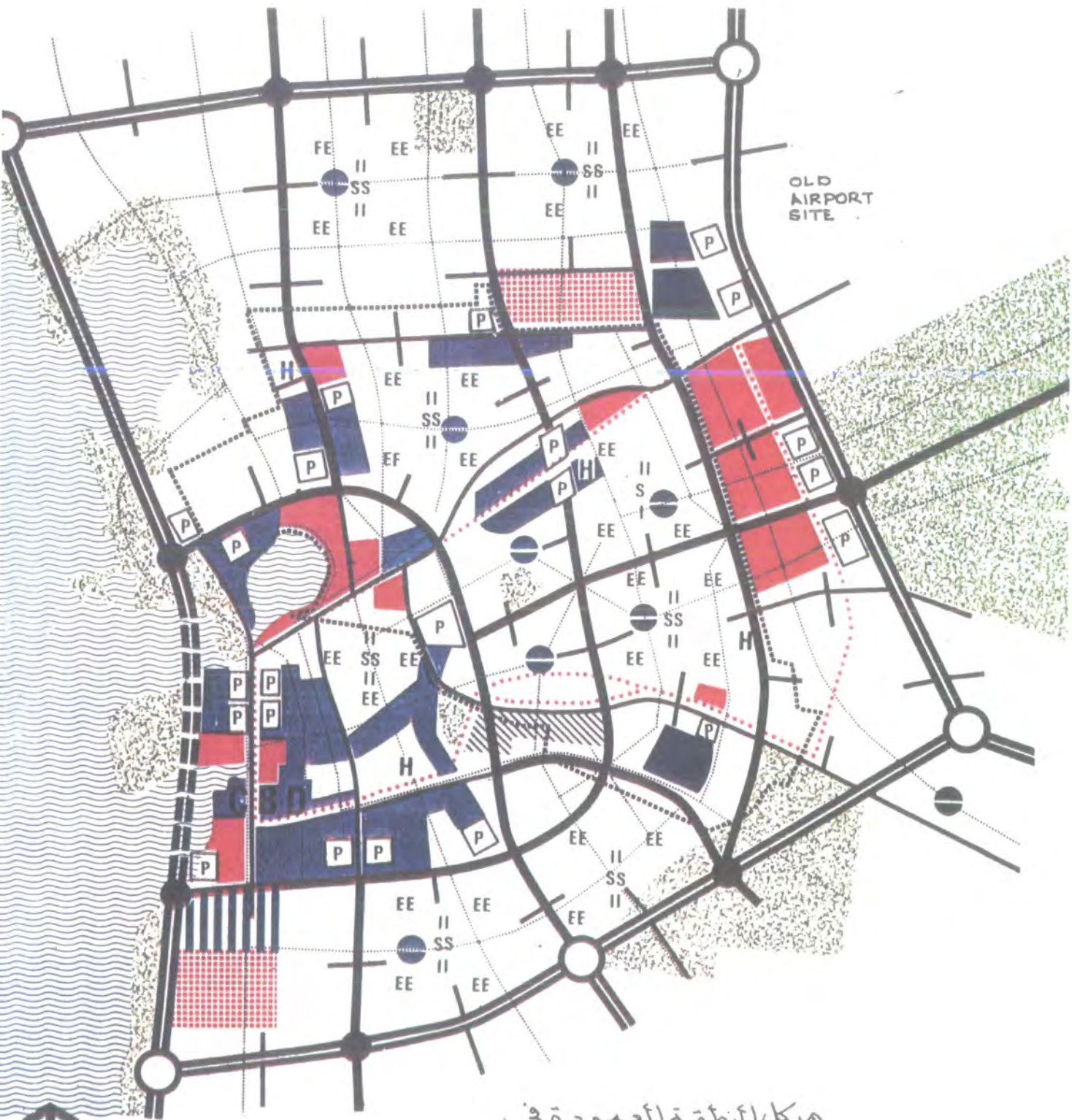
Having reviewed and established the detailed application of the Master Plan to the existing situation, the last stage of this study was to prepare detailed 1:1000 scale plans and regulations. In 1974-75 when this work was carried out, funds were not available to prepare these plans for the entire 17 sq km area, and the decision was made to omit the historic area and the southern low cost housing areas from this phase of the study.

As is set out in the next Chapter, a special conservation study was carried out for the historic area, but the southern area was not subsequently studied. This omission is to be regretted as this area still remains unplanned.

When the new road network was thrust through, it was without regard to the active and, until then, settled social character of the area[1].

NOTES

1 A well researched study of this southern area was carried out as a post graduate thesis at Newcastle University by a Saudi student, Eng Haider Assad. Eng Assad made use of the RMJMP surveys and general planning context as the basis of his study. While his work was received with interest and appreciation by the Town Planning Department, it did not prove possible, due to greater pressures, for his proposals to be implemented.



هيكل المنطقة المعمورة في
المنطقة المركزية بجدة

CENTRAL JEDDAH DEVELOPED STRUCTURE

SOURCE : JEDDAH CENTRAL AREA - RMJMP, 1975 . 212

FIGURE 13.1.

In 1971, during the Immediate Action stage of their programme of work, RMJMP had included a description of the outstanding urban heritage present in the Holy Cities and in Jeddah and stressed the need to take action to protect buildings of architectural and historic quality as well as their encompassing traditional areas. While no positive action was taken by the authorities at that time, in the preparation of the city plans, the Consultants respected these historic areas and routed new highways and land for urban growth and redevelopmment away from, rather than within or through, such areas.

The Consultants action area planning programme was not a suitable vehicle for the study of the rich, intricate and sensitive fabric of such historic areas. In the case of Jeddah, the magnificent old coral limestone buildings were, almost without exception, located in tightly packed groups through which narrow tortuous alleyways threaded their way like veins of calcite in a block of marble. Small squares provided much-needed breathing spaces and formed a focal point for community life, while minarets provided a guide for location and an aid to navigation for sailors entering the port through the reefs.

Sir James Craig, when British Ambassador to Saudi Arabia, provided the writer with a somewhat amusing account of the

old city penned by Sir Reader Bullard who spent a term as British Consul in Jeddah in 1923-25. He describes 'nightlife' as follows:

> "As though the summer nights were not hard enough to bear we were plagued by pariah dogs, and for a time by owls, which would make a hissing noise for hours, about two seconds on and one second off".

(It should be noted the the Consulate stood on the northern edge of the town near the city wall and it was in the desert outside the wall that the owls found the rats and jerboas that they fed on; having fed, the Consulate cornices and parapets provided a convenient perch.)

> "So sore was the persecution that I borrowed a shotgun, and after a tremendous safari through the dim rooms I would, if I was lucky, find the owl outlined against the sky and shoot him sitting".

It was to take RMJMP, assisted by the Mayor, until 1978 to convince the authorities to mount a detailed social, physical and conservation study of the old city of Jeddah.

The Historic Area was the centre and the business heart of a large, rapidly growing and prosperous city. In such circumstances, owners had little desire to meet the cost of maintaining the large family homes of their ancestors when the possibility existed, through redevelopment, to build a 'modern' office or apartment block which would provide an excellent yield on investment. New development is much more profitable than maintaining an old building; indeed the more magnificent the building, the more costly

the maintenance. By 1978, land values had reached over SR9,000 per square metre. Traditional buildings had become vulnerable and their future perilous. The scale of development in the 'boom' years of the mid to late 1970s had already accounted for the loss of many historic buildings in the city centre, particularly, as shown in Figure 14.1, in the area west of King Faisal Street (sometimes termed Shara D'ab as a pot of gold was found during its construction in the mid 60s). For most of the remaining historic buildings, the major problem was lack of adequate maintenance. The sub-division of these large buildings into small units which were rented, in many cases on a room by room basis, worsened this situation. Equally bad for these buildings was their use for storage or warehousing.

By 1978, without a major reversal of the existing situation and prevalent attitudes, the historic fabric of the old city would, almost certainly, not have withstood this combination of neglect and greed. Probably, with the few exceptions of families who still either lived and/or worked in their family homes or who respected their qualities, the old city would have been razed and redeveloped as part of a great tide of growth and prosperity. Thus, in every way, the study undertaken by RMJMP was timely and essential.

The three stages of the study programme were:

Stage One : Surveys & Alternative Strategies

Two : Urban Design Proposals

Three : Development Control & Civic Design Manual

Because of the rich quality of the townscape of the Historic Area, planning proposals were prepared at 1:500 scale with 1:200 and 1:50 scale details as necessary.

The study progressed from an overview of the Master Plan context and role of Central Jeddah, to the detailed study of the Historic Area and, finally, to the preparation of full contract documents for the restoration of five historic buildings. The programme allowed twelve months in which to complete these tasks.

The transportation, land use, population and employment context of the Central Area within the Master Plan context had been established in the Central Area study carried out in 1974-75 and described in the previous chapter. In strategic terms and in relation to the ongoing implementation of the Master Plan, the city centre role, when reviewed in 1978, was found not to have changed significantly. The Central Jeddah structure plan which formed the planning context for the Historic Area study is illustrated in Figure 14.2.

The Historic Area, as defined for the purposes of the study (see Figure 14.1) comprised approximately one and a half square kilometres contained within the Corniche on the west and the King Abdulaziz ring route around the

north, east and south, i.e. the area contained within the old city wall.

The area comprised three main components, the waterfront, the primary new/redeveloped commercial and business centre between King Faisal Street and the new Corniche service road, and the older residential/shopping/service industry area to the east of King Faisal Street. The four main city radial roads: Mecca Road, Medina Road, Airport Road and Port Road, converged on the King Abdulaziz ring and served as the major traffic routes to the city centre. The lagoon, Ministry of Foreign Affairs, and the Kishla formed an area of urban design importance immediately north of the Historic City. To the south was an area of mixed uses including offices, warehousing and residential.

Thus the study area contained a wide range of new commercial and residential buildings as well as most of the remaining historic buildings which formed an important part of the architectural heritage of Jeddah. The area was under severe pressure for new development. Large areas had been developed or committed for substantial modern development projects mainly of commercial and office use, particularly in the western part of the study area. The existing land uses within the study area in 1978 are shown in Figure 14.3 and are summarised in Table 14.1.

Table 14.1 Existing Land Allocation

Land Use		Area (hectares)
Residential (including local footpaths)		21.66
Hotels		2.57
Commercial		
i	Retail/offices	21.60
ii	Warehousing	3.11
iii	Fish and vegetable souk	1.65
Civic		4.91
Mosques		1.82
Schools		0.86
Taxi and bus station		0.68
Public open space		3.10
Roads and related spaces		49.95
Vacant sites		7.80
Sub total		119.71
Land at present under reclamation		29.01
TOTAL		148.72

Source: RMJMP Historic Area Study, 1978

The procedures used for the control of new development lacked a sufficient basis of information on building disposition, their potential and problems and as such were inadequate to secure the proper planning framework for the historic core of the city. It was also apparent that the majority of the old buildings were becoming dilapidated and unless measures were taken to revitalise and restore

them they would be likely to reach a condition beyond repair with demolition being the only course of action.

In order to prepare a strategy and suitable structure within which new development could proceed but still remain and respect the historic areas, a balanced approach to the problem was adopted. Total preservation was impossible as the historic core had been fragmented by demolition and new development projects. In any case, total preservation would have tended to deaden the area and render it obsolescent. Such an approach would also inhibit the regeneration of the historic fabric and quality of the area in a way which could respond to contemporary social and economic needs and amenities. Thus, the need was to carefully relate new development within the context of the old and traditional.

This approach to conservation and rehabilitation was also one which would not impair the day to day functioning of the city. However, to enforce and implement this policy special responsibilities and controls would have to be applied to protect the qualities of the urban environment.

The first stage of the study comprised comprehensive surveys and appraisals of the existing situation. The resulting appreciation of the Historic Area was that it was generally suffering from multi-occupancy and poor maintenance and gave an overall initial impression of being ripe for redevelopment. More detailed surveys, however, indicated that it would be possible to

rehabilitate many of the old buildings as the basic structures were in a sound condition. Also, an immediate and vigorous programme of rehabilitation could provide an attractive environment and preserve an historic continuity for future generations.

Although less than fifty years ago the Historic Area represented over 90% of the entire area of the city, by 1978 it constituted only 0.2% of the Metropolitan Area. The results of the socio-economic survey indicated that the resident population in June 1978 was 47,400. This showed a decline from the 1971 figure of 56,000, attributable to the extensive redevelopment of the Central Business District.

For the purposes of the socio-economic survey and analysis of the Historic Area, three districts were defined (see Figure 14.4) as follows:

1 The Central Business District, within which new office and apartment buildings predominated (Zone 2).

2 The Traditional Residential District, within which was located most of the traditional houses and activities. (Zone 3, including 2a and 2b).

3 The Eastern District, mainly comprising newer, non-descript buildings (Zone 3a).

The distribution of population and employment within each of these districts was:

Table 14.2 Population and Employment by District

	Employment	Population
Central Business District	30912	9191
Traditional Residential District	5869	30893
Eastern District	7898	7286
	44679	47370

Source: RMJMP Historic Area Study, 1978

The high population densities were reflected in the ratios of floor area in square metres per person, shown in Table 14.3.

Table 14.3 Occupancy Rates, Gross Floor Space/Per Person

Zone	Density in Traditional Residential Dwellings (sq m/person)	Density in Modern Residential Dwellings (sq m/person)	Density in Retail and Office Properties (sq m/person)
CBD	11.8	14.97	15.59
TRD	11.36	16.18	29.28
ED	13.37	15.18	17.58

Source: RMJMP Historic Area Study, 1978

The population density was marginally higher in the traditional housing than in the modern apartments, with highest densities in the Traditional Residential District in the older house types. The relatively high space in commercial premises in the traditional district was attributable

to the large areas of storage usage in many of the trading establishments.

The most notable feature of the population composition of the Historic Area was that a large proportion of the population was comprised of children. The under-15 age group accounted for 40% of the area's population. The distribution of population within the old city by age and sex was:

Table 14.4 Population Distribution by Age and Sex

	Males		Females		Total	
	%	Total	%	Total	%	Total
0 - 4	14.0	3574	12.1	2642	13.1	6216
5 - 9	11.4	2911	15.2	3319	13.2	6230
10 - 14	12.7	3243	14.8	3232	13.7	6475
15 - 19	14.0	3576	13.1	2861	13.6	6437
20 - 24	8.2	2094	10.0	2184	9.0	4278
25 - 29	7.1	1813	7.9	1725	7.5	3538
30 - 34	6.2	1583	6.9	1507	6.5	3090
35 - 39	5.1	1302	6.7	1463	5.8	2765
40 - 44	7.5	1915	4.4	961	6.1	2876
45 - 49	4.7	1200	2.9	633	3.9	1833
50 - 54	3.7	945	2.3	502	3.1	1447
55 - 59	1.6	408	1.0	218	1.3	626
60 - 64	1.3	332	1.4	306	1.3	638
65 +	2.4	637	1.4	284	1.9	921
TOTAL		25533 (53.9)		21837 (46.1)		47370

Source: RMJMP Historic Area Study, 1978

This age structure suggested a history of improved general health and a recently declining level of fertility. Taken on its own, and disregarding the ratio of males to females, the age structure was not significantly different from that of Jeddah as a whole, nor did it show par-

ticularly strong evidence of in-migration.

The average household size was a little over 5 persons per household, marginally higher than for the city as a whole. This probably reflected the smaller proportion of single male in-migrants. It proved impossible, during the socio-economic survey, to determine the average number of married couples per household owing to the reluctance of respondents to reveal details of this nature. It was observed, however, that the families living in the Central Business District area consisted mostly of only one married couple, and an average of four to six persons. The same was true for those living in the modern blocks within the traditional area and in the Eastern District. Several examples of larger, two or three generation extended families were found in the sampled buildings. These were all Saudi in nationality, and tended to be found in the single occupancy, larger type of traditional house, especially in the Shara Al Alawi area. In the case of the latter, household sizes of over 20 persons were found; in most cases these belonged to higher income groups.

The incidence of communal groups of bachelors, employed mostly in the construction industry, was high, though not as high as in other parts of the city. It was estimated that there were approximately 1900 single person households in the area, indicating that family units with two or more members had an average size of about 6.5 persons.

The majority of the one person households were found to be living in crowded conditions. In particular, they were found over shops in the Shara Al Alawi or in the southern boundary of the area in King Abdulaziz Street.

Despite the presence of numbers of bachelor migrant workers, the general impression of the area was that it was one of family dwellings, especially in the inner areas away from major streets.

Income levels within the area were very close to those found in the city as a whole. This is illustrated in Table 14.5. The class boundaries were found to be compatible with those of the city as a whole and a large proportion of the households fell within the SR 2,000 to SR 4,999 per month income group.

Table 14.5 Income Groups of Households

Income per month	Study Area	Jeddah
Under SR 1,000	4.8	4.9
SR 1,000 to 1,999	18.2	19.6
SR 2,000 to 4,999	48.6	45.8
SR 5,000 and over	28.4	29.7
	100.0	100.0

Source: RMJMP Historic Area Study, 1978

The Historic Area therefore was representative of the city as a whole, containing a range of income levels. An analysis of the nationality of households within each income group showed that Saudi nationals predominated in both the

highest and lowest income groups. The Yemeni population represented a large proportion of the lowest income group. The Egyptians, Levantines and persons from the Indian sub-continent had a more even income distribution in the middle income ranges.

The percentage of households possessing selected amenities is illustrated in Table 14.6.

Table 14.6 Possession of Household Amenities (%)

Electricity, piped water	98.6
Sewage (mains or septic tank)	99.7
Air conditioning	78.4
Television	93.7
Radio	93.5
Telephone	46.6
Flush toilets	70.0
Washing machines	81.2

Source: RMJMP Historic Area Survey, 1978

The only noticeable deficiency was in flush toilets but, by 1978, action to improve the sewerage infrastructure was under way.

A final important aspect of living conditions was that the great majority of houses were rented, and there were very few examples of owner occupiers. The ownership pattern is shown in Table 14.7

Table 14.7 Tenure

Rented	95.4%
Owner Occupied	2.5%
Other	2.1%
	100.0%

Source: RMJMP Historic Area Survey, 1978

Since the Historic Area was confined within the larger city, any population growth was likely to be a function of population movement and socio-economic conditions rather than natural growth. In particular, the form of future development and relative rent changes would have a considerable influence. The population of the area had remained broadly in line with the figures estimated in the 1971 Master Plan. It had declined somewhat below the original 1991 target of 54,000, to a level of 47,000 mostly as a result of redevelopment projects. For planning purposes, allowing for a slight decline, a 'benchmark' figure of 45,000 was used.

It was estimated from the results of the socio-economic survey that there were approximately 44,700 persons employed in the Study Area in mid 1978. The distribution of this employment was concentrated in the Central Business District where employment density was high and population density low. The Traditional Residential District contained 66% of the area's population but only 13% of the jobs, and the Central Business District contained 69% of the jobs, and only 19% of the resident popu-

lation. There was a fairly even balance between the number of residents and the number of jobs in the Eastern District.

In order to test the resident population's awareness of and reaction to the qualitites of the areas in which they were living, an attitude survey was conducted as an adjunct to the socio-economic survey. Some of the questions asked were open-ended, to which the respondents answered in their own words, others were of the simple yes/no/don't know type. Generally, it could be anticipated that a potential conflict would arise between a preference for old buildings which have greater aesthetic and cultural importance, and modern buildings which can provide better living conditions. The questions were aimed at determining to what extent the prospect of better housing conditions might override aesthetic considerations.

The 'closed' questions are shown in Table 14.8 together with the responses. A total of 81% of respondents stated that they liked living in the area, and a majority of 58% thought the area had not deteriorated in recent years. However, a large proportion, 86% believed there was a need for more attention to be paid to the appearance of the area. A sizeable majority, 68% believed it was worthwhile repairing property in the area suggesting that the inhabitants, though mostly tenants, would not allow their houses to fall into serious disrepair through apathy and neglect.

Table 14.8 Responses to Closed Questionnaires

		% yes	not specific	no
1	Do you like living here?	81	9	10
2	Do you think it worth repairing and maintaining your house in this area?	68	10	22
3	Do you think this area requires more attention to improve its appearance?	86	11	3
4	Do you think this area has deteriorated in recent years?	28	14	58
5	Do you like the appearance of the new buildings which have been built recently in Central Jeddah?	73	9	18
6	Do you like the appearance of the older type of house in this area?	65	14	21
7	Would you like the old buildings to be replaced by modern ones?	52	12	36
8	Would you prefer to see the old buildings repaired and modernised in the traditional style?	81	10	9
9	Do you think some buildings should be removed to create room for cars?	53	18	29
10	Do you think more open space with trees should be created in the city?	73	11	16
11	If there was no cost to yourself, and you had the choice of living in a new building or having your existing building restored and modernised, which would you choose?	56	7	37

Source RMJMP Historic Area Study, 1978

The open-ended questions were aimed at eliciting the qualities of the older buildings which were valued most and those which represented drawbacks. The responses are shown in Table 14.9.

The most frequently cited reason for liking the old buildings was not, surprisingly, the latticed wood balconies and windows but an element of nostalgia. Over half the people interviewed stated that it reminded them of the past. Another frequently mentioned quality was that the buildings were cool; fifteen per cent mentioned that they were cool and thirteen per cent commented on the diminished need for air-conditioning. Adverse comments centred mainly on the state of repair of buildings and concern that they were not structurally sound. The most important improvements needed were stated to be repairs, especially to the windows.

Table 14.9 Responses to Open-Ended Questions

1 What do you like most about the old type of buildings?

	% Citing
- Reminds me of the past	52
- Beautiful windows	18
- Coolness	15
- Less need for air conditioning	13
- No answer	13
- Do not like the buildings	5
- The buildings are "less crowded"	6
- The buildings are strong	3

2 What do you not like about the old type of buildings

	% Citing
- Buildings are not strong or safe	32
- No answer	17
- Cracks in walls	5
- Too much woodwork	11
- Fire risk	3
- Dangerous stairs	3
- Bad layout of rooms	5
- Insects	4
- Poor streets	8

3 What are the most important improvements needed in the buildings?

	% Citing
- General repairs	36
- No answer	19
- Paint outside	5
- Paint inside	8
- Repair windows	16
- Improve sanitation	4
- Repair woodwork	3
- Repair facade	2
- Bathrooms required	3
- Improved water supply	3

4 What are the most important improvements needed in the street?

	% Citing
- Lighting	61
- Asphalting	67
- Cleaning	34
- No answer	13
- Pavements	12
- Trees	2
- Repairs	4
- Storm water gullies	3

5 If you had to leave this house, would you prefer to stay in Central Jeddah or move to another part of the city?

	% Citing
- Prefer to stay	64
- Elsewhere	20
- No answer	13
	100

Those answering "elsewhere":

	% Citing
- Medina Road	12
- Mecca Road	6
- Other	2
	20

Source: RMJMP Historic Area Study, 1978

The most important improvements needed in the streets were fairly predictable and reflected known deficiencies - street lighting, paving and asphalting and cleanliness.

Finally, respondents were asked what they would do, if they had to leave their house. Sixty four per cent stated that they would prefer to stay in central Jeddah, confirming that the area was not thought of as an undesirable area. Those who wished to move opted (perhaps through wishful thinking) for the more expensive areas of Mecca Road or Medina Road.

In summary, it could be concluded from this survey that:

1 The inhabitants were in the main aware of the improving conditions in the area.

2 There was a high level of awareness of the aesthetic qualities of the traditional buildings.

3 Most inhabitants were primarily concerned to see an improvement in housing conditions, but most would prefer to see traditional styles retained.

4 Most residents had a feeling of attachment to the area and would like to continue living there.

5 There was a strong inherent support for the principles of conservation among the population of the Historic Area.

In addition to the land use and socio-economic surveys, a detailed examination of the traditional buildings was undertaken as part of the consultants comprehensive surveys of the Historic Area. As these surveys were both extensive and informative they are described fully in this work.

Seven principal building types were identified:

a) Mosques
b) Caravanserais (khans)
c) Storehouses
d) Small traditional houses
e) Medium-sized town houses
f) Large merchants' houses and palaces, and

g) Public buildings

A brief description of each of these types, as surveyed in 1978-79, is as follows:

a) Mosques

Until 1967 the soaring, white minarets of Jeddah's mosques were the city's most distinctive feature, being visible from as far as twenty kilometres out to sea. By 1978 they were no longer visible from the seaward side because of high rise development along the margins of King Abdulaziz Road and King Faisal Road, but their local significance remained undiminished. Of the dozen or more mosques within the city's historic core area, five remained which were of particular architectural and historic significance ie. Masjid ahs Shaf'i Mosque (minaret, c.1251, remainder 1532); Masjid abu Hanifah or Masjid al-Hanafi Mosque (1732); Masjid al-Mimar Mosque (before 1834); Masjid al-Akash or Masjid al-Akashah Mosque (before 1834), restored and radically altered 1959); and Masjid Uthman bin Affan or Masjid al-Albanus Mosque (c. 15-16th century AD).

Constructed of coral limestone blocks faced with lime stucco and whitewashed, all were comparatively austere in appearance. Window openings were small and ornamentation strictly limited to shallow mouldings. There were no domes as such and only single minarets of which those of Masjid ahs Shaf'i Mosque and Masjid abu Hanifah Mosque

were the most elegant being octagonal in plan form and divided into three diminishing stages by protecting balconies whose undersides are embellished with "stalactites". Each mosque had a rectangular plan form derived from that of the Prophet Mohammed's house at Medina comprising an open courtyard (sahn) and an arcaded or colonnaded sanctuary (liwanat) on the side facing Mecca. The wall facing Mecca is indicated by a niche (mihrab). Regrettably, a sixth mosque of similar merit to those above mentioned, Masjid al-Basha or Masjid Sultan Hassan Mosque (1735) had been recently demolished.

b) Caravanserais

Known locally as "khans", Jeddah's caravanserais were celebrated among travellers as "... sanctuaries and sacred places, free from insults and robberies ...", wherein all could stay and enjoy, without payment, the shade provided by an arcade-surrounded courtyard, as only rooms and storage were charged for. Camels and other beasts of burden were housed on the ground floor while their owners were quartered on the upper floors. During the Hadj they would be full of pilgrims and at nightfall musicians and story-tellers would provide entertainment by the flickering light of oil lamps. Once numerous, they were located close to the city's entrance gates: Bab al-Medina (Medina Gate); Bab Mecca (Mecca Gate); Bab al-Sharif (Noble Gate); and Bab al-Magharibah (Westerners' or North Africans' Gate). Since the demolition of the city walls

and entrance gates in 1947, most had disappeared. However, five examples of architectural and historic significance had survived in the northern sector of the city's historic core area. Each was two-storeys in height and constructed from coral limestone blocks faced with lime stucco and whitewashed. With one notable exception, which was ornately decorated and had arabesque designs carved into the plasterwork, all were without ornamentation.

c) Storehouses

Many storehouses had survived, particularly in the vicinity of the main souk and Shara al-Alawi. As befits their purpose, few were of individual architectural and historic significance. In construction and size they were similar to caravanserais.

d) Small traditional houses

Small traditional houses of two, three and four storeys, built of coral limestone faced with lime stucco and either whitewashed or colour-washed pastel shades of pale blue, pink, cream, yellow, etc, constituted the major part of Jeddah's heritage of buildings of architectural and historical significance. Few featured the ornately-carved bay windows (rawashin) that distinguish the larger town houses and merchants' houses, possessing instead small balconies with lattice screens (shish) and simple casements (mushrabiyah). Of the older surviving examples, many exhibited ornately-carved plasterwork on the lower storeys.

e) Medium-sized town houses

Similar in construction and finish to small traditional houses, medium-sized town houses had broader frontages and rose up to six storeys. Their principal distinguishing feature was their large, ornately-carved rawashin. Constructed of teak (tectona grandis) or similar hardwoods resistant to insect attack and high levels of relative humidity, and supported by either corbels or projecting timbers and raking supports, these extravagant structures traditionally varied in number and quality according to their builders' means. Many featured intricately worked panels and shutters, and had broad projecting canopies. Normally they were unglazed to allow the circulation of cool air. Entrance doors were also ornately-carved and comprised two heavy leaves of teak hung on substantial wrought iron hinges and secured with a robust lock. Many had wickets in them to restrict access. Of the older surviving examples, many featured ornately-carved plasterwork on the lower storeys or fine stone heads and jambs to the doors and windows.

f) Large merchant's houses and palaces

Jeddah's large merchant houses and palaces were the embodiment of the city's greatness as an entrepot and trading centre. Though few in number, such buildings as the Nasif House and the Noorwali House represented the ultimate development of the builder's art. Monumental in their overall dimensions yet delicate in their detailing, they were built by the city's merchant princes in the 19th

century. All were constructed of coral limestone faced with lime stucco and whitewashed. Similarly, all were lavishly furnished with ornately-carved bay windows, latticework balconies and balustrades, roof-top terraces, and casements. Front facades were generally symmetrical in their arrangement and in a number of examples featured a central projecting bay. On the ground floor a spacious, stone-flagged entrance hall, kept cool with constantly sprinkled water, was used to receive visitors. On the same floor both guests and servants were quartered, access to which was controlled by the house-master. Upper floors were occupied by the owner and his family and often by the families of his children who were quartered in large apartments each of which included a large reception room for the exclusive use of the women of the household. On the topmost floor a series of timber loggias enabled the whole family to gather together and enjoy the cooling onshore breezes. These rooms were generally lined with panelling and divided by elaborate screens. Persian and Chinese carpets enlivened the floors while the glittering light from crystal chandeliers reflected in gilt-framed mirrors. Of the dozen or so such buildings that had survived few have remained in their original condition and usage. Until the early 1970s many in the northern sector of the city's historic core area were in diplomatic use as legations and chancelleries. Regrettably, the most famous of all Jeddah's large merchant houses, a large building on the harbour front known as Beit al-Baghdadi which once

housed the Turkish Governor and later accommodated the celebrated Arabist H. St. John B. Philby, was demolished in the 1950s.

g) Public Buildings

Few public buildings of note had survived in Jeddah historic core area. The half demolished Hadj Quay, with its colannaded frontage and vaulted roof, and the adjoining Ministry of Health building were the only reminders of the Old Port. Similarly, the Municipality Offices, which once housed the British Embassy, with its splendid Corinthian portico and Norman-inspired windows, was a reminder of an earlier period in Jeddah's long history that was to make way for redevelopment. The nearby Lawrence Chancellery building was, in 1978, undergoing rehabilitation. Unique in Jeddah, the Al-Falah School building was crowned with an onion dome sheathed in timber. The main souk which runs from north to south, parallel with King Faisal Road, comprised many buildings, few of which were of individual architectural or historic merit. However, the importance of the area lay not in the individual quality of its parts but in the overall relationship of those parts each to the other. From them sprung the diversity and richness of human endeavour that gave the area its unique character.

A number of buildings of architectural or historic interest were examined under the following headings:

a) Foundations and formation

b) Load bearing masonry walls and openings

c) Suspended floors and roofs, and

d) Other attached structures.

a) Foundations and formation

From onsite observations it appeared that few buildings had a definable foundation. However, below ground level, a larger size of coral limestone block was generally used which, while not acting to spread the load, assisted in the redistribution of any imposed loading ensuring that heavy pressures were evenly distributed. The formation of these limited foundations was variable, some being taken down to the coral limestone bedrock, some being founded on the loose to medium dense sand which overlays the coral limestone bedrock, and others being constructed of moderately compact coral limestone hardcore. These variations accounted in part for the variation in movement that was visible. Depending on the plan form of the buiding a considerable difference of loading may arise between the internal and external load bearing elements of the structure causing differential settlement to take place. For example, external walls were generally continuous in contrast to internal walls which were pierced by numerous openings necessitating the use of arches and piers. The former evenly distributed the loading whereas the latter concentrated the loading and unless foundations had been adequately increased in size settlement took place as a faster rate. As a result, arches initially tended to crack at mid-span and then throughout necessitating the intro-

duction of a beam spanning from springing to springing. This ensured that the arch would not collapse but would not prevent further settlement cracks.

b) Load bearing masonry walls and openings

The majority of random rubble walls were constructed of cut blocks of coral limestone of roughly cubical proportions, varying in size from 250 to 400mm, laid with a thin bed and perpendicular joints using either lime mortar or mud as a binding material. Stout timber members, laid horizontally at approximately 1m vertical centres and set into both the internal and external faces of the walls, resist horizontal tensions arising from differential settlements. Openings were formed either by the introduction of timber lintols or masonry arches depending on the span and loading. Timber lintols usually comprised a series of stout parallel beams spread across the full thickness of the wall and tied through into the masonry for a good length.

c) Suspended floors and roofs

The most common form of floor structure was timber boarding laid on timber joists which vary in section according to span and loading. Long spans of up to 5m were not uncommon using rough uncut timber of 150 to 200mm diameter. Superimposed upon this timber supporting structure there was usually a layer of small coral limestone hardcore bonded with lime upon which was in turn bedded either a screed or floor tiles. The total thickness of

this superimposed layer varies from 100 to 400mm, but was generally between 150 and 200mm. Roofs were similarly constructed but had a thicker superimposed layer in order to prevent water penetration. Insect infestation and water penetration were common problems.

d) Other attached structures

These may be divided into three groups, ie. concrete beams and posts some of which support timberwork above; timber posts and spreaders on the same line as the main load bearing masonry walls where storey height windows are provided; and timber framed balconies (shish) and bay windows (rawashin) which were either self supporting cantilevers or carried down to the ground. The first group had suffered from spalling due to the presence of soluble salts in the concrete and deflection due to the inadequate section of beams. The second and third groups suffered from the same problems as the suspended floors and roofs, but were magnified by embrittlement of the timber work due to a loss of natural oils and breakdown of cell structure from the effects of intense ultraviolet radiation.

Figure 14.5 illustrates an axonometric view of these typical construction methods.

From this examination of all the traditional buildings within the Historic Area - more than a thousand historic structures - a total of 537 were selected as buildings of architectural and historic significance because of their architectural character, integrity, quality of workmanship

and setting. Individual merit divided these buildings into three categories:

Class 1 - buildings of national significance (unique or outstanding examples of their type)

Class 2 - buildings of regional significance (good examples of their type)

Class 3 - buildings of local significance (examples of buildings of lesser individual merit which collectively form the vital backdrop against which Class 1 and Class 2 buildings are seen ie. buildings of townscape importance)

The number of buildings allocated to each category is set out in Table 14.10.

Table 14.10 Buildings of Architectural and Historical Significance. Number and Classification

Class 1	Buildings of National Significance	58 (10.8%)
Class 2	Buildings of Regional Significance	236 (43.9%)
Class 3	Buildings of Local Significance	243 (45.3%)
TOTAL		537 (100%)

Source: RMJMP Historic Area Study, 1978

The large majority of these buildings were located in six groups, which were graded A, B or C according to the relative proportions of Class 1, 2 and 3 building in each. The most significant single building group (Grade A) lay

to the east of King Faisal Street and comprised more than 75% of the total number of listed buildings. Two other Grade A groups were identified, both located immediately west of King Faisal Street in the northern sector of the study area.

The location of these buildings and the area grade is illustrated in Figure 14.6.

Following this comprehensive survey of all aspects of the Historic Area, the consultants then reviewed the opportunities and constraints to conservation. The key to the physical survival of Jeddah's historic core lay in its continued functioning as a thriving community. This, in turn, would depend upon its ability to adapt and accommodate change. It was not envisaged that the future of the area would be that of an open air museum, forever frozen in time and unchanging. On the contrary, the pressing need was to improve the low standards of amenity enjoyed by the area's residents related to their increasing levels of expectation. These had to be brought more closely into line if residents were not to move out of the area in the pursuit of a better 'quality of life'. The concern was not whether change should take place, but how that change should come about and what its exact nature should be within the context of the Historic Area. This view was wholly in accordance with the strategic objectives of the Jeddah Master Plan.

On the basis of the evaluation and appraisal of the survey

information four alternative strategies were selected for detailed study and evaluation. In each case, these alternatives were considered within the Master Plan and Central Area context. The two basic objectives the alternatives required to satisfy were, first, preserving, in as far as possible, the historic character and architectural heritage of the city and, second, achieving, in a balanced and efficient manner, a distribution of people, jobs and services (eg. roads, car parking and utilities) compatible with the existing opportunities and constraints within the area.

Option 1 proposed the conservation of all areas which were identified as possessing groups of historic buildings. Within these areas the policy would be to protect all Class 1 and Class 2 buildings and, as far as possible, retain Class 3 historic buildings. New develoment within these areas would be required to be strictly in scale and conform with the existing traditional architecture. This strict policy of conservation would apply to 58 ha (about 40%) of the area.

Option 2 was significantly different in the degree to which the conservation policy was applied. Strict conservation would be applied only to the large homogeneous Grade A area to the east of King Faisal Street. Within the other areas with historic buildings, Class 1 and Class 2 buildings would be protected, and Class 3 if circumstances permitted. New development would be in sympathy with

the older buildings. The area for total conservation was reduced to 44.5 ha (30% of the study area).

Option 3 balanced the previous two in terms of listing all Grade A areas (51 ha, or 34% of the study area) for conservation. This was perhaps the clearest and best-defined statement on conservation. The strict regulations which would apply to the preservation and improvement of these areas both in terms of buildings and their setting, were applied directly to the Grade A areas.

Option 4 was selected to show what could be considered the minimum significant area for conservation. Areas were downgraded to a more flexible policy, which would aim to protect Class 1 and Class 2 buildings only. This option covered 36ha (24% of the study area). This option represented the present trends and pressures for redevelopment and would likely, without a policy for conservation, reflect the situation in about five years time.

Of the four options, number 3 was commended as achieving both the best balance of conservation and growth and change within the study area and fulfilling the Master Plan targets for the city centre. Option 1 did not meet the Master Plan target and Options 2 and 4 - particularly Option 4 - would reflect a population increase.

Following a presentation of these options to the Mayor and Municipality officials, it was agreed to proceed into the detailed planning stage of the project on the basis of

Option 3 - the recommended option.

Part One of the second stage of the study was to prepare the urban design proposals. These comprised a report and 1:500 scale plans of the Historic Area, supported by 1:200 and 1:50 scale urban landscape details, street furniture, planting and paving inventories. Figure 14.7 illustrates the land use proposals. Figure 14.8 indicates a typical plan layout of a part of the traditional area and the accompanying sketches (Figure 14.9) give a sequence of views through this typical area. The open space network and its relation to the overall road layout in shown in Figure 14.10.

Part Two of this second stage comprised the preparation of complete sets of contract documents for the restoration of five traditional buildings. These buildings comprised a Class 1 buiding, a caravanserai - another Class 1 building - and a linked group of three Class 2 buildings. These buildings formed a group on a conspicuous site around an open space (wherein had formerly stood the Bab Medina) at the northern perimeter of the study area. The purpose of this part of the study was to study in depth the feasibility (and probable cost) of the restoration of historic buildings and to demonstrate how this could be carried out. In addition to a complete set of working drawings, which included measured drawings of the buildings, general specifications and bills of quantities, a special specification was prepared which itemised, by description and

drawing, specific details of plasterwork (internal and external), timber details of doors, windows and decorative woodwork and wrought iron grilles, fanlights, etc. In all, a complete and exhaustive inventory of every significant part of the exquisite detailing of these buildings was recorded and instructions set out for the required renovation or restoration.

A selection of photographically reduced plans, sections and elevations of one of these buildings, (Beit Bajneid) showing the existing condition and the proposed renovations is illustrated in Figures 14.11 to 14.18.

The third and final stage of the study was to prepare a Development Control and Civic Design Manual. This Manual set out, building by building, a descriptive list of the 537 buildings (see Table 14.10) of architectural and historical interest. This list included a comparative analysis of the 537 buildings under the headings shown in Figure 14.19. A policy statement on conservation principles and practice was also prepared. With regard to the three categories of listed buildings, the conservation policy, related to the quality of their encompassing area, was described as follows:

Table 14.11 Buildings of Architectural and Historical Significance. Proposed Conservation Policy

Listed Building Class	Conservation Area Grade A	B	C	D
1	Preserve/ Restore 57(10.6%)	Preserve/ Restore 1 (0.2%)	Preserve/ Restore Nil	Preserve/ Restore Nil
2	Restore/ Rehabilitate 223(41.5%)	Restore/ Rehabilitate 9 (1.7%)	Rehabil- itate/ 3 (0.6%)	Rehabil- itate/
3	Restore/ Rehabilitate 209 (38.9%)	Rehabilitate/ Redevelop (traditional) 25 (4.6%)	Rehabil- tate/ Redevelop (traditional) 8 (1.5%)	Rehabil- tate/ Redevelop 1 (0.2%)

Source: RMJMP Historic Area Study, 1978

Methods of safeguarding these buildings were listed under the appropriate headings of legal, adminstrative, financial, technical and educational.

These measures were followed by detailed recommendations for development control standards and procedures to be applied conjointly with the 1:500 scale plans plus detailed plans prepared, first in draft form and then, on approval by the Municipality, as final plans for the Historic Area.

A Saudi seconded team worked with the consultants throughout the study period. Towards the end of the project, in 1979, the Mayor decided to establish a separate entity to deal with the implementation of the plans and, generally, the care, protection and enhancement of the

Historic Area. The Saudi team leader, Engineer Amr Dawish, was charged with this responsibility. For the first six months of its existence, Engineer Dawish and his team continued to operate from the Consultants Office until they had refurbished a historic building which became the conservation centre and sub-municipality of Al Balad.

During this period the consultants assisted in defining the duties of this office as follows:

1 Cataloguing of all locally-known records (survey, plans, drawings, illustrations, photographs, etc) relating to Jeddah's unique architectural heritage;

2 Compilation of detailed information on local building materials and methods of construction;

3 Registration of local tradesmen and craftsmen approved for conservation works;

4 Processing of all development applications (both private and public sector) to ensure compliance with zoning and civic design regulations;

5 Advising on the issue of building permits for conservation works;

6 Checking that all new development and conservation works are in accordance with approvals, and initiation of enforcement procedures against infringements;

7 Documenting all changes and updating of all plans and other records;

8 Cataloguing and 'recycling' of salvaged building materials and fittings (particularly doors, windows, trelliswork, etc) from demolished historic structures;

9 Review of conservation policy, zoning and civic design regulations, and advising on necessary amendments; and

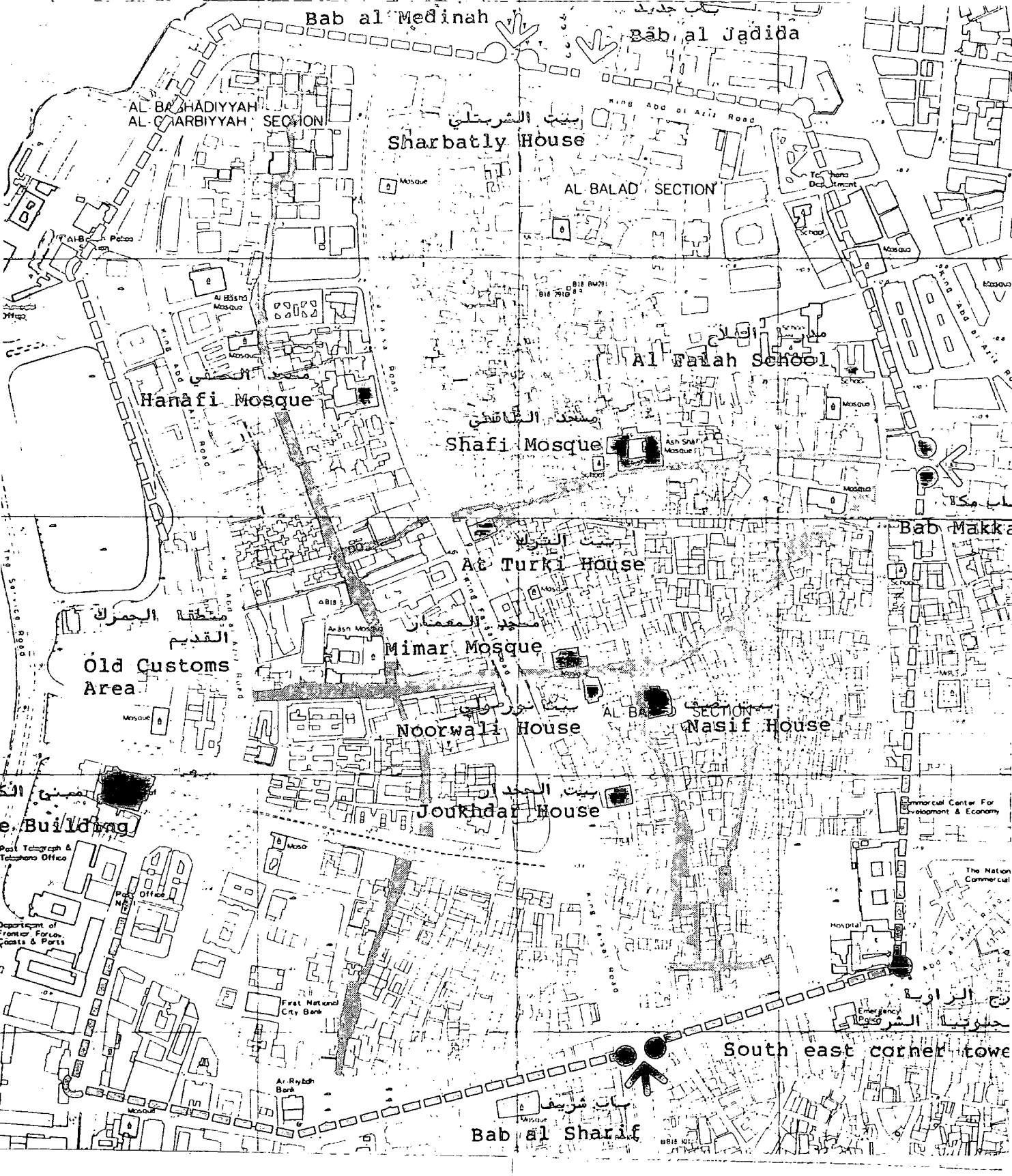
10 Liaison with other Municipality and Ministry departments on current and proposed works.

Since its inception (Eng Dawish was appointed Mayor of Tabuk in 1982 and was succeeded by Eng Saud Al Gofeidi), the conservation of the old city has been vigorously yet carefully pursued. Supported by the great interest and direct assistance of the Mayor, the area has been transformed. Landscaping, paving, utility services, street lighting, refuse collection and the restoration of over thirty historic buildings had been achieved by 1985. It is now possible, particularly with the street lights aglow of an evening (the new electric lights are replicas of the old kerosene lamps), to walk through large parts of the old city, to feel a warm sense of history and heritage and, indeed, to conjure up visions of Lawrence, Doughty and the other travellers who walked the self-same streets.

The task is not yet complete, but it is gratifying for the writer to record that a heritage has been saved.[1]

NOTES

1 A different fate applied to Suakin - a Sudanese city on the Red Sea WSW of Jeddah. Not a building now remains of this historic city which shared the same indigenous architecture and use of materials on Jeddah. It is fortunate that Jean Pierre Greenlaw in his book "The Coral Buildings of Suakin" recorded the city as it was in the 1920s. This superbly illustrated book shows how identical in design and construction the buildings were in both cities.



خطوط سور المدينة
The line of the City Wall

المباني الحالية البارزة
Prominent existing structures

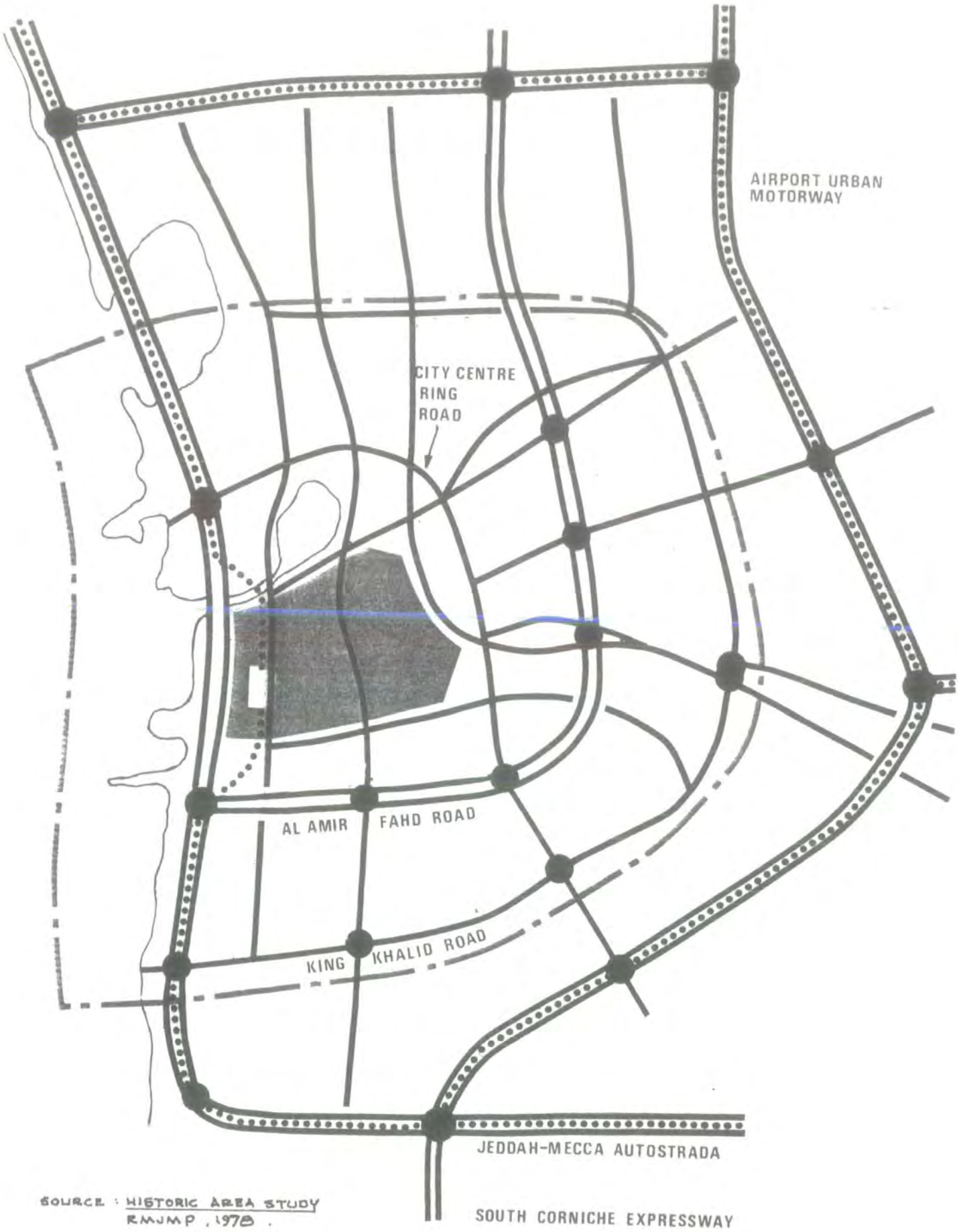
البوابات
Entrance gates

طرق المشاة
Pedestrian routes

THE EXTENT OF OLD JEDDAH

SOURCE : HISTORIC AREA STUDY - RAMMP, 1976.

FIGURE 14.1.



SOURCE : HISTORIC AREA STUDY RMJMP, 1978.

0 200 400 600

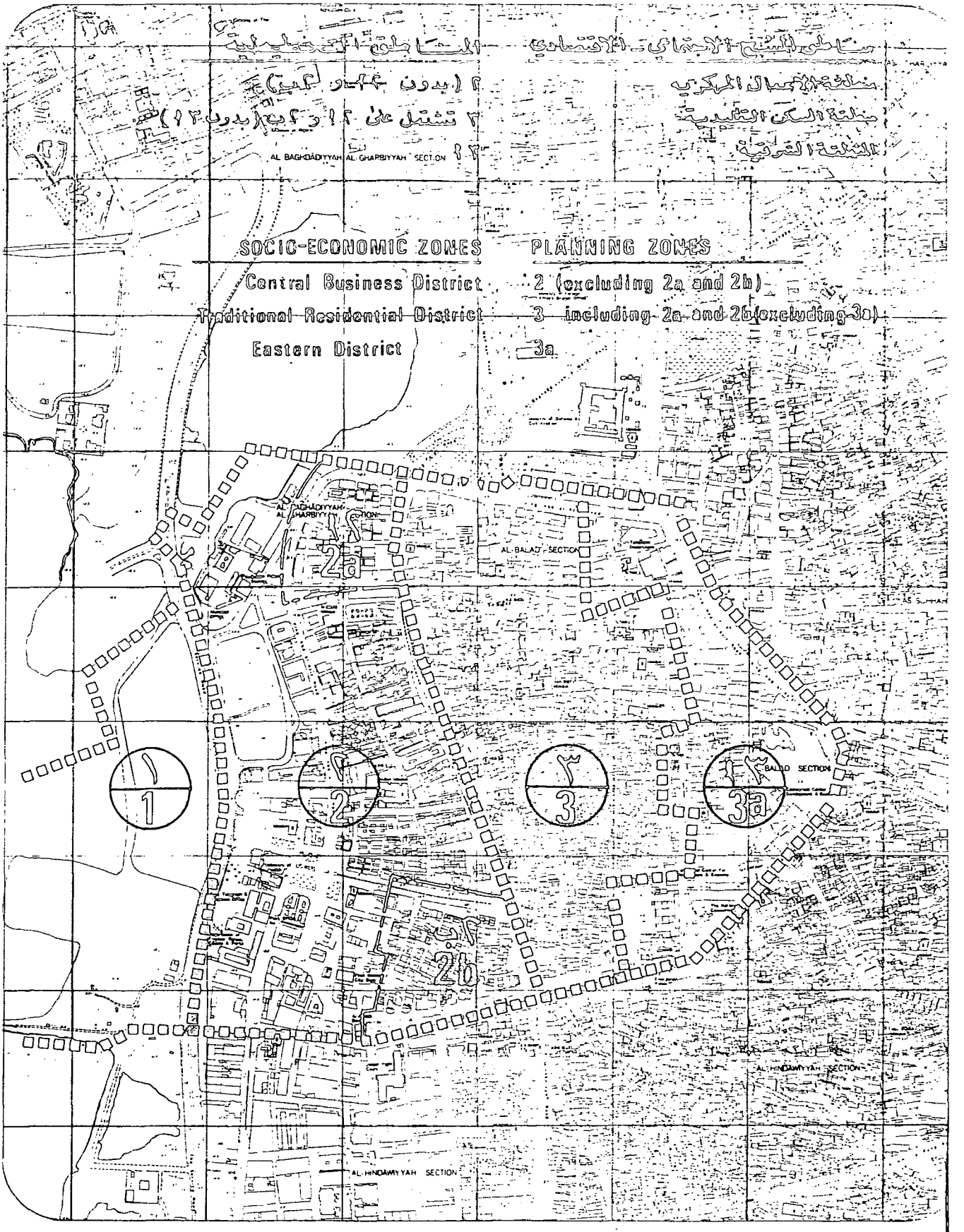
N

The Study Area
Central Jeddah Sector
Public Transport Route
Roads

Revised Structure Plan For CENTRAL JEDDAH

FIGURE 14.2.


أراضى مستصلحة
Reclaimed Land
AL BAGHDADIYYAH
AL GHARBIYYAH SECTION
Municipal Office
Post, Telegraph & Telephone Office
Post Office
Department of Frontier Forces, Coasts & Ports
Ar Riyad Bank
Museum
مناطق سكنية
مواقع غير مبنية
مناطق تجارية
مخازن
مشاريع حكومية
موقف سيارات
فنادق
مدارس
مناطق مفتوحة ، مقابر ، حدائق
مساجد
Resident
Vacant S
Retail/Co
Warehou
Governm
Car Park
Hotels
Schools
Open Spa
Mosques
0
100
200
300
N
Existing Land Use



المناطق التخطيطية وعلاقتها
بمناطق المسح الاجتماعي الاقتصادي

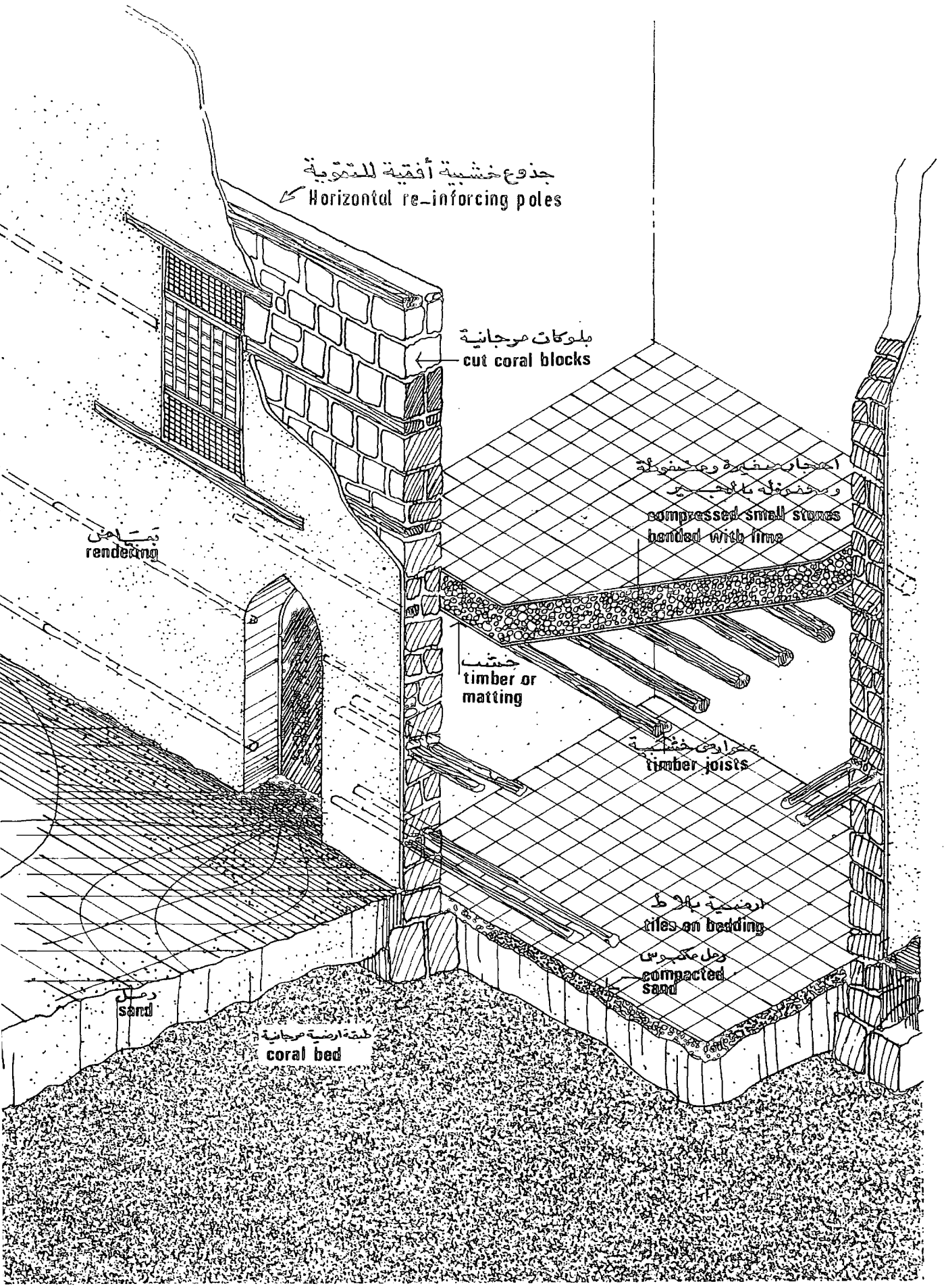
0 200 400 600m

Socio Economic Zones related to Planning Zones

ش
N

FIGURE 14.4.

SOURCE: HISTORIC AREA STUDY - AMUMP, 1978



ypical Construction of the
raditional Buildings

FIGURE 14.5
SOURCE: HISTORIC ADEN STUDY
AMWMP, 1978.

ملاحظة : الأشكال من ٢/١ - ٢/١١ ومن ٣/١ - ٣/١١ تبيّن تفاصيل مخططات المواقع

FOR DETAILED LOCATION PLANS SEE FIGURES 2.1 TO 2.11 AND 3.1 TO 3.11

AL-BALADIYYAH AL-GHARBIYYAH SECTION

AL-BALAD SECTION

AL-BALAD SECTION

Municipal Office

Al-Balad Police Station

Al-Basha Mosque

Akash Mosque

Ash Shafi Mosque

Ministry of Health

Post Telegraph & Telephone Office

Post Office No. 1

Department of Frontier Forces, Coasts & Ports

First National City Bank

Ar-Riyadh Bank

Telephone Department

Commercial Center For Development & Economy

The National Commercial Bank

Hospital

Emergency Police

King Abd al-Aziz Road

King Faisal Road

Service Road

School

Mosque

FIGURE 14.6.

SOURCE : HISTORIC AREA STUDY - RMJMP, 1978.

0 0·1 0·2 0·3 Km

N

LISTED BUILDINGS AND CONSERVATION AREA.

مباني مدرجة في قائمة المباني التاريخية درجة أولى (مستوى الدولة)

" " " " " " درجة ثانية (" الأقليم)

" " " " " " درجة ثالثة (" محلي)

حدود المنطقة التي سيتم المحافظة على مبانيها

درجة المنطقة

Listed Buildings Class 1 (National Significance)

" " Class 2 (Regional ")

" " Class 3 (Local ")

Boundary Of Conservation Area

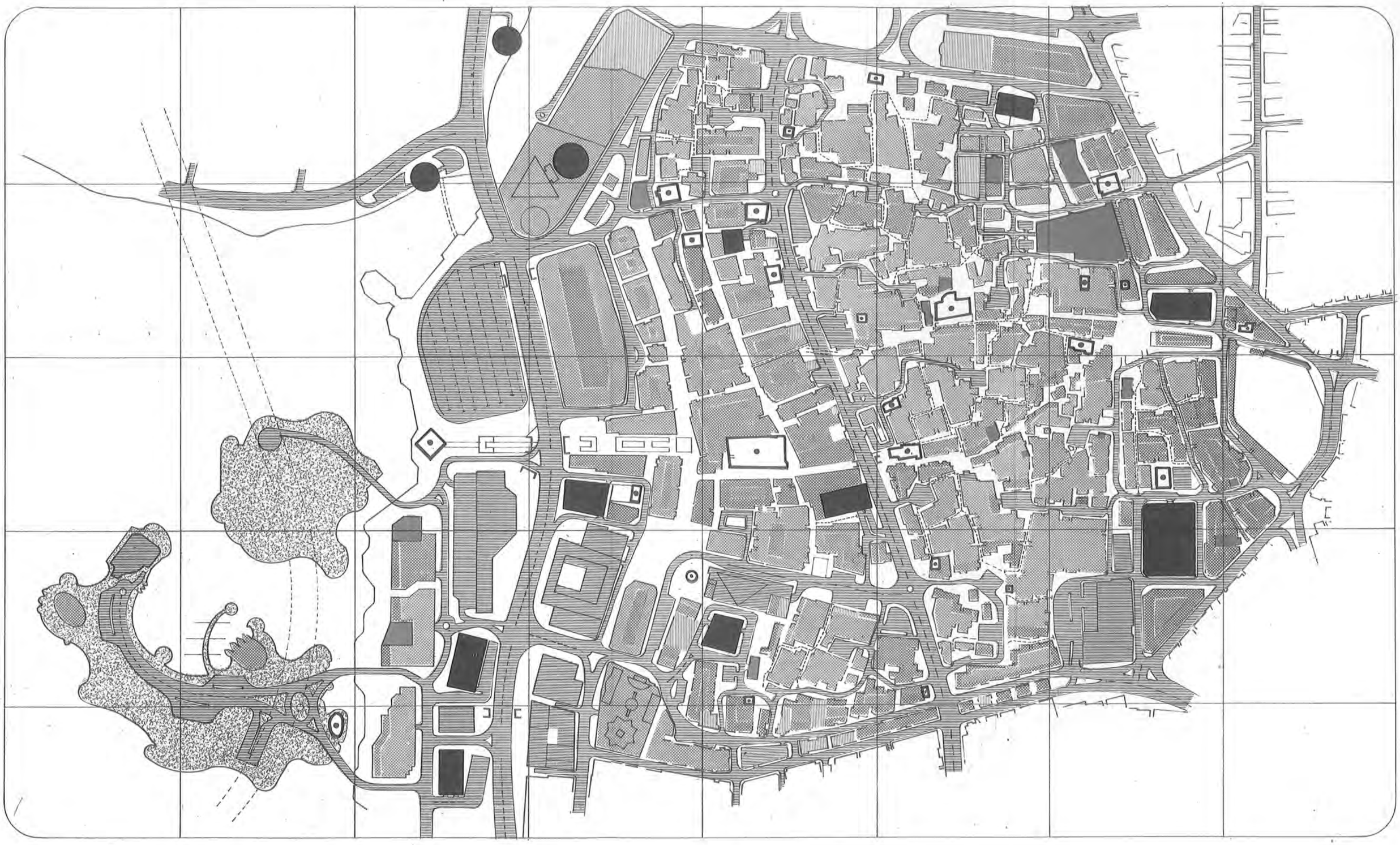
Ⓐ Area Grade

٠ ٠،١ ٠،٢ ٠،٣ كم

ش

258

المباني التاريخية والمناطق التي سيتم المحافظة على مبانيها



0 0.1 0.2 0.3 Km.

N

LAND USE PROPOSALS

منطقة سكنية — Residential Area
منطقة تجارية — Commercial Area
مسجد — Mosque
فندق — Hotel

منطقة حكومية — Government Area
مدرسة — School
موقف سيارات متعدد الأدوار — Multi Storey Car Park
أماكن مفتوحة للترفيه — Recreational Open Space

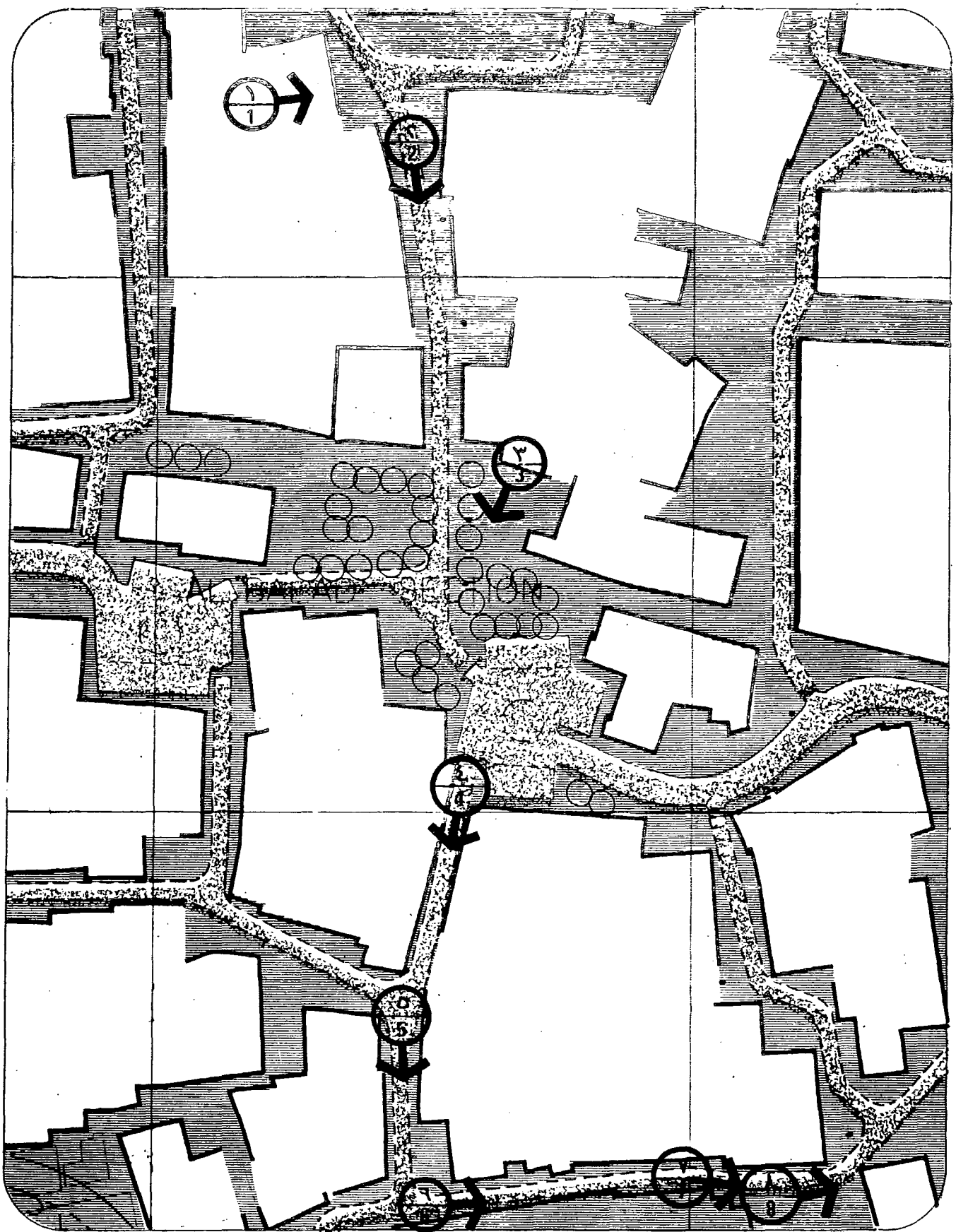
٠ ٠,١ ٠,٢ ٠,٣ كم.

ش

الاستعمالات المقترحة للأراضي

FIGURE 14.7.

SOURCE : HISTORIC AREA STUDY RMJMP 1978

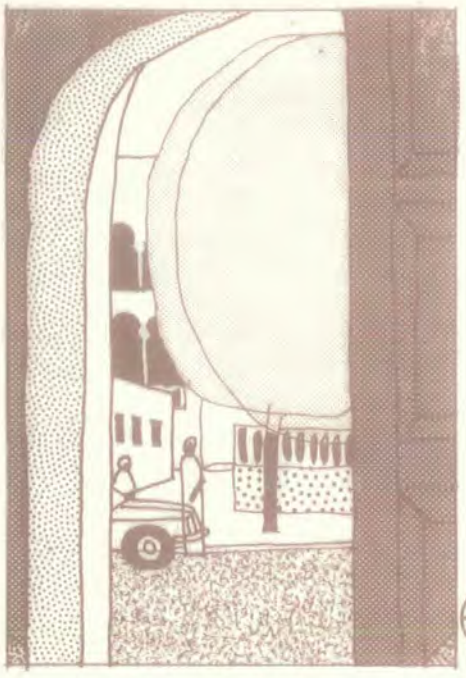


SOURCE : HISTORIC AREA STUDY - AMIMP, 1978

FIGURE 14.8.

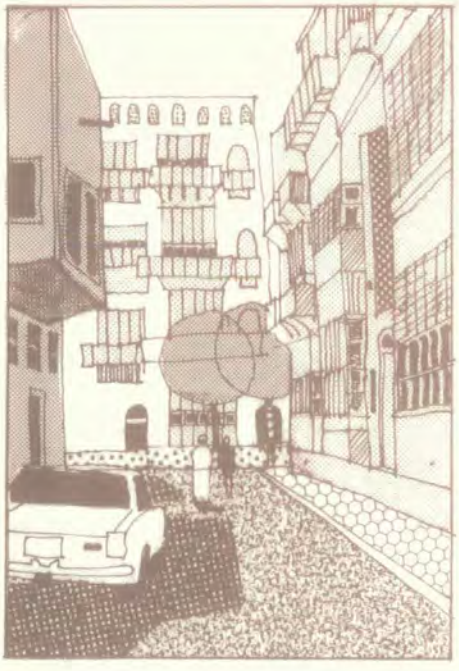
مخطط لقطاع تقليدي
في منطقة تاريخية

A Typical Sector In The Historic Area.

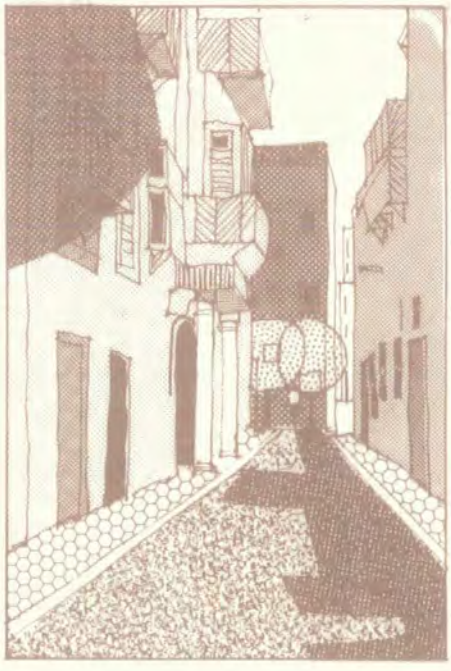


١/1 منظر من باب مبنى
View from building doorway

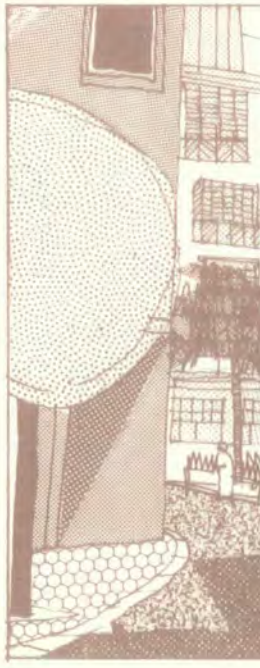
٢/2 منظر في إتجاه الطريق
View down a driveway



٥/5 منظر للطريق
Driveway view



٦/6 منظر للطريق
Driveway view



٧/7 ساحة منسقه (مبلطة ومشجرة)
View into a landsca

Sequence of Views Through a Typical Sector of the Historic Area

٤/4 رقم المنظر
View reference number

0 0·1 0·2 0·3 Km

N

OPEN SPACE AND ROAD NETWORK.

الطرق ومواقف السيارات السطحية		Roads And Surface Car Parking
أماكن مفتوحة		Open Space
مَسْجِد	M	Mosque

BUILDING A

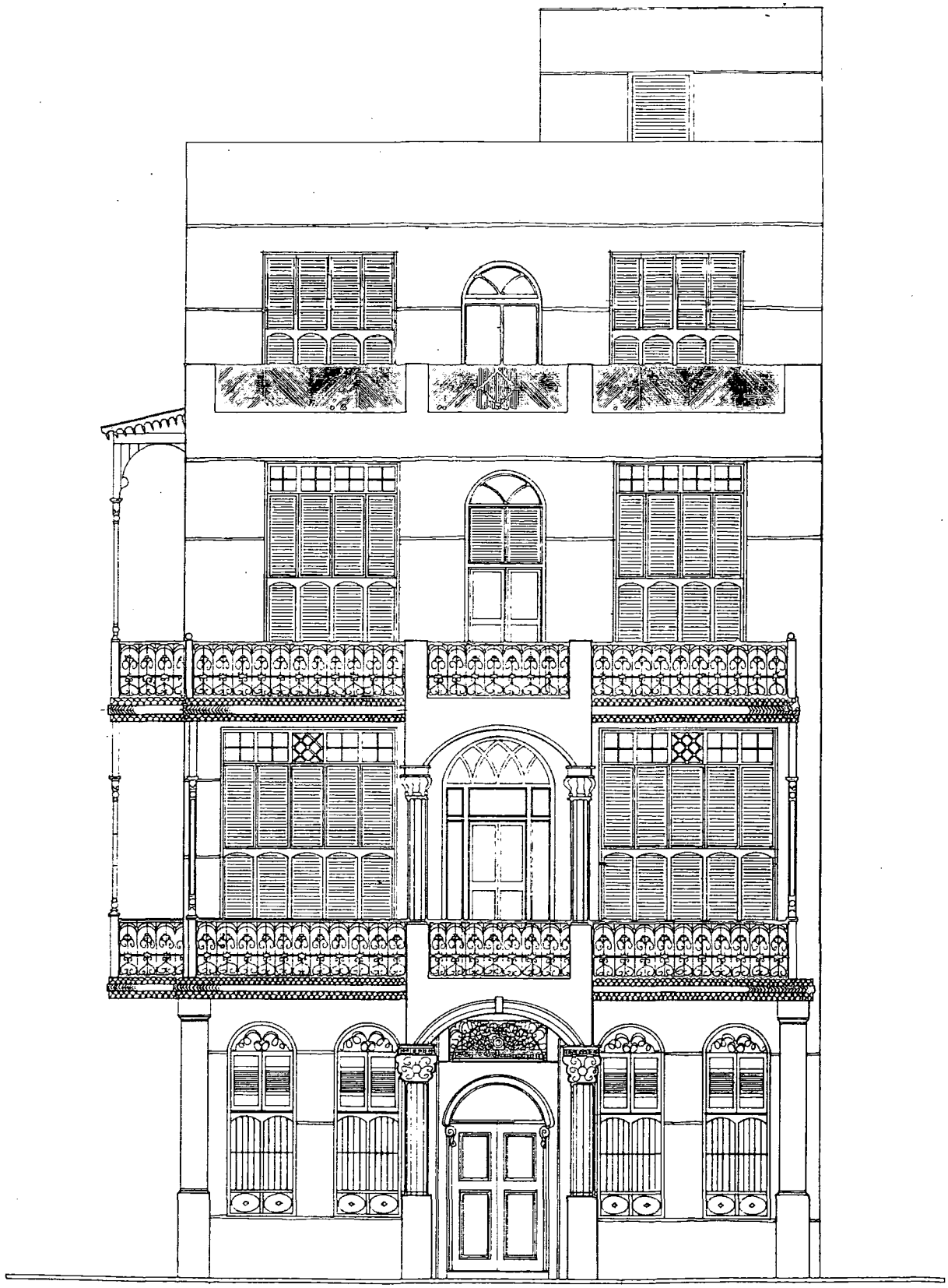
المبنى أ

EXISTING CONDITION
NORTH ELEVATION
SCALE 1:100

الوضع الراهن
الواجهة الشمالية
مقياس الرسم ١/١٠٠

SOURCE : HISTORIC AREA STUDY - RMDMP, 1978

FIGURE 14.11



BUILDING A

المبنى أ

PROPOSED RENOVATIONS
NORTH ELEVATION
SCALE 1:100

اقتراحات التجديد
الواجهة الشمالية
مقياس الرسم ١/١٠٠

SOURCE : HISTORIC AREA STUDY - BANMAP , 1978

FIGURE 14.12.

BUILDING A

EXISTING CONDITION
EAST ELEVATION
SCALE 1:100

SOURCE : BISTORIC AREA STUDY - DBKLHP , 1978

FIGURE 14.13 .

BUILDING A

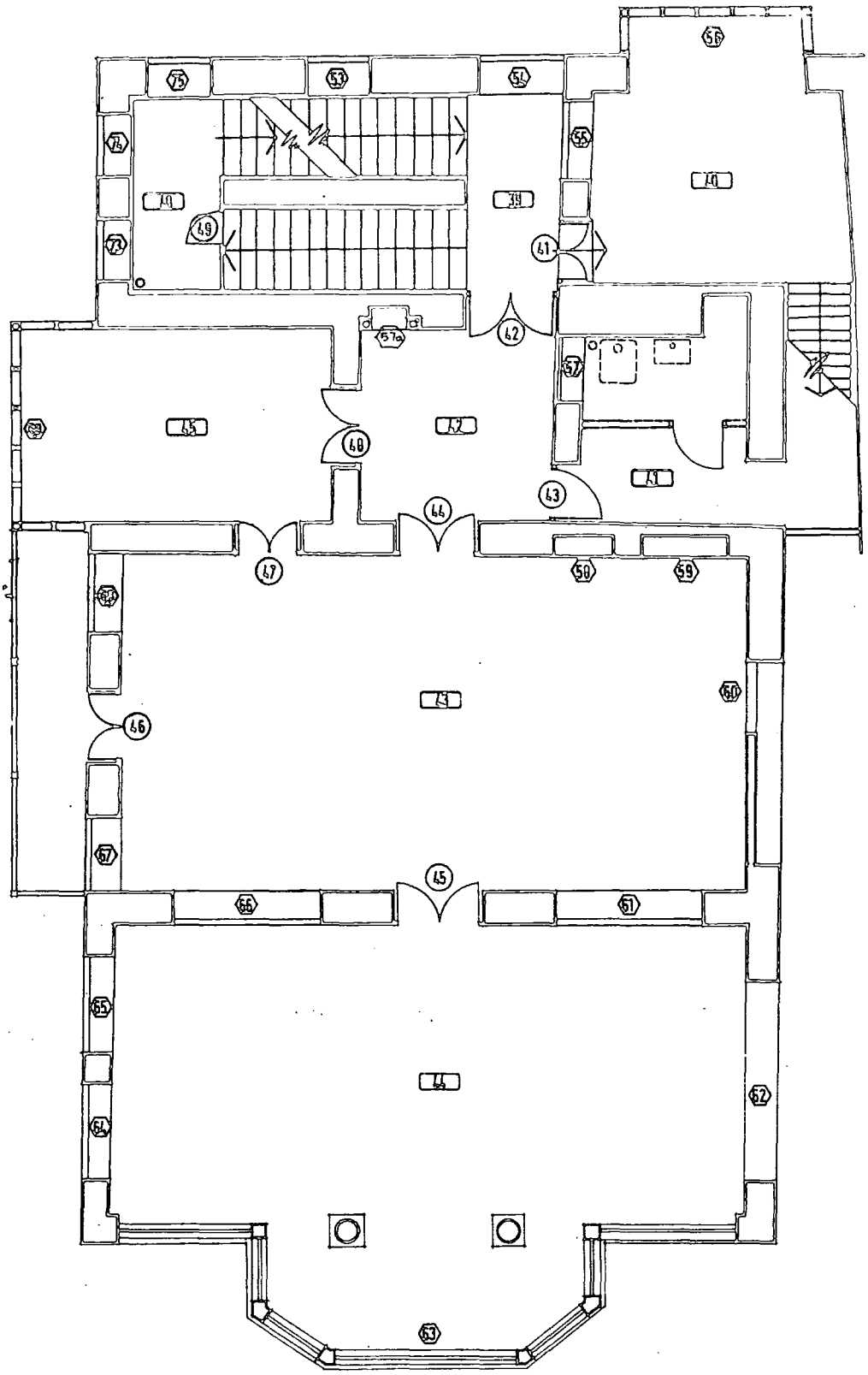
PROPOSED RENOVATIONS

EAST ELEVATION

SCALE 1:100

SOURCE : HISTORIC AREA STUDY - RMJMP, 1978

FIGURE 14.14.



BUILDING A

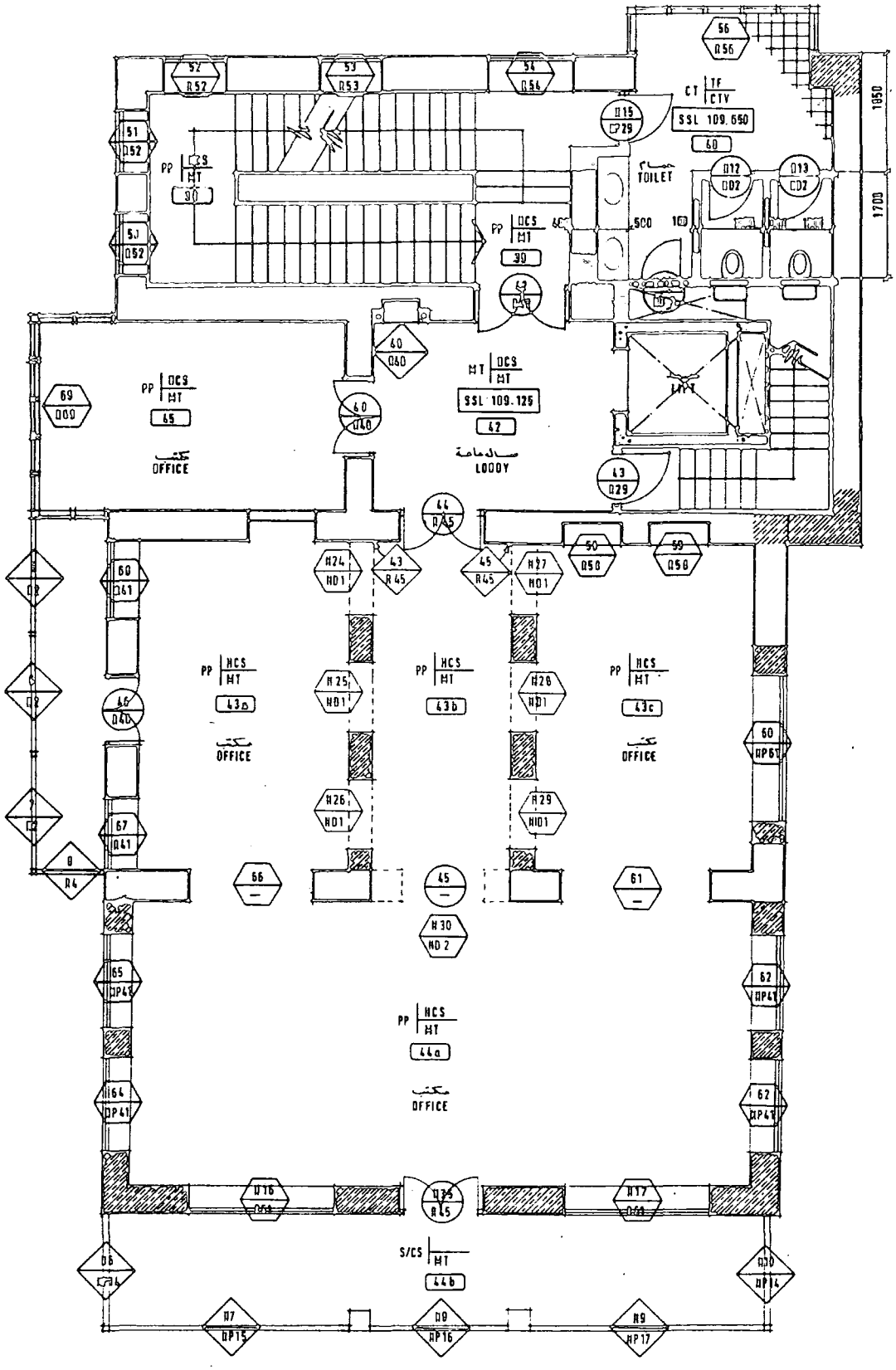
EXISTING CONDITION
TYPICAL FLOOR PLAN
SCALE 1:100

المبنى أ

الوضع الراهن
مسقط افقي نموذجي
مقياس الرسم ١/١٠٠

SOURCE : HISTORIC AGRA STUDY - AMJMP, 1978

FIGURE 14.15 .



BUILDING A

المبنى أ

PROPOSED RENOVATIONS
TYPICAL FLOOR PLAN
SCALE 1:100

اقتراحات التجديد
مستوى الدور النموذجي
مقياس الرسم ١/١٠٠

SOURCE : HISTORIC AREA STUDY - DMJMP, 1978

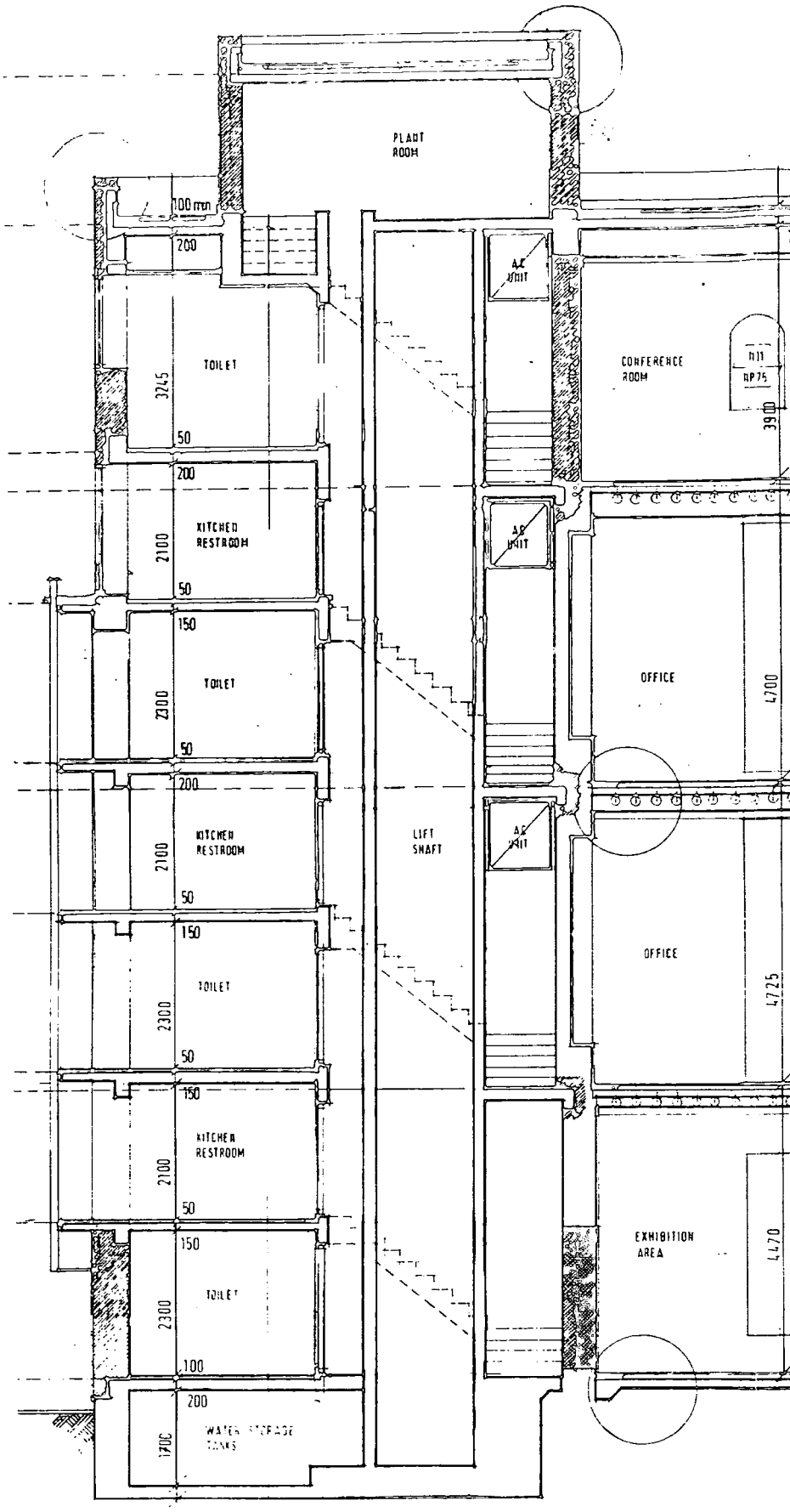
FIGURE 14.16.

BUILDING A

EXISTING CONDITION
SECTION AA
SCALE 1 100

SOURCE . HISTORIC AREA STUDY - RMJMP , 1978

FIGURE 14.17.



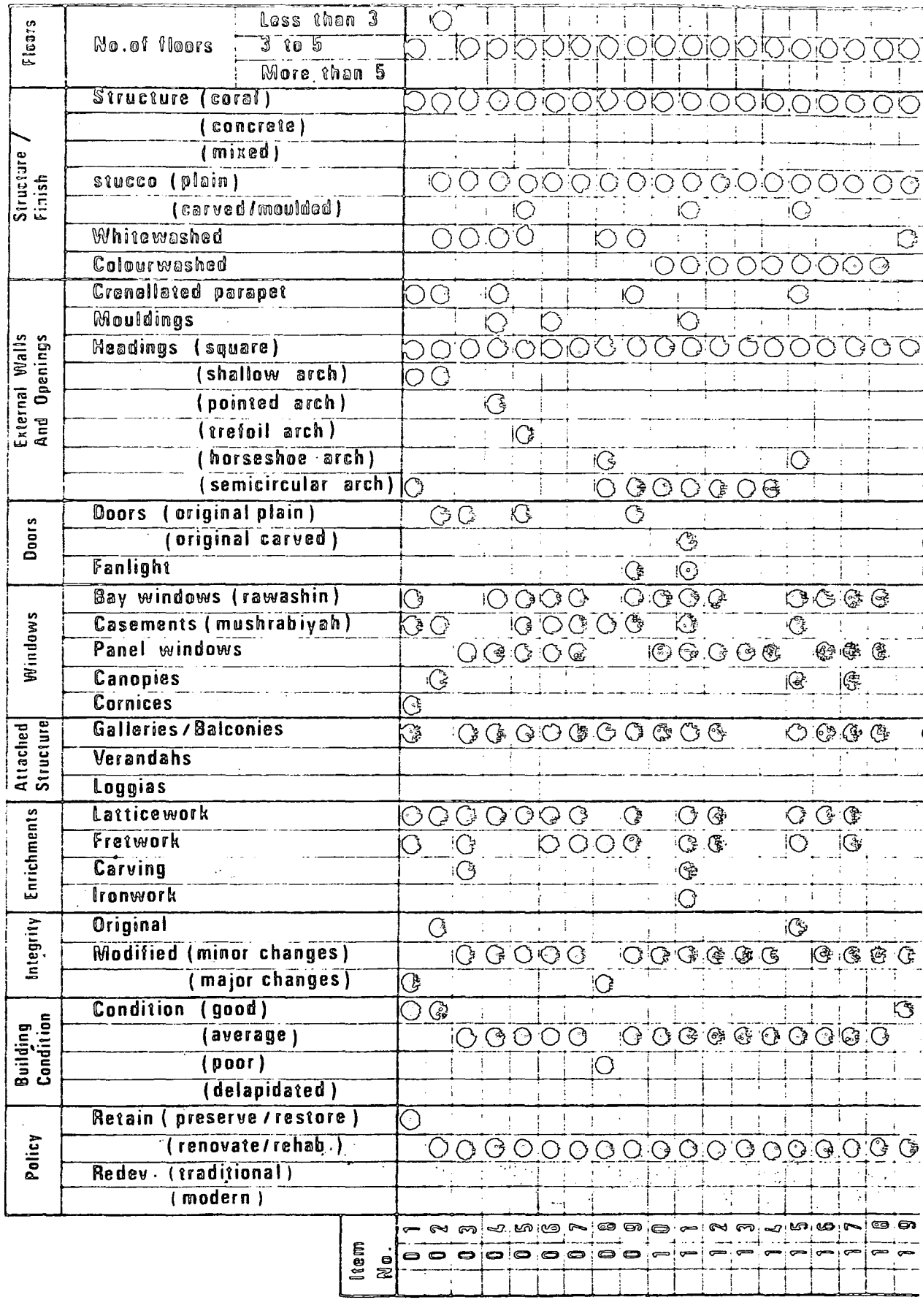
BUILDING A

PROPOSED RENOVATIONS
SECTION AA
SCALE 1 : 100

SOURCE : HISTORIC AREA STUDY - ANUMP, 1979.

FIGURE 14.18.

COMPARATIVE ANALYSIS OF BUILDINGS OF ARCHITECTURAL AND HISTORICAL SIGNIFICANCE : WEST



SOURCE : HISTORIC AREA STUDY - RMJMP, 1978

FIGURE 14.19.

During the preparation of the Master Plan, the consultants and their Saudi-seconded team realised that Jeddah, "The Bride of the Red Sea", was failing to make use of the potential of its Red Sea coastline. Thus, in order to protect the unique opportunity presented by the beautiful reef-lined coast, the entire coastline was zoned for open space/recreational use in the Master Plan.

In the early 1970s the situation was that the downtown seafront was being used as a rubbish-dumping area with random car parking taking up the empty spaces adjoining the sea. The north coast, i.e. the coastline north of the desalination plant, seemed distant from the city. Apart from the Medina Road, there were no asphalted roads north of the Palestine Road. But already seafront sites were beginning to be closed off by the erection of 2m high boundary walls. Most of the south side of Sharm Obhur was open land. The more popular north side contained several enclosed beach-hut type compounds and a few private villas. Access from the Medina Road was across open desert and grazing camels had to be avoided when driving over this large area of sand and scrub.

About 10 km to the north of Sharm Obhur lay a large abandoned palace which had been built for King Saud ibn Abdulaziz. This building was taken as the northern extremity of the North Corniche Project.

The south coast, i.e. the coastline south of the Saudi Naval Base, was remote and totally undeveloped. Access was possible only by four-wheel-drive vehicles and there were no access roads from the city. In the southern fringes of the city a growing number of unplanned low-income shelters were proliferating to house non-Saudi unskilled labour. Also the southern areas were being used by the Municipality as a rubbish-dumping ground. So, at that time the south coast was unused, indeed practically unknown, to the people of Jeddah.

The Master Plan team were enthusiastic about creating a beautiful "Corniche" to equal, or even surpass, European or American examples. It was accepted that a corniche should be not only for the city centre but for the entire coastline, in anticipation of the future growth of Jeddah to a city of almost two million people.

It was also realised that, in order to achieve this potential, it would be necessary to act quickly or this opportunity could be lost. This initiative was supported by Eng Mohammed Said Farsi, at that time the Planning Officer of the Western Region, but soon to become the Mayor of Jeddah.

Thus the consultants who had prepared the Master Plan were commissioned to carry out a detailed study of the entire coastline - over 120 km in length. This was to be a part of the overall development and beautification of the City of Jeddah and an integral part of the fulfilment of its

open space and recreational policies.

The primary objective in planning the Corniche was not simply to design a dual carriageway road along the coastline. A Master Plan new high speed route was planned inland of the coast - The Andalus Expressway - to allow the Corniche and its access roads to become a scenic, landscaped recreational route for the relaxation and enjoyment of the families and people who would wish to make use of this natural asset. This principle had been made clear in the Master Plan. The value of having a Master Plan is that each discrete part of the city can grow and develop in accord with the overall concepts and plans for the city as a whole. This approach is an essential part of city planning, its methodology and execution.

The first stage of the project was to prepare and update the 1971 mapping. New air photography and mapping were necessary because the earlier mapping was already out of date, particularly in the central and northern sectors of the city. The 1967 British Admiralty Chart of the entrance to the port (Figure 15.1) was of value in appraising the overall sea contours and coral reef locations.

In parallel with the preparation of up-to-date mapping, surveys were carried out on the geology of the coastline, landscaping potential, and climatic conditions. A special marine/ecological survey was also prepared. A summary of the findings of these surveys is as follows:

GEOLOGICAL

North of the city centre massive coralline limestone lies on the surface or at the relatively shallow depth of less than 2 metres over almost the entire area. The main exception is on the north side of Sharm Obhur where relatively thicker deposits (2-5 metres) of silts and clays or detrital limestone in a sandy matrix overlie the limestone. From the city centre southwards the near coastal area is composed largely of thick soft unconsolidated marine sands and silts often in a sabkhah-type environment. The survey emphasised that more detailed investigations of the subsurface conditions would be essential for any major civil engineering works, particularly in the southern part of the area.

LANDSCAPING POTENTIAL

Borehole investigation indicated that existing sources of ground water showed a very high content of dissolved solids and high levels of salinity thereby rendering them unsuitable for irrigation.

Recycled sewage effluent was recommended for irrigation of ornamental planting. Until this became available it would be necessary to utilise treated water (i.e. desalinated water mixed with water from Wadi Khulais) both for human consumption and irrigation.

The soils of the study area were found to be unsuitable for plant growth due to their lack of humus content and plant nutrients. Therefore sweet soil, humus and

nutrients would have to be imported. Because of the inherent high salinity of the soil together with the salinity levels of the ground water, a degree of isolation would have to be maintained between the improved growing soils and the natural soils of the area.

The introduction of irrigation water, sweet soil and nutrients and the isolation of growing soils from saline soils would permit the range of potential plant species in the area to be extended beyond the existing small range of scrub and saline tolerant species of shrubs and trees.

MARINE/ECOLOGICAL

One of the major dangers to the coral reef and therefore the balanced life pattern of its marine inhabitants was pollution. The existing and likely future sources of pollution were the discharge of untreated sewage directly into the sea and especially into areas of shallow water (such as lagoons); the discharge (either accidental or intentional) of oil and waste from craft at anchor or passing along the coast; the increase of sediment in inshore waters resulting primarily from the land reclamation and dredging procedures and, finally, the discharge from industrial plants, especially desalination plants, of waste water which, as it is of a higher temperature than is normal in the sea, has a higher salinity level and contains toxic materials.

The urban/recreational development along the sea coast, especially in Sharm Obhur, had started to produce detri-

mental effects upon the marine ecology.

The minimum tidal range of the Red Sea, whilst having advantages in the creation of marinas and the development of the seashore, creates problems of water circulation and change. In semi-enclosed areas such as lagoons and Sharm Obhur, sea temperatures of 25° C to 30° C encourage sea based leisure activities - bathing, snorkelling, water skiing, sailing and boating.

As a result of these surveys, a further study was prepared listing the types of trees and plants which would be most suitable for use under the prevailing soil and climatic conditions.

STAGES OF PLAN PREPARATION

The three stages of work for which detailed 1:1000 and 1:500 scale plans were to be produced were:

1 The Central Area

2 The North Corniche (including Sharm Obhur)

3 The South Corniche

As the pressures of development were greatest within and adjoining the existing built-up area, the Central Sector of the Corniche was tackled first. This sector, as well as the coastline, included about 20 sq km of land for layout and subdivision proposals. The sequence of work was as follows:

1 From the new land and marine maps examine possible areas of reclamation of land from the sea.

2 Detail the primary road network in accordance with the approved Master Plan. This included the Jeddah-Mecca Motorway; the access and servicing of the seaport; the city centre network and the primary connections to the north.

3 Relate the potential for reclamation to opportunities for recreational roads, sea-facing parks, gardens and open spaces. Ideas and concepts for an overall recreational route and associated facilities were examined.

4 Delineate sites (on reclaimed land) for a central Bus Station and city centre car parking areas.

5 Give special attention to the recreational opportunities and landscaping of the three lagoons:

- The Ministry of Foreign Affairs lagoon
- The Northern lagoon (where a new large sports centre was to be built)
- The Hamra lagoon.

These aspects, plus other detailed analyses and studies, formed the basis on which the detailed layouts were prepared for the central sector of the Corniche. In addition, special regulations were prepared to control the height, massing and layout of buildings which would overlook the sea. This was to ensure that the prevailing cool north-westerly winds would still be able to penetrate inland and, in particular, to the Historic Area.

Immediately following the approval of the plans and reports, contract documents for implementation were commissioned. An important point is that the implementation processes were monitored and controlled by the design team. This minimised delays and ensured that the plans and concepts would be translated into reality. The planning stage and all the subsequent stages to implementation and then maintenance - particularly of landscaping - were all part of one continuous process.

The second priority area was the Northern Corniche i.e. from the Hamra area to the old palace north of Sharm Obhur.

The marine survey had indicated that there was a shallow natural sea shelf 200-300 metres wide extending from the Desalination Plant to the mouth of Sharm Obhur. At the sea edge of this shelf was a 30m deep coral reef with its abundant varieties of coral and myriads of fish - a complete ecological system.

Almost all the seafront land along the North Corniche between the Central Area and Sharm Obhur was privately owned. Much of this land was in the course of being developed. It was realised that it would be both extremely difficult and costly to expropriate this land. This problem led to the decision to make use of the wide, shallow shelf between the land and the reef. This provided the "key" to the concept of the North Corniche.

This basic concept was developed and after several years of hard work has been implemented as a magnificent Corniche (see Figure 15.4-15.6).

The third and final part of the study was the Southern Corniche. This extended 50km southwards from the Saudi Naval base located south of the seaport. A Radio/Communications Station was proposed on an isolated site about 25km south of the Naval Base. After prolonged negotiation, the site of the Communications Station was moved inland from the sea thus preserving the coastline. The Southern Coastline was planned and is now implemented as a 50km long seafront recreational area.

The planning policy adopted for the southern area was different to that of the north. This southern coastline was planned for use, not only by the people of Jeddah, but by the residents of Mecca and Taif and the inland areas. To this end, a direct link from the Jeddah-Mecca Motorway was incorporated into the Master Plan. This is an example of how regional, city and local planning should be integrated towards achieving overall, coordinated planning and development. The Jeddah-Mecca-Taif sub-region has the greatest single concentration of people in the Kingdom. Additionally, economic and social ties and transportation linkages, plus the opportunities for cultural, leisure and recreational interactions must be considered in the plan-making processes.

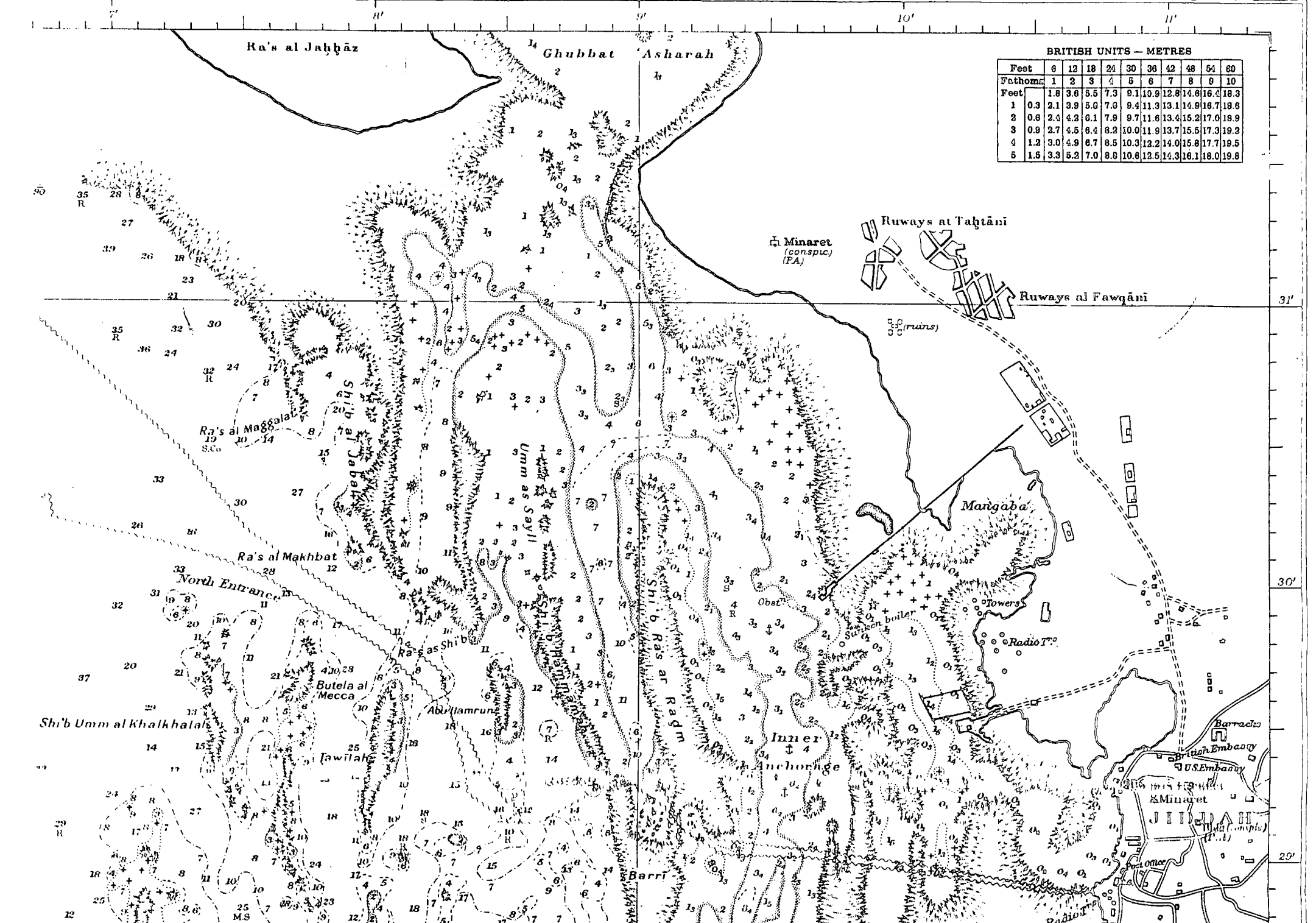
In support of this regional function, the Southern

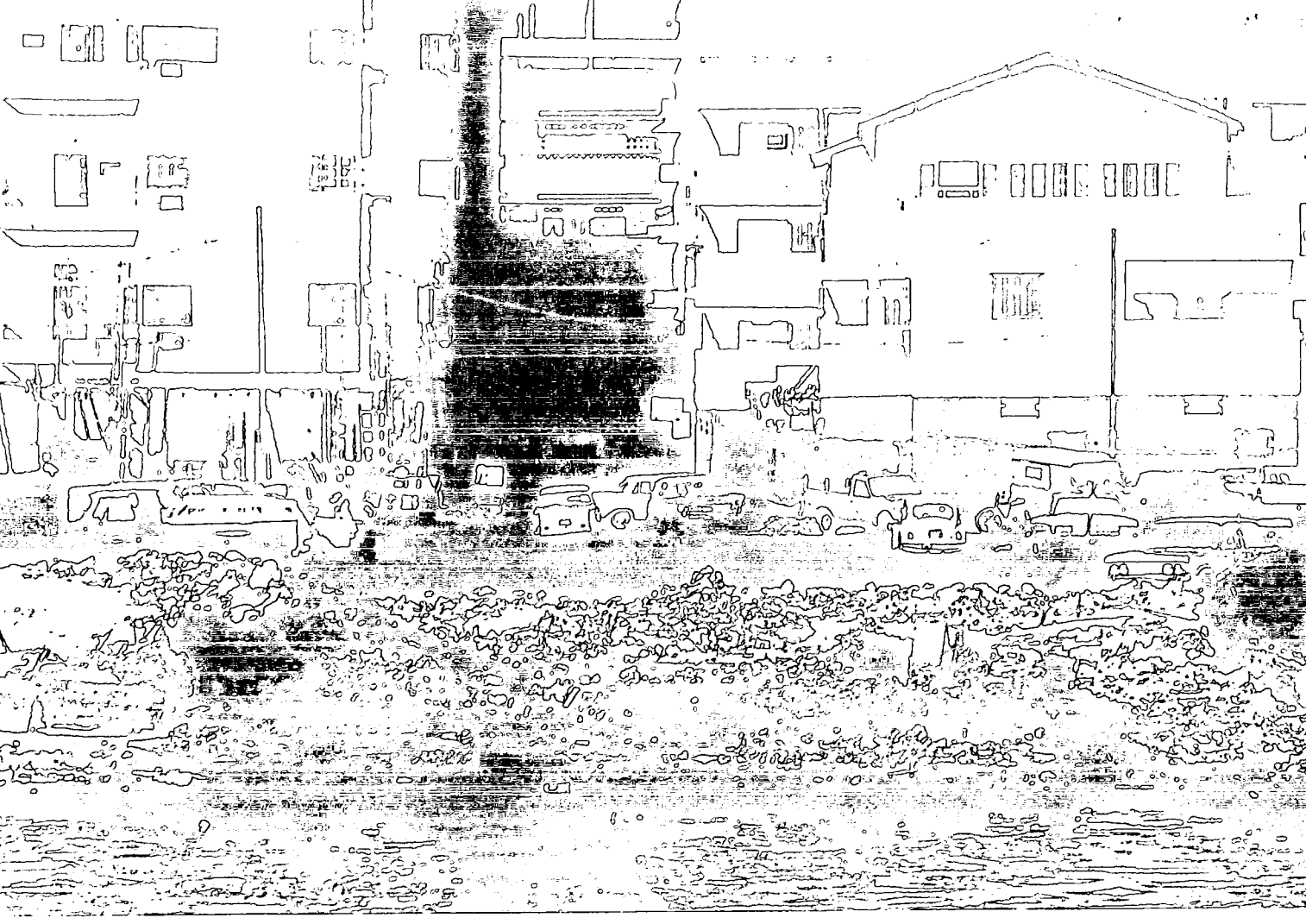
Corniche plans made allowance for residential/holiday homes and local facilities, as well as sports and recreation centres. Provision was made for hotels and restaurants, a major marine and residential/commercial complex as well as stadia, ice-rinks and a large "Disneyland" for children and adults alike. Improved city centre-corniche road access, including a southern expressway linking to the Motorway, as well as the general beautification and revitalisation of the southern areas of the city were planned as part of the overall southern corniche studies.

The planning, design and implementation of the Central, North and South Corniche was all achieved within a period of seven years. The inspiration and driving force was the Mayor of Jeddah - Engineer Mohammed Said Farsi.

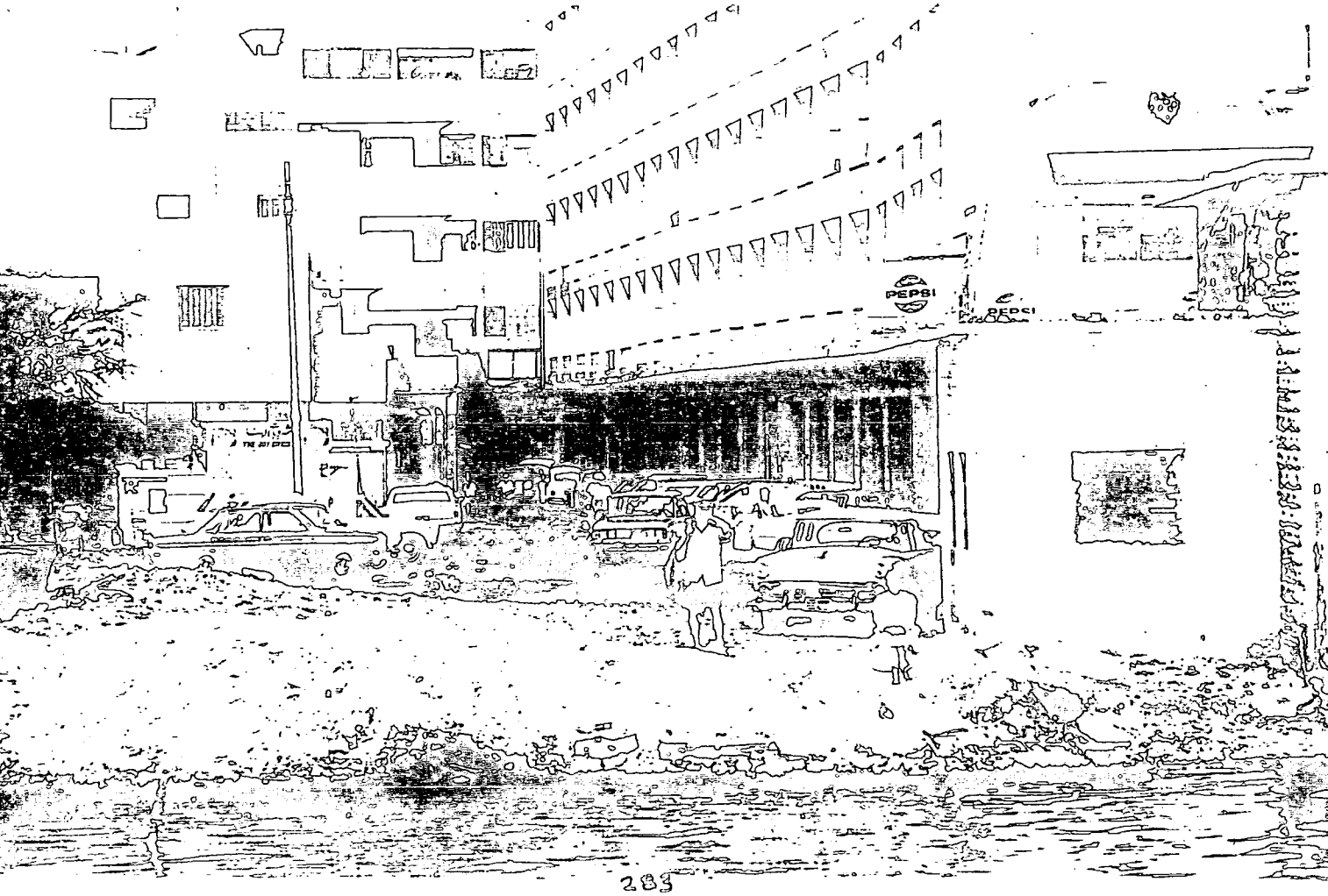
An "extra dimension" was given to this achievement by the Mayor. This is the sculptures and monuments which grace the Corniche with their beauty and variety. These were provided by citizens and companies as a voluntary contribution to their city. The interplay of sea and land in this attractive and sensitive manner has achieved for Jeddah a Corniche perhaps unequalled anywhere in the world. This asset is available freely to all the people of Jeddah and the Western Region.

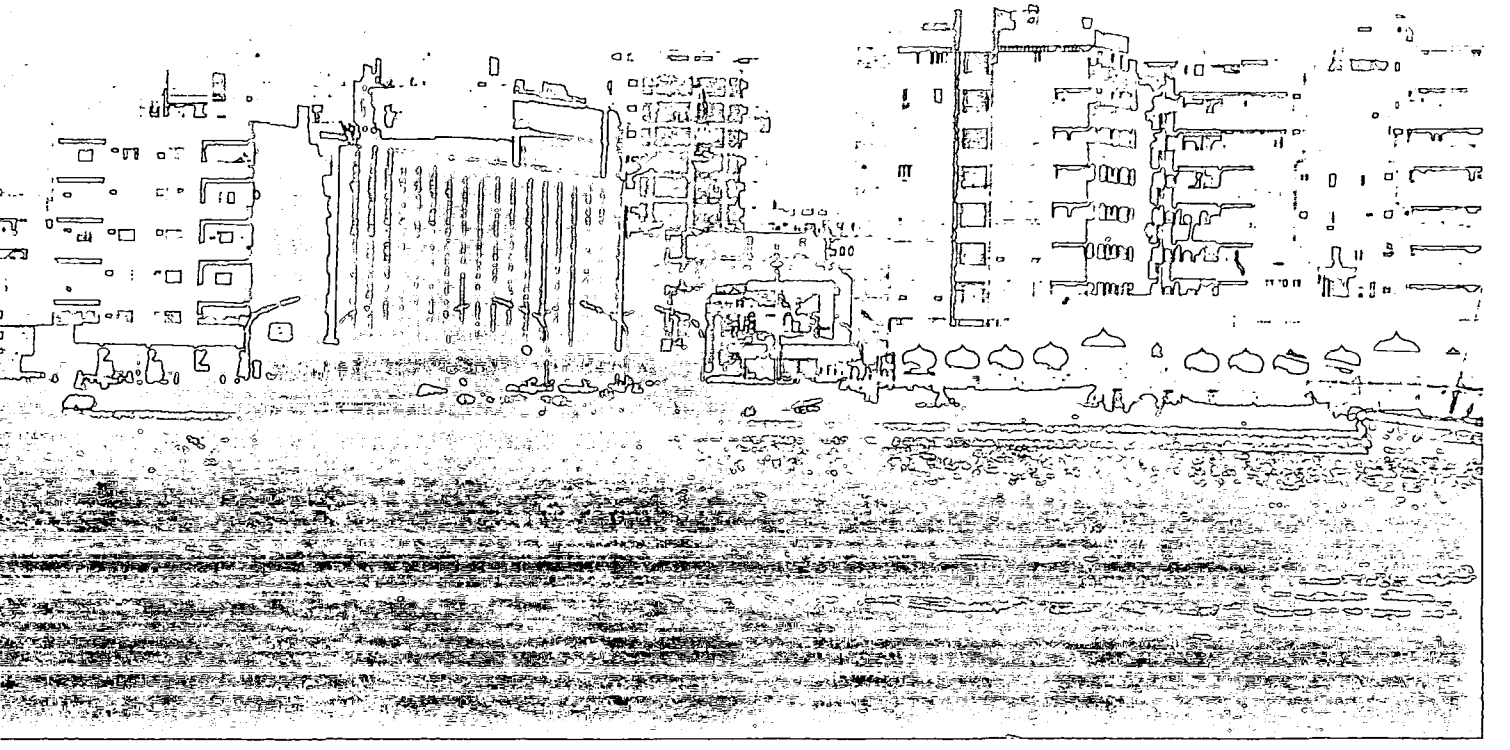
Five photographs (Figures 15.2 - 15.6) show first, the neglected state of the central area seafront in 1973 and then views of the completed Corniche.


7'
8'
9'
10'
11'
31'
30'
29'
Ra's al Jahḥāz
Ghubbat 'Asharah
BRITISH UNITS — METRES
Feet 6 12 18 24 30 36 42 48 54 60
Fathoms 1 2 3 4 5 6 7 8 9 10
Feet
1 0.3 2.1 3.9 5.6 7.3 9.1 10.9 12.8 14.6 16.4 18.3
2 0.6 2.4 4.2 6.1 7.9 9.7 11.6 13.4 15.2 17.0 18.9
3 0.9 2.7 4.5 6.4 8.2 10.0 11.9 13.7 15.5 17.3 19.2
4 1.2 3.0 4.9 6.7 8.5 10.3 12.2 14.0 15.8 17.7 19.5
5 1.5 3.3 5.2 7.0 8.8 10.6 12.5 14.3 16.1 18.0 19.8
Minaret
(conspic)
(PA)
Ruways at Taḥtānī
Ruways al Fawqānī
(ruins)
Ra's al Maqalat
Shi'b al Jabalah
Umm as Sayil
Ra's al Makhbat
North Entrance
Ra's as Shib
Shi'b Ra's ar Raḍm
Butela al 'Mecca
Abu Ilamrun
Shi'b Umm al Khalkhalah
Tawilah
Inner Anchorage
Barr
Mangaba
Obstn
Sunken boiler
Towers
Radio Tr.
Barracks
British Embassy
U.S.Embassy
Minaret
JIDDAH
Mda (Complex)
(PA)
Post Office
Radio Tr.



THE CENTRAL AREA SEAFRONT IN 1973 FIGURE 15.2.





THE CENTRAL AREA SEAFRONT IN 1973

NOTES :

1. THE TURKISH CUSTOMS HOUSE WAS STILL EXTANT & IS SHOWN IN THE RIGHT HAND FOREGROUND.
2. DEVELOPMENT CARRIED OUT IN THE 1960's IGNORED THE SEA & LACKED ANY QUALITIES, ARABIC OR OTHERWISE, OF ARCHITECTURAL DESIGN.
3. ALL THE SEA SHOWN IN THIS PHOTOGRAPH HAS SINCE BEEN RECLAIMED FOR THE CENTRAL AREA CORNICHE, ROADS, CAR PARKING & RECREATIONAL AREAS.

FIGURE 15.3.

Plate 7.3 A Photomicrograph of an 83% w/w C_{16}TACl Int(1) Phase Sample at 40°C

Mag.^{n} x 100

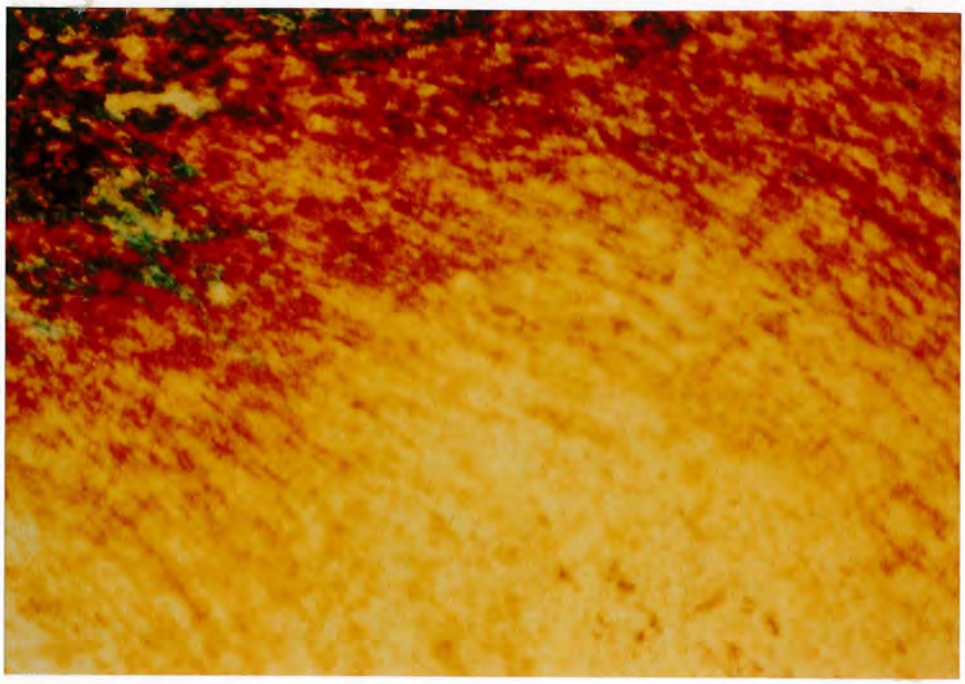


Plate 7.4 A Photomicrograph of an 88% w/w C_{16}TACl Gel Phase Sample at 30°C

Mag.^{n} x 100

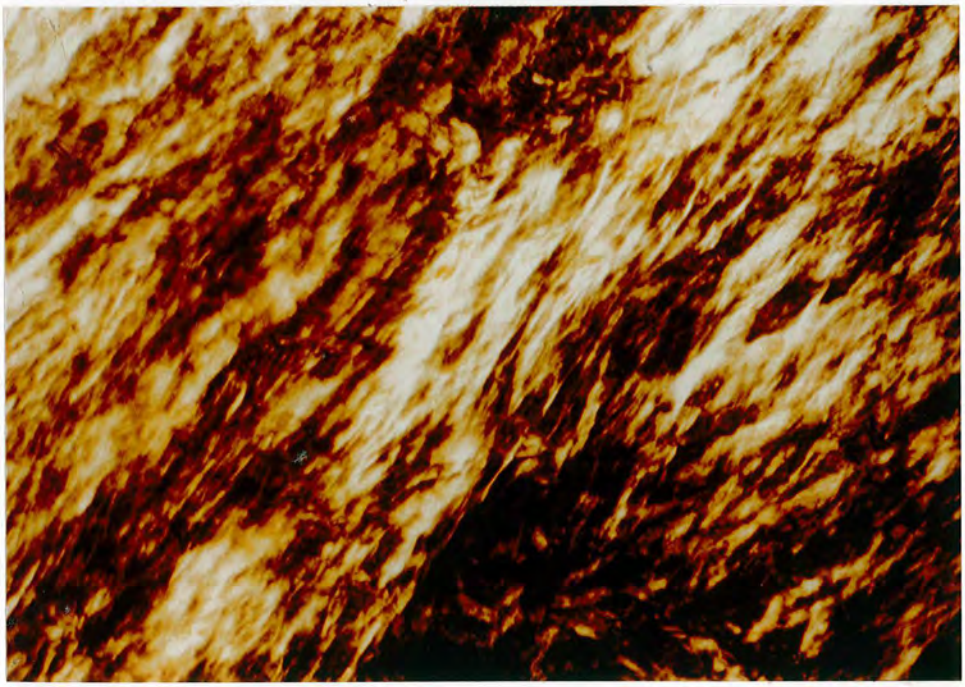


Plate 7.5 A Photomicrograph of an 88% w/w C_{16}TACl lamellar Phase Sample at 60°C. (oil streaks)

Mag.^{n}x 100

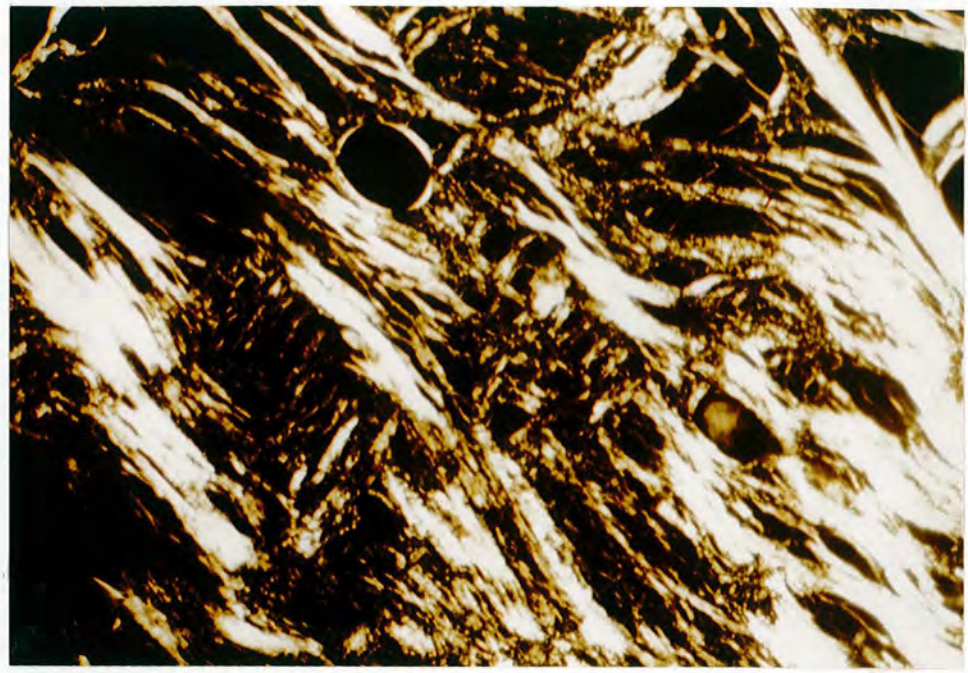


Plate 7.6 A Photomicrograph of an 88% w/w C_{16}TACl lamellar Phase Sample at 60°C. (mosaic texture)

Mag.^{n} x 100

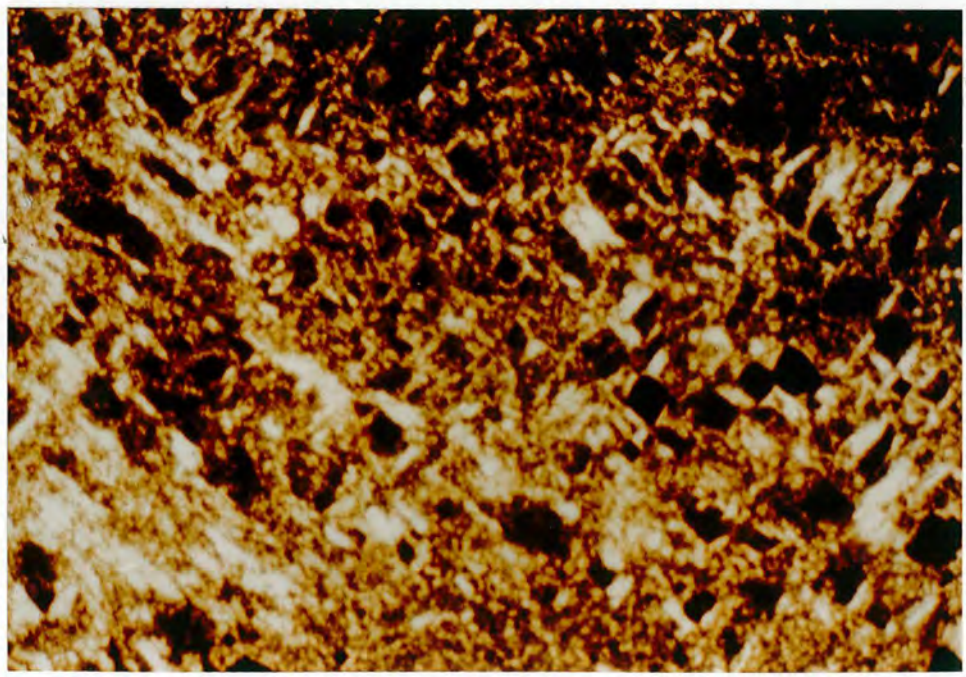


Plate 7.7 A Photomicrograph showing the C_{16}TACl-Water Interface at 30°C

Mag.^{n} x 100

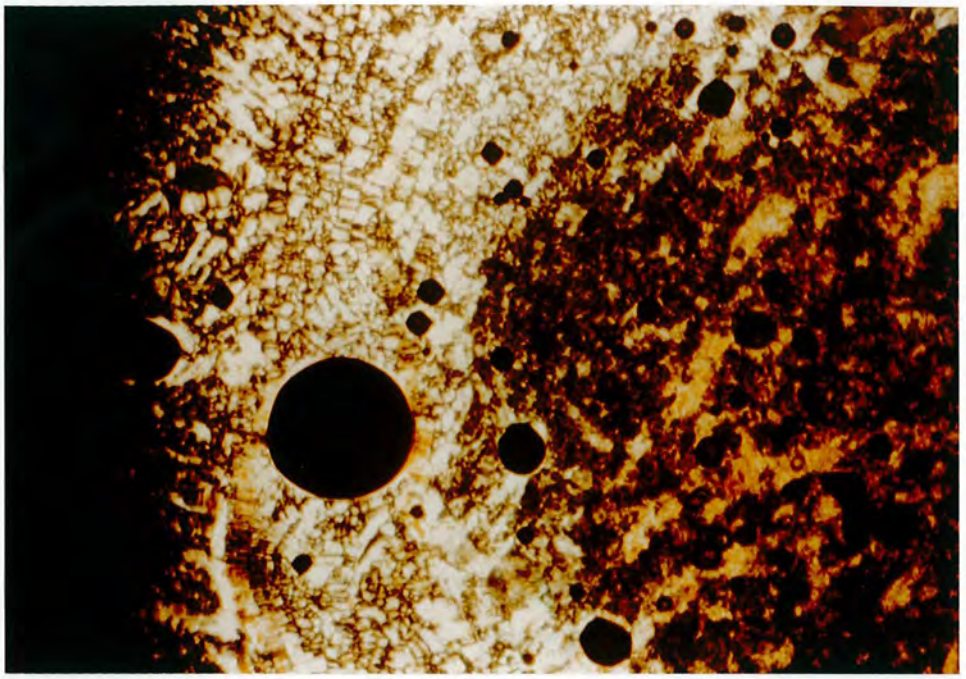
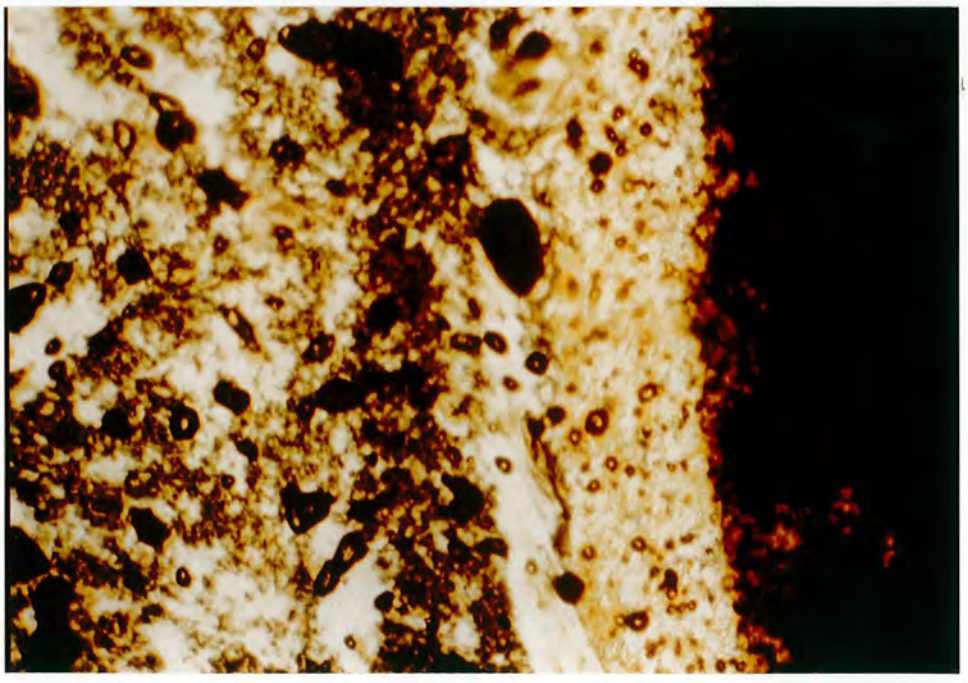


Plate 7.8 A Photomicrograph showing the C_{16}TACl-Water Interface region at 40°C

Mag.^{n} x 100



Two detailed studies of residential areas were prepared by RMJMP as part of the Master Plan follow-up work. The areas selected were, in 1974-75, for the most part unbuit on, but likely to be developed at an early stage of city growth. In these two studies, one to the north and one to the east of the city centre, in addition to preparing 1:1000 detailed layout plans, the standards set out in the Master Plan for the provision of social services, including open space provision, density and form of development could be tested and applied.

The northern action area, the location and context of which is shown on the attached diagram (Figure 16.1) was 640 hectares in area and located south of the stormwater channel and east of the Medina Road. The Master Plan population and employment proposals for the area can be summarised as follows:

Table 16.1

DISTRIBUTION OF POPULATION AND EMPLOYMENT

A POPULATION Area	1971	1991 low	1991 high
City Total	381,148	800,000	1,650,000
North Jeddah	3,828	133,105	200,585
Action Area	2,215	46,000	46,000

B EMPLOYMENT Area	1971	1991 low	1991 high
City Total	100,000	240,000	495,000
North Jeddah	914	41,612	68,903
Action Area	746	6,962	15,700

Source: RMJMP Jeddah North Action Area, 1975

These statistics indicate the undeveloped nature of the northern sector in 1971 as well as its anticipated development to capacity over the Master Plan period. Expressed as a proportion of the total population of the city, the population resident within the northern sector would increase from 1.0% in 1971 to 16.6% of the 1991 low population forecast and 12.2% of the 1991 high population. No numerical increase in population resident within the action area was anticipated between the low and high rates of urban growth as its planned capacity would be achieved at an early stage of Plan implementation.

The Master Plan policy for dispersal of employment throughout the city resulted in the proportion of jobs to be located within the northern sector increasing from 0.8% in 1971 to 17.3% of the 1991 low and 13.9% of the high employment growth rate. The major employment locations

within the action area would be located along Medina Road where service industry was well established, in the new industrial estate along its northern boundary and within proposed service centres.

The transportation analyses carried out during the Master Plan study highlighted very large peak period traffic flows within the north Jeddah sector. However, only a small proportion of the traffic volume would be generated by the sector itself, the larger proportion having an origin or destination elsewhere. Of the 66,500 passenger car units (pcu's) entering and leaving the action area in the 1991 peak hour, more than three out of every four vehicles would be journeying through the sector.

Thus, the highway network for the action area that was developed allowed for major north-south traffic movements to be served by the Medina Road, which was increased in scale to an all-purpose primary road with parallel service roads and grade-separated intersections; a second all-purpose primary road with service roads and grade-separated intersections, which (when constructed) was named Prince Fahd Road, and along the eastern boundary of the action area, an urban motorway primary route with a 20 metre central reserve for the rapid transit system. The road network also included a principal collector/distributor road to link local residential roads into the primary road network.

East-west traffic movements were served by an all-purpose

primary route with service roads (Tahlia Road) in the north of the action area and a principal collector/distributor road in the south.

The principal land use within the area would be residential, including ancillary facililities for the 46,000 persons who would live in the action area. Overall, and in accordance with the Master Plan standards, the density of development was limited to 72 persons per hectare (pph). The proposed breakdown of residential accommodation, including villas (palaces, large and small villas), medium cost housing and low rise apartments in carefully selected locations was as follows.

Table 16.2

RESIDENTIAL ACCOMMODATION Type	Resident Population
Villas	13,000
Medium Cost Housing	24,000
Apartments	9,000
TOTAL	46,000

Source: RMJMP Jeddah North Action Area, 1975

In addition to the provision of local facilities in the action area a district centre to serve a population of 60,000 was zoned within its southern boundary where the proposed highway network afforded a high level of vehicular accessibility.

An area for industrial and distributive use was zoned

along Medina Road and in an industrial estate along the northern boundary of the action area.

The Master Plan policy for building heights permitted villa and medium cost housing to a maximum of two storeys and apartments up to five. Apartments in excess of two floors could be permitted but only in areas associated with service centres and adjoining the larger areas zoned for public open space. In this way, the demand for apartment accommodation could be satisfied within easy reach of community facilities and without affecting the privacy of residents in low rise developments.

In accordance with the Master Plan policy, a district centre occupying a site of 17.5 hectares was located centrally within the action area. Local roads were planned to provide direct access to the centre from the major routes, thereby ensuring a high level of vehicular accessibility for the 60,000 residents the centre would serve. Good pedestrian links from the surrounding housing area to cater for shorter movements on foot were also integrated into the detailed plans.

The district centre comprised six main elements; a commercial area consisting of some 120 shop units, banks, cafes and other services at ground floor level along pedestrian malls and landscaped courts with a mixture of office and residential accommodation over; a medical centre and day hospital; a zone of government services including police, fire and administrative offices; community buildings

comprising a Friday mosque, recreation centre and meeting hall; residential development and a park and sports area. The provisional gross land area allocated to each was:- commercial area, 1.0 hectare; hospital, 1.0 hectare; government services, 0.5 hectares; community buildings, 0.5 hectares; residential development, 4.0 hectares; park, 8.5 hectares. A further 2.0 hectares of land was allocated to car parking, loading bays and road space, giving, in total, a 17.5 ha land allocation.

The standards of provision adopted for facilities to support the resident population were as follows:

Table 16.3 Space Standards for Ancillary Facilities in Residential Areas

Facility	Ha/1000 population
Schools	0.64
Local Open Space	1.00
Mosques	0.25
Shops	0.25
Clinics and other	0.25
TOTAL	2.39

Source: RMJMP Jeddah North Action Area, 1975

The provision of school sites was based on the Ministry of Education's policy as expressed in the Master Plan report and on an assessment of school catchment areas within the north Jeddah sector. In total twenty four schools, each accommodating, on average, 500 pupils would be required to serve the 46,000 people resident within the action area by 1991 according to the forecast age structure of the

population at this date. The composition of this proposed school provision was calculated as follows:

Table 16.4 Proposed School Provision

Type	Elementary	Intermediate	Secondary	Total
Boys	7	4	2	13
Girls	7	3	1	11
TOTALS	14	7	3	24

Source: RMJMP Jeddah North Action Area, 1975

The location of school sites was related to population distribution and the location of other community facilities. Elementary schools, for example, were distributed to ensure that all homes were within approx 400 metres of their nearest school. The layout plans made provision for children living within a five minute walking distance to walk to school along a safe pedestrian system.

One of the aims of the Plan was to establish school sites as an integral part of the open space system for an area. Thus, in addition to providing safe and attractive pedestrian routes to and from the schools, parks, playgrounds and playing fields would combine to provide a recreation facility for both the schools and the community. The average site area of the 24 schools designated in the 1:1000 scale layout plans was 0.9 hectares - equivalent to a ratio of 0.5ha/1000 population. This was deemed an adequate provision.

The provision of local open space was made in accordance

with the breakdown indicated in Table 16.5. In new development areas such as this locational problems did not arise, and the full standards of provision were capable of implementation. The space provision was broadly split into three: that to cater for children's playgrounds and incidental open space; that to provide local amenities and that to provide parks and sports grounds.

Table 16.5 Local Open Space Provision

	Rate/1,000 population
Children's playgrounds and incidental open space	0.2 ha
Local amenities such as gardens and kickabout areas	0.4 ha
Parks and sportsgrounds	0.4 ha
TOTAL	1.0 ha

Source: RMJMP Jeddah North Action Area, 1975

Locational factors (in addition to providing open spaces near to schools) were dictated by the need to provide play areas for small children close to dwellings, especially where the dwellings would be concentrated in apartment buildings. Local open spaces were also provided at focal points within the community in association with local centres or with a mosque and small groups of shops. Landscaped areas aimed at providing visual relief between housing and other uses such as primary roads were also integrated into the layout plans.

Provision was made for 30 local mosques within the action

area, some of which were allocated to the industrial zone in the north. The distribution of mosques within the residential areas was made having regard to the density of development and the need to locate local mosques within a reasonable walking distance of all homes. At an overall density of 72 persons per hectare each mosque would serve about 1,500 persons (the majority of whom would live within a walking distance of not more than 200 metres). Allowing for 25% attendance (equivalent to all males in the population over the age of 10) at any one time and for washing facilities and a garden included with the building, a site of 450 sq m was considered adequate as follows:

Table 16.6 Proposed Space Standards for Local Mosques

	sq m
Prayer hall for 400 persons	235
Ablutions	15
Garden/courtyard	200
TOTAL	450

i.e. an overall rate of provision of 0.3m^2/person of total population.

Source: RMJMP Jeddah North Action Area, 1975

A Friday mosque was designated within the district centre and a site area of 3,000m^2 allocated for this purpose. The car parking provided for the adjacent commercial area would be available on Fridays: thus no separate parking area was required for the Friday mosque.

In addition to the shopping contained within the District Centre, provision was made for corner shops at the rate of two units of 20 sq m each per 1,000 residents. Two slightly larger units of 25 sq m each for a similar number of residents were allocated to local centres. Generally, corner shops were located adjacent to local mosques.

Two local centres were proposed to serve the residential areas most distant from the district centre. Each would serve a population of about 10,000. Both local centres were located so as to provide a high level of pedestrian and vehicular accessibility for local residents. In addition to shops and service trades, each local centre would contain a full range of community facilities including the local mosque, community buildings for health, police, etc., elementary and intermediate schools, car parking areas, gardens and recreational space. It was in these locations that provision was made for the development of medium rise apartments, both over shops and on separate residential plots.

The Master Plan made an allowance of 0.25 hectares per 1,000 population to cover the provision of clinics and health centres as well as sites for less specific community facilities which might be required. After consultation with the Ministry of Health, a health centre on a site of 1.0 hectares was allocated within each local centre to serve up to 10,000 residents. This site area

accommodated surgeries, waiting rooms, other local health requirements and car parking. A small hospital with a more comprehensive range of medical facilities was located adjacent to the district centre.

Thus, the content of the two local centres was:

Table 16.7 Proposed Local Centres

Approximate population served	Shops and Service Premises	Health Centre & Community Facilities	Mosque	Car Parking
10,000	20 - 25	1	1	200 *

* Approximately two thirds of this number was required for households living in apartments over shops.

Source: RMJMP Jeddah North Action Area, 1975

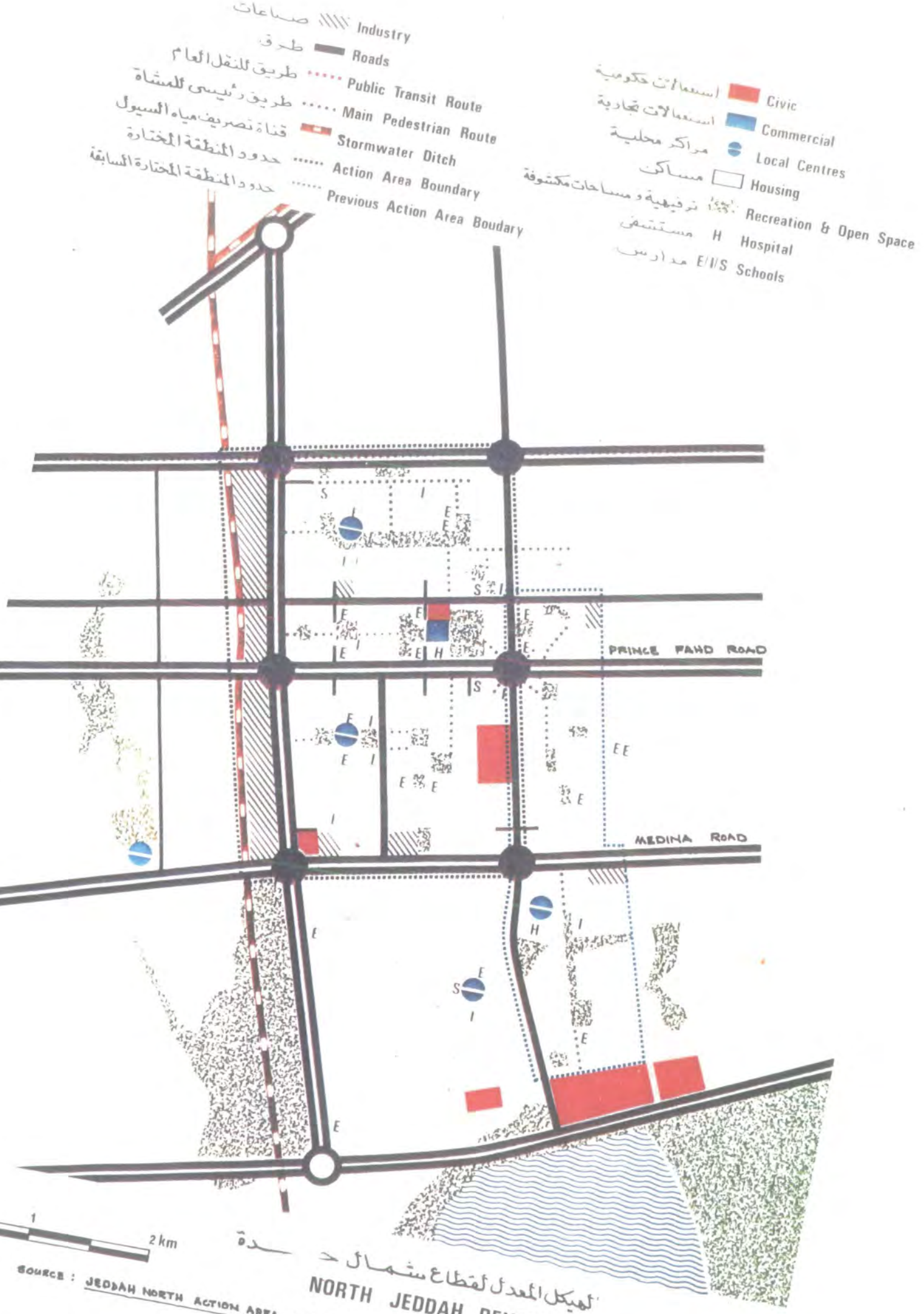
JEDDAH EAST ACTION AREA

Applying a similar approach and methodology to that of the Northern residential area, detailed 1:1000 scale plans were prepared for a smaller area of 244 hectares in the eastern sector of the city, south of the Mecca Road (see Figure 16.2). The Master Plan road structure, land use zoning and planning standards were taken as the basis for the development of the area. Again, modifications were introduced in order to apply the more generally based Master Plan proposals to a specific area.

In these, and in subsequent action area plans prepared by RMJMP and other consultants, a similar approach was adopted. Thus, over a ten year period, which included the first review of the Master Plan, the built form of the city gradually evolved. This process took place, not as a constant fixed plan in time or in physical form, but as the application of principles set out to control the macro elements such as the broad distribution and density of land uses and the transportation structure which would serve them. Within this discipline, local plans were developed and then fed back into a constant review and updating of the strategic plan and its parameters. In other words, plans and plannning was an iterative, rather than static, process.

In parallel with this work by Consultants, and adopting a similar approach, the Town Planning Office prepared land donation plans for large areas of land, particularly to

the south of the city. The land donation system allows the King to disburse building plots to Saudi citizens who require a plot of land on which to build a home.



SOURCE : JEDDAH NORTH ACTION AREA - RMJMP, 1975

NORTH JEDDAH DEVELOPED STRUCTURE
الهيكل المعدل لقطاع شمال جدة

FIGURE 301

لهيكل المعدل لقطاع شرق جدة

EAST JEDDAH DEVELOPED STRUCTURE

SOURCE : JEDDAH EAST ACTION AREA - RMJMP, 1975
302

FIGURE 16.2.

By the mid 1970s it was clear that the pace of development and the consequential demand for land was outstripping the capacity of the Town Planning Office and its Consultants to prepare the layout plans to meet this need. Instead of a controlled and phased release of land to meet the pressures of growth in accordance with the phasing proposals of the Master Plan, the reality was that the Town Planning Department was not allowed to refuse development of land not in conformity with the phasing of growth defined in the Master Plan. While this topic will be discussed later in this work in the chapters which evaluate the relative worth and application of the Plan, by the mid 70s, owners of large parcels of land, in their haste to place building plots on the market, began to commission local, sometimes even international, firms to prepare layouts for planning approval.

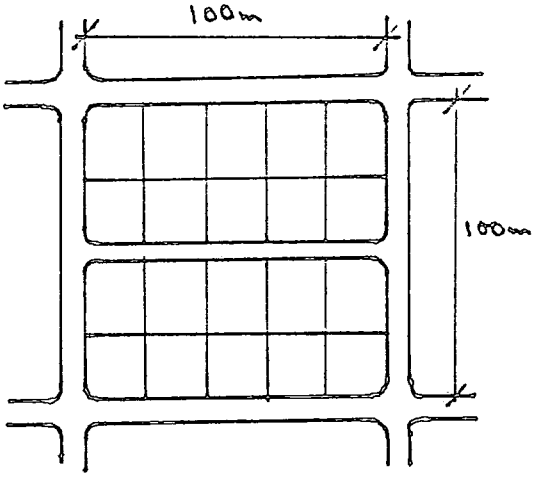
There is, of course, nothing unacceptable in principle about this approach to the development of land, provided that adequate provision is made for both the Master Plan needs (e.g. the highway network and the appropriate use of the land) and the ancillary support facilities required.

Thus, although the carefully prepared programming of development (related to a programme of provision of roads and public utility services) set out in the Master Plan was overtaken and disrupted by events, the Town Planning

Office maintained the principles of setting planning standards (as distinct from preparing a plan) and required these standards to be achieved in private sub-division land planning.

It was unfortunate that one of the earliest private development initiatives - the MOD-L Garden City mentioned in Chapter Eleven - failed to be implemented as it incorporated generous standards of open space and provision of social facilities. For the most part, private landowners wished to achieve the greatest possible return from their land holding - a situation not peculiar to Jeddah or indeed Saudi Arabia.

Early layouts, were based on a 100 metre square sub-division grid layout. This yielded twenty plots, approximately 20m x 22m per grid square as follows:



Add to this unimaginative approach the construction of 2m-2.5m high boundary walls which, while ensuring privacy for the family within their home and garden, resulted in inadequate sight lines at cross road intersections. The outcome was a series of dangerous cross roads at which car

crashes occurred with much too regular frequency.

The response by the Town Planning Office was to insist upon a 45^{o} splay at all corner plots to provide sightlines at road intersections. This was applied, but it was soon noted that this angled corner, with access to two and not one road, was where the owner located his access gate - thus defeating the road safety purpose the angled corner was intended to fulfil.

Such early lessons, of which this is a simple example, were quickly learned by the Town Planning Office. Remedial action was taken, as part of evolving a system of development control procedures appropriate to the needs and pressures of the time.

The Town Planning Office, assisted by their Consultants, were firm in requiring developers to comply with the Master Plan. For example, road corridors were safeguarded in accordance with the provisions of the Plan. In fact, the Mayor of Jeddah insisted that where, for example, the Plan specified a 30m road, a 50m land reservation should be designated. Subsequently, this decision was found to be invaluable when, with increasing difficulty in making landowners observe car parking standards within their site, a 10m service road could be constructed on both sides of the 30m dual carriageway (i.e. the Master Plan requirement), thus providing both highway and car parking capacity. Also, for the same reasons, the Mayor insisted that the width of local roads be increased from an 8 metre

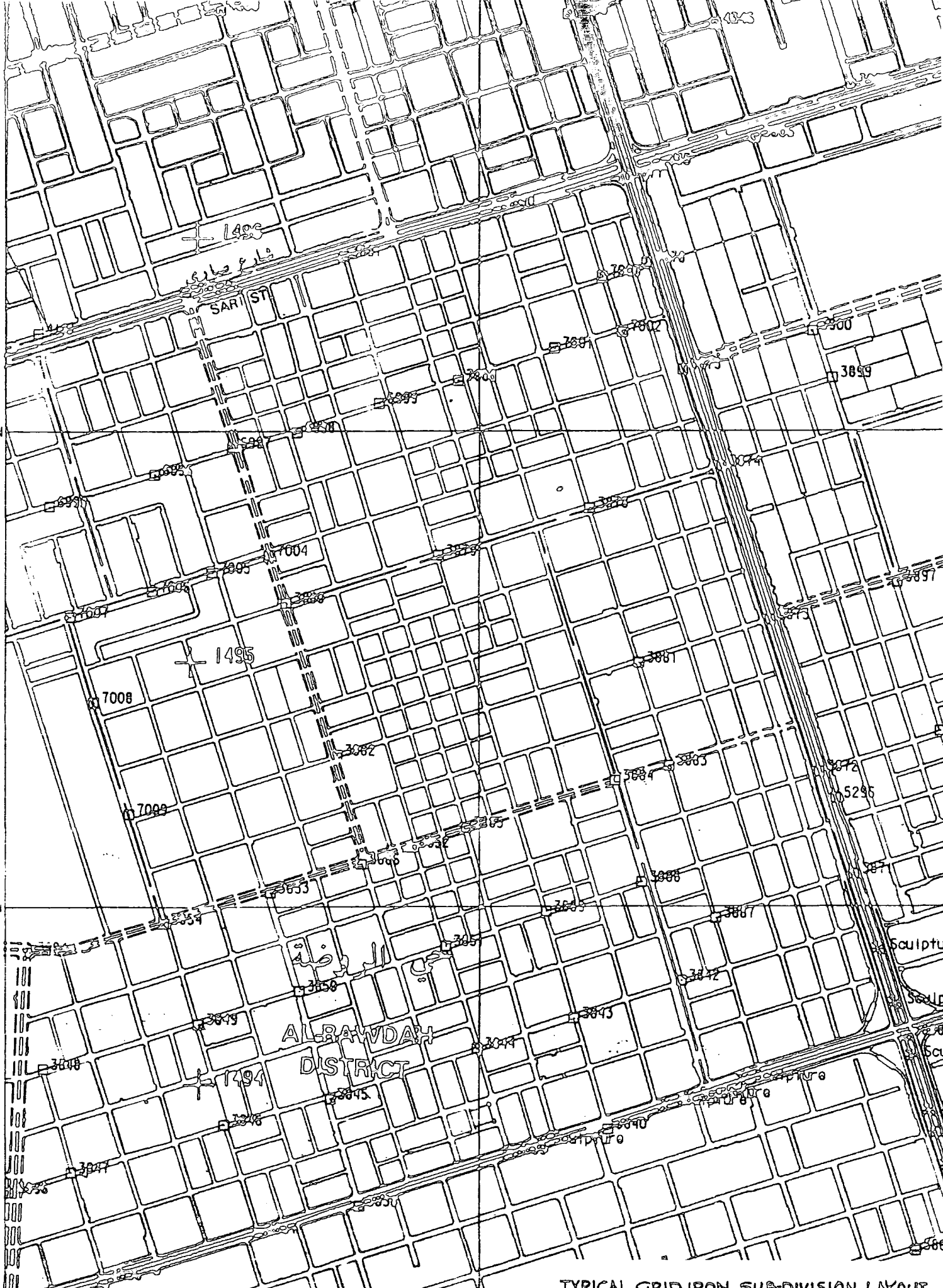
cross section to 15 metres. Requirements for open space and provision for social facilities, calculated in accordance with the necessary standards, were insisted on by the Planning Office. This became known to developers as the "70:30 rule" as they soon learnt that, excluding major roads, the ratio of "public", i.e. local roads, open spaces, school, clinic, mosque and shopping areas to "private" i.e. subdivided house plot areas would not be acceptable by the TPO unless not less than 30% of their land was allocated for public needs.

Examples of typical layouts, from the grid pattern onwards, are attached (Figures 17.1-17.3). These indicate graphically the evolution of private sub-division layouts. Crossroads, it will be noted, were superseded by T or Y junctions and, in some cases curved, rather than straight, roads appear.

By the early 1980's over 200 sq km of land, predominantly in the northern sector of the city, had been planned by private developers.

It must be recorded, however, that the development of these private sub-divisions gave rise to a major problem. An owner, having received planning permission, would then sell off individual plots. The owner of a plot would, in many cases, after receiving building permission, then start to construct his house. But his specific plot could be in an open, unmarked area and the land surveyors responsible for setting the plot boundaries would often

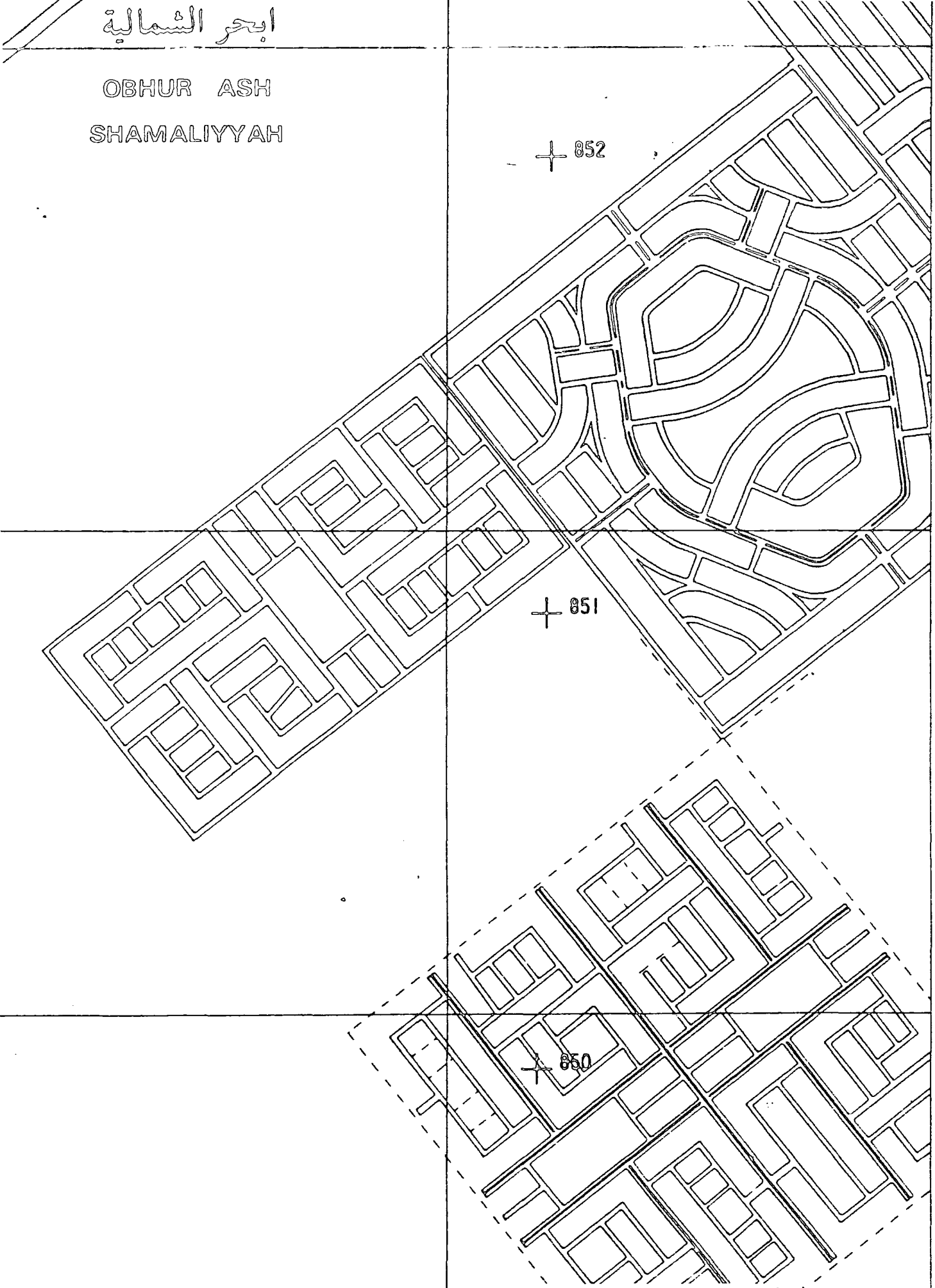
have to locate and determine these boundaries by taking a traverse from a fixed point several kilometres distant from the plot in question. Inevitably inaccuracies crept into the fixing of the plot boundaries and it would only be when subsequent owners (or the consultants for the city road network construction) came to determine their specific plot or road alignment, that the error would come to light. This lack of accurate setting out, which was not realised at the time by either the landowners or the Municipality, is an object lesson, in the need for absolute accuracy in the transformation of plans on paper to the land itself. It was only in 1985 that the Municipality started to resolve this problem by preparing cadastral, land ownership maps, i.e. maps based on accurate coordinate controlled land measurement.



TYPICAL GRID IRON SUB-DIVISION LAYOUT

SOURCE : HUNTINGS AIRSURVEY LTD , 1983

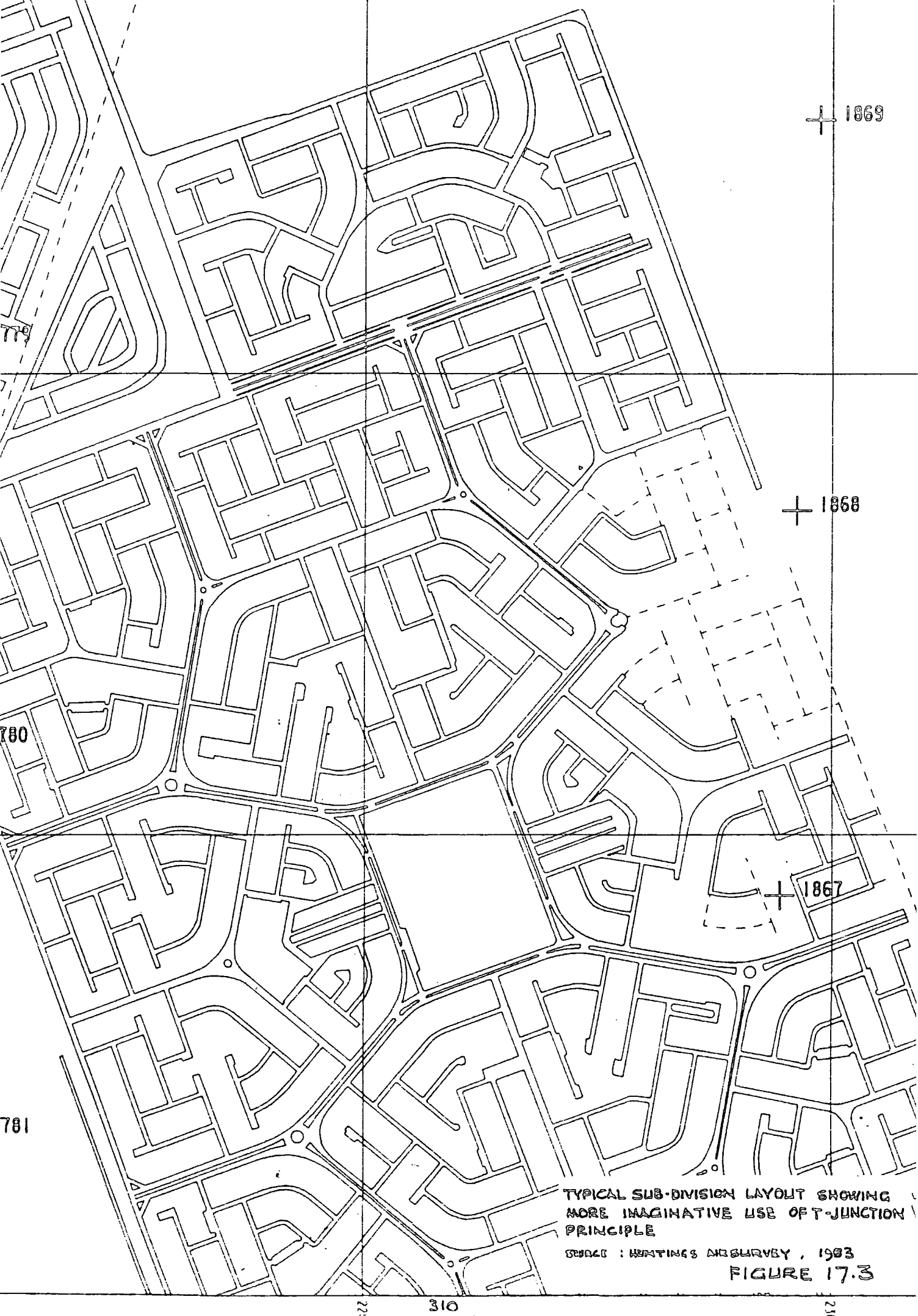
FIGURE 17.1



TYPICAL SUB-DIVISION LAYOUT SHOWING T-JUNCTIONS RATHER THAN CROSS-ROADS

SOURCE : HUNTING AIR SURVEY LTD , 1983

FIGURE 17.2



TYPICAL SUB-DIVISION LAYOUT SHOWING MORE IMAGINATIVE USE OF T-JUNCTION PRINCIPLE

SCALE : HUNTINGS AIR SURVEY, 1983

FIGURE 17.3

As the setting up of a public transport system requires specialised study, the Master Plan transportation advisors were commissioned in 1976 to carry out an Urban Public Transport Study. Two basic objectives were set:

1 to prepare a long term planning strategy for the development of public transport to complement the highway strategy incorporated in the Master Plan,

2 to determine short term priorities for the development of urban public transport services and for the construction of passenger terminals and bus maintenance depots.

Even though the increase in the ownership and usage of private cars generally results in a decline in demand for public transport (particularly in Jeddah where massive expenditure had been committed to constructing major highways), the need to restrain the use of private transport and to encourage the use of public transport formed the basis of this study.

The Master Plan established the land-use and transportation framework and urban development policies for city growth over the twenty year period 1971 to 1991. The highway planning proposals provided a high degree of freedom for the predicted car owners to use private transport. Consequently public transport would serve pri-

marily the needs of non-car owners and people without the family car available for some journeys.

By 1976, indications of growth supported the high, rather than low, growth estimates made in the Master Plan. Thus, the high population estimate of 1,650,000 for 1991 formed the quantitative basis for the provision of urban public transport services. On this basis, the assessment of potential demand indicated that the urban public transport services would be likely to attract 34,000 to 45,000 passengers during the peak period in 1981 and 71,000 to 94,000 passengers during the peak period in 1991. These estimates confirmed the need to establish an efficient public transport system to complement the highway and car parking facilities being provided for private transport users.

Even fast and frequent public transport services are usually less convenient than the "door-to-door" and "travel when you choose" characteristics of the private car. Therefore the public transport service was designed to meet three objectives:

1 to achieve maximum convenience to passengers by having services routed close to their origins and destinations;

2 to achieve operational efficiency by matching the capacity of the system to the levels of passenger demand throughout each sector of the city;

3 to achieve economic efficiency by minimising capital investment in public transport facilities, as a means of pursuing a low fares policy in order to encourage the use of public transport.

Achieving these objectives necessitated maintaining a high degree of flexibility to meet the changing patterns of demand throughout a period of rapid urban expansion. Under efficient operating conditions, conventional bus systems can carry up to 8,000 passengers per hour per route, whereas transit systems can accommodate higher capacities of up to 50,000 passengers per hour per route. From an assessment of user requirements, it was estimated that approximately 50% of the passenger demands would be dispersed throughout the city. Therefore the travel demands in Jeddah would be served best by a multiple route, high frequency bus system. The potential demand for, and role of, a fixed track system was examined in the analysis and evaluation of alternative long term strategies. In the short term the study concluded that the scale and dispersed pattern of passenger demands would be served best by a bus system. Thus, in terms of achieving a high degree of flexibility at minimum capital cost, the strategic short term policy recommended for public transport was to develop a bus system.

The Master Plan road hierarchy of primary expressways, secondary collector/distributor roads and local roads allowed considerable flexibility for buses to be routed to

and through the residential and commercial areas of the city. The bus system which was developed thus comprised a network of high speed, limited stop express bus routes backed up by a frequent stopping local service. The routing and route frequency proposed for this system are illustrated in Figures 18.1 and 18.2 respectively.

In 1976 public transport services were provided by taxis and mini-buses, which had a capacity to carry 20 to 25 passengers. The assessment of the demands for urban public transport services indicated the need to introduce larger size, higher capacity urban buses, which would provide a more efficient means of accommodating the higher passenger volumes along the main bus routes.

In order to provide an attractive alternative to the private car, urban buses must provide a high degree of passenger comfort, must be strongly built to provide a high level of passenger safety, and must be built to a high standard engineering specification to ensure operational reliability. Consequently, the recommended specification for the urban bus was a standard 11 metre long by 2.5 metre wide, diesel-engined single deck bus, with a capacity of up to 70 passengers.

The Master Plan and subsequent Central Action Area study made provision for two public transport interchanges. The main bus terminal was located off King Abdulaziz Street to the west of the existing commercial centre. Secondary bus terminal facilities were located at the proposed transit

route station adjacent to the proposed commercial/office centre on the site of the then airport. These locations were near the centre of demand and they were conveniently located in terms of access to the main highway network.

The potential demands for urban and inter-city public transport services indicated the need to, first, pursue a development strategy of developing one terminal of adequate size to accommodate the short term requirements. Secondly, the longer term needs should be safeguarded by securing a reservation for the future development of a second terminal. The short term policy adopted was therefore to develop the terminal on the site at the sea front adjacent to the existing commercial centre as an immediate action project. In the interests of passenger convenience the terminal was subsequently designed to incorporate convenient interchange between bus and taxi as well as direct interchange of passengers between inter-city and urban bus services.

Unlike passenger terminals, bus depots should be located outside the city centre but in a location providing good access to the population to be served. Depot locations should also ensure that buses can reach their route commencement points quickly and directly thereby minimising unnecessary bus mileage before going into service. In the interest of operational efficiency, the bus maintenance depots were designed on a modular basis where each module provided the comprehensive operational and administrative

control centre and maintenance facilities for operating a bus fleet of up to 125 buses. The assessment of the long term and short term fleet requirements indicated the need to develop two such standard depots and to safeguard the longer term requirements by securing reservations for the future development of two additional depots. Two sites were scheduled, one at Kilo 8, just off the Mecca Road and one to the south of the stormwater channel near the Medina Road.

In order to achieve an efficiently managed service, four essential requirements must be met:

1 convenient access and circulation for passengers' travel desires;

2 reliability in terms of the routes and frequencies of services;

3 comfortable conditions for passengers during their journey;

4 safety for passengers in terms of the buses being of suitable design, maintained in good mechancial condition and being driven by experienced bus drivers.

i.e. an efficient operational and management structure is an essential prerequisite to establish an attractive alternative to private transport.

The efficiency of the city bus services also depends on establishing an effective means of coordinating overall

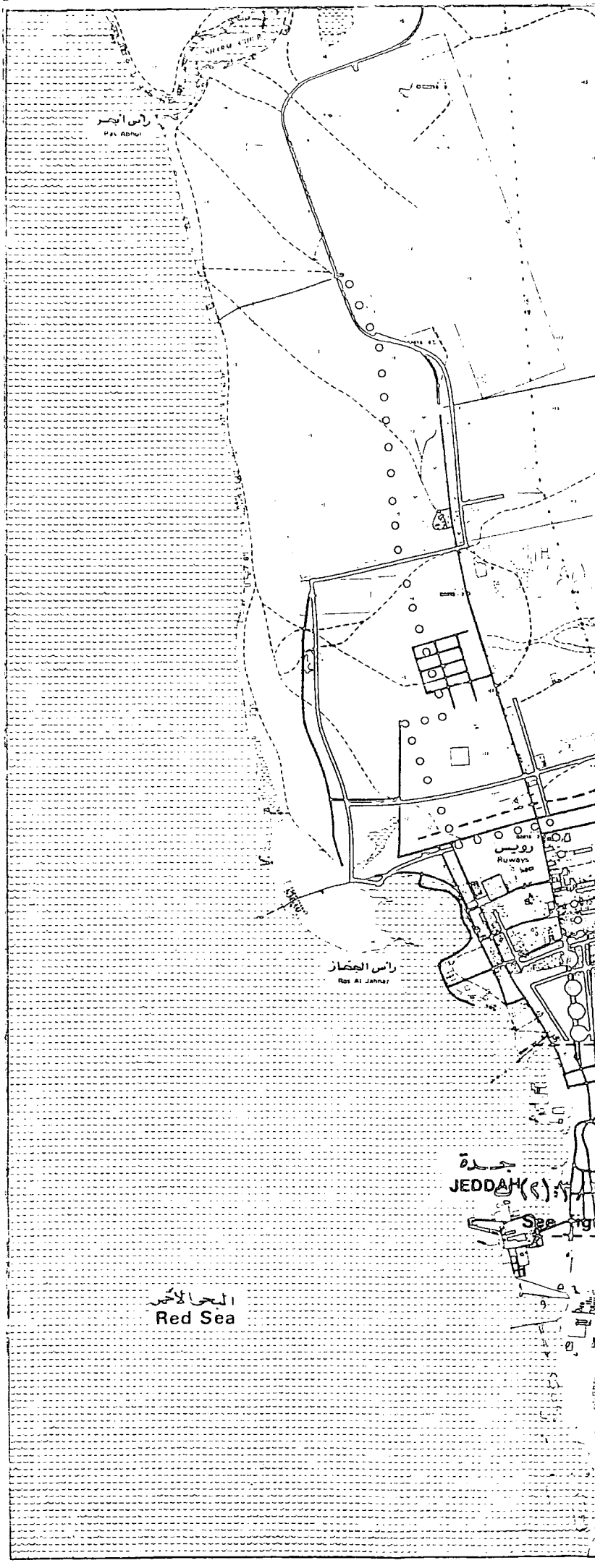
transport policies, especially for highways, traffic management, car parking, traffic control and the licensing and fare structures for taxis and mini-buses. In the longer term it was recommended that these strategic planning and management functions would best be achieved by establishing an Urban Transport Authority. In the short term, a Public Transport Directorate was established to coordinate the operation of bus, mini-bus and taxi services.

Establishing new public transport facilities and providing high quality, reliable, convenient, efficient and safe public transport services cannot be achieved cheaply. Nevertheless, the costs of setting up a public transport system represented a relatively small percentage of the investment in the highways, car parking and urban facilities planned to accommodate the growth of the population envisaged in the Master Plan proposals. However, as the scale of investment required to provide the new public transport facilities would be well beyond the resources of the owners/operators of the present day mini-bus services, the recommended strategy for the development of urban public transport services was based on:

1 Central Government establishing a financial aid programme to assist in funding the high capital investments of setting up the public transport system;

2 the Central Government providing financial aid to pursue a low fares policy by subsidising operating costs.

The decision to set up an urban bus service for Jeddah was taken by the Ministry of Communications, Department of Transport, in 1978. A central passenger terminal was constructed on the site scheduled for this purpose, out of town depot sites secured, and, by 1979, a comprehensive bus service was operating throughout Jeddah.



الأتوبيس التقليدي
Conventional Bus

٠ - ٥٠ أتوبيس في الساعة
0 - 50 Buses / hour

٥١ - ١٠٠ أتوبيس في الساعة
51 - 100 Buses / hour

أكثر من ١٠١ أتوبيس في الساعة
Over 101 Buses / hour

الأتوبيس السريع
Express Bus

٠ - ٥٠ أتوبيس في الساعة
0 - 50 Buses / hour

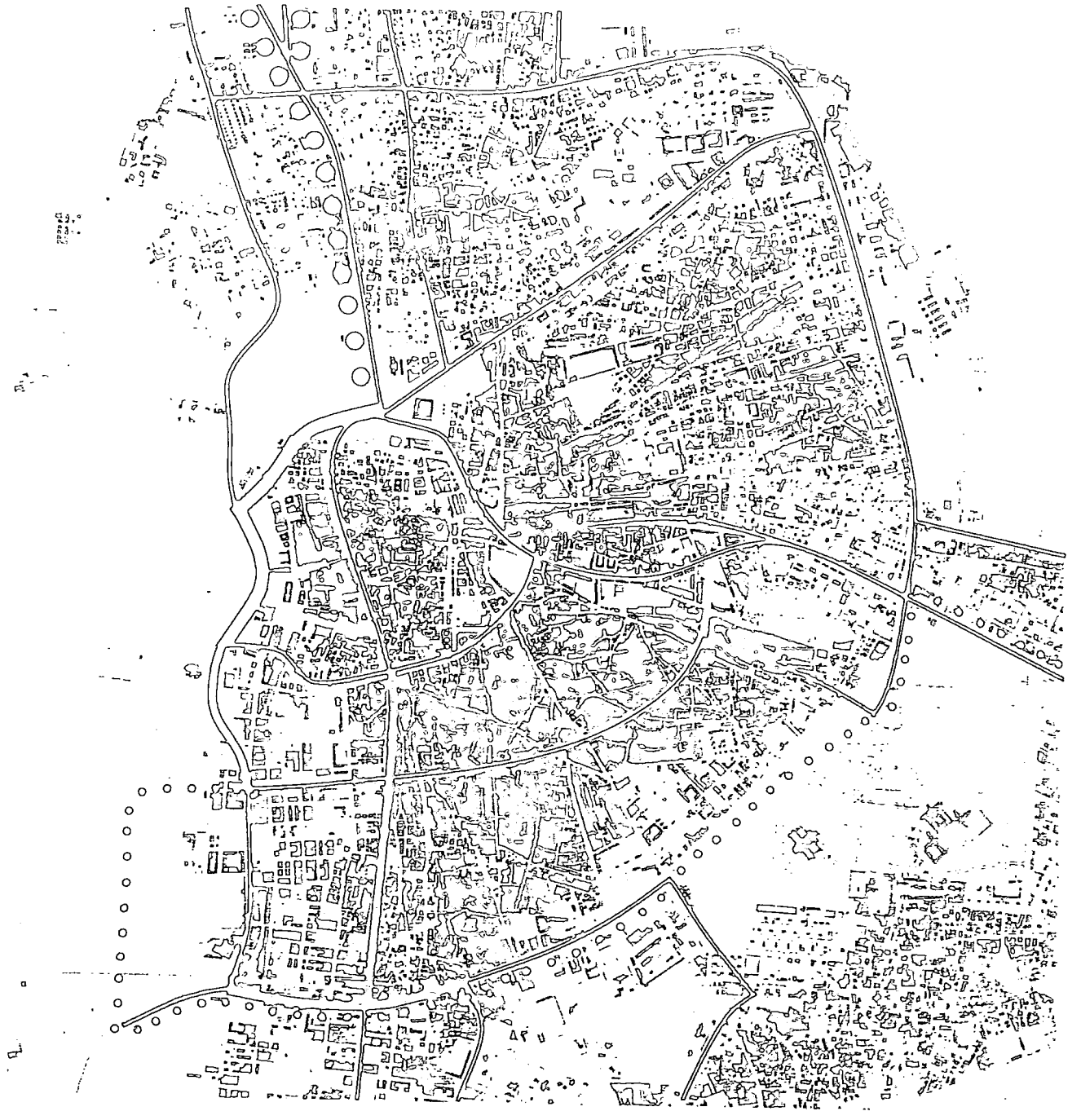
٥١ - ١٠٠ أتوبيس في الساعة
51 - 100 Buses / hour

أكثر من ١٠١ أتوبيس في الساعة
Over 101 Buses / hour

PROPOSED BUS ROUTES - 1981

FIGURE 18.1.

SOURCE : URBAN PUBLIC TRANSPORT STUDIES
JAMIESON, MACKAY & PTNS, 1977



الأتوبيس التقليدي
Conventional Bus

٠-٥٠ أتوبيس في الساعة
0 - 50 Buses / hour
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51 - 100 Buses / hour
أكثر من ١٠١ أتوبيس في الساعة
Over 101 Buses / hour

BUS FREQUENCIES – 1981

FIGURE 18.2.

SOURCE : URBAN PUBLIC TRANSPORT STUDIES
JAMIESON, MACKAY & PTNS, 1977

Until the early 1980s, when the system adopted for naming and numbering streets and areas started to be implemented, there was no overall or consistent identification system which permitted streets or areas of the city to be enumerated. This was both confusing and inefficient. The postal service depended upon incoming mail being held at a central depot under a post office box number until collected. Telephone, electricity and water bills were distributed by hand by each authority (and often lost or misplaced in the process). Residents learned how to draw guidemaps (or give verbal instructions which were more often than not the cause of endless search) to direct visitors to their home. No common base existed for statistical or reference purposes. With a large and rapidly growing city this was an unsatisfactory situation.

Consequently, following the approval of the Master Plan, the Ministry of Municipal and Rural Affairs decided that the Kingdom should have a common system of street and area identification. The various consultants who had, or were in the course of preparing city Master Plans were appointed to carry out a three part study:

1 to evaluate systems in use in other countries and recommend the most appropriate system which should be adopted for the Kingdom

After evaluation, consultation and decision on the system to be adopted for the Kingdom, the consultants were then to:

2 Apply the selected system to the city (or cities) for which they had prepared a Master Plan.

3 Prepare contract documents for implementation.

The stated objectives which the system had to satisfy were as follows:

1 The system should relate to the approved Master Plan.

2 It should be easily applicable to any area of the city, old or new.

3 It should be easily comprehended by the public, both residents and visitors.

4 It should give positive location, without ambiguity, quickly and easily for emergency use, to the Post Office and all other Government Departments.

5 It should be expandable and also meet changes within the already developed urban areas.

6 The updating procedure should be a simple task.

7 It should enable a computer programme to control the system for rapid retrieval of information.

8 It should be able to provide positive designation to an isolated development.

9 The areas between existing city development and isolated development should be capable of being filled in using the same system, without distortion.

10 The system should indicate the direction and orientation of streets and communities and their relative distance from the central area of the city.

11 The system should be equally appropriate for cities which form a grid pattern and those with a random street pattern.

12 It should allow for the identification of the following types of street:

a) Major arteries of long continuity

b) Intermediate shorter streets

c) Small places and courts

d) Built-up masses with disconnected circulation.

13 The system should be capable of immediate application.

By mid 1976 each consultant had submitted his first report recommending a system to be followed. A series of meetings and reviews were then held in the Ministry's offices. After a two month evaluation period, a system was selected for implementation. In fact, due to the comprehensive nature of the remit and the need to have a dual numbering and naming system, a great deal of com-

monality was found in the consultants recommendations (preliminary discussions with Ministry officials had determined that a dual system was essential - a numerical system to form the basis of all future data referencing and a naming system for everyday identifiable and understandable usage).

The traditional system of haras, or districts had been found to be unworkable as a basis on which the system could be developed. They had been outstripped by city growth and the hara, related to a small, pedestrian based grouping of buildings, was inconsistent with, for example, the new urban transportation networks, the new residential areas in course of development and, in general, the new scale of growth and mobility allowed by vehicular transportation.

The selected system was based on two levels of reference, a city level and a local level; the combination providing a unique reference number for each street or plot of land.

At the city level, each city was divided into four quadrants formed by two roads forming axes crossing at a central point in each city and running in a north-south and east-west direction. In all cases, the axes to be adopted would be well known existing streets.

Each major road parallel to the two main axes was then numbered in sequence in a north, south, east and westerly direction, with, for example, the northern roads numbered

N1, N2, N3, etc. until the extreme major road of the approved Master Plan area was reached. In order to give orientation to the system each major road was given a direction letter depending on which side of the axis it lay. This system is shown diagrammatically in Figure 19.1.

Major roads formed community sectors which were given a reference number by taking the furthest intersection of the two major roads from the city centre (see Figure 19.1).

Where, at the perimeter of the Master Plan area, no roads existed or were proposed in the Master Plan, the system adopted was to assume the existence of a hypothetical road as a boundary. This hypothetical road was given the number of next road in sequence as the roads progressed from the centre (see Figure 19.2).

Within each defined community sector, the local roads were numbered progressively from the direction of the two central axes (see Figure 19.3). Odd numbers were allocated to roads parallel to the N-S axis and even numbers to roads parallel to the E-W axis. When a street had a short break or gap in it but was on the same parallel and thus allocated the same number, a suffix was added to that number to distinguish each fragmented length of street, eg. 25, 25a.

Plots were numbered with odd numbers on the right and even

numbers on the left of the street, increasing numerically away from the city centre.

The names for streets and sectors were chosen by a special committee set up by the Municipality. In the first instance, names were confined to community sectors andtheir encompassing major roads. Where names were not provided for local streets, the number provided the address and street location.

Having thus allocated each plot an odd or even number along a numbered street, the address within the city could be determined.

A typical address is illustrated numerically in Figure 19.4 ie. plot 18 is situated in community sector N2/W2 on street number 19.

When the name was allocated to a local street the system would be duplicated as follows:

No. 18, Street 19 (Street Name)
N2/W2 (Sector Name)

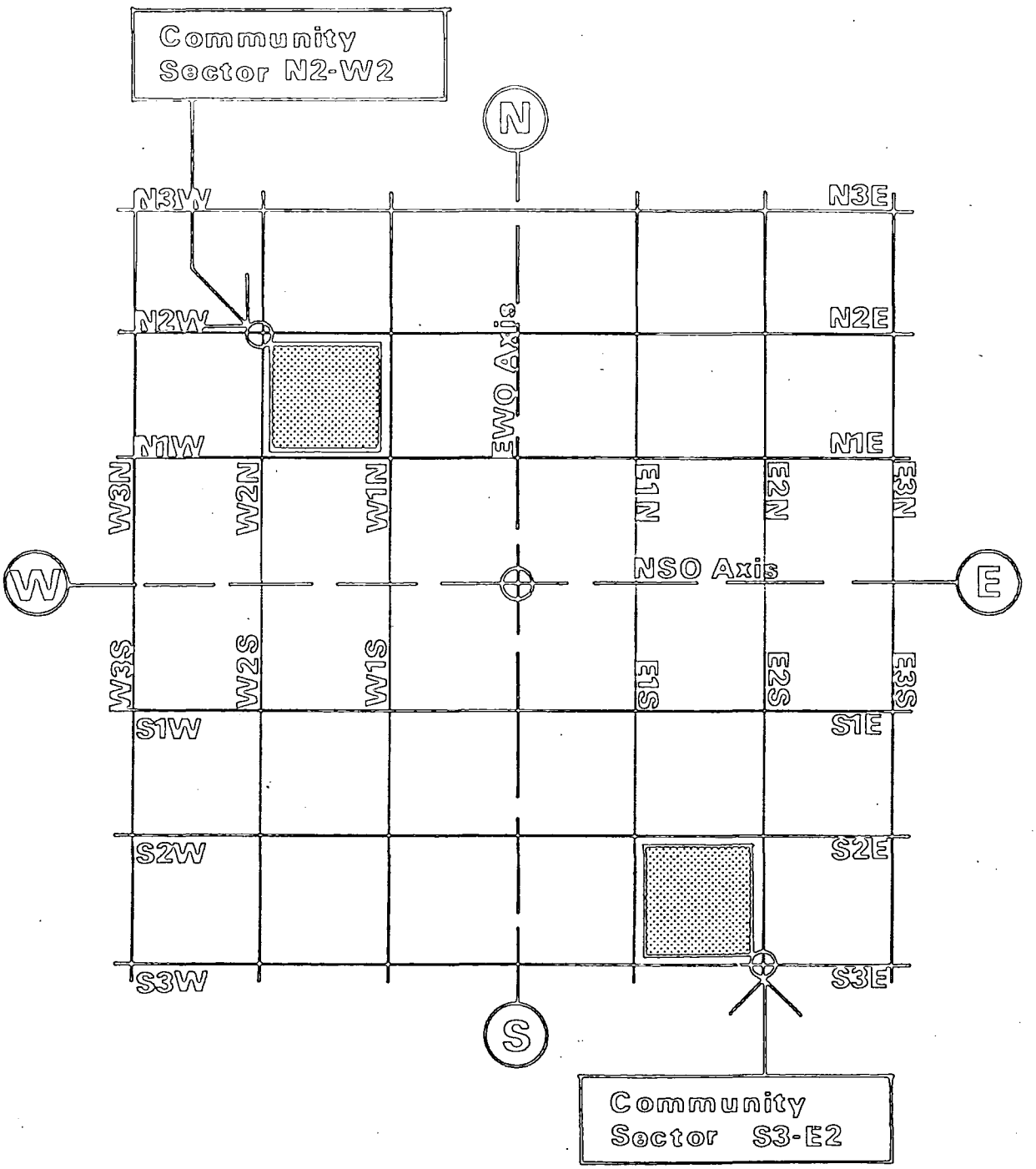
Members of the public can choose whether to use the named or numerical system as their address (or both).

During the second stage of their studies, the Consultants applied this system to the city or cities for which Master Plans had been prepared. This stage also defined the standards to be adopted in implementing the system. For example, in April 1977 the Ministry issued an instruction

that the street names were to be written clearly using the Naskh Arabic style of calligraphy. The design, including use of colour identification, size and layout of all signs - from motorway gantry type to the plot/house number plate - and locational principles were evolved, jointly by all consultants, during this second stage of the project.

The final stage of the project, which was completed in 1978, was the preparation of contract documents, including city street and area identification plans, working drawings, specifications and bills of quantities. These documents formed the basis on which competitive tenders were received to implement the system.

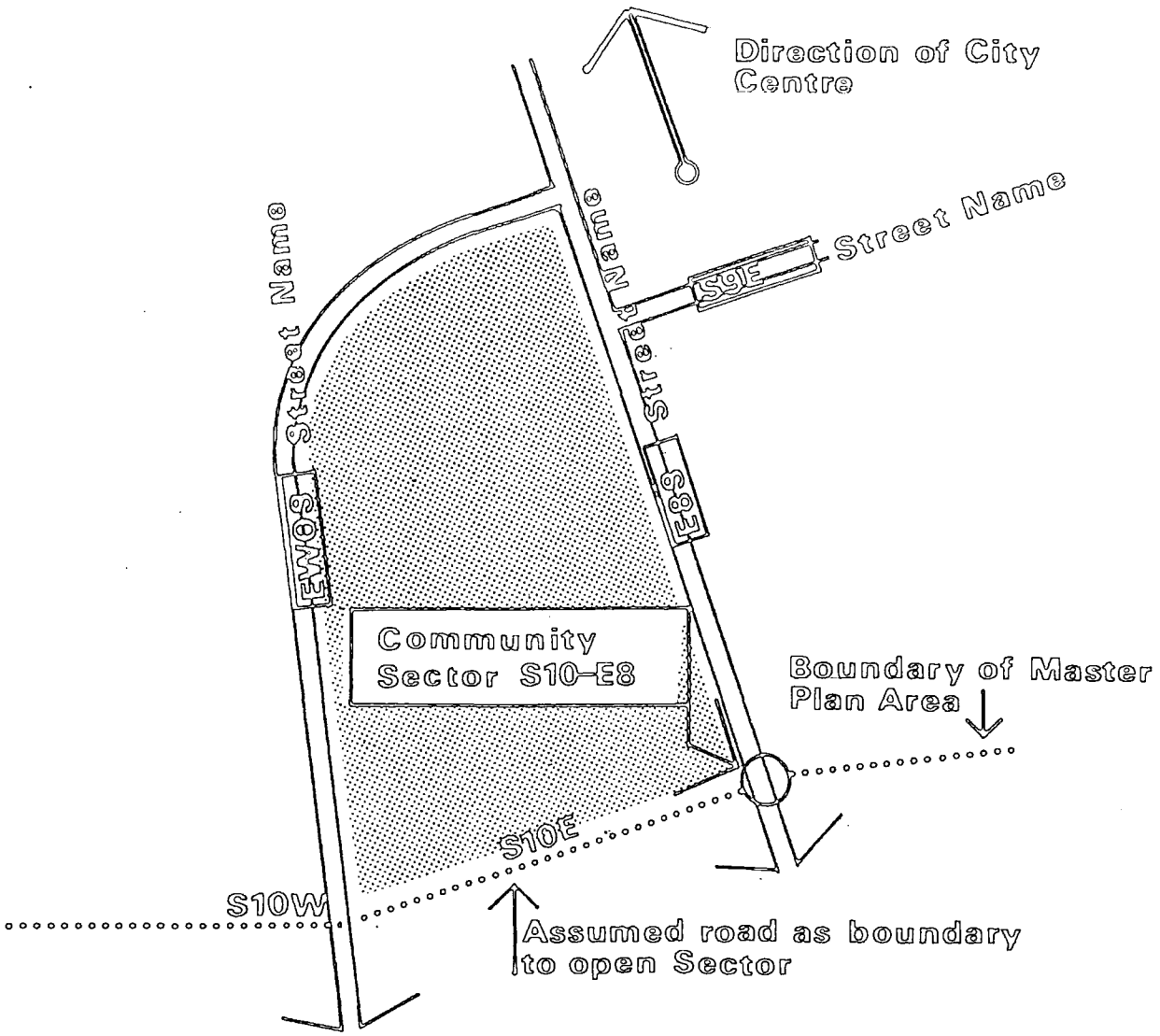
By 1985 this system had been implemented for most of the developed area of the city of Jeddah. The contractor responsible for the implementation also produced guidemaps for sale to the public. A key plan showing the sector names is indicated on Figure 19.5 and a typical map showing part of the city is illustrated in Figure 19.6



The Selected System
at the Master Plan Scale

FIGURE 19.1.

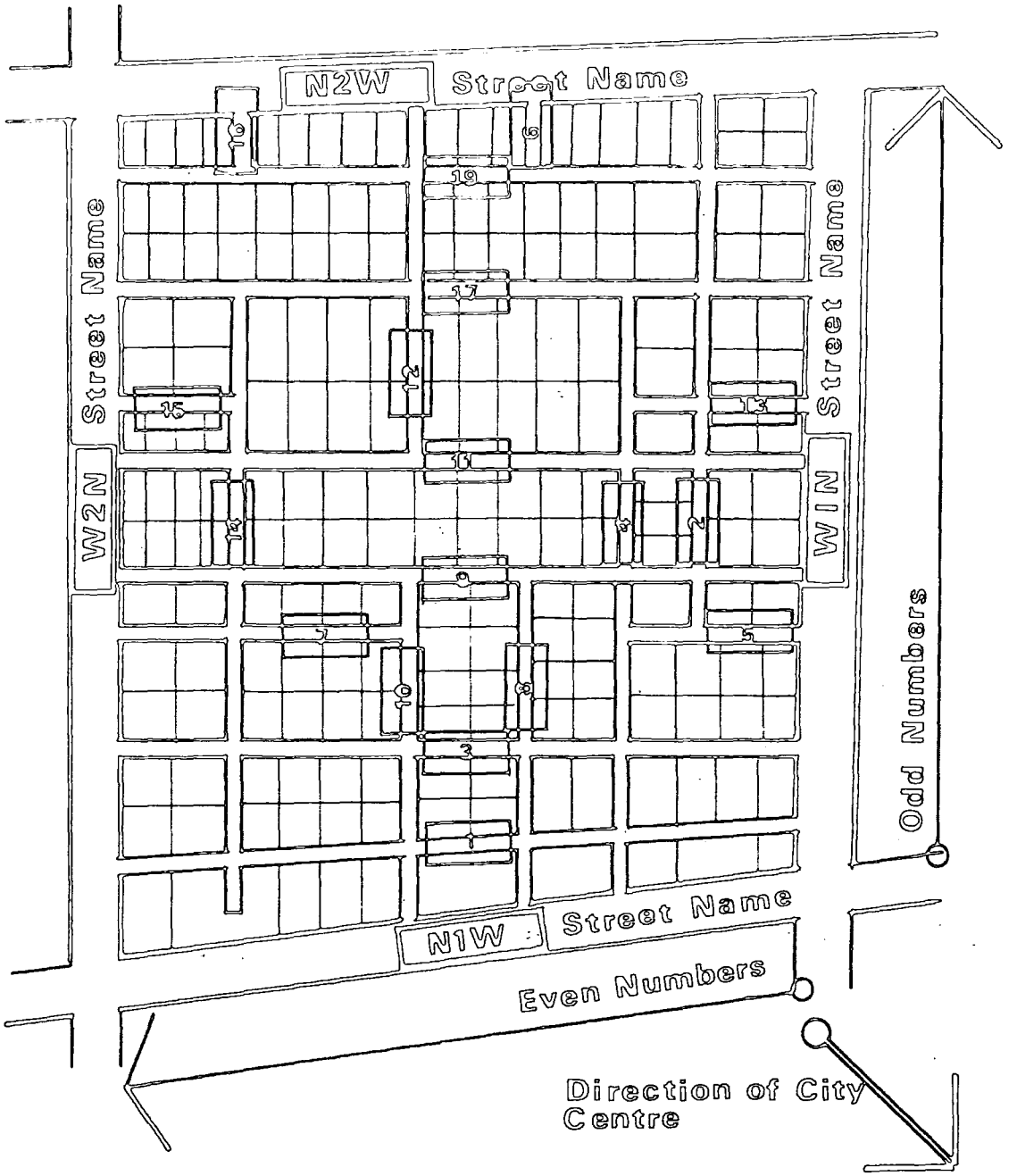
SOURCE : STREET NUMBERING STUDY - DMMAP, 1977



The Selected System
Open Sector Definition

FIGURE 19.2.

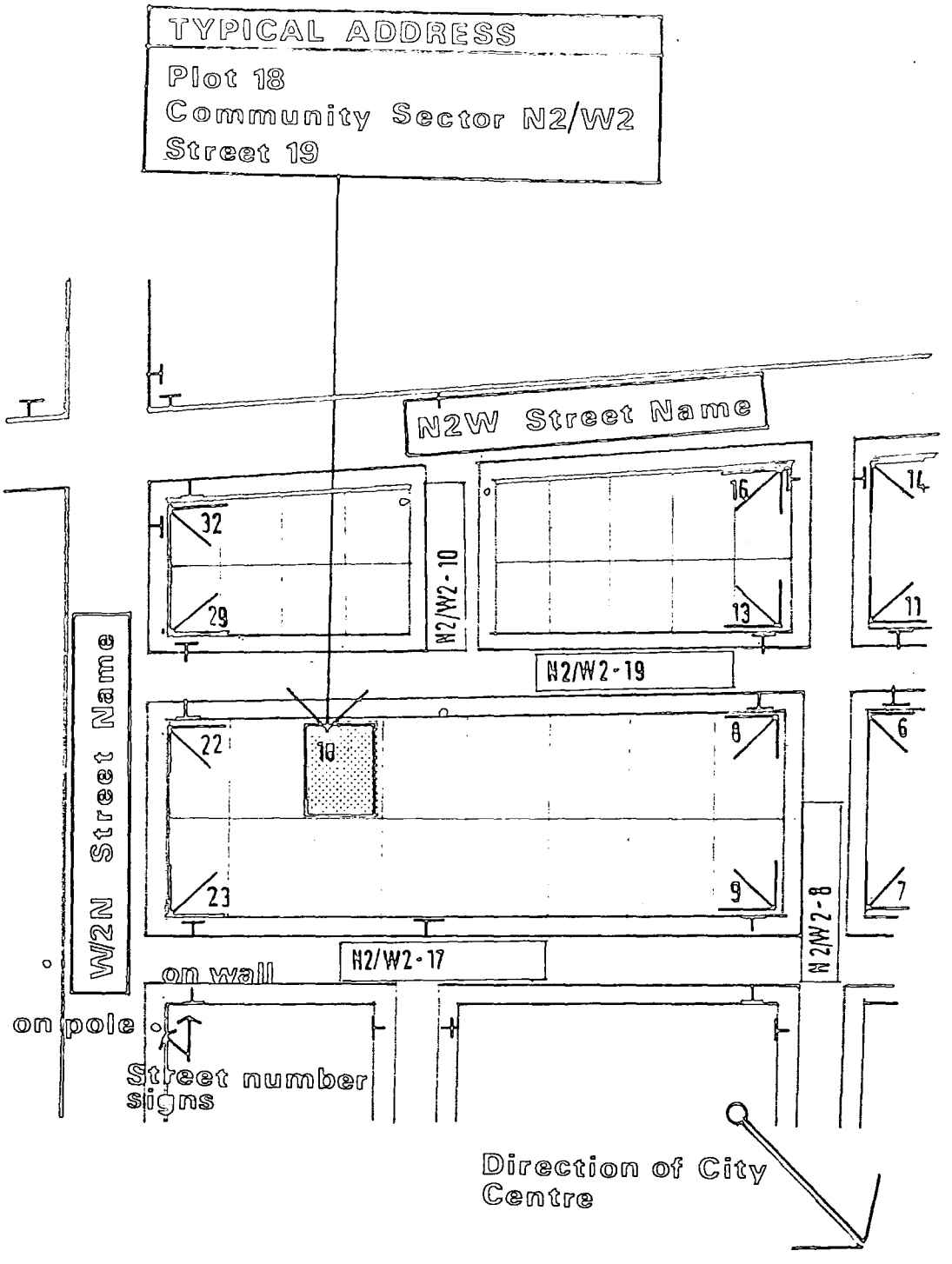
SOURCE : STREET NUMBERING STUDY - RMJMP, 1977



The Selected System
at the Local Scale

FIGURE 19.3.

SOURCE : STREET NUMBERING STUDY - DMUMP, 1977



Plot Numbering
Typical Address

FIGURE 19.4.

Source : Street Numbering Study - DMMAP, 1977

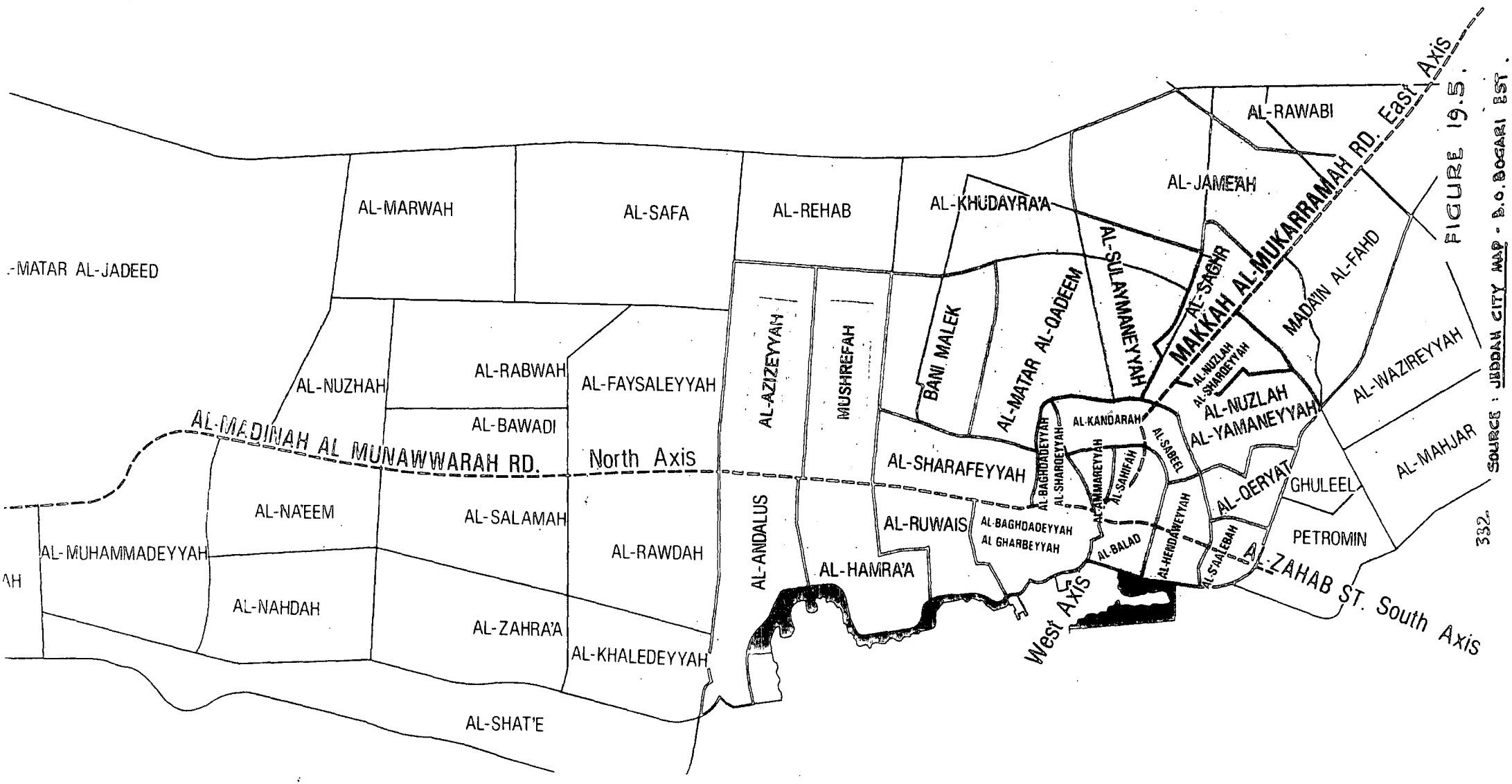
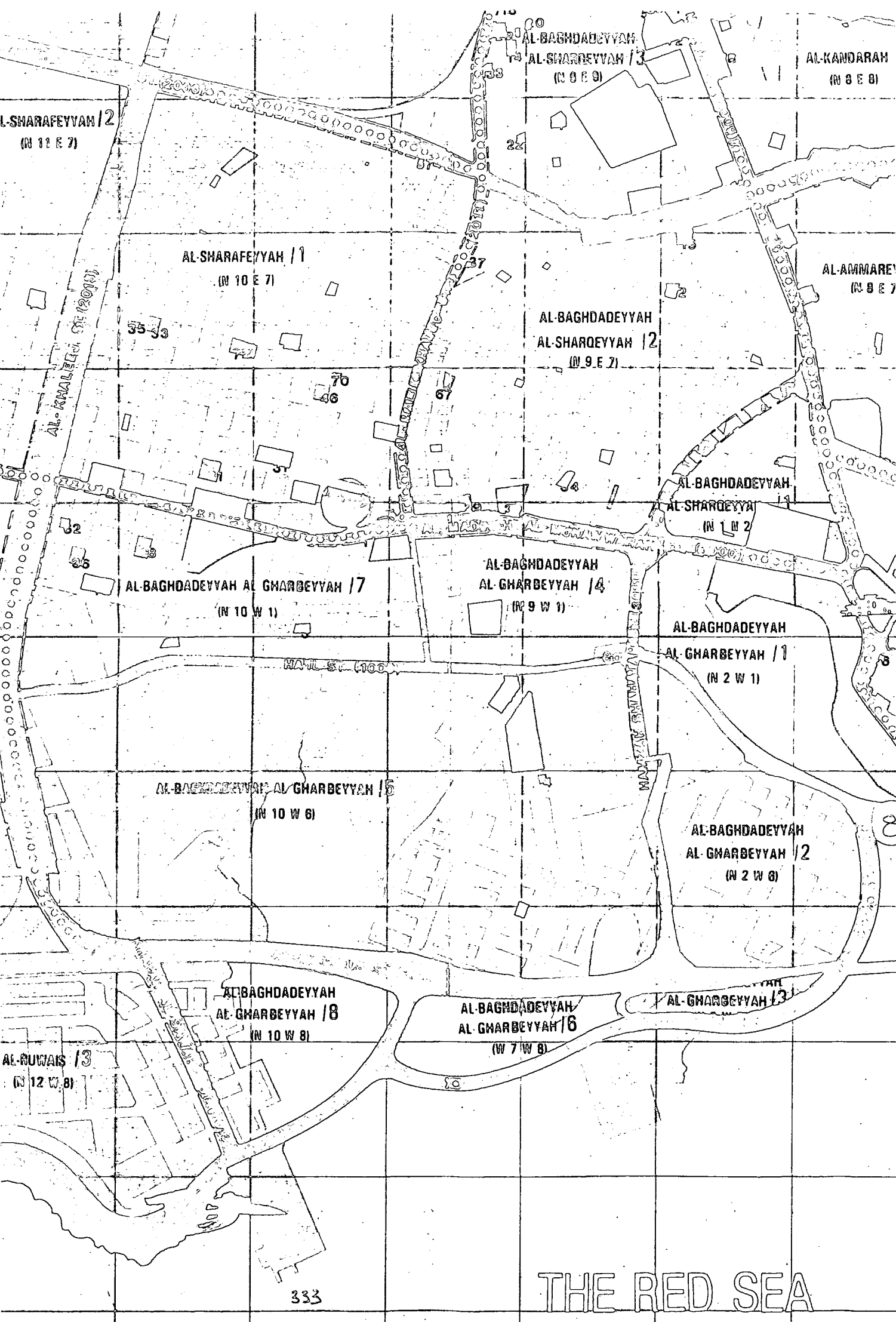


FIGURE 19.5.

SOURCE : JEDDAH CITY MAP - B.O. BOGARI EST.


AL-BAGHDADEYYAH
AL-SHARQEYYAH /3
(N 8 E 9)
AL-KANDARAH
(N 8 E 8)
L-SHARAFEYYAH /2
(N 11 E 7)
AL-SHARAFEYYAH /1
(N 10 E 7)
AL-BAGHDADEYYAH
AL-SHARQEYYAH /2
(N 9 E 7)
AL-AMMAREY
(N 8 E 7
AL-KHALEEJ ST (100)
AL-BAGHDADEYYAH
AL-SHARQEYYA
(N 1 W 2
AL-BAGHDADEYYAH AL GHARBEYYAH /7
(N 10 W 1)
AL-BAGHDADEYYAH
AL-GHARBEYYAH /4
(N 9 W 1)
AL-BAGHDADEYYAH
AL-GHARBEYYAH /1
(N 2 W 1)
HAIL ST. (100)
AL-BAGHDADEYYAH AL-GHARBEYYAH /5
(N 10 W 6)
AL-BAGHDADEYYAH
AL-GHARBEYYAH /2
(N 2 W 8)
AL-BAGHDADEYYAH
AL-GHARBEYYAH /8
(N 10 W 8)
AL-BAGHDADEYYAH
AL-GHARBEYYAH /6
(W 7 W 8)
AL-GHARBEYYAH /3
AL-RUWAIS /3
(N 12 W 8)
THE RED SEA
333

SCOPE OF WORK

In 1977, following a limited competitive tender, the Consultants Sert Jackson International/Saudconsult were appointed to carry out the first review of the Master Plan. The consultants, RMJMP, who had prepared this plan, were not invited by MMRA to compete.

This review was to be carried out in four principal stages:

1 Main Guide Plan or Master Directive Plan (1:10,000 scale) plus technical reports.

2 Implementation Plan (1:2500 scale) plus technical reports.

3 Selected Action Area Plans (1:1000 scale) plus technical reports.

4 Approval for Implementation.

The required stages of work may be summarised thus:

ONE : Main Guide Plan

1.1 Collection and Information

Starting from national level, through regional to city and district levels. This stage required positive and accurate knowledge of all items and

influences, direct or indirect. This phase, as well as the survey of existing physical matters, such as buildings, roads, topography, population, etc., also covered all other items such as Five-Year Plans, studies of tradition, religious and secular customs and other areas. This was to be applied to district levels as well as city level.

1.2 Analytical Studies

Following the collection and organisation of information, the analytical stage required the work of a specialised, integrated and harmonious team on all scientific, technical and philosophical activities to achieve a profound and cohesive study.

1.3 Extraction of results and preparation of Main Guide Plan

The results of the analytical and predictive studies identify the main outlines of the Guide Plan. These can then be extracted and featured in a 1:10,000 scale city plan, supported by a relevant technical report to explain the Plan. The Plan's purpose was to give guidance and direction, i.e. provide directives to general policies either in land use or distribution of residential densities, as well as in transportation movement (roads and all types of public

transportation), development boundaries and organisational regulations.

TWO : Implementation Plan

This was to consist of 1:2,500 scale plans, supported by a report clarifying the land use ratios, areas of various uses, land acquisition, etc.

The Implementation Plan was to cover the same area as the Guide Plan. Its purpose, as indicated by its title, was to deal with all aspects of implementation, physical situation, precise knowledge of time phases, boundary of residential building areas and identification of locations and timing of various services and utilities.

In this way development was to be related to the timing of utilities and services. The Implementation Plan was also to indicate the residential and non-residential areas and any areas of historical significance which should be preserved.

THREE : Selected Action Area Plans

These plans at 1:1,000 scale together with an attached report were considered the most appropriate plans for implementation. Areas were to be chosen according to priorities and needs,

particularly areas and districts which needed prompt organisation, so as to avoid their negative influence either socially or physically on other parts of the city.

FOUR : Approval for Implementation

Following the final submission of each of these three stages of work (final reports were to be preceded by drafts), approval for implementation would be given to the consultants by MMRA.

In effect, this approach was not structurally different from that followed by RMJMP in preparing the first Master Plan. The significant change of emphasis was that the 'Master Plan' was to be known as a 'Guide Plan' and that, in place of four five year phases of implementation, a more specific and detailed examination was to be made of plan implementation. In this it is the writer's opinion that the scale of 1:2,500 required was too detailed and could thus confuse strategy with local problems or issues. 1:5,000 scale - which is sufficiently clear to appreciate major problems, but not as detailed as to lose sight of the overall need - would have been a more appropriate scale for this task. Nonetheless, if this approach were to achieve firmer control and organisation of phased development, it was a step forward to fill the 'gap' between 1:10,000 and 1:1,000 scales of planning.

THE SURVEYS

The three major primary surveys carried out by Sert Jackson during 1977-78 dealt with physical planning, transportation and socio-economic data. These surveys paralleled the work done in 1971 by RMJMP, but, and most unfortunately, while the 1971 survey information was made available to Sert Jackson, they were discouraged from setting up a dialogue with RMJMP. No serious attempt could therefore be made to achieve, for predictive and other purposes, a continuity of analysis. Thus, the essential fourth dimension of planning - time - was not give sufficient weight or importance. In this, as is so often the case in planning, 'political' rather than 'technical' wisdom had prevailed because of the Ministry's view that a fresh appraisal, 'unbiased' by the views of the previous consultants, was the correct way to proceed.

A brief review of the findings of the surveys, which collectively describe the existing situation in Jeddah during 1977-78 is as follows:

ONE : Physical Planning

This survey dealt with land use, the physical characteristics of the city, such as building age, condition and density, and land values and ownership.

The land use survey showed that the metropolitan area of Jeddah extended to 1,215 square kilometres, of which 97 square kilometres had been developed (exclusive of major

air and sea-port uses which accounted for a further 100 square kilometres). The major developed land uses were housing 29%, roads and parking 22%, and undeveloped land within the urban area 32%. No other urban land use exceeded 25%.

New growth had been located generally in accordance with the existing (i.e. RMJMP) Master Plan. A major exception was the new major centre shown to the west of the new airport, which had not started. Residential development had been predominantly high-rental apartment blocks, which, by 1978, were in over-supply. Housing for low-income residents had not been so vigorously provided, so the city had a shortage of such housing.

New shopping had tended to follow the road construction programme, new shops being located on service roads. There was little evidence of the RMJMP Master Plan concept of secondary centres.

Although there had been growth in this sector, manufacturing industry was still low for a city of Jeddah's size. Major new projects included the expansion of the refinery and the Mercedes truck assembly plant.

Community facilities were being continuously expanded but had still some way to go. This was particularly true of the provision of local playgrounds and recreation areas.

Transport facilities were a major land use sector, especially at a time of transition between the old and new

airports. A problem which had yet to be resolved was the future land use and redevelopment of the existing airport.

Overall, the nature of growth in Jeddah, i.e. very low growth for many centuries, rapidly, accelerating growth for the last quarter century, had resulted in buildings of low average age. However, the standard of building had been such that the construction and/or facilities of many buildings was poor, especially in low-income areas.

Building densities followed a similar pattern to building quality, being most dense in the poorer area of south Jeddah, and the traditional housing areas around Ruwais and Bani Malek and least dense in the higher quality housing areas. Residential vacancy rates were high, especially in the areas of new high-rental houses.

Land ownership was complex, but was predominantly privately owned, with large tracts of government land for public facilities, and government owned lands beyond the urban areas. Land values were high, especially in the central area. Land which fronted to major roads attracted a large premium over adjacent lands, due to the attractiveness of such lands for commercial development.

TWO : Transportation

The traffic and highway related surveys were carried out during June and July 1978. The purpose of these surveys was twofold, first, to use the information gained in updating the Master Plan. Secondly, to allow this infor-

mation to be used by the highway design consultants engaged on the detailed design of the urban road network.

The data collected on transportation characteristics was divided into two broad groups. First, there was a need to monitor the changing patterns of car ownership and use in order to be able to respond to, and accommodate, such changes within the planning framework. Secondly, it was necessary to determine solutions to immediate problems and to ensure their continuing effectiveness in the future. The first category was determined by carrying out a home interview survey. In order to be able to assess any changes, it was necessary to cover the same range of data collected in the 1971 Transportation Surveys.

As a household survey only produces trip information for those trips having one end at home within Jeddah, it was necessary to supplement this data with those of trips having a home base outside Jeddah and yet entering and leaving the Metropolitan Area i.e. the number of through trips had also to be determined. A roadside interview survey was therefore conducted, collecting from a sample similar information to that collected from the households within Jeddah. These two surveys combined to produce the information on trip characteristics and vehicle ownership.

An analysis of Central Area traffic problems was made by a combination of complementary survey techniques, involving 14-hour classified traffic counts, junction counts, and a parking survey of the Central Business District. The

classified traffic counts formed a cordon ring around the Central Area recording the types of traffic as it entered and left the Central Area. The parking survey noted where vehicles parked whilst within the cordon. A junction count at the entrance provided information for the seaport area.

Studies were undertaken at selected junctions to ascertain the capacities of the different layouts and operations. The information gathered was intended to enable certain junction design characteristics (including the appropriate phasing of traffic signals) to be improved.

So as to produce a bench mark for the highway network development against which future extensions and improvements could be measured, a complete road inventory and condition survey was undertaken. The physical characteristics of every road in Jeddah were assessed and recorded.

In this survey, comparisons were made to record and evaluate the changing circumstances since 1971. This information, with notes, is set out in the following five tables.

Table 20.1 Household and personal trip records: A comparison 1971-1978

	Date	No of valid Interviews	No of valid Trips Recorded
Jeddah:	Transportation Survey 1978	7542	28900
Jeddah:	Western Region Plan Study 1971	973	6361

Source: Sert Jackson Transportation Survey, 1978

Thus the 1978 household survey was based on approximately eight times as many interviews as that carried out in 1971, and the total number of trip records obtained was nearly five times greater.

A further comparison was made between the differing household size distribution:

Table 20.2 Household size characteristics

DATE	Households Sampled	Persons in Sample	Persons per Household	Household Size Distribution(%) 1-3 pers.	4-8 pers.	9 or more
Jeddah: Transportation Survey 1978	7542	37484	4.97	34%	54%	12%
Jeddah: Western Region Plan Survey 1971	973	4914	5.05	30%	65%	5%

Source: Sert Jackson Transportation Survey, 1978

The average household size had decreased slightly (i.e. by

0.08 persons per household) between 1971 and 1978, but of most significance was the increase in the percentage of households containing 9 or more persons (i.e. from 5% to 12%).

Table 20.3 Jeddah: Transportation Survey, 1978 Household Income and Vehicle Ownership Characteristics

Family Income	Households in Income Groups		No Vehicles Owned		One Vehicle Owned		Two or more Vehicles Owned		Total percentage
	Nos	%	Nos	%	Nos	%	Nos	%	
Under 1000 SR/month	8326	5	7360	88	897	11	69	1	100
1000-1999 SR/month	33235	19	21735	65	10833	33	667	2	100
2000-4999 SR/month	78154	46	25829	33	47472	61	4853	6	100
Over 5000 SR/month	50623	30	10442	21	30797	61	9384	18	100
		100%							

Table 20.4 Jeddah: Western Region Plan Study,
1971 Household Income and Vehicle Onwership Characteristics

Family Income	Households in Income Groups		No Vehicles Owned		One Vehicle Owned		Two or more Vehicles Owned		Total percentage
	Nos	%	Nos	%	Nos	%	Nos	%	
Under 1000 SR/month	61202	82	50753	83	9966	16	483	1	100
1000-1999 SR/month	9421	13	4217	45	4679	50	525	5	100
2000-4999 SR/month	3021	4	776	26	1846	61	399	13	100
Over 5000 SR/month	819	1	210	26	399	49	210	25	100
		100%							

Source: Sert Jackson Transportation Survey, 1978

Table 20.5 Vehicle Type Ownership Distribution: A comparison 1971 and 1978

Survey	Non-Vehicle Owning Households		Motorcycle-Owning Households		Households owning private vehicles											
					Cars		Taxis		Light goods/ Pick-ups		Jeeps		Others		Total Owning One or more Vehicles	
	Nos	% of total	Nos	% of total	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%	Nos	%
Jeddah: Transport-ation Survey 1978	64469	38	5911	3	90114	53	3726	2	9131	5	1104	1	1380	1	105455	62
Jeddah W Region Plan Study 1971	67775	80	4805	6	13638	17	860	1	839	1	315	-	545	1	16197	20

Notes:
1 1971 sample size was 3,764 households, expansion factor = 20.981; therefore the estimated total number of vehicle-owning households = 78,972.
2 It is assumed that in 1971 no household owned more than one vehicle.
3 Motorcycles are not included as vehicles.
4 'Others' include trucks and buses.
5 Percentages are given to the nearest whole number.

Source: Sert Jackson Transportation Survey, 1978

These tables show the significant increase in household income over this period and, associated with this increase in affluence, the even more dramatic increase in car ownership. From 80% of households not owning cars in 1971, this figure had decreased to 38% in 1978 and the total households owning one or more vehicles had increased from 20% to 62%.

The 1971 transportation surveys had identified the average car ownership level as 48 vehicles per 1000 persons. Consequently, based on a resident population of 381,000 people, the number of cars within the City was estimated to be some 18,000. The predictions made in the 1973 Master Plan based on experience in other countries and the forecasting techniques developed by the Transport and Road Research Laboratory, estimated that car ownership would increase to 230 vehicles per 1000 persons by 1991 and to reach a "saturation" level of 300 vehicles per 1000 persons by 2010.

The Sert Jackson transportation surveys indicated that car ownership had increased, in 1978, to 120 vehicles per 1000 persons. The revised Master Plan was based on car ownership increasing to 250 vehicles per 1000 persons by 1990; 330 vehicles per 1000 persons by 2000; and reaching a "saturation" level of 350 vehicles per 1000 persons by 2010.

Taking account of the growth in both car ownership and population, the number of cars within the City in 1978 was

estimated to be 110,000. This represented a sixfold increase during the seven-year period 1971 to 1978.

The population and car ownership forecasts made in the revised Master Plan indicated that the number of cars within the city could increase to 400,000 by 1990 and could reach 750,000 by 2000. These forecasts represented a twentyfold increase during the period 1971 to 1990 and over a fortyfold increase during the period 1971 to 2000.

THREE : Socio-Economic

The population of Jeddah in 1978 was approx 915,800. Of this total, 862,362 was derived from the 5% random sample interviewing of householders and the remainder were counted but could not be interviewed for various reasons. Adjusting the 1971 figure of 381,000 to include the floating population gave an equivalent total of approximately 404,600. This represented an increase of over 511,000 people in 7 years - an average annual increase of 73,000 approx or over 6,000 increase monthly between 1971 and 1978. If this growth was projected on a linear basis, it would give a population of approximately one million by 1979 and by the end of 1985 it would be 1,459,000.

Of the 1978 population 47.2% (432,250) were of Saudi nationality and 52.8% (483,550) were non-Saudis. In 1971 Saudis made up 57.9% (234,500) and non-Saudis 42.1% (170,175) of the total population, so that the greater increase was in foreign immigrants into Jeddah. In spite of the increase in immigrants, the majority of whom were

of working age, the overall population of Jeddah continued to remain young, with 41% of the total belonging to the under 15 years age group. Males (55%) outnumbered females (45%) in each of the age/sex groups defined, though the basic structure of the population remained similar to that in 1971.

For the Metropolitan Area of Jeddah, population densities per hectare had increased by 12% per annum since 1971 ie. from 8.1 to 18.4 persons per hectare. For the built up area of Jeddah, population densities had increased from 41 to 91 persons per hectare, or a percentage increase of 122% since 1971. The boundaries of these areas are shown in Figure 20.1. There was a great variation however in the density of population according to locality. For example, population densities in northern areas were as low as 16 persons per hectare, whilst in areas immediately south of downtown Jeddah they were as high as 800 persons per hectare with increases in almost 600% registered between 1971 to 1978.

A great improvement had been achieved in the standard of living since 1971. This was reflected in better accommodation facilities and housing conditions in general. Although there had been a rapid increase in the population of Jeddah, 85% of households were, by 1978, living in dwellings of 4 rooms or more, as compared to 31% in 1971. In 70% of cases accommodation amounted to more than 1 person per room, as compared to 26% in 1971.

Shanty dwellings had decreased in number with only 3% of households living in shanty cottages, the large majority of whom were low income earners. However, a significant proportion of the dwelling stock, 20% (34,700 dwellings) of the total (173,500), was in bad condition, and accentuated the general problem of the housing needs of the city. Approximately 20% of Saudi households (13,900) lived in dwellings in poor condition, the majority (9000) of which were of older Arabic traditional dwelling type; also, in 1978, over 20% of families of non-Saudi nationality (103,600 people) lived in dwellings in poor condition.

There were almost 59,700 boys (57.5%) and over 44,000 girls (42.5%) studying at Government schools, giving a total of over 103,700 (100%). In addition there were 2260 boys and 3500 girls in private schools. Thus, by 1978, a total of 109,460 children were attending school in Jeddah.

Teacher/Student ratios for boys in Government schools varied between 1:17 in secondary schools and 1:26 in elementary schools. Student/teacher ratios for Government girls schools were parallel with those for Government boys elementary and intermediate schools. In girls secondary schools, however, the high teacher/student ratio of 1:40 reflected the lack of trained and qualified teachers in this sector of Jeddah's educational structure.

The secondary education attendance statistics also showed that schooling for girls was behind that for boys.

Government elementary and secondary girls schools were larger and more crowded than boys schools. Compared to males the educational level in the female portion of the population was consistently lower. Perhaps the most outstanding instance of this was the fact that, at almost 50%, the illiteracy rate for females was more than double that for males. Approximately one third of the adult population of Jeddah was illiterate. The education of girls was heavily supplemented by night literacy classes, with 60 schools attended by 8000 students, and a teacher/student ratio of approx 1 : 35.

Class/student ratios for Government boys schools had attained the standard of 1 : 30 as set by the Ministry of Education. This was a remarkable indication of the progress of education in Jeddah during the 1970s. However, girls schools generally had more crowded classrooms with an average of 1 : 35 ratio for students in each class. There were lower student/teacher ratios (1 : 16 for boys and 1 : 15 for girls) in private schools. School sizes averaged out at 282 for boys and 233 for girls.

There were approximately 330,000 people in Jeddah who were over 6 years old and who did not attend school or who had completed formal education. Of these almost 1 in 6 had attained or completed college/university training. One in every three of the 330,000 people had completed some level of schooling. While problems remained, there was no doubt

that educational facilities for children in Jeddah had been transformed during the period 1971 to 1978.

There were approx 300 doctors available to serve an estimated population of 915,000, i.e. a ratio of 1 doctor for 3000 patients. Comparison of 1971 and 1978 doctor/patient ratios showed a marginally improved situation, bearing in mind the problems presented to Government Health Authorities in Jeddah by a population which had more than doubled in the last seven years.

In 1978 there were seven hospitals and 36 clinics in Jeddah. These hospitals had 203 doctors, 431 male and female nurses, and 142 administrative staff; and were able to cope with all cases in gynaecology, paediatrics, maternity, opthamology and tuberculosis, as well as general cases. They were visited daily by an average 5703 patients.

Since 1972 the Ministry of Health had been active in extending its services. Construction was in final stages on a new General Hospital (460 beds) located on Medina Road. This hospital was scheduled to open in 1980. The number of hospital beds in Jeddah in 1978 was 1540 i.e. 1 public hospital bed for 600 people living in Jeddah.

The number of employed heads of household in Jeddah was approx 163,000. Of the eight categories of occupation, the 'services' component attracted to itself the bulk of employed population (approx 29% of heads of household).

At the other end of the scale 'agriculture' held only 1% of employed population.

'Commercial' occupations engaged 15%, while (manufacturing) 'industry' and 'construction' were on par with each other (approx 14% each of employed population). 'Government' and 'transportation' employment had each about 1 in 10 of the working population of Jeddah. Of the heads of household in Jeddah 94% were employed, with the remaining 5 categories - 'unemployed/never worked', 'student', 'housewife', 'retired' and 'content' - having an approximately equal share of the remaining 6% of householders. It was noted during the survey that those resident longer in Jeddah were less likely to be engaged in manufacturing industry or in the construction trades, but more likely to be employed in the commercial or service sectors, or holding a job in government. This reflected the higher concentration of Saudi nationals in the commercial and service sectors.

The examination of the nationality of heads of household indicated that:

i Immigrants from African Non-Arab countries, from India and from Europe had a strong preference for the construction trades and manufacturing industry;

ii North Americans and Europeans tended to involve themselves more in 'service' occupations;

iii The Saudi component of the working population showed a strong predilection for the commercial, service and transportation sectors of the urban economy;

iv Otherwise there was a fairly even spread of occupations through different nationalities.

The improvement in the general standard of living was reflected in the sharp increase in household incomes. The proportion of households who were earning more than 2000SR per month increased from 5% in 1971 to almost 80% in 1978. Even taking inflation into account, the growth in real incomes had been unprecedented. In practically every house there was a refrigerator, a TV set, a radio, a fan and a gas stove. The high incidence of basic consumer durables was considered a recent phenomenon and clearly demonstrated the significant progress made in this direction. Luxury consumer durables had started to penetrate households; having acquired the basic domestic equipment, households were moving towards the purchase of other durables. Thus, ownership of washing machines and air-conditioners had already reached a level of 70%.

By 1978, the sewage system had extended to cover 67% of the population of Jeddah; and a public refuse collection system, which had not previously existed, covered approx 50% of dwellings. However, according to opinions recorded in the socio-economic survey, major problems remained concerning sewage disposal capacities, the need to introduce

a comprehensive garbage disposal system, and, in general, the cleanliness of the urban environment.

Practically every house was connected with electricity and running water. The improvement in this respect had also been unprecedented: seven years previously only 68% of houses had electricity and only 46% had running water.

A significant proportion of houses had a telephone but the majority were still without. By 1978, slightly more than 30% of dwellings in Jeddah had a telephone connection. Although the majority of dwellings did not have this service, the progress made in this direction over the previous decade was impressive.

THE REVISION AND UPDATING OF THE 1971 MASTER PLAN

Sert Jackson International/Saudconsult produced the final version of the revised Master Plan in January 1980. Entitled 'The Jeddah Master Directive Plan', it concentrated on the ten year period 1980-1990 and was the summation of the survey and analysis carried out over the three year plan preparation period.

In preparing this Plan, longer term strategies were examined to the year 2000 and a preferred strategy adopted. This then formed the framework within which the 1990 situation was postulated. This work consisted of a Master Directive Plan at a scale of 1:10,000 supported by reports and schedules. The Plan aimed to achieve two primary functions.

1 guide market pressures to the extent that they may be acceptably accommodated

2 provide for public facilities to the extent that they may be reasonably anticipated.

The Plan was based on estimates of growth in population and employment which forecast that by 2000 Jeddah's population would be 2,250,000 (from 1,000,000 in 1980) and employment would increase from 282,000 in 1980 to 900,000. The Master Directive Plan 1990 estimates were that the population would increase to 1,600,000 and employment to 640,000.

If the RMJMP 1971 plan estimates are compared to the 1980 estimates, at the high 1971-1991 predicted rate of growth, the figures show the following:

Table 20.6

POPULATION	1990	1991
RMJMP estimate		1,650,000
Sert Jackson/Saudconsult estimate	1,600,000	
EMPLOYMENT		
RMJMP estimate		495,000
Sert Jackson/Saudconsult estimate	640,000	

The main elements of the Sert Jackson plan comprised:

1 Residential: It was proposed to reduce housing den-

sities both in traditional areas (partly by rehabilitation and partly by the introduction of much needed public facilities), and in the undeveloped newer areas. Specific new residential developments in the Plan period included South Corniche City, the existing airport (after 1984) and the North Corniche up to Sharm Obhur.

2 Employment: It was proposed to strengthen Jeddah's role as a commercial centre by:

a) Extending the industrial areas to the south of the existing industrial estate, and, to a lesser extent, to the east of the bypass. This would thus provide adequate well-serviced land for warehousing, for processing and redistributing goods and for manufacturing of construction and consumer oriented products.

b) providing adequate major highways and supporting infrastructure to serve the new airport and the seaport.

3 Transportation: it was proposed to cater for all travel demand, given the following constraints:

a) restricted growth in central area employment

b) controlled development of commercial 'spine' roads

c) reduced densities in existing and proposed residential areas,

d) limitation on car accessibility and usage for work trips.

In order to meet the demand for travel movement, it was considered that a public mass transit system would be needed to be introduced by 1985.

4 Hierarchy of facilities and centres: A hierarchy of centres was proposed so as to better provide for the various service requirements of the community. These would provide for social needs such as mosques, shops, open space, schools in such a way as to minimise travel, increase amenity and give a focus to the local community.

5 Form of the city: It was proposed to emphasize the natural features of the city region, namely the coast and the hills, and to conserve these as much as possible for future public enjoyment and leisure. These features both contained and gave rise to the resulting linear shape of the city. Linear growth would generally be low rise in form with the exception of the spinal corridors radiating from the existing city centre and the corniche frontages. In these latter areas a higher density of development would be accepted.

As a reflection of the dynamic growth of the city, the

study area for the Master Directive Plan encompassed an area of 1215 sq km. This is shown compared to the RMJMP Plan area in in Figure 20.1.

In their review of the RMJMP Master Plan, Sert Jackson first examined the validity of the thirteen key objectives the earlier plan sought to achieve and which are set out in Chapter 9 of this work.

In summary, these objectives aimed at achieving ordered and balanced growth by means of:

1 balancing residential areas to workplaces and shopping to minimise congestion and maximise transport facilities,

2 segregation of 'bad neighbour' uses to promote a clean, safe environment,

3 provision of community facilities, e.g. schools, open space, mosques, clinics, hospitals, to promote social welfare and community cohesion

4 provision of a high standard of transportation and public services.

Sert Jackson concluded that the planning objectives for their study should accept these same objectives. The revised Plan also shared with the 1973 Master Plan the general preference for structuring uncommitted development along the coastal plain north to the southern edge of the new airport, and, as far as possible, keeping development

away from the foothills. In these general terms, the Master Directive Plan basically attempted to adjust population growth and development to the concepts established in the original plan. In view of the extent of existing or committed development that had been achieved by 1980, and which had followed the 1973 Plan, this was the most sensible approach.

Certain specific matters contained in the 1973 Plan were found not to have been realised and were amended in the 1980 Plan. In summary, these were:

1 The proposed satellite development to the south west of the new airport had not occurred. Areas between this satellite development and the stormwater ditch, not scheduled for development, had in fact been developed, with mostly speculative accommodation designed for upper income groups.

2 Much of the population increase which had taken place since 1971 had resulted in an increase in density of the older traditional areas of the city. This had led to overcrowding and lack of facilities for those lower income groups living in such areas.

3 Proposals for a hierarchical centres policy, comprising a predominant city centre, two major secondary centres and a series of district centres had not been realised. New retail growth, which should have taken place in the two major secondary centres, had

taken the form of linear extension to the central area along the Medina Road and, to a lesser extent, along the Mecca Road. The office component of these centres tended to be spread in relatively cheap residential accommodation speculatively developed (with help of government loans) during the construction boom.

4 Although it would appear that there was a demand for supermarket type shopping facilities to be made available at a district level, such facilities as had developed since the approval of the 1973 Plan had neither taken root in the locations proposed, nor been supported with any balance of community facilities. Generally, provision of public facilities for open space, education and health was well below that required for the population.

5 Total car ownership in the city increased by more than 500% between 1971 and 1978, exceeding the 1973 plan projections by 50%.

The revised Plan was thus more of a 'tuning-up' exercise, noting and correcting such deficiencies as were found in the earlier Plan, rather than a root and branch re-planning of the city. The review also accepted that, essentially, the 1973 Plan could not have foreseen the economic boom that resulted from the 1973-1974 oil price increases. This boom fuelled speculative land and building development, which, in turn, set up tremendous pressures on the 1973 Plan development boundary and

phasing proposals, which could not be wholly resisted. Figure 20.2, which compares the RMJMP population growth estimates (made in 1971) with that of the revised growth estimates prepared by Sert Jackson, shows the dramatic increase which took place over the five years 1975-1980. However, also Figure 20.2 shows that, in the longer term, no great disparity emerged between the two predictions.

IMPLEMENTATION

The study area for the Master Directive Plan (Figure 20.1) had been extended to take account of the rapid growth of the city. In the preparation of the Master Directive Plan a long term strategy plan had been established for the year 2000 at a scale of 1:50,000 and a more detailed physical plan produced for 1990 at a scale of 1:20,000 (shown reduced to 1:150,000 as Figure 20.3). The latter encompassed an area of 1215 sq km. This area extended to the north of the new airport, in the east along the Mecca Road to Kilo 17 and, to the south the Corniche and Royal Decree Land.

As required in their Agreement, Sert Jackson also prepared a detailed 1:10,000 plan for an area essentially comprising the main city, to the extent of available maps.

Having established the Master Directive Plan, Sert Jackson produced Execution Plans to implement the Master Directive Plan. These plans defined, located and programmed the necessary investments in public services and facilities.

In order to achieve the benefits of a phased programme of development including the coordination of capital programmes and for the development of roads, utilities, public facilities, etc. Sert Jackson decided to phase development in relation to the Third and Fourth Development Plan periods i.e. 1979-1983 and 1984-1988. In this way phased service programmes could be related to national funding and budgets. This also accorded with the timescale of the Master Directive Plan and with the timing of the proposed Execution Plans.

As the area for manoeuvre in terms of phasing was relatively limited, the criteria adopted were as follows:

1 Committed highway programme: Major roads, either built or committed, would create pressure for development. Where such roads were part of a committed programme, then other services facilities should be programmed to accommodate in an orderly way the resulting demand for development. The proposed road network for the 1990 Master Plan is illustrated as Figure 20.4.

2 Subdivisions: No subdivision should be approved unless it lay within an area of the city which was programmed for development in the Master Directive Plan. Existing approved subdivisions had extended well beyond the 1978 built-up area. Development of these subdivisions should be restrained to accord with the Execution Plan phasing. No services should be

extended to out-of-phase development.

3 Other development commitments: These, as for example the Royal Decree land near the mouth of the Wadi Fatima, were very sizeable in extent. Phasing of services would depend on the degree of political commitment and on the degree to which their development could be seen to be part of the orderly and balanced growth of the city.

4 Strategic phasing requirements of the plan: In a situation where the natural land development pressures were extending rapidly in all directions, phasing of utilities and services, to be economic of resources, could act as a natural restraining force. However, in addition to the general goal of extending the serviced area of the city in a systematic and economic manner, the plan promoted for example the early development of the North Corniche up to Sharm Obhur, and the development of the existing airport land. It also aimed to work towards the balance of land uses finally proposed for 1990. The estimated land use requirements for the period 1977-2000 are quantified in Table 20.7. The timing and location of facilities and their financial programming formed the basis of the Execution Plan.

Table 20.7 Existing and Proposed Land Use by Sector, Jeddah Metropolitan Area, 1977, 1990 and 2000

Land Use	Area Hectares Existing ie 1977		Proposed 1990		Proposed 2000	
Residential:						
Low Density	1,120		13,455		13,000	
Medium Density	755		4,250		7,300	
High Density	895		4,545		5,000	
		2,770		22,500		23,300
Commercial incl. Mixed Uses		340		1,050		1,300
Industry:						
Light	203		1,200			
Warehousing and storage	134		2,600			
Oil-related	163		230			
		500		4,030		5,500
Government		910		6,630		7,500
Facilities		250		400		600
Recreation open spaces		140		1,680		3,500
Transport:						
Major roads	1,350		2,500		3,000	
Other transport	8,900		8,960		12,500	
		10,250		11,460		15,500
Utilities		400		1,560		2,000
Redevelopment of Old Airport Site subject of special land use study	Included in 'Transport'			1,980	Included in 'Above land uses'	
Total Developed Land Area		15,560		51,040		63,200
Vacant land		105,940		70,460		58,300
Total metropolitan area		121,500		121,500		121,500

Developed land area per person

1977	180 sq m
1979	325 sq m
1990	319 sq m
2000	276 sq m

Source: Sert Jackson Revision & Updating of the existing Master Plan 1980.

INSTITUTIONAL FRAMEWORKS

The Jeddah Planning and Development Department (JPDD) is responsible to the Ministry of Municipal and Rural Affairs. A Steering Committee was established at the inception of the Sert Jackson project to give guidance in the preparation of the Jeddah Action Master Plans. This Committee was chaired by the Mayor. Members included the Sert Jackson Project Director, the Assistant Director of the Jeddah Planning and Development Department, the Director of Planning of the Municipality and UN representatives. Independent of this committee, the Supreme Coordination Committee of the Municipality was responsible for the resolution of all implementation matters connected with the development of Jeddah. At a higher level, there was the High Committee for Planning, under the chairmanship of the Governor of Mecca.

The Consultants proposed that the JPDD should become a technical department with a specific identity. It was also proposed that the function of the Steering Committee be taken over by a planning coordination committee. This committee would be assisted by the existing coordination committee.

The planning coordination committee would be responsible for:

1 The implementation of the Master Directive Plan, Execution Plan and Action Area Plans.

2 The preparation of any subsequent plans or regulations, or amendment to plans or regulations.

3 The preparation, coordination and implementation of all budget programmes related to the above plans.

4 Coordination of all consultants undertaking technical studies related to the above plans.

The development coordination committee would assist the above committee with responsibility for:

1 Coordination and direction of all agencies connected with the implementation of approved budgeted expenditure related to the planned development of the city.

2 Resolution of any problems or disputes arising between executive agencies in the implementation of approved planning and development policies.

It was proposed that a development control sub-committee should be formed to streamline procedural and technical matters in respect of development control. The members of this sub-committee would be the Deputy Mayor for Technical Affairs, the Vice Mayor of Municipal Affairs, Vice Mayor of Administration, the Director of the JPDD, the Director of Lands, the Director of Municipal Services, and two nominated members to represent registered Saudi Consulting Offices. This sub-committee could also include assistant mayors of the local municipalities as members. This sub-committee would examine special or controversial cases.

The Director of the JPDD would act as its convenor-secretary.

The JPDD would, be responsible for studies, preparation of plans and recommend actions in all fields included in the planning function for decision by the appropriate authorities. It would:

1 Act as a clearing house for the projects defined in the Execution Plan and Action Area Plans.

2 Update such plans, e.g. five-yearly review of Master Directive Plan.

3 Act as the technical secretariat on all planning matters, relating to the proposed planning coordination committee.

4 Coordinate with all agencies responsible for the development of the city.

The JPDD would carry out the following coordination functions:

1 Capital programme: This would be derived from the preparation and monitoring of the capital improvement programme which would then be handed over to the Municipality for implementation. Such a capital improvement programme would be presented to the Steering Committee for approval and be linked to the Execution Plan. The projects would be continuously updated on a yearly basis in order to match the

overall five year programme.

2 Planning and Programming of Service Centres: The distribution and build-up of service centres would be linked to the resident population. Therefore, the JPDD would be involved in the identification of sites of such service centres and their gradual development. Building programmes would be undertaken by the sectoral ministries but standards of provision would be reviewed by the JPDD.

3 Planning of Utilities: The JPDD would be involved directly with priority selection and programming according to population needs.

4 Land Acquisition: The JPDD would act as a clearing-house for land acquisition programme for specific projects such as the creation of streets or the location of service centres. An estate department would follow the land acquisition programme and recommend the purchase or expropriation of land accordingly.

5 Development Control: The JPDD would have an important consultative role in matters relating to the control of all development.

6 Planning Byelaws: Following the approval of the Master Directive Plan, Planning Byelaws would, in principle, form the legal means of implementing the plan. Jeddah Municipality would be the competent authority to implement the plan and enforce the

planning regulations. In summary, its duties would include:

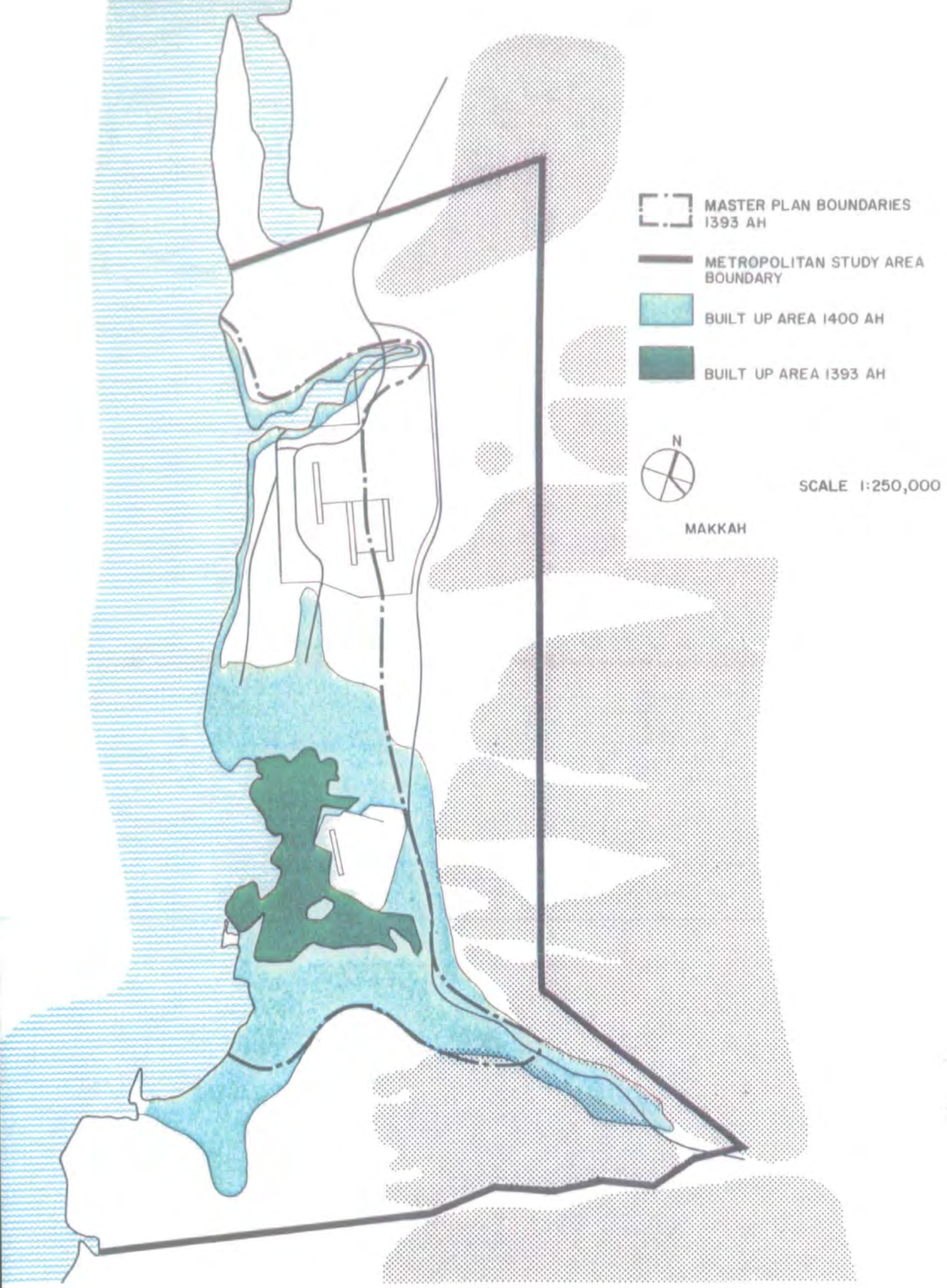
- issuing permits for subdivision of land or alteration thereof
- issuing permits for the creation or alteration of buildings on approved sites
- interpreting the planning regulations to the public and other public agencies
- penalising contraventions of approved permissions, and otherwise generally enforcing the planning regulations.

7 Land Development Policy: In order to achieve balanced urban development, the planning authority would need to make available land in the right place at the right time, as necessary, for the planned provision of services.

ONGOING WORK

Upon completion of their planning studies in 1980-81, Sert Jackson International/Saudconsult disbanded and a new entity - Sumait - was formed to continue with detailed Action Area planning follow-up studies in collaboration with the Town Planning Office. Since 1981, Sumait have carried on with this work and had (by 1985) prepared about 100 sq km of detailed plans for different sectors of the city's metropolitan area following the same procedures and

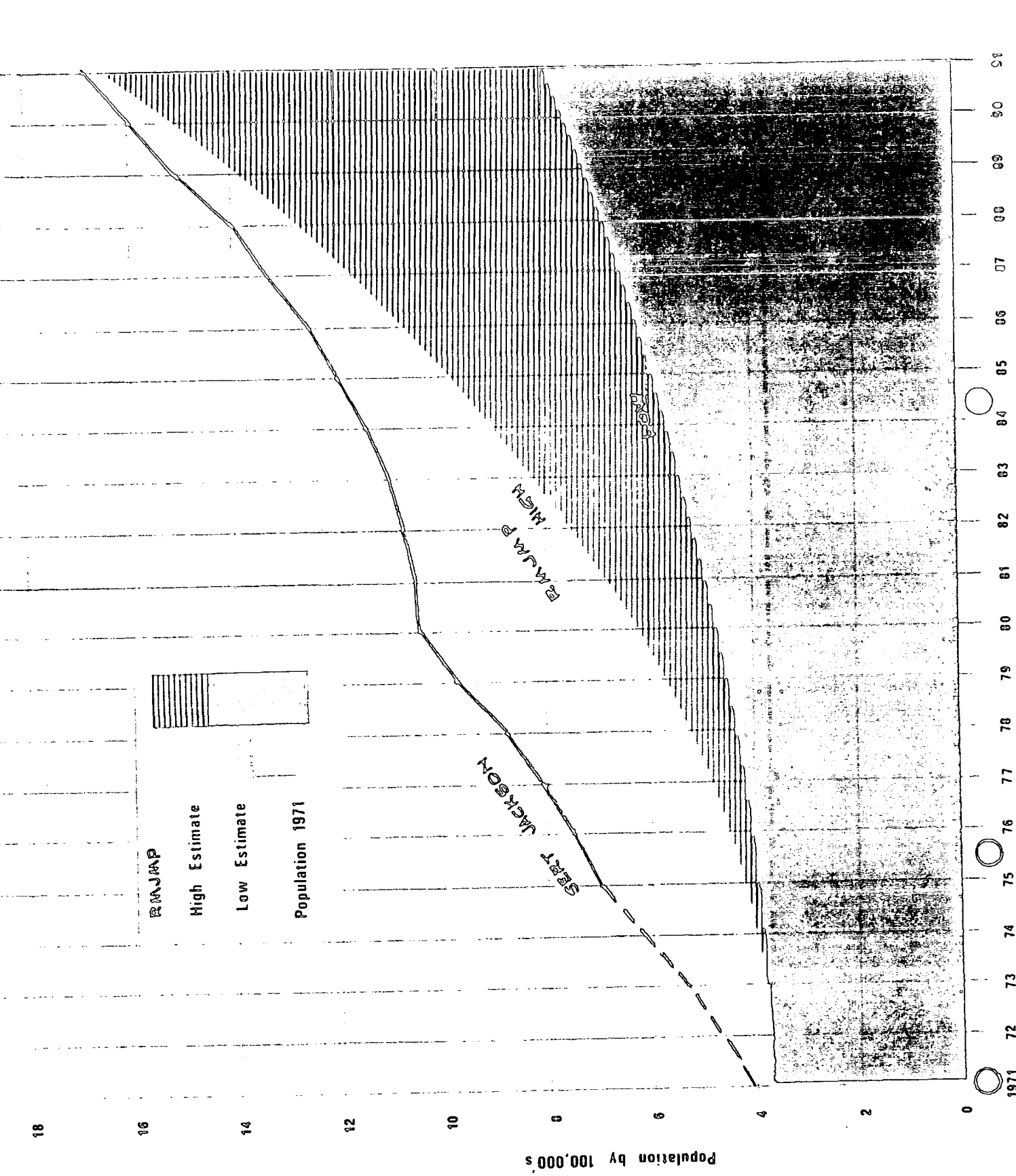
requirements laid down in the Sert Jackson Agreement.



JEDDAH METROPOLITAN AREA BOUNDARY

SOURCE : MASTER DIRECTIVE PLAN - SERT JACKSON, 1380.

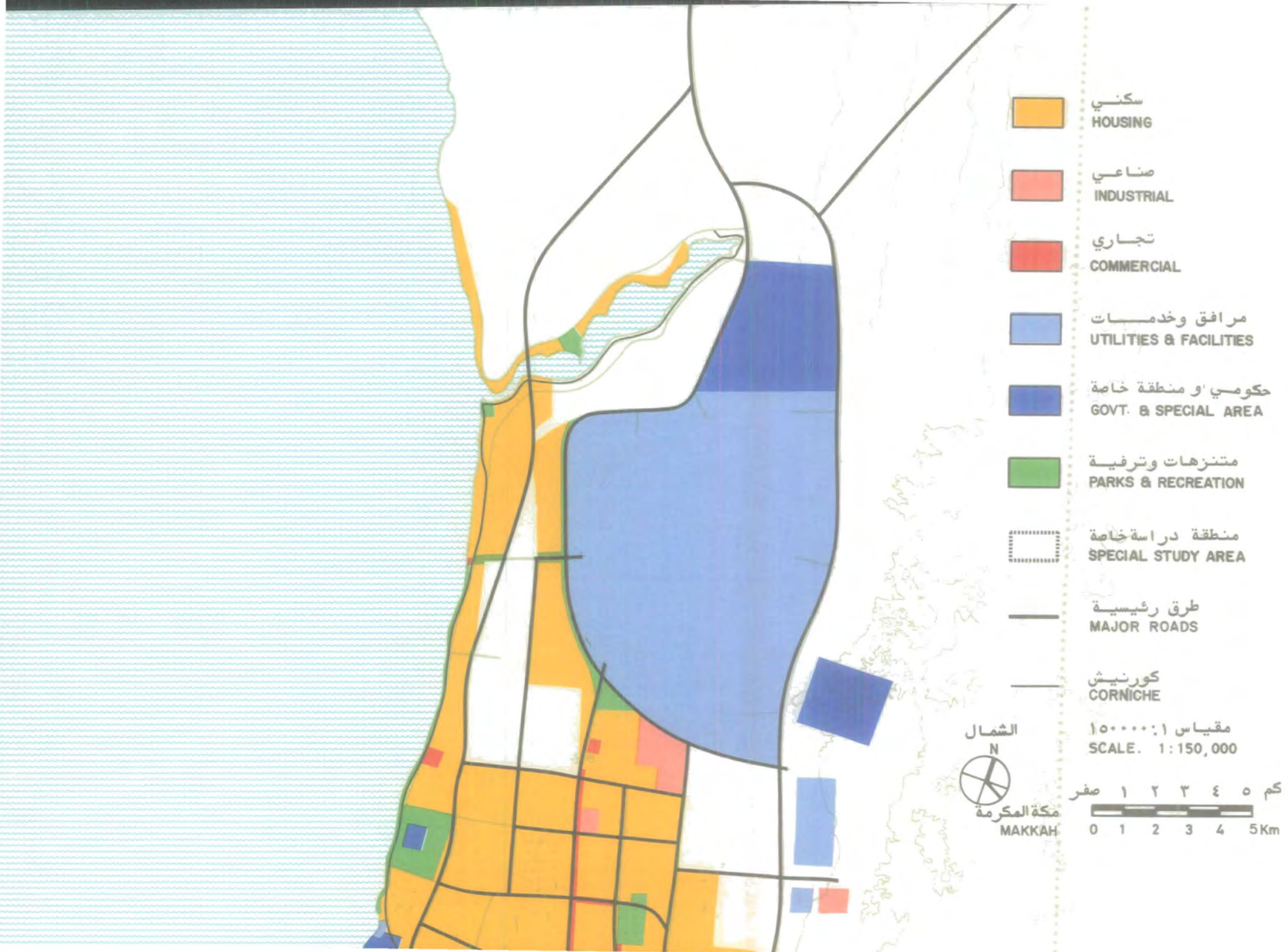
FIGURE 20.1 .

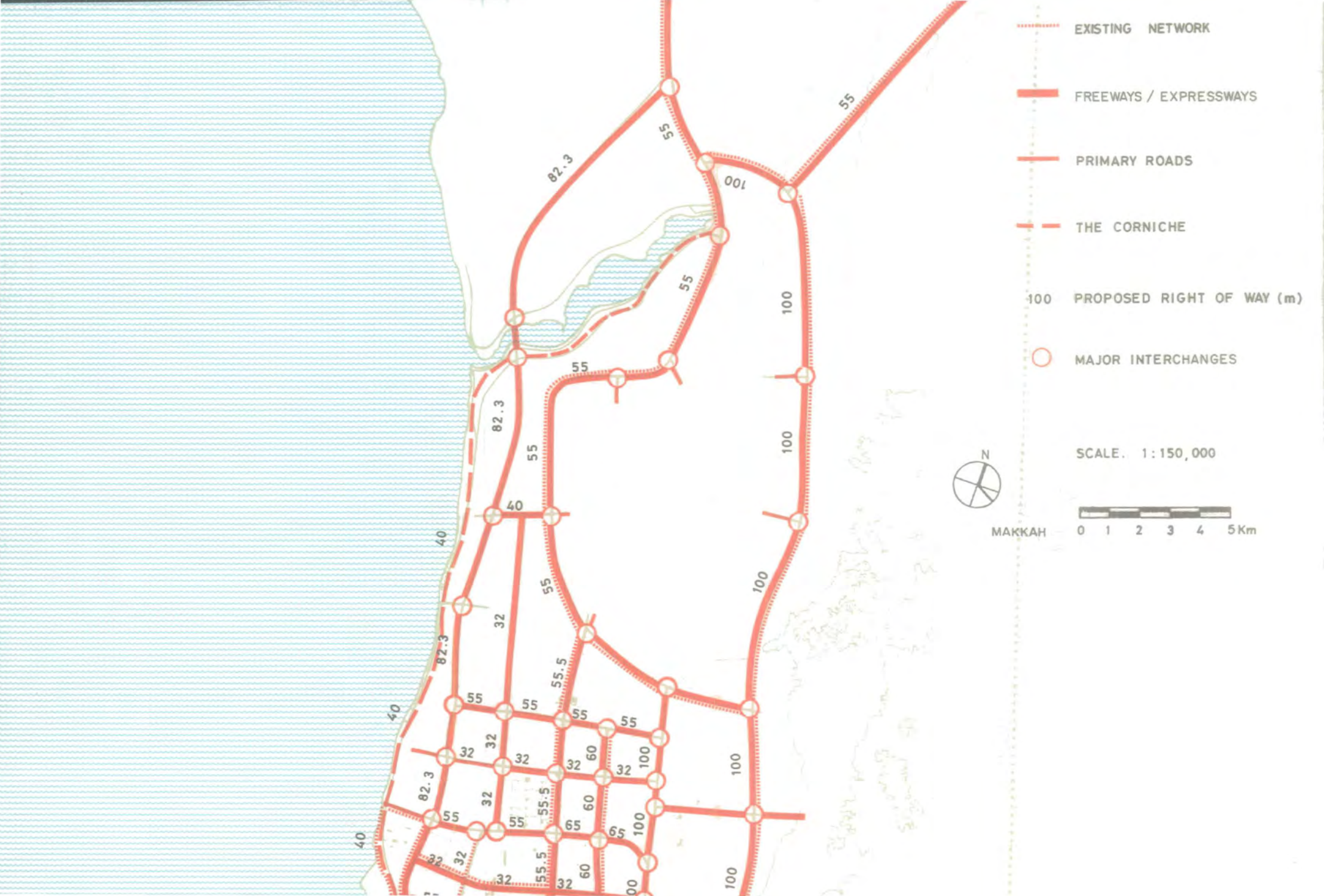


JEDDAH POPULATION GROWTH ESTIMATES 1971-1991

SOURCES : MASTER PLAN - RMJMP 1975
MASTER DIRECTIVE PLAN - GARY JACKSON, 1980

FIGURE 20.2


سكني
HOUSING
صناعي
INDUSTRIAL
تجاري
COMMERCIAL
مرافق وخدمات
UTILITIES & FACILITIES
حكومي و منطقة خاصة
GOVT. & SPECIAL AREA
متنزهات وترفية
PARKS & RECREATION
منطقة دراسة خاصة
SPECIAL STUDY AREA
طرق رئيسية
MAJOR ROADS
كورنيش
CORNICHE
الشمال
N
مقياس ١:١٥٠٠٠٠
SCALE. 1:150,000
كم ٥ ٤ ٣ ٢ ١ صفر
0 1 2 3 4 5Km
مكة المكرمة
MAKKAH


EXISTING NETWORK
FREEWAYS / EXPRESSWAYS
PRIMARY ROADS
THE CORNICHE
100 PROPOSED RIGHT OF WAY (m)
MAJOR INTERCHANGES
N
SCALE. 1:150,000
MAKKAH
0 1 2 3 4 5Km

During the period 1971-1975, the first phase of Plan implementation effort had been concentrated on the preparation of highway designs and contract documents. Apart from the first flyover, which was opened in 1975 at the Kilo 2 Mecca Road-Airport Ring Road intersection, on site work up to 1975 had been concerned with the improvement and widening of existing roads.

The next decade, from 1975 to 1985, saw a dramatic increase in the construction of the city's highway network. By 1985, the entire urban road network had been nearly completed. Over 4000 km of urban roads, primary, secondary and local, were built during this period.

This accomplishment achieved one of the principal aims of the Mayor. Realising that if roads were able to precede development, road corridors could be safeguarded and construction proceed rapidly, the Mayor pursued a vigorous programme of road construction. Over the period of the Third Five Year Development Plan (1980-1985), the Municipality of Jeddah received, for road construction alone, a total budget of SR2,916,802,000 (or approximately £500,000,000) allocated as follows:

Table 21.1 Municipality of Jeddah: Road Projects and Budget Allocations 1980-85

	SR
Corniche	272,000,000
Tunnels and bridges	137,600,000
Walkways and lighting	210,000,000
Beautification	1,827,202,000
Temporary asphalting	470,000,000
Total	2,916,802.000

Source: Municipality of Jeddah, Training Seminar for Engineers, February 1984.

In order to expedite the road construction programme, the Municipality and the Ministry of Communications agreed that primary roads of national significance should be implemented by the Ministry, in coordination with the Municipality's own programmes. Thus, by the mid 1970s, the Ministry of Communications had launched an equally ambitious road building programme to serve the city and the region.

The four major projects undertaken by the Ministry using the Consultants, Dar-al-Handasah (Shair and Partners) were:

1 Upgrading of Medina Road north of Palastine Road to motorway standard.

2 The elevated central area ring road section of Prince Fahd Road.

3 The city by-pass road from Medina Road north of the New Airport to the Mecca Road at about Kilo 12 from

the city centre.

4 The Jeddah-Mecca motorway.

These four routes formed an integral part of the 1973 RMJMP Master Plan. Their location is shown in Figure 21.1, which indicates the extent of the city highway network as at 1978.

As the new Airport was scheduled to open in 1980, priority was give to the upgrading of the Medina Road to urban motorway standard. This was the most complex of the four projects as it was the only one which used a busy existing road; the other three were totally new road routes. The approach adopted was to build the grade separated intersections first. The junction at the southern entrance to the new Airport was designed to free flow urban motorway standard (see Figure 21.2). The section of Medina Road to the south (ie. Saudia) terminal was completed just prior to the opening of the new King Abdulaziz International Airport in late 1980. A further two years were required to complete the remaining section, to the foreign airlines terminal and the Hadj reception centre at the northern end of the airport. By 1983, the link to the recently completed dual carriageway road to Medina including a grade separated access to the by-pass was complete. Thus, in total, twelve grade separated intersections, from the crossing of Medina Road with Palastine Road to the northern by-pass interchange provide an uninterrupted free flow of traffic to the airport and northwards to Yanbu,

Medina and Tabuk.

In parallel with the Ministry of Communications programme for Medina Road, the Municipality started constructing the east-west cross routes. The first route to be completed, in 1977-78, was Tahlia Road (Road 5 on Figure 21.1) and the second and third grade separated junctions within the city to be completed were the Medina Road-Palastine Road and the Medina Road-Tahlia Road intersections respectively.

As discussed in Chapters 13 and 14, there was a critical need to create north-south routes around, rather than through, the city centre, in part to serve the city centre, to protect the Historic Area and also to link the industrial southern areas, including the seaport, to the mainly residential northern areas. The rapid growth of Jeddah, and the continued existence of the Old Airport (which could not close until the new one was operational and thus acted as a constraining barrier to cross city traffic), meant that a high capacity ring route, close to the city centre, was required urgently to cope with the population growth and the resultant increase in traffic volumes.

In order to meet this traffic demand, it was decided that the 6km long central section of Prince Fahd Road should be elevated with slip ramps forming access and egress to the secondary road system. This road, which required demolition to clear the corridor it occupied, took four years to

build and was opened in 1982. It was a remarkable achievement. Cross city traffic can reach the seaport in minutes rather than the previous 'snarl-up' which took place around and through the city centre. Again, in parallel with the construction of the elevated section, the Municipality extended Prince Fahd Road northwards to act as a parallel major north-south route to the Medina Road.

The by-pass was built in two stages. First, from the existing Mecca Road to link with the east-west Tahlia Road and, secondly, from Tahlia Road northwards to the Medina Road just north of Sharm Obhur. The first section was constructed without grade separation at its junctions with the east-west city primary roads. These junctions were upgraded during the second, northern phase of construction. The first phase of the first stage opened in 1978 and the completed by-pass was opened in 1982, by which time all twelve grade separated interchanges had been completed and the link across the existing Mecca Road to the Mecca motorway was also completed.

The fourth major route constructed by the Ministry of Communications was the Jeddah-Mecca motorway. This route, which was completed and opened by H M King Fahd ibn Abdulaziz in October 1985, is a further remarkable highway engineering achievement. In strategic terms, it was one of the priorities identified by RMJMP during the regional stage of their plan for the Western Region and had been

included in their Master Plan studies for Mecca and Jeddah. In this respect it demonstrates the value of interrelated urban and regional planning, as both city plans were prepared with this regional route incorporated into their respective urban structures.

As with the Prince Fahd central section, the Motorway required a high capacity elevated route from the eastern built-up sector of the city westwards to the seaport southern entrance and the south Jeddah primary road network. The motorway then continues, on land reclaimed from the sea, northwards to link up with the high speed motorway standard road (Al Andalus Road) which lies to the east of Medina Road. This was the third major north-south route (i.e. excluding the by-pass) incorporated in the 1973 Master Plan. The elevated length of this motorway, from the eastern boundary of the city to its continuation at ground level as Al Andalus Road, is 17km and this length has 7 grade separated junctions.

The total distance between Mecca and Jeddah of about 75km city centre to city centre is now linked by a road to motorway standard and can be traversed in just over forty minutes. This is in utter contrast to a journey time (as mentioned in Chapter 7) between Jeddah and Mecca which , only forty years previously, was measured in days, not minutes, as asphalted roads were non-existent.

It was not until 1983-84 that the Ministry of Defence and Civil Aviation released the old airport for development.

This permitted an immediate start on the urgently needed north-south and east-west high speed roads to complete the major elements of the city road network. These roads are nearing completion at the time of writing this work.

The current (1985) Ministry of Communications road projects for Jeddah comprise the following:

1 Completion of all roadworks under the elevated Jeddah-Mecca Motorway.

2 Construction of Seaport Gate no. 4/Petromin interchange including the bridge over the pipelines between the tanker terminal and the refinery (as part of the south Jeddah primary network).

3 Completion of the Jeddah-Mecca Motorway-Al Andalus link.

4 Construction of Phase 1 of the interchange between the by-pass and the south primary to the stadium interchange.

5 Construction of an elevated road at Waley al-Ahd Road from the Prince Fahd Road intersection to the Medina Road intersection.

The Ministry appointed the Consultants Saud Consult to prepare detailed designs and contract documents for these projects.

In parallel with this work by the Ministry of

Communications, the Municipality has progressed with the completion of the primary and secondary network and the permanent and temporary asphalting of local roads. Additionally, as described in Chapter 15, the Corniche recreational route has been completed. The situation as at June 1985 is shown in Figure 21.2. Table 21.1 lists roads, main and local, by Sub-Municipality as at December 1984 (the Sub-Municipality boundaries are also shown in Figure 21.2). This was when the last available comprehensive check on progress was carried out by the Municipality.

In order to assess the extent to which the 1973 Master Plan road network was followed, the Master Plan road proposals are shown as a transparent overlay to Figure 21.2. Given the necessary adjustments which emerge from detailed studies to define actual road corridors, there remains an overall consistency between the '73 proposals and the actual. The main difference, which relates to the underlying land use development, was that the '73 Plan did not allocate urban development in the large area east of Medina Road and south of the new airport. When it proved not possible to prevent development in this area (a large part of which falls within the noise contours for aircraft; an area which, in theory, is not suitable for residential development), the road structure was amended to service this area.

The northern section of the by-pass had to be moved east-

wards because the Ministry of Defence and Civil Aviation decided to build a third runway and thus extended the airport site eastwards. The opening of the new airport allowed construction to start within the old airport site in 1983. The old airport road network which, by 1985, was nearing completion (but without grade separation at intersections in the current construction programme), departed from the 1973 proposals in order to make use of the existing asphalted runways and taxiways, which could, with the construction of kerbs, central reserves and lighting, act as highways at less cost than that of building new roads.

A few key parts of the network have yet to be constructed. This most important of these are, first, the link from the old airport site southwards across the Mecca Road to the completed section of the south Jeddah network (this route is shown with a broken line adjoining the number 12: i.e. Al Thagar Sub-Municipality in Figure 22.2), and the completion of the southern part of the network. Overall, it has been a remarkable achievement to have completed most of the total urban road network in less than a decade.

The Municipality, in building this road network, gave thought and care to landscaping. All pavements (in local terminology - sidewalks) and central reservations of dual carriageways had tree and shrub planting boxes incorporated in their design. Tree lined streets and avenues

now predominate the urban scene; not only spreading green 'fingers' throughout the city, but also providing shade and shelter from a hostile sun. The planting and maintenance of these trees and shrubs is the responsibility of the Plantations Department of the Municipality. A large tree nursery is maintained by this department. Figure 22.3 shows a satellite photograph of Jeddah taken in 1983. This high resolution photograph shows the extent of vegetation planted in Jeddah and also shows clearly the road network as completed at that time.

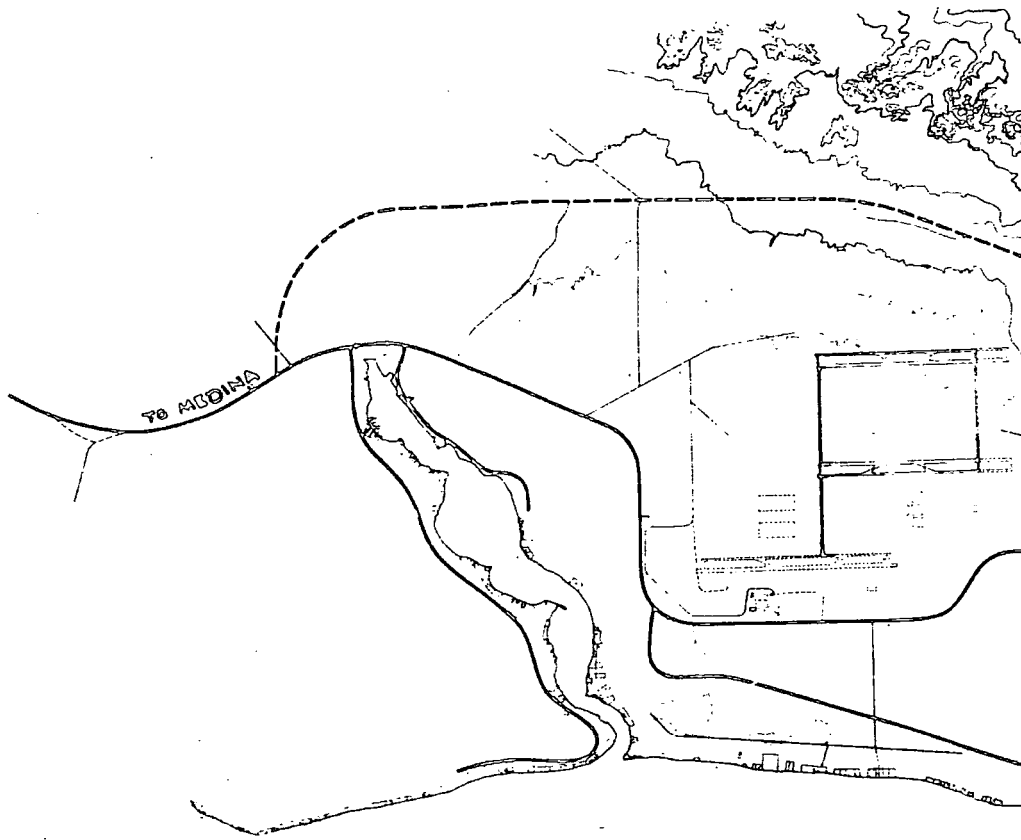
Table 21.1 Road Network by Sub-Muncipality as at December 1984

Municipality	Estimate of population	Major Roads km	Major Roads %	Local Roads km	Local Roads %	All Roads km	All Roads %
Obhur (incl Dhaban)	24,000	211.4	23.74	354.2	11.10	565.6	13.85
New Jeddah	120,000	128.3	14.40	366.0	11.47	494.3	12.12
New Airport	100,000	180.2	20.23	534.0	16.73	714.2	17.49
Aziziyah	122,000	43.0	4.83	233.1	7.30	276.1	6.76
Ruwais	45,000	26.1	2.93	94.5	2.96	102.6	2.95
Old Jeddah	70,000	16.9	1.90	43.7	1.37	60.6	1.48
Sharafiyah	120,000	21.4	2.40	151.1	4.73	172.5	4.23
Bani Malek (incl Briman)	45,000	63.2	7.10	135.9	4.26	199.1	4.88
Hindawiyah	400,000	21.2	2.38	148.8	4.66	170.0	4.16
Al Thagar	26,000	28.7	3.22	87.8	2.75	116.5	2.85
Um al Salam	75,000	15.0	1.68	351.8	11.02	366.8	8.98
University	160,000	21.8	2.45	305.9	9.58	327.7	8.03
Khozzam	145,000	53.8	6.64	268.5	8.41	322.3	7.89
Al Mina	100,000	59.7	6.70	116.8	3.66	176.5	4.32
TOTALS	1,522,000	890.7	100.00	3192.1	100.00	4082.8	100.00

Notes: Major roads are roads which are wider than 20m in cross-section.

Local roads are roads which are 20m or less in cross-section.

Source: Arabian Cleaning Enterprises and RMJMP, Appraisal of the Existing Road Network as at December 1984.

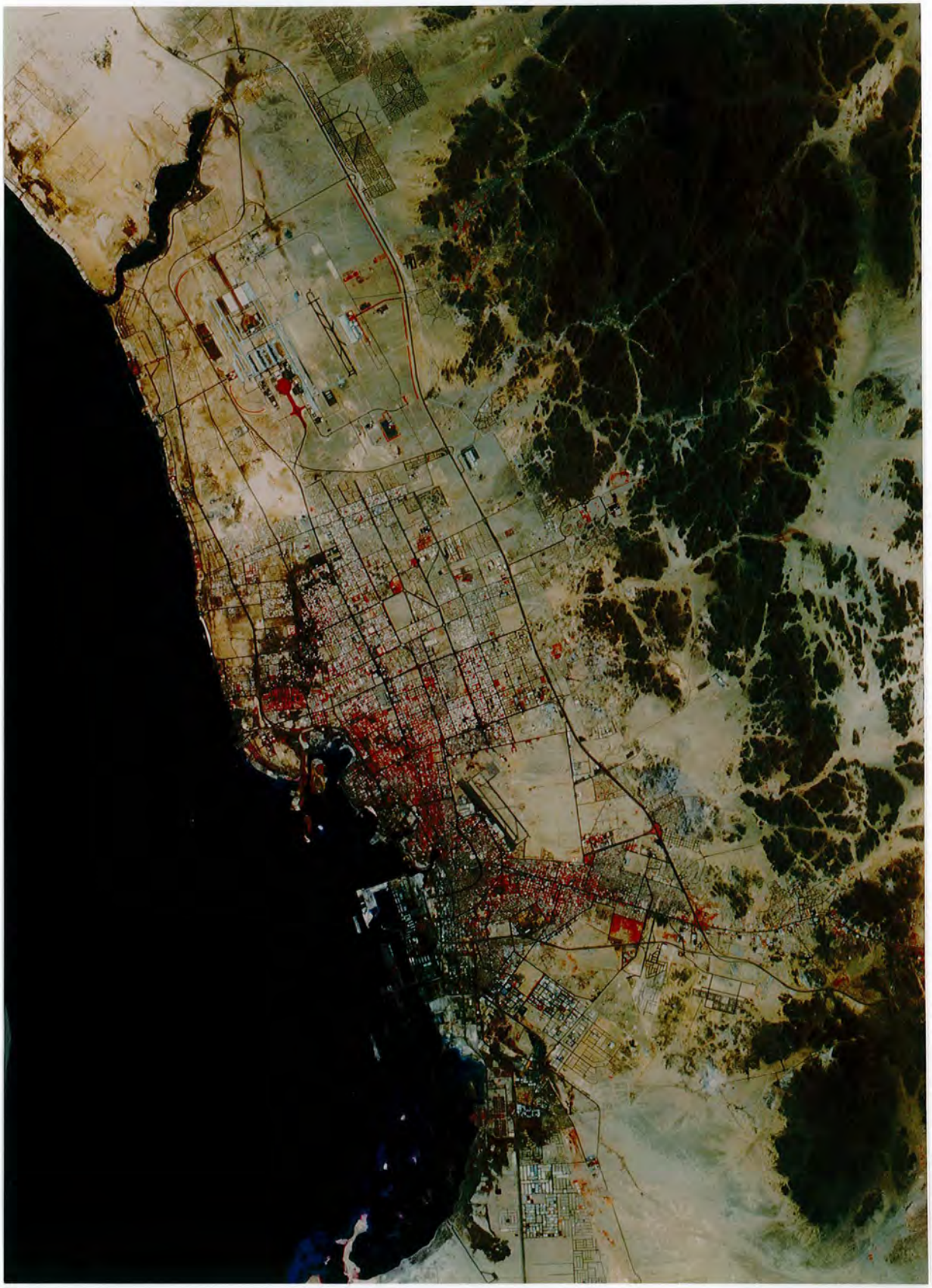

TO MEDINA

EXISTING & PROPOSED ROAD NETWORK, 1985

NOTE: OVERLAY SHOWS 1971 MASTER PLAN NETWORK

SOURCE: JEDDAH MUNICIPALITY, 1985.

FIGURE 21.2



HIGH RESOLUTION LANDSAT-THEMATIC MAPPER AND MODULATOR OPTO-ELECTRONIC MULTISPECTRAL SCANNER (MOMS) SATELLITE PHOTO-GRAPH OF JEDDAH, 1983.

NOTES : 1. VEGETATION SHOWS RED ON PHOTO.
2. DARK GREY/BLACK AREAS WITHIN BUILT-UP AREA SHOW WHERE SURFACE WATER IS NEAR OR AT GROUND LEVEL.

SOURCE : URBAN MAPPING OF THE CITY OF JEDDAH, KINGDOM OF SAUDI ARABIA ON THE BASIS OF HIGH RESOLUTION SATELLITE DATA - MOHAMED ALWASH, FAWAZ ZAKIR & ABDUL RAZZAK, FACULTY OF EARTH SCIENCES, KING ABDULAZIZ UNIVERSITY, JEDDAH.

FIGURE 21.3

STRUCTURE OF MUNICIPALITY SERVICES

Upon his appointment as Mayor of Jeddah, Eng Mohammed Said Farsi initiated an analysis of the services provided to the city by the Municipality. This led to a reorganisation of the Municipality structure in order to achieve a more efficient and effective service and one which would respond to the pressures of rapid growth. Two main functional streams were recognised. First, Administrative and Financial matters and, second, Technical Affairs. An Assistant Mayor was appointed to lead each of these two major functions and a departmental structure developed to fulfil the increasing responsibilities of the Municipality.

A simplified overall organisational structure of the Municipality is illustrated in Figure 22.1. The responsibility for the management and coordination of all aspects of the development of the city rests with the Department of Technical Affairs, led by its Assistant Mayor, Eng Barakat Bajunaid.

Responsibilities are divided between twelve departments as follows:

1 Archives and mapping

2 Building Controls and Permits

3 Electricity

4 Land Acquisition(*)

5 Land Distribution(*)

6 Planning

7 Projects and Follow-Up

8 Roads and Bridges

9 Stormwater Drainage

10 Studies

11 Supervision

12 Surveying

(*) Land Acquisition and Land Distribution are under the control of a single Director-General and may be considered as one unit.

The Assistant Mayor for Technical Affairs is also responsible for such ongoing matters as building permits, a service which is delegated to 17 Sub-Municipalities:

1 Al Mina
2 Khuzzam Palace
3 Al Hindawiyah
4 Al Balad
5 Sharafiyah
6 Al Thagir
7 University
8 Bani Malek
9 Al Ruwais
10 Azziziyah
11 New Airport
12 New Jeddah
13 Obhur
14 Eskan
15 Dahban
16 Breman
17 Um al Salam

REVIEW AND DEVELOPMENT OF MUNICIPALITY TECHNICAL SERVICES

In his address to the Training Seminar for Municipality Engineers (Jeddah, February 1984), Eng Barakat Bajunaid, the Deputy Mayor for Technical Affairs, stated:

Municipality and its technical services will have given you some idea of how all the parts are contained within one overall whole. We do not regard this structure as fixed or ideal. Rather we are continually seeking ways and means to improve and make more efficient the service it is our duty to provide".

A key aspect in the improvement of efficiency is the need to have a comprehensive technical information service. Equally important, in the case of a rapidly growing city such as Jeddah, is the need to keep this information up to date and ensure that all technical departments have access to a consistent and up to date data base. This is an essential prerequisite of decision making, particularly where large problems or issues require, by their complexity, many different factors to be considered.

The Municipality, to meet this need, is currently engaged in setting up a Topographic and Cadastral Information Management System (TACIMS). This project will establish a computer/graphic basis for information storage and retrieval. It will be essential that this system not only be installed and in production, but also that:

- It is kept up to date.
- Its potential capacity is utilised to build up a city wide comprehensive data base.
- It is used by all technical departments to establish a unified, consistent and comprehensive data base covering technical information.

The aim of the Municipality is to train and prepare an expert team to operate the system, and to create a struc-

ture that will ensure that it is used by all the technical departments involved in the city planning, development, expropriation and recording processes.

In order to achieve these aims, the Department of Technical Affairs started, in 1985, a detailed analysis of their existing structure and a review of how best to develop an efficient and integrated technical service. This review includes the relationship of the Municipality to other Government providing Ministries (e.g. Health, Education, Communications) and, in particular, to the Public Utility Companies (i.e. electricity, water, sewage, telecommunications) which fall under the overall direction of the MMRA Regional Office of Public Utilities in Jeddah.

The writer, in consultation with The Deputy Mayor for Technical Affairs, has considered how the present structure of the Department of Technical Affairs could evolve and respond to the challenge of continuing to seek means to improve the efficiency and quality of the services it provides. The following recommendations were made the subject of a report by the writer to H E The Deputy Mayor.

RECOMMENDATIONS FOR THE DEVELOPMENT AND IMPROVEMENT OF MUNICIPALITY TECHNICAL SERVICES

Organisations exist for a reason - to fulfil their purpose and discharge their responsibilities in an efficient, methodical and caring way. Morale as well as mature and experienced leadership (the 'human' element) is as impor-

tant as the organisation itself. The structuring of an organisation should reflect these two attributes and values, so that the people involved, at all levels, understand and support the aims, objectives and functions of the organisation of which they are a part. This approach can also be a major factor in continuity over time and, from this point of view, no one individual should be considered irreplaceable or without whom the organisation would cease to function.

With these principles in mind and from an analysis of the interrelationship of departmental functions (see Figure 22.2), a coherent structure which groups functions and responsibilities within common or shared need is set out diagrammatically in Figure 22.3.

This diagram highlights the need to create a central strategic body to embrace all Technical Affairs. This Strategy Group would be responsible for an overview of all technical activities, including formulating policies and objectives; setting priorities and programmes; controlling the allocation and use of budgets for studies and projects; and be the reference point for all Heads of Departments on matters of policy and decision-making. This central group would have a liaison function with Municipal Affairs and Administration and Financial Affairs, under the overall direction of HE The Mayor of Jeddah. The Studies Department, which initiates studies and projects, and the Follow-Up Department, which records

progress on all technical matters, should be part of this strategic group.

The remaining activities of the Department of Technical Affairs could then be grouped under three functional headings:

1 Information

2 Control

3 Executive

These are shown in Figure 22.3 as three separate groups identified by function.

The Information group would be responsible for the setting-up and constant updating of all technical information and data systems. These systems should be applied to:

a) Land Use Planning

b) Transportation Management and Planning

c) Design Standards

d) Building Regulations

e) Road Design and Layout

f) Utility Networks

g) Land Valuation

h) Land Ownership

i) Demographic and Economic Information

The systems being developed as part of the TACIMS Project have the capacity to manage this comprehensive series of

data and to produce graphic representation of this information wherever appropriate or possible to do so.

The first task of the Information Group, once this system starts to function, should be to produce a handbook and explanatory guide for all Heads of Department which will set out the programmes, the data selection, processes and programmes, and how to obtain access to and use of this information.

The Control Group would be responsible for controlling the use of land and all development thereon. Its framework of reference would be the Master Plan for Metropolitan Jeddah. As well as this control responsibility, the Group would prepare and review the forward planning and needs of the city, at both a strategic and detailed level. It would also set standards and the procedures to be followed at all stages in the development process and, in coordination with the Information Group, monitor and check the progress of the growth and development of the city, to ensure that the required standards were being complied with.

The activities of the Control Group would thus comprise town planning; the general administration of lands and buildings; expropriation of land; and the control and issuing of permits for buildings. As this latter function is delegated to Sub-Municipalities, the Control Group should ensure that correct procedures are followed strictly.

The Executive Group would take responsibility for all projects carried out by the Municipality including buildings, roads, utilities, such matters as the naming and numbering of areas and streets, traffic and identification signs, beautification projects and all cleaning and maintenance responsibilities.

With regard to the seventeen Sub-Municipalities, it is necessary to consider their role and function in respect of technical matters. In order to provide a framework for their terms of reference and responsibilities, and to ensure that they are carried out in a consistent and standardised manner, there should be an overall Director responsible for the Sub-Municipalities.
Sub-Municipalities which have in common similar problems and characteristics, should liaise with each other within a group system. For example, the heavily built-up City Centre, with most of the commercial and office development and high rise buildings, requires a coherent format of overall coordination in regulating the distribution and control of development, and such specialised aspects of traffic and car parking management and control. The newer northern development areas have much in common with each other and are different in nature and quality from the very mixed developments to the south of the Central Area. Thus three groups emerge as a logical functional grouping of purpose and shared problems and attributes.

In summary, the Central Strategy Group would formulate and

direct the overall control, direction and priorities to be followed by each Group and be consulted on all major decisions. The Information Group would ensure a consistent and up-to-date flow of information and "feed back" to all groups. The Control Group would be responsible for all non-executive functions related to planning and development. The Executive Group would carry out all projects executed by the Municipality, including supervising the use of Consultants and Contractors on specific projects.

These Groups, as well as the Sub-Municipalities, should not function in isolation from each other, but should achieve an organised system of coordination to ensure that each provides a supportive role to the overall achievement of an efficient, well organised and managed Department of Technical Affairs.

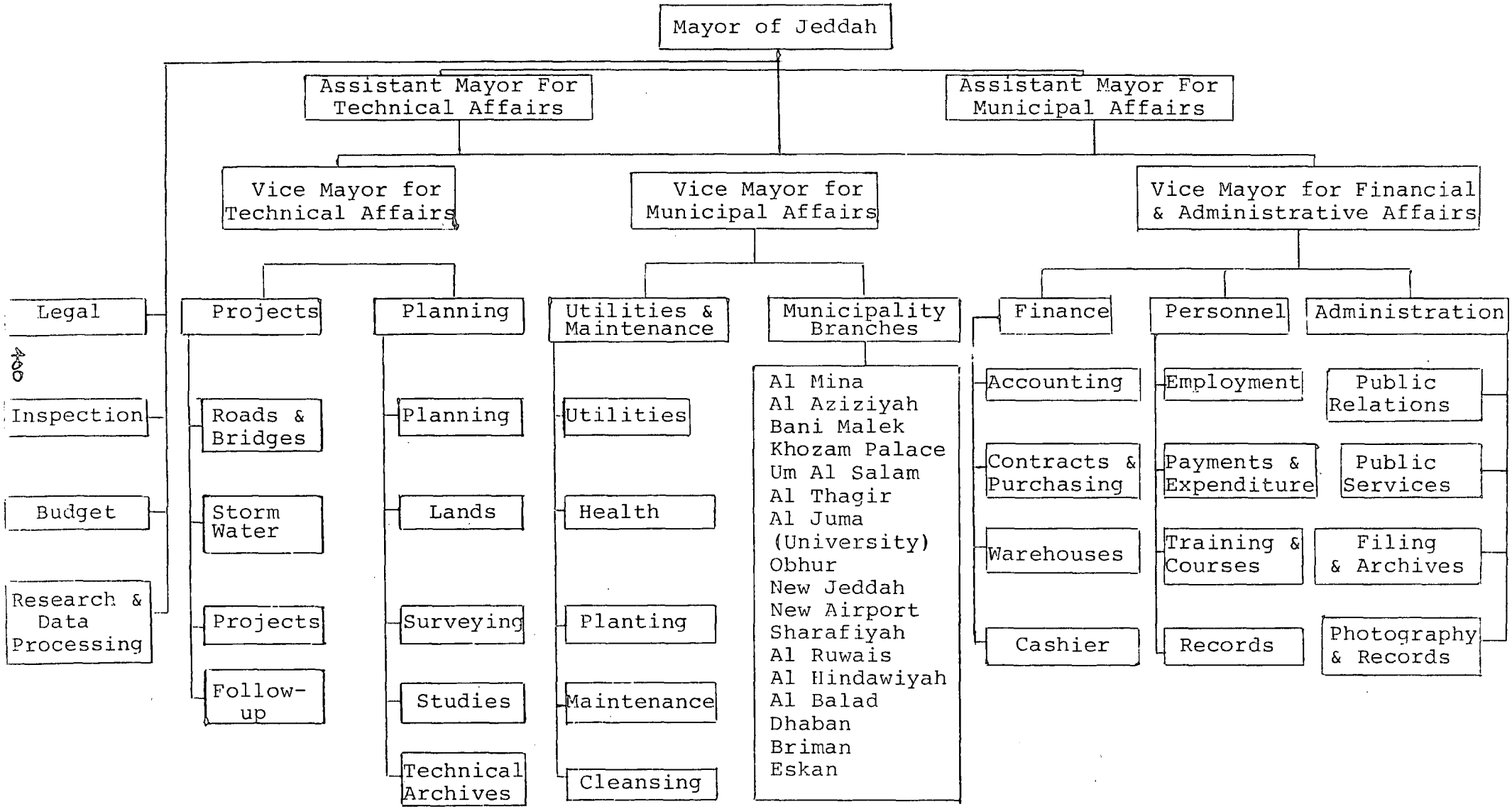
This proposed structure is shown in Figure 22.4 which indicates the four Groups and the division of operational departments between Groups. Each Group should have a Director responsible for the overall management and control of the departments within his Group. Also, each Group would appoint a Coordination Officer who would be a member of the Coordination Committee, which would hold regular meetings to ensure that an overall cohesive purpose and direction of effort was being maintained.

A specific Sub-Committee of the Coordination Committee should be responsible for liaison with the agencies responsible for the design and implementation of all essential

public utilities.

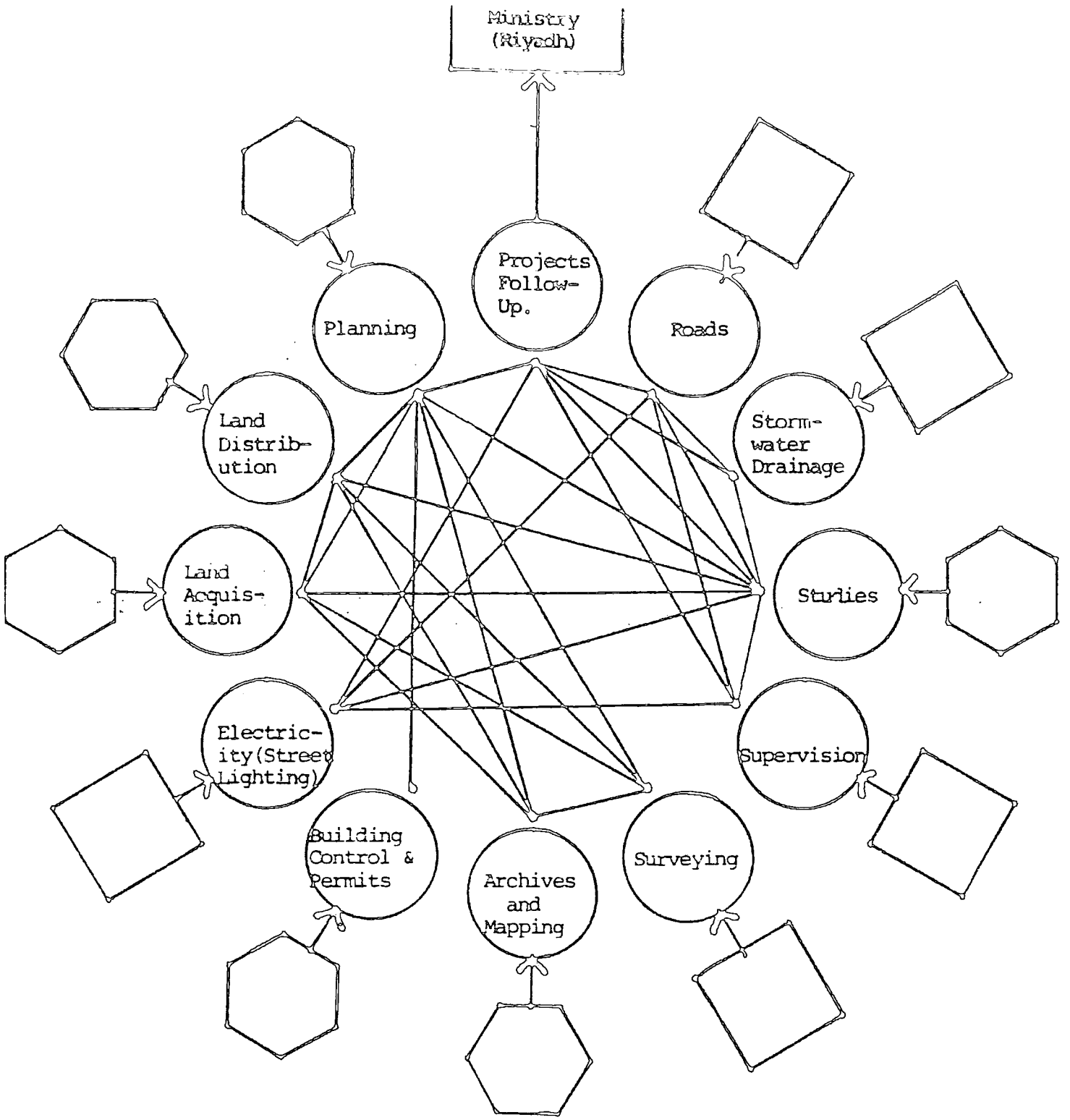
The seventeen Sub-Municipalities are shown in three Groups - North, Central and South, under the overall direction of a Director-General of Sub-Municipalities (see Figure 22.4).

The writer advanced these views in the spirit of Eng Barakat Bajunaid's address quoted earlier in this Chapter - that the Municipality must seek to maintain an active and dynamic structure capable of responding efficiently to the pressures of growth and change in a large, thriving and growing metropolitan city.



SIMPLIFIED STRUCTURE OF THE ORGANISATION OF JEDDAH MUNICIPALITY

FIGURE 22.1



Legend

Department of Technical Affairs - Internal Department.

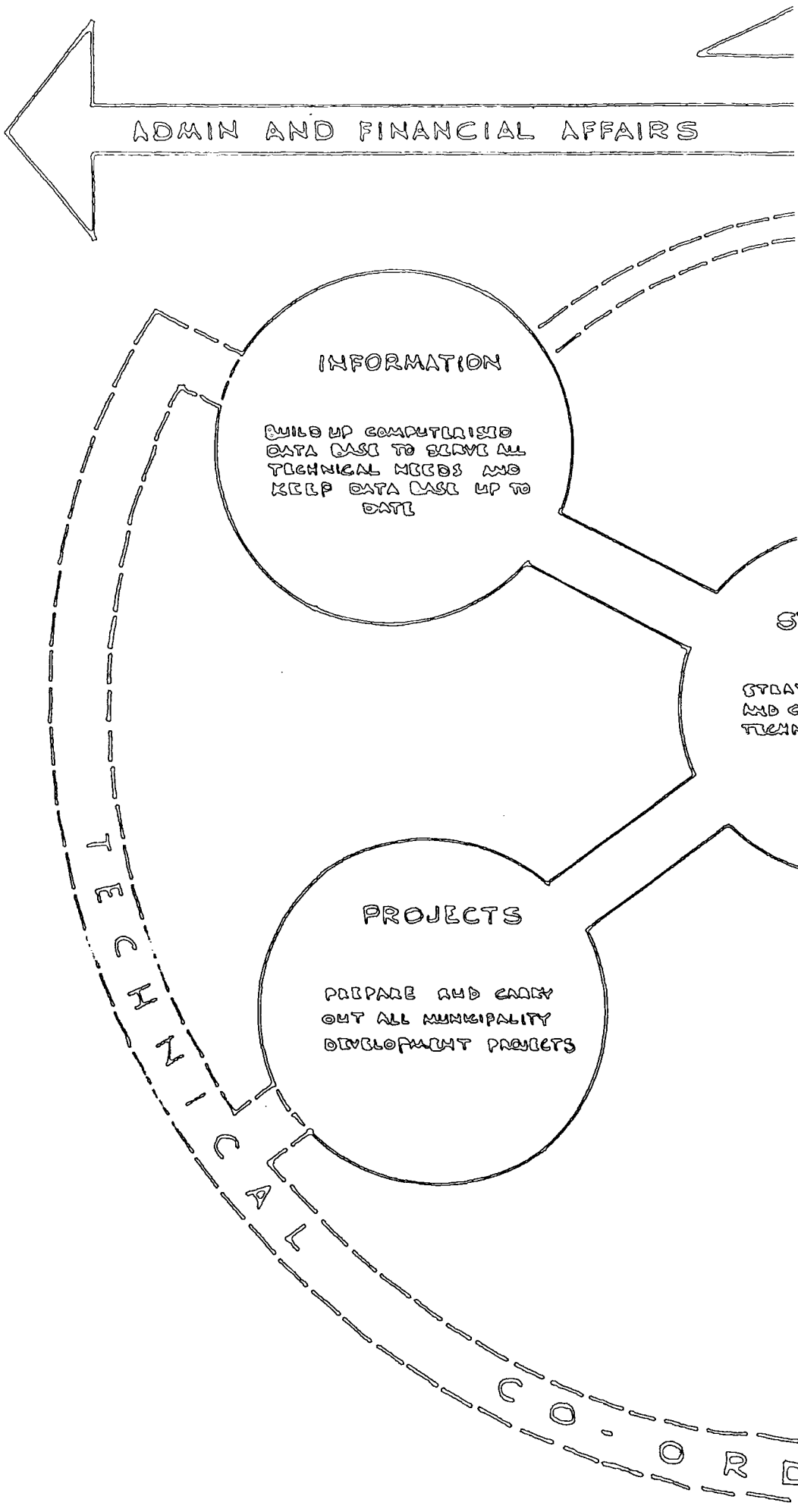
Public Utilities, Consultants, and Contractors.

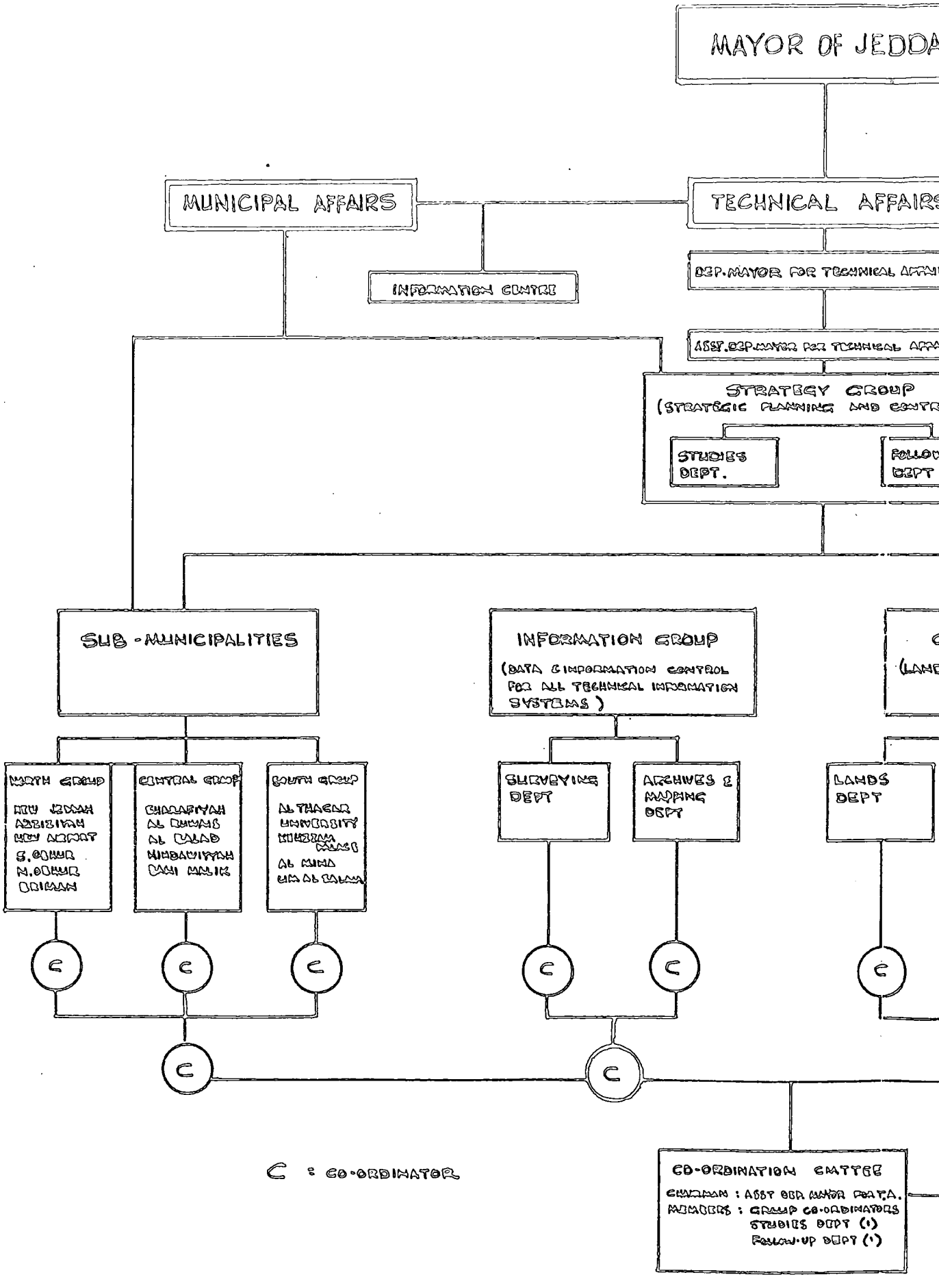
Sub-Municipality Offices and Consultants.

JEDDAH MUNICIPALITY , DEPARTMENT OF TECHNICAL AFFAIRS : INTERNAL / EXTERNAL CO-OPERATION .

FIGURE 22.2.

MAYOR


ADMIN AND FINANCIAL AFFAIRS
INFORMATION
BUILD UP COMPUTERISED DATA BASE TO SERVE ALL TECHNICAL NEEDS AND KEEP DATA BASE UP TO DATE
PROJECTS
PREPARE AND CARRY OUT ALL MUNICIPALITY DEVELOPMENT PROJECTS
TECHNICAL
CO-ORD


MAYOR OF JEDDA
MUNICIPAL AFFAIRS
TECHNICAL AFFAIRS
INFORMATION CENTRE
DEP. MAYOR FOR TECHNICAL AFFAI
ASST. DEP. MAYOR FOR TECHNICAL AFFA
STRATEGY GROUP
(STRATEGIC PLANNING AND CONTR
STUDIES DEPT.
FOLLOW DEPT
SUB-MUNICIPALITIES
INFORMATION GROUP
(DATA & INFORMATION CONTROL FOR ALL TECHNICAL INFORMATION SYSTEMS)
NORTH GROUP
NEW JEDDAH
AZIZIYAH
NEW AIRPORT
S. CORNICHE
N. CORNICHE
OBHUR
CENTRAL GROUP
CHARAFIYAH
AL RUWAIS
AL WALAD
HINDAWIYAH
WAHI MALIK
SOUTH GROUP
AL THAGAR
UNIVERSITY
KHUZAMA
AL NUWA
UMM AL SALAM
SURVEYING DEPT
ARCHIVES & MAPPING DEPT
LANDS DEPT
C
C
C
C
C
C
C
C : CO-ORDINATOR
CO-ORDINATION CMTTEE
CHAIRMAN : ASST DEP MAYOR FOR T.A.
MEMBERS : GROUP CO-ORDINATORS
STUDIES DEPT (1)
FOLLOW-UP DEPT (1)

ANALYSIS

The Master Plan for Jeddah, which was prepared in 1971-72 for a future 20 year period, could not have envisaged the momentous events of international significance which would subsequently have a direct effect on the Plan. These events were, first, the emergence of OPEC as a controlling agency which could regulate, apparently at will, a price fixing structure for most of the world's oil supply. Secondly, stemming from this, the vast revenues which would accrue to Saudi Arabia. Not only did the price of oil increase from $1.80 per barrel in 1970 to $36 per barrel in 1981, but Saudi Arabia's output increased from 3.5 million bpd to 9 million bpd. This resulted in an increase in annual revenue of the order of $9,526 million i.e. from $2,300 million in 1970 to $11,826 million in 1981.

A principal beneficiary of this wealth was the City of Jeddah. During the period of the Third Five Year Plan (1980-85), Jeddah received about one third of the Kingdom's total expenditure on development projects. Excluding the considerable sums spent on land expropriation and compensation for roads and open spaces, the Municipality's budget for projects during this five year period was of the order of SR4,272 million. This amount has been summarised as follows:

Table 23.1 Third Five Year Plan - Jeddah Municipality Projects; Total Cost

Subject	Budget (SR)
Jeddah Corniche	272,000,000
Tunnels and bridges	137,600,000
Roads:	
Beautification	1,827,202,000
Temporary asphalting	470,000,000
Walkways and lighting	210,000,000
Stormwater	732,273,000
Public Gardens and Plantations	120,946,000
Public Markets	119,888,000
Other Projects	366,820,000
Computers	16,000,000
TOTAL	4,272,729,000

Source: Municipality of Jeddah, Training Seminar for Engineers, February 1984.

In order to obtain a comprehensive picture of the overall expenditure/investment in the city over this period, other public spending must be added to that of the Municipality. Such expenditure included that on Education, Health and a wide range of religious and cultural facilities; on massive infrastructure programmes to provide water, electricity, sewage and telecommunications; on the major 'one off' projects such as the new International Airport (the cost of which was of the order of SR3,100 million), Saudia City to accommodate airport and Saudia employees (population approximately 20,000), the vast expansion of

the Seaport, King Abdulaziz University (including a new township for university staff), the Naval Base (again including a staff township), other major public housing projects by the Ministry of Public Buildings and Works, and self-contained community developments by various Ministries and Government Departments for their staff (e.g. Ministry of Defense, National Guard). In addition to the Municipality expenditure on roads listed in Table 23.1 the Ministry of Communications was responsible for the design and construction of the city's primary road network.

It is not possible to obtain records of expenditure on these projects, but in the writer's estimation, it is possible that the total public expenditure on Jeddah during this period could have peaked at over SR500,000,000 (approx £80,000,000) per week.

What almost created an uncontrollable situation was not this vast public expenditure, but its accompaniment of private spending which almost overwhelmed the Plan and the planners.

The fundamental reasons for this lie in the politico-institutional context. During this period of unprecedented growth in the late 70s-early 80s the Municipality was under political pressure not unduly to constrain development. In many ways this was an understandable concomitant of the growth of prosperity in a developing country. The improvement of living conditions is one way

in which people can be seen to be enjoying a share of national wealth. Against this policy, the Municipality's powers to exercise development control though the issue of planning and building permits was of limited value.

An example of this Government policy was the the provision of non-interest bearing loans for residential development by the Saudi Arabian Real Estate Development Fund (REDF). The REDF was established in 1976 to provide interest free loans to individuals and small investors up to SR300,000 repayable over 20 years. The loan itself would be reduced by 20% for timely repayment and by a further 10% for early repayment. The availability of such funds, and the terms under which they were offered, led to a boom in private residential development. In Jeddah, as a major centre, greater advantage was taken of this facility than elsewhere in the Kingdom. This, in turn, added to the pressures placed on the Municipality to grant permissions for housing development.

Within this context, it must also be mentioned that considerations of National Defence and internal security coupled with the private interests of influential businessmen could override Municipality plans and lead to irrational development.

History and tradition also presented difficulties in the presentation and orderly implementation of the Plan. It is in the nature of the Sha'aria not to present unnecessary restrictions on the individual in making benefi-

cial use of land legally in his possession.

Under all these circumstances, the orderly and controlled phasing of development by five year periods enumerated in the RMJMP Master Plan became unrealistic and unenforcable.

Additionally, the MOMRA reforms implemented in 1976 as a result of the McKinsey recommendations (op cit p.168 Chapter 10) did not include powers for the Municipality to exercise strong controls over private development.

The pace of development and the pressures outlined above meant also that the Municipality similarly had limited powers to control land use. This applied for example to sites zoned for schools, mosques and other social facilities. The providing authority would often find it more convenient to purchase a site not in accordance with the Action Area zoning plan but on land where a purchase, by negotiation with the owner, could be more readily obtained irrespective of its suitability for its purpose. In practice, it proved impossible for the Municipality to prevent a change of use from that permitted. A recurring example of this was the use of residential accommodation as offices.

Another deficiency was the reluctance, by the Municipality, to apply the car parking standards provided for in the Master Plan follow-up studies. In new areas of development, this was overcome, to a considerable extent, by increasing the cross-section of the road to

allow for extra parking lanes on one or both sides of the road.

Sert Jackson International, in their 1978 review of the RMJMP Master Plan (op cit Chapter 20) highlighted three aspirations of the original plan which it had been impossible to realise. These were summarised as:

1 A hierarchy of shopping centres from city to community level. In the Review Plan this concept was replaced with unrestricted ribbon shopping development along major roads.

2 District Centres serving local commercial and community needs.

3 The servicing of areas with utilities prior to development.

With regard to the first two aspects, the RMJMP Plan may have been idealistic rather than pragmatic in its approach. The value of such an approach did however receive the full support of the Ministry at the time the Plan was prepared. The third aspiration was similarly frustrated due to the unprecedented rate of city growth which occurred during the first ten years of Plan implementation.

EVALUATION

The existence of an official plan approved prior to the 'boom' period of growth allowed the city to grow within an ordered and generally controlled framework. As has already been discussed, the surge of private development and the forced pace of development overwhelmed other aspirations of the Plan. However, the essentially robust and, at that time (if the high population estimate is taken), the ambitious growth targets allowed for in the Plan enabled the planners to channel this dynamic growth within the planned framework.

The vast expenditure on public works, particularly roads and infrastructure, matched by the tremendous efforts made by the Mayor through his Co-ordination Committee to achieve coherent, rather than chaotic, results could be said, in fact, to have accelerated the implementation of the Plan rather than to have destroyed it. In this, there can be no doubt that the existence of an approved plan within which capacity for expansion to about 2,000,000 population had been allowed was the essential pre-requisite to guide and control this period of unparalleled urban growth.

Indeed, it is likely that the reason Jeddah received such a large share of national investment during this period was because it did possess an approved Plan and, thus, investment could confidently be channelled directly into its implementation.

What was inescapably attendant on such major and rapid programmes of implementation was the inconvenience to the residents of the City who had to live and work through the disruption and upheaval such programmes inflict. At different times, large areas of the City suffered electricity cuts and an unreliable water supply as streets were dug up to install new or larger cables and pipelines or that the demand exceeded the resources to maintain the service. Disruption caused by road construction often meant traffic congestion and delay. This is exemplified in Figure 23.1 which indicates the principal shopping thoroughfare - King Abdulaziz Street - looking more like a construction yard than the heart of a busy, bustling shopping area.

A more serious aspect of this construction boom was the extent to which 'value for money' was achieved. In the mid to late 70s, the supply of building materials, mostly imported, could not keep pace with demand. At one stage, the average period spent offshore by ships awaiting an unloading berth reached 112 days and a fleet of helicopters was used to expedite unloading. Labour was in short supply and skilled tradesmen could command a premium for their services. Inevitably project costs increased, particularly where ambitious target completion dates were imposed on the contractor. Concern was expressed by the public sector that collusion was suspected in tendering for and carrying out major projects both between consultants and contractors and between contractors tendering for the same project. One result of this was that the

consultants appointed for the design/contract documentation stage would be replaced by an independent consultant of a different nationality for the supervision stage of the contract.

In the private sector, the provision of residential accommodation to meet the growing demand necessitated by the economic boom was thwarted by the profits to be made out of speculation in land. Short term gain, rather than longer term investment, directed a great deal of private sector money into the buying and selling of land as an end in itself. It was only when rents reached such a pitch [the writer's experience is that the rent for his home in 1970 was SR16,000 per annum; the same villa, in 1977, was leased for SR160,000 per annum] as to assure a prodigious return on investment, that speculation moved into buildings rather than land. And then, quantity rather than quality was the keynote.

Reliable information is impossible to obtain, but by inspection and by a general awareness of the situation, it is the writer's judgement that value for money was not achieved in the construction field in the mid to late 70s. With such doubtful standards of construction, future problems of safety and stability of structures and applied decorative features (e.g. blockwork walls with a marble external facing) will arise.

During the early 80s a noticeable improvement in standards of construction began to take place. Tighter controls and

inspections by Municipality engineers ensured that sub-standard construction would no longer be accepted. Also, by the mid 80s, speculative housing developments had almost ceased. This was the direct consequence of the precipitate action which, by 1982-83, had created a large surplus of apartment type housing.

Speculation in shopping and commercial centres, although still in evidence in 1984, had again dwindled, but not before several over-ambitious, badly located centres were built which, by 1985, lay mainly unoccupied.

For the inhabitants of Jeddah a welcome outcome to this period of overbuilding was that rents, for housing, shops and office space began to return to a more normal situation. Developers, who had built well and who asked a fair, rather than exorbitant rent found tenants and continued to be assured of a commercially viable development. Property speculation, as distinct from bona-fide property development, was an unfortunate but perhaps inevitable product of this period of rapid growth. Since the early 80's, well-designed and constructed villas, apartment buildings, centres and public buildings have improved and stabilised the city.

The Mayor of Jeddah, in addition to the official and diplomatic responsibilities of his office, took a direct involvement in vetting the standard of new development and, in particular, the environmental quality of Jeddah. The Mayor personally examined all major development appli-

cations, including those for public buildings - particularly mosques - and initiated a city wide programme of landscaping and the provision of public parks and gardens. The Mayor was also able to persuade leading businessmen and companies (Saudi and expatriate) to contribute works of art including fountains, monuments and sculptures to enhance the city. This was done, in part, because no provision was made in Municipality budgets for such adornments and also because it was the Mayor's opinion that the people of Jeddah would have greater regard for their city if functional requirements could be balanced by grace and dignity.

Prior to his appointment as Mayor as liaison officer to RMJMP, Eng Mohammed Said Farsi had participated in the preparation of the Master Plan. He was confident that the Plan had been prepared soundly and that it was an appropriate framework for growth. The Saudi engineers, architects and planners, who had been members of the team which prepared the plan, went on to receive senior posts in technical departments in the Municipality, in MOMRA or in the Ministry's regional office in Jeddah. These professionals were, again, determined to place development within planned rather than an ad hoc framework.

Thus, the aspirations of the training programme initiated in 1971 was to prove its value to an even greater extent than could originally have been anticipated. It also provided continuity in people and in decision making

throughout the preparation of the Plan and its implementation. This continuity maintained a stability, purpose and sense of direction which was vital in serving the best interests of the city during a period of rapid growth and change. The continuing presence of the Consultants who had led in preparing the Plan and whose experience remained available to assist the Municipality, was a further major factor in maintaining this sense of purpose and direction, as well as ensuring an ability to cope with the unprecedented pressures and demands placed on the Plan and the planners.

In his concluding speech to the engineers of the Municipality at the training seminar held in February 1984, the Mayor reminded young engineers of their duty and responsibility to their city as follows:

> "It has taken a great deal of planning, thought and effort over the last fifteen to twenty years to achieve what you now see. Everyone in the Municipality, myself included, took part in this effort. Younger, newly graduated engineers have to gain the necessary experience before they can take charge of a department ...
> We should learn how to blend all the information we have gained into a better knowledge and understanding of both the specific and strategic nature of our work. Thus, if you specialise in highway design or road construction you should still be aware of the quality of the environment and aesthetic as well as practical values ... A city is like a person : it has a heart and it must live".

During the preparation of the Master Plan, thirteen key objectives which the Plan should seek to fulfil were listed (op cit Chapter 9). Fifteen years later, an evaluation as to what extent these objectives had been

fulfilled could be summarised as follows:

Objective A "... to ensure adequate and continuous supply of water and energy".

The achievement of this mundane yet essential factor in urban formation must be accounted a major success. For a brief period in the late 70s, when construction problems affected supply to parts of the city, interrupted provision of supply occurred. Apart from that hiatus, from 1980 onwards, the city and all its inhabitants were assured of a plentiful supply of water and electricity. Note: A distinction must be made in the case of the illegal and unplanned developments which took place in fringe areas of the city where it was not the planned policy to service such areas.

Objective B "Promote the maintenance of public health at all levels".

New government hospitals and clinics, to the highest health and welfare standards, now serve the people of Jeddah. Specialist and general private hospitals augment the free service provided by the government.

Within the responsibilities of the Municipality, the cleanliness of the city, the maintenance and watering of parks,

planting and gardens is effectively carried out. Refuse collection and street sweeping is dealt with on a daily basis by a public health company under contract to the Municipality. Their duties include pest and mosquito control, street maintenance and removal of abandoned cars. In addition to the general function of keeping the city clean and tidy at all times, training programmes for Saudi staff are carried out by the company. These programmes also include the education of school children in the importance of keeping the city clean and tidy.

Objective C "Provide an adequate road network at city and local levels".

This objective has been, like Objective A, a signal achievement. Few cities today have achieved as comprehensive and efficient a road network and one which respects the quality of the environment as that of Jeddah's.

Objective D "Encourage the development of appropriate public transport systems ..."

As described in Chapter 18 (Urban Public Transport) the city now has an efficient public transport system using buses for local and inter-city needs. Currently (in

1985), the Municipality is reviewing a proposal for a rapid transit system in conjunction with the Transyt Company of Toronto, Canada. The feasibility of a 2½ km central area pilot proposal awaits a decision by MOMRA and Ministry of Communications as to whether or not it will be allowed to proceed as the initial stage of a segregated rapid transit system.

Objective E "Achieve ... an appropriate mixed distribution of high, medium and low income groups to maintain social cohesion ...".

In this the Plan cannot claim to have achieved fulfilment. In overall terms, a polarity has occurred between the northern private high income sector residential areas and the low income groups concentrated in the southern residential areas. At the local level, apart from the luxury villas in select enclaves within the residential areas north of Palestine Road and west of the Medina Road, a more random mixture of development has achieved a socially acceptable balance of building density and income groups. As Saudi Arabia is a rich country, however, it must be stressed that there is no impoverishment or deprivation. With severe punishment for criminal or moral offences, lack of older, decayed inner areas

or suburbs and little if no unemployment, the city enjoys a comparatively safe, healthy, morally disciplined but amenable lifestyle.

Objective F "Provide sufficient religious, medical, educational, administrative and recreational facilities ... taking into account special aspects of life in Saudi Arabia".

The "special aspects" were the deep rooted Islamic customs and way of life of a strict Muslim community and the determination, by the leaders of the country, to maintain these values. In this context, the act of prayer five times each day, the strict observance of fasting during the holy month of Ramadan, and the general conduct of the people of Jeddah, non-Muslim as well as Muslim, reflects that of a city in the country holding custodianship of the Holy Places of Islam. At the purely local level mosques, schools, hospitals, clinics, parks and gardens have been provided generously to serve the people of Jeddah. In this, the great wealth of the Kingdom has been applied unstintingly to achieve this objective.

Objective G "Encourage development of local industry and employment".

In so far as a Plan can be supportive towards the attainment of this objective, then it could be said to have been so. The

Ministry of Trade and Commerce, in support of the Third Five Year Plan's objective to encourage growth in the private sector, has made land and essential services in the Industrial Estate available at very low cost. Other institutions such as the Islamic Development Bank have granted generous facilities to assist new businesses and commercial ventures. Also, Jeddah's role as a major regional administrative centre, provides substantial employment opportunities in the public sector at all levels.

In the private sector Government regulations, which require that a Saudi national represents non-Saudi commercial and industrial concerns, ensure local involvement and thus a share in the prosperity of all aspects of trade and business. In this context, the merchants of Jeddah lead the Kingdom in experience and expertise.

As well as University courses in Business Studies, Institutions offering technical training in trades and skills have been set up by the Government to prepare Saudis to take a more direct role in the management of trade and industry.

The building industry, which in 1978 accounted for 14% of the workforce is currently in decline. This should be partially offset by the growing need to service and maintain both the existing infrastructure and the built environment.

Objective H "Support development of business and commercial planned activities ..."

This objective correlates with G. Again, in so far as the Plan and its implementation was able to provide for the physical infrastructure of roads and services together with adequate land for development to support growth in these sectors, then this Objective was achieved.

Objective I "Control city growth to the extent that is necessary to allow maximum benefit to all, at least inconvenience".

An evaluation of this objective rests on the interpretation of 'maximum benefit'. If the worst excesses of private development have been eradicated and, if the inconvenience of living within a vast construction site has passed, then the benefit of living in a clean, organised, green and efficiently planned city may now be said to be beneficial to the people of Jeddah.

In the sense of a planned phasing of growth,

then, as already instanced, the Plan could not be said to have succeeded.

Objective J "Provide development controls to ensure the beneficial and balanced growth of the city". As discussed in Chapter 10, planning regulations of a consistent and comprehensive nature do not exist in Saudi Arabia. The Municipality control land use and density of development by first, specifying the land use in the planning permission (although this, as mentioned earlier, was in many cases unenforcable in practice). Secondly, by applying formulae to control density of development based on percentage land use cover and height of buildings (see Figure 12.1, p203). The Municipality maintained environmental and social standards in new development areas by ensuring that provision was made for non-residential purposes e.g. open space, school sites, shopping and community facilities, appropriate to need.

There is much to be said for such, essentially, simple regulations where no overall statutory controls can be applied. For the most part, these rules did control the density of development to an extent which maintained a balance of road space (and thus traffic volumes), consumption related to

provision of public utility services, social and environmental standards.

Objective K "Safeguard areas of buildings of outstanding architectural and historic value as part of the conservation of the Islamic tradition".

This objective referred primarily to the special case, which was emphasised in the Master Plan Report, of the Historic City. Continuing to emphasise this objective led to the Historic Area Study (op cit Chapter 14) and to the conservation and rehabilitation of this outstanding urban heritage. Without the pursuance of such an objective, it is likely that the old city would, by 1985, have disappeared completely due to the market pressures and the potential value of the land for multi-storey city centre redevelopment.

Objective L " ... develop a dynamic sequence of city planning which will be able to respond to the pressures of growth and change".

The fact that the robustness of the Plan and the continuity achieved by the planners coped with the dramatic growth and change over the period 1972-85 could be said to indicate success in fulfilling this objective.

Objective M "Establish an effective information and classification system for data storage and retrieval".

This objective must be accounted for as a casualty of other, more immediate and demanding pressures on all technical staff involved in plan implementation. However, as described in Chapter 22, the Municipality are making considerable progress towards overcoming this deficiency.

Overall, in considering the extent to which the thirteen objectives set out in 1972 were achieved during the period of implementation to 1985, the evaluation must be that, to an even greater degree than might have been anticipated, most of the objectives could be said to have been achieved or progress made towards their attainment. An objective which fell short of achievement - that of social cohesion - was perhaps too theoretical to withstand the social and economic forces which apply to the individual's desire for a quality of life and the expression of this in his home as an indicator of his material success in life. Such 'clustering' of wealth to the exclusion of less privileged individuals is not unique to the city of Jeddah. More importantly however, the polarisation of income groups in Jeddah was neither absolute nor widespread, nor, at any level, had it resulted in deprivation or distress.

The second 'casualty' of rapid growth i.e. that of achieving a balanced and controlled sequence of develop-

ment (Objectives I and J), lacking adequate planning powers and the declared national policy to encourage growth, was simply not capable of fulfilment. One of the advantages of immense wealth, however, is that no penalty need be incurred under great pressures of growth in not adopting the most sensible and cost effective approach to the growth of a city.

A matrix of comparative degree of achievement of the thirteen plan objectives could be presented as follows:

Table 23.1 Plan Objectives : Matrix of Achievement

Objective	Degree of achievement		
	+	0	-
A	*		
B	*		
C	*		
D	*		
E		*	
F	*		
G	*		
H		*	
I		*	
J			*
K	*		
L	*		
M			*

As has been mentioned in this evaluation and in Chapter 10, no comprehensive planning legislation exists at national level. This poses the question that, if the Kingdom had possessed the equivalent of the British 1947 Town and Country Planning Act, would the legislation have assisted or hindered the approval and implementation of

the Master Plan. Underlying this question is, of course, the wider context of form of government. Saudi Arabia is a Kingdom ruled, to a large extent, by an autocratic ruler. Democratic processes in the form of elected parliamentarians or local government members as practiced in the United Kingdom do not exist in Saudi Arabia. Ministerial and municipal appointments are made by the King, in consultation with his Council of Ministers. Each city has a Municipal Council, again nominated, and, at the more local Hara level, an Omda, or wise man cum spokesman, represents local views and regulates such matters as registration of births, marriages and deaths and certificates of character.

In Saudi Arabia there is thus no elected planning body and no public participation in decision-making in planning and its implementation.

It is the writer's view that, such was the pace of growth and the magnitude of funds available to commit to the development of the city to serve this growth, that the statutory processes to be followed in, for example the UK by way of approval of plans and the implementation of development control, including public participation and the right of appeal, would have made both the approval of the Plan and its subsequent implementation within the time period demanded impossible. So rapidly did circumstances change and so great were the pressures requiring decisions and actions that, if the 'democratic' processes had also

required to be observed, the result would have been inaction when action was required and time lost when there was no time to lose.

Care should be taken in attempting to draw comparisons between what is appropriate to a UK situation i.e. that of a mature society with an ingrained sense and acceptance, indeed insistence, on democratic procedures to that of a comparatively newly founded country with no democratic or urban traditions and, almost overnight, the possessor of vast wealth. In the latter circumstances, the manner in which Saudi Arabia is governed and decisions made is appropriate and has undoubtedly best served the interests of the City of Jeddah during the period with which this work is concerned.

One example in support of this view is that by 1984, 350 km of the planned 600 km primary road system planned for Jeddah in 1991 was in operation. About a further 50 km of the network was under construction and a total of 42 grade separated interchanges were either completed or under construction. This can be compared to a UK metropolitan situation wherein has lain years of proposals, reports, debate, public inquiry, and comparatively little achieved in the construction of a road system capable of meeting the traffic demands imposed upon metropolitan areas.

HYPOTHESIS

This work has been concerned primarily with presenting a record of what happened during this dynamic period of growth and expansion of Jeddah and to explain how it happened. But why was it that it did happen? Could it be said that what happened would have taken place simply because needs and pressures made it inevitable? Or was there, in some way, a combination of factors within which and from which (or conversely, without which), the City of Jeddah could not possibly have achieved a fourfold expansion in fifteen years in a comprehensive rather than piecemeal and, generally, in an efficient, rather than wasteful, manner?

The writer's judgement is that such a combination of critical factors can be identified and that without the interaction of four elements, each one essential to the other in creating a whole, what was achieved and how it was achieved would not have been possible.

The four components which prepared the city for growth and which, despite tremendous pressure, maintained a harmonious and cohesive whole, were the following:

1 A framework within which growth could be organised and directed.

2 A committed activist with the necessary authority and aptitude to ensure that the complex and multiple agencies, public and private, involved in the process of

city growth were marshalled and coordinated towards the cohesive implementation of the Plan.

3 Continuity in decision making.

and

4 The potential availability of resources, principally financial, to provide for the demands of growth.

The first component - the framework for growth - was the Master Plan. A working rather than theoretical document, the Plan was used throughout to maintain direction and equilibrium. In 1973, in so far as the writer is aware it was the only, and thus first, physical planning report and Master Plan to receive the approval of the Council of Ministers (this factor had a direct bearing on the fourth component listed above). The success achieved in implementing the Plan lay in the nature of its preparation. The variable rather than fixed growth rate over the period 1971-1991 was crucial in the Plan's ability to serve the future. Also, the continuous detailing, revision and updating of the Plan was a basic part of the Plan's implementation. In this, the 'philosophy' of the Plan of an approach and methodology which created a process of planning based on the Plan rather than a finite and inflexible plan could be judged to have been both relevant and correct.

Thus the first component provided the means but whether these means were to be used, ignored or squandered was an

equally vital factor. This brings the second factor into account - leadership. Mohammed Said Farsi was appointed Mayor of Jeddah in 1974. As Planning Officer for the Western Region, as liaison officer to the Consultants who prepared the Master Plan, and, as an architect by training, Mohammed Said Farsi combined technical experience with a positive and dynamic personality. Also, having participated in its preparation, he understood the Plan and the process by which it had been prepared.

Relevant as they are, these aspects, in themselves, do not constitute the essential factor of leadership which the Mayor, with increasing confidence, displayed in his management of the growth and development of Jeddah.

Although the circumstances of history can play a large part in making people what they are, the mark of the individual can make the difference between success or failure, between recognition or obscurity, between action or procrastination. In terms of their impact on cities, Shah Abbas in 17th Century Isphahan, or, earlier, the Medicis in 15th Century Florence, left a signal account of their personal greatness, as did, although for different reasons, Baron Haussman in 19th Century Paris. In 20th Century England, great civic leaders such as Neville Chamberlain in Birmingham and Herbert Morrison in the London County Council, each, in their own way, left their stamp of authority on their cities. Ebenezer Howard and his Garden City movement is a further outstanding example

of an individual who achieved a greatness appropriate to his place and time. Mohammed Said Farsi can be compared to these men in terms of his singlemindedness of purpose and his stamp of authority as Mayor of Jeddah.

It would be wrong, however, to say, and in this the writer is certain that Eng Mohammed Said Farsi would agree, that the building of a city could be the responsibiilty of any one person. This is the third quadrant of the circle - the team work and the continuity which was achieved in this over a fifteen year period. Starting with the Consultants and their training programme for Saudi engineers, from this foundation was built a knowledgeable, experienced cadre of professionals who continued, both Saudis and Consultants, to detail and develop the Plan and to be involved directly in all stages of its implementation. It is difficult, perhaps unjust, to single out names but the writer is able to quote the Mayor on this:

> "We were like pioneers, discussing and planning the future of Jeddah. Your Saudi colleagues whose names come to mind include Hassan Assad, Tarif Assad, Abdulaziz Hussain, Abdulaziz Abbas, Ahmed Sawan, Zaki Farsi, Sami Al Khatib, Barakat Bajneid, Amr Darwish, Abdulla Baeissa. These and many others all worked together without any disputes or disagreements with the experts who came to help and guide us in our work."

The 'experts' mentioned by the Mayor was the RMJMP multi-disciplinary team. The nature of regional or city planning is such that many skills must be brought to bear to comprehend the many elements involved. This includes expertise in the fields of sociology, economics,

geography, transportation and highway planning and environmental standards and design. Information, when collected, requires to be checked, analysed and synthesised. Resources and objectives need to be quantified and alternatives evaluated. Only then can plans and programmes be prepared.

This is a process which requires a composite approach - that of several minds working together to achieve balanced and comprehensive solutions. In this process, the individual must be prepared to fuse his thoughts and findings with those of others. The harmonious achievement of this fusion of minds is the responsibility of the director of the project. He stands as the arbitor and final decision-maker on behalf of his team.

As a footnote it should be mentioned that because of this element of continuity, the lack of achievement towards the objective of establishing an effective data storage and retrieval system was less serious than might otherwise have been the case. Perhaps this is not the best way to build up a databank and has, inevitably, limitations in time, but in practical terms, this continuity of people did much to ensure consistency in decision making.

With regard to the fourth factor - the potential availability of financial resources - the key word is 'potential'. The aim of the Council of Ministers to ensure that sufficient resources would be made available for the overall improvement and betterment of the standard of life for the

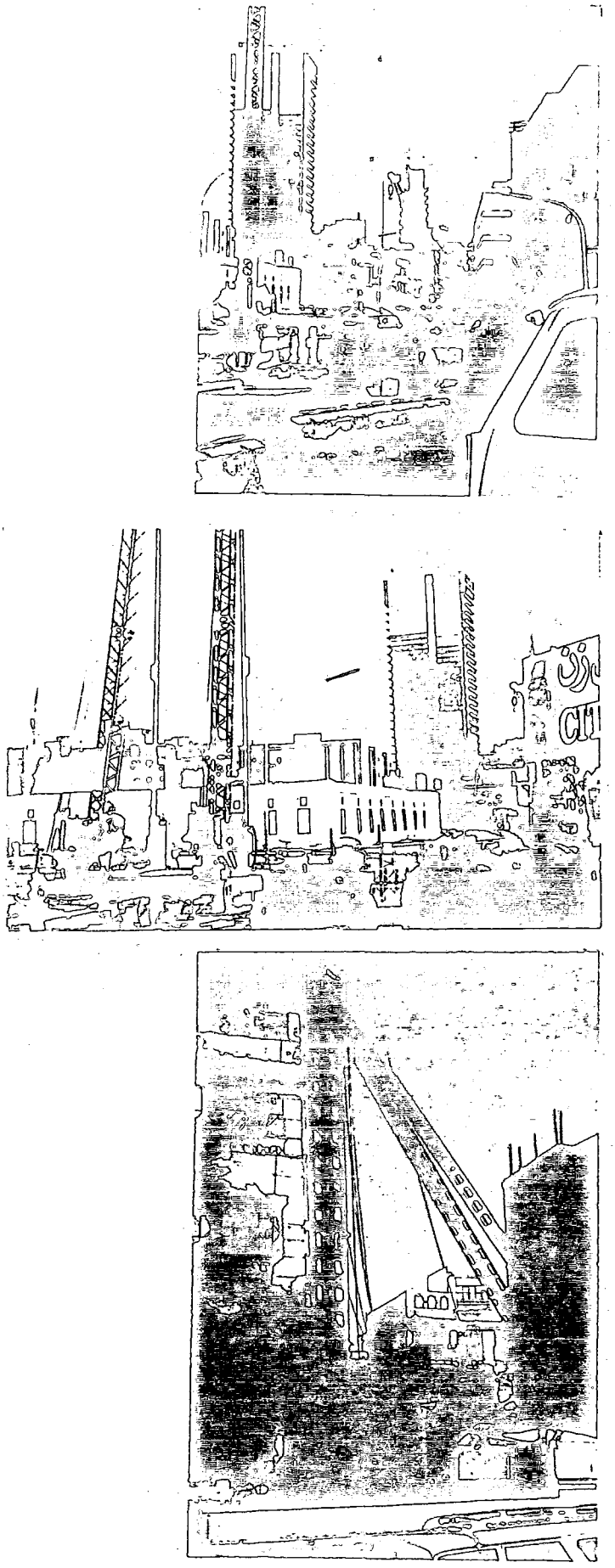
people of Saudi Arabia had to be paralleled by the efficient, rather than wasteful, distribution of the vast resources available. In this Jeddah, with an approved framework for growth and possessing, due to its existing strong geographic and economic base for growth, the greatest potential of any city of the Kingdom to absorb growth, was ready and able to take full advantage of this situation.

Thus, the four key ingredients of direction, leadership, continuity and resources combined, in thought and in action, to achieve the development of a city at an unprecedented rate, but firmly and securely within an overall and consistent development framework.

Finally, mention must be made of the High Committee which, such was the importance attached by the Kingdom to the Western Region Plan, was set up to supervise and approve the consultants' work (op cit p69). Under the chairmanship of HRH Prince Faway bin Abdulaziz, the senior participating members of the High Committee were HRH Prince Ahmed bin Abdulaziz (Deputy Governor of Mecca) and H E Sheikh Abdullah Sudairy (Deputy Minister for Municipal Affairs). The outstanding quality and ability of these two leaders did much to ensure the successful preparation and implementation of the plan. In this they were supported by the other members of the High Committee and the Technical Committee, notably Dr Omer Azzam, an architect planner, and Engineer Saud Lingawi, who had, as Director

General for Planning, the overall responsibility for planning within the Kingdom, and of course, the Mayor of Jeddah.

In the final analysis, the human element is the single most important element of all.



KING ABDULAZIZ STREET, 1973 SHOWING TRUNK SEWER UNDER CONSTRUCTION.

FIGURE 23.1.

As has been described in Chapter 14, the old city of Jeddah is an outstanding example of distinguished vernacular architecture and townscape. It is difficult to believe in this, the 20th Century, which has seen more rapid change than perhaps any other period in history, that, until 1947, Jeddah was a small walled city.

> "When I think of Jeddah today, a city of over one and a half million people, I can also think back to a time when Jeddah was situated only with her walls, like a white dove, nestling peacefully on the seashore, awaking at daybreak, seeking her livelihood from the sea: fishing, commerce, cargo transportation."
>
> Eng. Mohammed Said Farsi, Mayor of Jeddah, 1984

Thus, 23 years later, in 1970 - when the writer started his stay in Jeddah - the city within its walls, virtually unchanged for more than a century in both its built form and way of life, was a clear, living memory to Saudis of the writer's age. With such a splendid heritage to appreciate and learn from, the writer resolved that the future architectural expression, as well as the planning of the city, should seek to achieve, in a contemporary form and expression, a comparative significance.

To attempt to write an appreciation of how successful or otherwise the quality of the environment and the built form of the development which has taken place over the fifteen years covered by this work, is not easy.

Certainly, the creation of a Corniche and the rehabilitation and restoration of much of the old city must be accounted as positive contributions to the quality and to the 'genius loci' of Jeddah. Equally positively, well designed buildings, many of them the recipients of international awards, have given the city an architecture of distinction. Three of many such developments are the new Airport (terminals designed by Ed Stone) and, in particular, the Hadj shelters (designed by Skidmore, Owings and Merrill); the new downtown Saudi Arabian Monetary Authority Headquarters (designed by Scott Rowell and Caudett) and the home of Abdulaziz al Sulieman, a magnificent interpretation of the vernacular style into contemporary expression, by the Aga Khan award winning Egyptian architect, Abdel Waheb al Wakil. Many other fine buildings, both public and private, exist and, particularly in recent years, the overall quality of architecture has improved.

Fine buildings, by themselves, however, do not necessarily create an urban environment. The creation of an environment of quality lies as much with the private, as with the public, sector. It also requires a meaningful relationship between man, space and time.

For example, the Historic City is an excellent example of a harmonious and distinctive urban-architectural form and continuity which was appropriate to the social order, climate and quality of life of its inhabitants one hundred

years ago. The keystone of this was the family and the family home, private and embracing several generations of the same family living together in harmony.

This way of life is no longer the norm. Younger Saudis now wish to have a home of their own and tend to form a husband/wife family group, separate, but linked, to the rest of their family. The car, as much as any other single factor, has promoted this trend. In addition, affluence allows a wider choice, including foreign travel and a desire for a wide range of recreational, shopping and other facilities. Again, within the space of a generation, Saudi Arabia has developed from a vast, sparsely populated, almost isolated country, into a significant voice in the affairs of the non-communist world. Inevitably, such major changes at both the international and national level, together with a dramatic improvement in the standard of education of the younger Saudis, has produced a lifestyle different from that of previous generations.

What has not changed is the adherence of the Saudis to the tenets of Islam. Continuity and probity in family life and in the conduct of national affairs has been maintained. Outward expressions of life and habitat are perhaps a sign of a different lifestyle, but, fundamentally, the way of life remains unchanged.

This subject in its wider and deeper manifestations, implications and relationship to the form, character and

quality of the emergent urban environment, within the context of all the complexities and opportunities of contemporary life is really the subject of a thesis in itself. The writer, in this work, wishes to make the point, that within the planning and architectural context of a city, lies the inter-relationships and interaction of social, cultural, monetary and climatic values.

Kaizer Talib[1] describes the contemporary living environment in Saudi Arabia as follows:

> "There has been a great amount of environmental change in the living and working conditions of the urban as well as rural population in the last twenty to thirty years. It is not only the possibility of importing new goods but the basic infrastructure (such as new roads, electricity, water, sewer, telephones and television) which seem to affect the lifestyle directly. Increased leisure time, better communication over long distances within the country, and the increased awareness of the world at large brought about by the different media have created new possibilities. In the rural areas, electrification, water and sewer systems have greatly improved the hygiene level.
>
> The unprecedented rate of urbanisation has affected both opportunity levels and physical environmental conditions in the cities."
>
> and again:
>
> "in spite of factors which influence urban life and cause alienation, the Saudis steadfastly maintain their own cultural values, social patterns, family life, and community relationships through contact with 'original' communities or neighbourhoods, villages or towns".

The extent of urbanisation in Jeddah, measured in built-up or partially built-up land, gives some idea of the rate at which this process has taken place. The walled city of 1947 encompassed 1½ sq km; by 1971 this had grown to just

over 40 sq km, but, by 1985, the urban area of the city had extended to over 1,200 sq km, with a densely developed 'core' of over 300 sq km.

These figures highlight the significance of an 'unprecedented rate of urbanisation'.

In qualitative terms, Kaizer Talib reports on Jeddah thus:

> "The Mayor of Jeddah, engineer Mohamed Said Farsi, is one of the few individuals in the country concerned about preserving traditional buildings. Approximately eight hundred of Jeddah's old houses will be saved by a preservation order. Building codes are also being established that would require designers to design in the context of the existing environment in the older parts of the city. In a rapidly stimulated urban economy, the implementation of such preservation orders and direct intervention by the local (and sometimes central) government agencies may be the only means by which the vernacular architecture can be preserved, restored and recycled".

This supports one of the key factors of the hypothesis set out in the preceding chapter, i.e. that of leadership. Although not able to avoid entirely the mediocrity of much of the new development the personal involvement of the Mayor has ensured that the quality of the new reflected an affinity and continuity with, now that Suakin[2] has entirely disappeared, the unique and magnificent vernacular of the old.

In terms of the environment, the Municipality of Jeddah has over recent years commissioned Consultants to prepare detailed studies which have led to the implementation of area improvement in older inner areas of the city. In new areas, as has been described in Chapter 17, generous pro-

vision of ancillary facilities and open space has been made in conformity with Municipality standards. This is, of course, a different matter from the control of the standard of design by the individual owner, but such regulations at least provide an overall coherance, context and framework within which the individual idiosyncratic expression of built form can be tolerated.

In a continued effort to raise the standard and quality of development, the Municipality during 1984-85 carried out a comprehensive review of the system whereby architects and engineers receive the licence which allows them to submit projects for Municipality approval. Non-licence holders are not allowed to submit plans and no building can be constructed (legally) without a building permit first being issued by the Municipality.

The first part of this review set out the experience and standards required of architects and engineers before they would be allowed to join the Municipality's register of Licenced Engineers. According to experience and assessment of achievement, each Consulting Office, Engineering Office or Engineer is now permitted a maximum number of design and supervision projects per year. This ranges from an unlimited number and size of project (Saudi Ministry of Commerce Registered Saudi Consulting Offices) to a maximum of six projects, each of not more than 1,200 sq km in gross area and three storeys in height for engineers with 2-3 years experience. Each year, this grading

system is reviewed by the special committee (which includes an expert on Islamic vernacular architecture). Engineers can have their permitted number of projects and magnitude of projects increased or decreased according to the quality of their work.

The Mayor has in mind to initiate awards for various categories of buildings. This award will take account of the context as well as the quality of the individual building or building group.

In order to obtain a building permit, the registered architect or engineer has to follow a three stage submission and approval process. First an avant project is required to indicate the general layout, concept, massing and use of materials proposed. Upon approval by the Municipality, the engineer then has to prepare a final design for his project, giving full details of layout, floor plans and, in particular, the elevational treatment proposed, with an outline specification of materials and external finishes. Only when this final design has been approved by the Municipality can the engineer then proceed with working drawings and contract documentation. The Municipality have set out what they consider to be the minimum requirement for this stage. No changes to the approved design will be permitted without prior approval. Finally, a nine part check list of stages of construction where inspection and approval to each stage is carried out for each project by the Municipality's supervising engineers.

This system, which started in 1985, should do much to ensure an improvement in the quality of design and construction throughout the city.

This approach is representative of the concern of the Mayor and his Municipality technical staff, now that (by 1985) the earlier frenetic pace of development has slackened. The Municipality are determined to raise standards of design and construction and, by so doing, strive to achieve a quality and form of built environment appropriate to that of an historic Arabian city.

NOTES

1 Talib Kaizer Shelter in Saudi Arabia (London: 1984).

2 See Reference 1, Chapter 14.

The form and structure of Jeddah as it exists today is that of its 1973 Master Plan. In city planning terms, it is a rare occurence to have achieved the implementation of a Plan for a major existing city within a fifteen year time period.

That this happened was not a matter of chance. Plans are not implemented unless all the people and agencies involved in the processes of implementation work together and work hard towards positive and productive ends. Furthermore, in a fluid situation of growth and change, it is vital that the Plan should make clear what is essential and what is detail. The writer has identified seven "essentials" which, jointly, maintained a sense of direction, balance and continuity throughout a remarkable decade and a half of dramatic city evolution. These were:

1 The Master Plan was not a self-contained study. It was prepared within a regional development framework.

Planning is an interactive process. Growth and benefit should not be restricted to cities to the detriment of rural areas. How to achieve a balance in this is not a simple matter; yet any urban study which neglects its regional or sub-regional context must be deemed to be incomplete, perhaps even damaging in its aspirations. Considerable thought was given by the Consultants as to how to achieve an integrated

urban/regional development programme. Examples of the success of this approach included:

a. The policy recommended and adopted of meeting urban water needs by desalination, saved livestock and agriculture from extinction in the wadis around (within, in the case of Medina) the Western Region cities. This policy also assured Jeddah of an adequate provision of water - a fundamental necessity.

b. The needs and functions of the Hadj were co-ordinated at city and regional level.

c. The urban primary road network integrated with the inter-urban network and programmes of construction.

d. The implementation of the new city at Yanbu by the Royal Commission for Jubail and Yanbu, secured a better balance of regional economic growth and distribution.

Jeddah's growth thus contributed to the wellbeing of the Western Region.

2 The Master Plan itself was conceived as an organic rather than static or fixed document. This meant establishing a system of planning which could - indeed had to - cater for pressures of growth unforeseen at the time of preparing the Plan. In this, the main

elements were:

a. Flexibility of growth to high or low population estimates.

b. A basic plan structure which was open ended in terms of potential for growth and rate of growth.

c. The directions of growth were those most sympathetic to the existing situation, natural setting and, overall, followed the embryo urban grain of the city.

d. Adequate provision for mobility and movement.

3 The three most important aspects, or opportunities, inherent in the existing situation were appreciated at an early stage and the maximum benefit derived from them. They were:

a. The sea

b. The Historic Area.

c. The development potential of the 'old' airport - a 20 sq km key urban site.

Where such key elements exist, their importance must be made clear. In other words, the planner must see wherein lie priorities and opportunities and not let them be lost by default or inaction.

4 The Plan attempted to identify, then maintain a sense

of rightness and continuity to the individual circumstances and characteristics of Jeddah. This is Patrick Geddes's "genius loci". Plan makers must respect this subjective aspect of their work.

5 The continuity which was achieved in progressing from plan preparation to plan implementation.

6 The continuity and strength of leadership maintained throughout this fifteen year period.

7 Motivation

An essential element of human endeavour. In this, the people involved rose to, rather than were overcome, by the challenge and opportunity inherent in such a vast and rapid programme of city development.

It is difficult to identify or to know where the process and application of planning stops. During his fifteen years involvement, the writer has ranged from considering the future of a region larger in area than the United Kingdom to the preparation of detailed measured drawings and contract documents for the restoration of historic buidings. What is important is to maintain a continuity of purpose and direction throughout; all are interacting parts of a whole, the one incapable of achievement without the other.

Technology is a planner's tool which has been taken up recently by the Municipality. Its Department of Technical Affairs is in the course of establishing a city wide tech-

nical data bank based on a computerised digital mapping system. This will improve the efficiency and productivity of Municipal services.

The improved quality of new buildings has benefited the urban environment. With this has come an increasing awareness, by the people of Jeddah as well as those participating in its development, of the need to ensure that Jeddah protects the heritage embodied in the traditional buildings and environment of the Historic City and maintains its qualities as an Arabian city by the sea.

Jeddah can face its future with confidence. It has experienced a tumultuous period of growth and expansion and emerged as a city of considerable individual character and distinction.

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Appendix A

بسم الله الرحمن الرحيم

المملكة العربية السعودية
وزارة الشئون البلدية والقروية
أمانة مدينة جدة

الرقم .....
التاريخ .....
المرفقات .....

(قسم)

الموضوع .....

٢٠ نوفمبر ١٩٨٤

الى : جامعة ديرهام

الموضوع : رسالة لجورج دنكن : " نمو مدينة جدة خلال السنوات الخمس عشرة) من ١٩٧٠ - ١٩٨٤ " .

بعد التحية ،

لا مانع لدينا من استفادة جورج دنكن من أية معلومات فنية يحتاج اليها في مساعدته على اعداد رسالته حول الموضوع المذكور اعلاه .

واننا لعلى ثقة بان هذا العمل سيكون سجلا مفيدا ومهما بسبب ما تحقق له من خبرة مباشرة طيلة السنوات الخمس عشرة الماضية . وسيقوم جورج دنكن عند اتمامه لهذه الرسالة ، وبناء على طلبنا بتزويد مركز المعلومات في الامانة بنسخة من رسالته .

) November, 1984

NIVERSITY OF DURHAM

HESIS BY GEORGE DUNCAN :
THE GROWTH OF THE CITY OF JEDDAH
/ER THE FIFTEEN YEAR PERIOD 1970-1984"

hereby permit George Duncan to make
se of such technical information as
ill be required to assist him in the
reparation of his thesis on the above
entioned subject.

am confident that, based on his fif-
en years' direct experience in the
anning and development of the City of
ddah, this work will be a most useful
d valuable record. On completion of
s thesis George Duncan, at my request,
ll place a copy in the Information
partment of my Municipality.

Appendix B

KUWAIT INSTITUTE OF ECONOMIC AND

SOCIAL PLANNING IN THE MIDDLE EAST

ANAPPROACH TO REGIONAL PLANNING IN SAUDI ARABIA

Prepared by : Abdulaziz Hussain Samman Felemban

May 1968

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The Problem and its importance.

In Saudi Arabia town plans have been prepared primarily for reorganisation of the buildings, dwellers blocks, and streets to meet the new needs of the people to live in better conditions. However, these efforts exerted would not lead to the creation of a comprehensive plan.

Planners realised the necessity of application of the various planning concepts tp the town, not only as a metropolitan but also to the surrounding areas under its jurisidition. Any deviation from that would lead to defective planning of the town and the entire region involved.

I have called for the adoption of regional planning principle to the local Government affairs in a statement published in the Saudi daily paper "AL BILAD" issue No.1563 in 1383. On 25.12.1384 I was offered an opportunity to go round most of the towns and rural districts of the Kingdom, to make studies for about five months. As a result of that study tour I came to the firm understanding that there is profound need for the adoption of the planning principle, at the level of a region for the development of town and rural affairs.

It was recommended that architectural standards be developed for the region with a view to improving means of living for the inhabitants of towns, to raise rural standards and to undergo planning and programming with the utmost justification and preference in all parts of the country.

As a prerequisite for regional planning we have to divide the Kingdom of Saudi Arabia into regions. This is what I am trying to do in this paper.

Problem of Research:

Most of the basic statistical data, whether demographic or economic & social, which are needed for this research, have been practically unavailable. To overcome such difficulty, in this research we adopted the approach of undertaking a preliminary survey which usually preceeds the comprehensive survey. As it will be mentioned later in this research, I am putting in here my personal experience for a period of five years, during which I have been responsible for town planning affairs. Also I am depending on reports which I submitted in this field, as well as my personal observations of the Kingdom, including a more recent tour for five months, which I took during the year 1964/1965.

This work is only a preliminary attempt in the direction of regional planning. It may be considered as a step in the right direction and I am hoping to have a chance to do more field work and analytical studies in the same field. I hope also that other colleagues would make use of this research as a starting point for further studies in this important area of planning in the future.

.... INTRODUCTION ....

CHAPTER I
INTRODUCTION

1.1 The Need for Regional Planning.

The complexity which has distinguished our modern life has created a need for new trends in all the aspects of national life and its goals. In recent times a growing need exists for activities such as town planning, countryside programming and for organising a new system of local government. Need is increasingly felt for the collection of statistical information and census data from various localities and for the regionalisation of such services as education, health, housing, water supply, electricity, roads and transport or even industry and agriculture.

The Kingdom of Saudi Arabia is a developing country with a vast area of about 2,150,000 square kilometers and a widely dispersed population in scattered settlements and activity centres. With distinct variety of national resources located in different parts of the country, and cultural activities in and around populated areas, it is very important to define the radiants and characteristics of such areas within the country, in an attempt to help in building up a strong base for economic and social development. It is to be mentioned that the regionalisation of development would provide a strong base for equitable distribution of public services among the population according to their needs in various localities in an integrated manner within the context of general development in the country. Through regional development, each region may become an active part of the country, capable of achieving for itself a balanced and proportioned development with the help of the central authorities, so that no single region may eventually over develop or remain under developed by comparison with the rate of progress destined for the country as a whole. This does not mean that the goal should be the establishment of absolute equality among all regions and localities in the country. Consideration must always be given to the natural capacity and resources in existance, as well as the cultural heritage and the historical characteristics of various regions, which naturally cannot be absolutely equalised.

1.2 Definition of Regional Planning.

The scope of planning can be national, regional, local or international in terms of resources and objectives. Whether the aims and objectives are economic or social or both, planning has its physical sides. This presentation is largely concerned with regional planning and more particularly with physical planning in Saudi Arabia with the view of reaching the most integrated and co-ordinated development.

As it is used throughout this research paper "Regional" planning deals primarily with physical planning of town and countryside, and the term is generally used with reference to the extension of town planning. Indeed in France it is often called "Urban regionalism". It may include the general planning of all available resources in the area, as in the organisation and work of the Tennessee Valley Authority in the U.S.A., an aspect which is becoming increasingly prominent in the planning programmes of other countries.(1.)

1.3

Scope of Regional Plans:

Regional plans are in essence the graphic representation of the policy to be followed with regard to the major elements of regional development, which are formulated on the basis of conclusions drawn from the result of regional surveys, and other complementary information on regional or national policy. Regional plans do not necessarily aim at accuracy of detail but rather at presenting a general outline capable of variation. In other words, while the proposals they contain should be feasible, it is one of their advantages that they can be both more comprehensive and more flexible than is possible in plans drawn up for smaller areas like a city or a town.

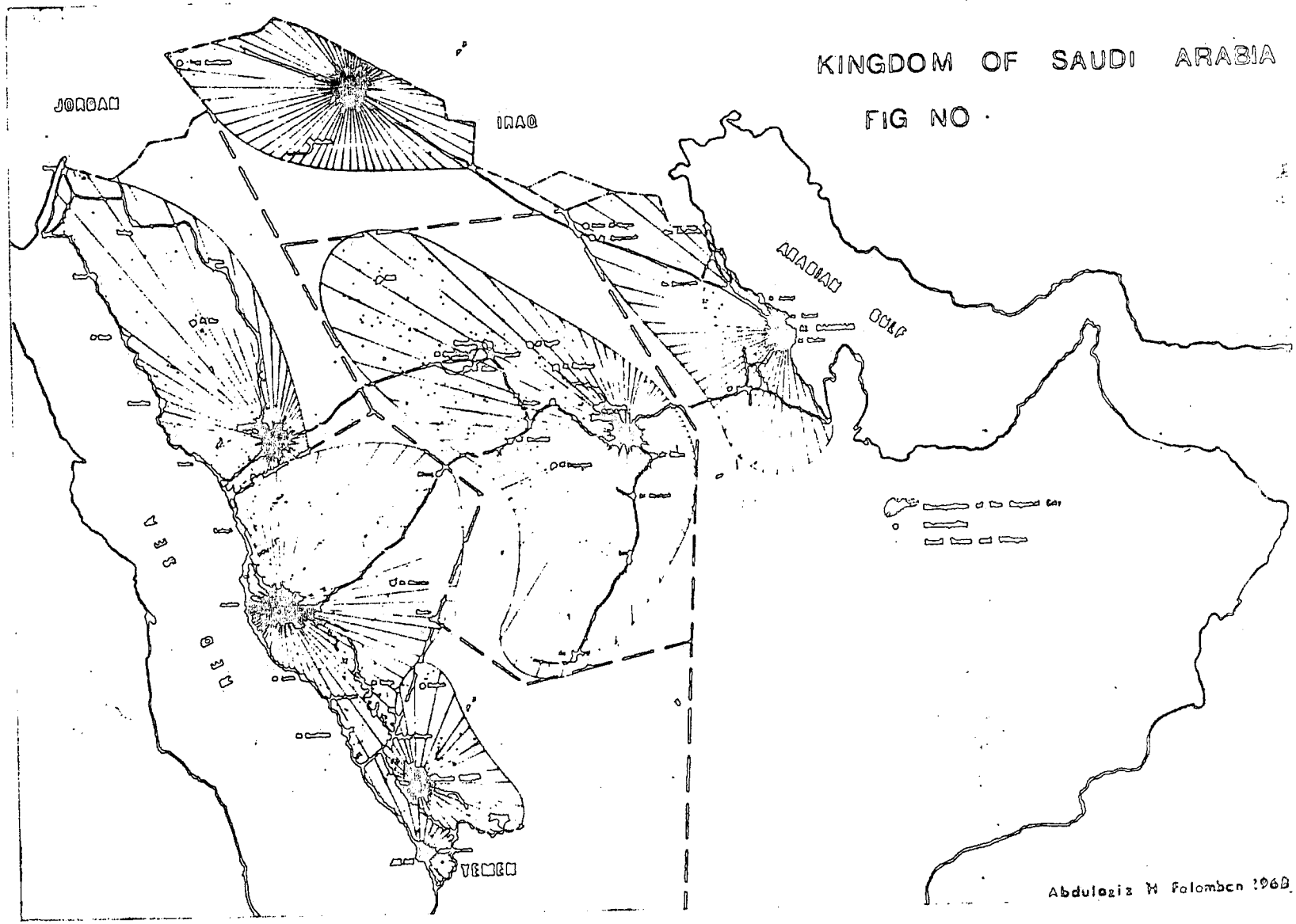
As town planning has developed and development has extended over wider areas, the study and preparation of skeleton plans for larger regions has become a necessity in order to secure effective results.

A tentative plan for a region should be a picture of development opportunities that suggests an ideal framework to be aimed at, rather than a detailed working programme for immediate execution. In Britain, it has been found that such plans have been of great assistance as a guide to the development of proposals in statutory development plans. They may be beneficial also in considering proposals for education and health services, water supply facilities and sewage disposal systems, and other lines of development.

Many problems of planning can only be solved if approached from the regional point of view and dealt with by local authorities and private owners, acting in co-operation, in large areas. The improvement of the road system in an area cannot be intelligently planned until a regional study has been made. In those countries where the location of industry and population is subject to some measure of control, the value of regional planning is too obvious to need comment (2)

4/ ... Chapter II ...

Sources: 1. Dickinson: City and Region, Third Edition, UK. 1956, Ch.1.p.3
2. James W.R. Adams, OBE., Modern Town & Country Planning, London, 1952, Ch. VI. p. 87.


KINGDOM OF SAUDI ARABIA
FIG NO.
Abdulaziz M Falomban 1968

Appendix C

KINGDOM OF SAUDI ARABIA

WESTERN AREA PLAN

The Socio-Economic Survey: Methodology

Ministry of Interior, Municipal Affairs

and

Robert Matthew, Johnson-Marshall and Partners

Socio-
Economic
Survey

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Introduction 1

Introduction

1.1 The socio-economic survey for the Western Area Plan is in 2 parts:

a A 5% sample survey to collect data on basic socio-economic characteristics.

b Additional detail surveys. Since the exact priorities for these will only emerge as the study progresses we cannot at this early stage draw up a precise specification for this second component.

1.2 This report, therefore, deals only with the 5% sample survey and sets out, as requested, in paragraph 5.6. of the Agreement, the method, type, sample and programme for this survey. We have tried to keep the report brief, but it is important at each stage of our study that we set out the methodology and processes by which we arrive at our findings.

1.3 We have divided the sample survey into two parts: urban and country. This is not because of any fundamental difference, but because the details of questionnaire design, sampling method, logistics and timing make it convenient to treat the two separately. This paper deals with the urban part of the survey which will be carried out in the 5 main centres of Jeddah, Mecca, Medina, Taif and Yanbu. A further paper will deal with our proposals for the rural survey.

Socio-Economic Survey

Questionnaire 2

Design and Purpose of the Questionnaire

2.1 Table 2.1 below shows how the 5% sample fraction indicated in our terms of reference requires a total of about 6,400 interviews and how these will be divided between the 5 centres.

Table 2.1: Sample Sizes

TOWN	BEST ESTIMATES OF POPULATION	NO. OF HOUSEHOLDS OF AVERAGE SIZE-6 PERSONS	SAMPLE SIZE 5%
Jeddah	300,000	50,000	2,500
Mecca	250,000	41,700	2,100
Medina	120,000	20,000	1,000
Taif (max)	100,000	16,700	800
Yanbu	50,000	8,300	400
TOTAL	820,000	136,700	6,800

2.2 We have planned for interviews which will last for 10-15 mins. The trial interviews confirmed experience in Europe that 10-15 mins. is a critical break point. Below this point it is possible to conduct most interviews 'on the doorstep'. Beyond this point arrangements must be made to enter the house, respondents become worried about the time taken and non-response increases rapidly. In short, the scale of the operation is magnified many times which in turn places it beyond the scope of our present study.

2.3 We conducted a large number of trial interviews before arriving at the final questionnaire (Appendix C). This questionnaire has been tested and adjusted in the light of a pilot survey of around 200 interviews. We found that it just met the conditions outlined in the previous paragraph and in fact, succeeds in both meeting these conditions and collecting all the main items of information we

require in a survey of this kind. Questions have also been included which will assist in collecting data for the transportation survey.

2.4 In designing the questionnaire we also bore in mind the fact that the large interview team required for the survey would be unlikely to contain many people with extensive survey skills. We therefore concentrated on unambiguous factual questions and avoided questions which would require detailed probing and evaluation by the interviewer.

2.5 The accompanying paper 'Instructions for Interviewers' (Appendix B) shows exactly how each interview will be conducted.

2.6 The main outputs for each city will give the total population and the way it is structured by household type, age, place of origin, occupation, industry and income. We have also asked a number of questions about car ownership, work journeys and housing conditions because of their fundamental importance for land use policies. We shall investigate correlations between these variables: in particular the data based on migration should yield invaluable clues to the factors making for change in study areas.

The sample sizes are adequate for the purposes of extracting information on individual zones within the cities,

2.7 A supplementary page on extra household members is added to each questionnaire to be used when appropriate.

2.8 We propose to survey Taif during July and August, when its population will be at a maximum. For this part of the survey it will be necessary to produce a slightly revised questionnaire with additional questions to determine the usual residence of people who have second homes in Taif.

2.9 To summarise, this survey will give the kind of information which is normally provided in fully developed countries by the national population census. For this reason, the questionnaire bears some resemblance to the more advanced types of standard population census form. However, this is not a result of any slavish copying: we arrived at this end point only after careful consideration of the data requirements of the Saudi Arabia Western Area Plan.

Socio-Economic Survey

Programme 3

Programme and Organisation

3.1 The timing of the various survey stages is conditioned by 3 factors:

a The need to obtain results early enough to be used in the regional plan process.

b The desirability of completing fieldwork in Jeddah, Mecca, Medina and Yanbu before the full heat of the summer. The Taif fieldwork will be left until July/August.

c The availability of suitable manpower limits the extent to which we can compress the time taken by hiring large numbers of personnel. Thus, there is a 2 way interaction between programming and manpower estimation.

3.2 The programme outlined in Figure 3.1 offers the most reasonable solution. The following points are noteworthy:

a Several stages must be completed before any fieldwork can commence. The first batch of interviewers must be hired and trained. A sufficient amount of map updating and pre-survey work must be completed to ensure a continuous flow of interviews from the start point. Finally, clearance must be obtained from the Client before the final questionnaire can be completed in time for fieldwork to commence on May 22 at the latest.

b It will be desirable to retain interviewers for as long as possible, rather than training a fresh batch for each city. On the other hand we must take account of the cost involved in operating interview teams at a significant distance from their base. The arrangement outlined in Fig. 3.1 offers the best compromise.

The main interview team of around 35 persons will be based in Jeddah and will operate solely in that city for the first 9 days. The bulk of the Jeddah fieldwork - apart from minor clearing up operations - will be completed in this period and most of the team will then be transported daily to Mecca. After completion of the Mecca survey, the team will be available to supplement the country survey or to carry out coding work until the end of July, when it will tackle Taif.

The second team - of around 12 persons - will be recruited and based in Medina. (Work will commence in Yanbu 1 week after the start of the Jeddah fieldwork). After completing Yanbu the team will move on to Medina and will finally be available to supplement the country survey team.

c Coding will be carried out in the Westplan office in Jeddah. It is proposed to start coding soon after the completion of fieldwork in Jeddah, and from that point onward there should be a steady flow of work coming in; both from the urban survey and the country survey.

d It is hoped to employ data processing facilities in Jeddah. If this should prove impossible, then the allowance of 1 month for data processing and preliminary analysis may prove to be inadequate.

INTERVIEWERS

3.3 We propose to build up a team of 30 interviewers to operate from Jeddah. At a normal rate of 10 interviews per man day this team should complete the bulk of the Jeddah fieldwork in about 9 working days. (We must allow a further period as shown in the programme for 'mopping up operations' by a selected nucleus). The same team should complete the Mecca and Taif fieldwork in rather shorter periods. It seems reasonable to assume that this team will be retained full time on the urban survey for a total period of around 25 working days including training time. The Medina team will have 10 interviewers. They should complete the Yanbu fieldwork in about 4 days and will then move on to Medina for a period of about 10 days. This team will be employed full time on the urban survey for a period of about 20 working days.

SUPERVISORS

3.4 As mentioned above, the ratio of supervisors to interviewers will need to be varied through the duration of the project. An average of 1:5 seems reasonable. The supervisors will be partly members of the Westplan counterpart team but mainly from outside the organisation.

CODERS

3.5 The interview staff could be used for coding purposes in the lag before the Taif fieldwork commences; alternatively they could be diverted to the country survey which would be a more efficient use of their training. Either way some permanent coding staff will be required. Each coder should be able to code and check an average of 30 questions per day. Supervision of coders will be carried out by the Westplan permanent staff.

Socio-
Economic
Survey

Appendix A

Sampling Procedure

A.1 A sample survey of the kind we are considering involves a choice from a number of alternative types of sample frames. The best-known types of frame are as follows:-

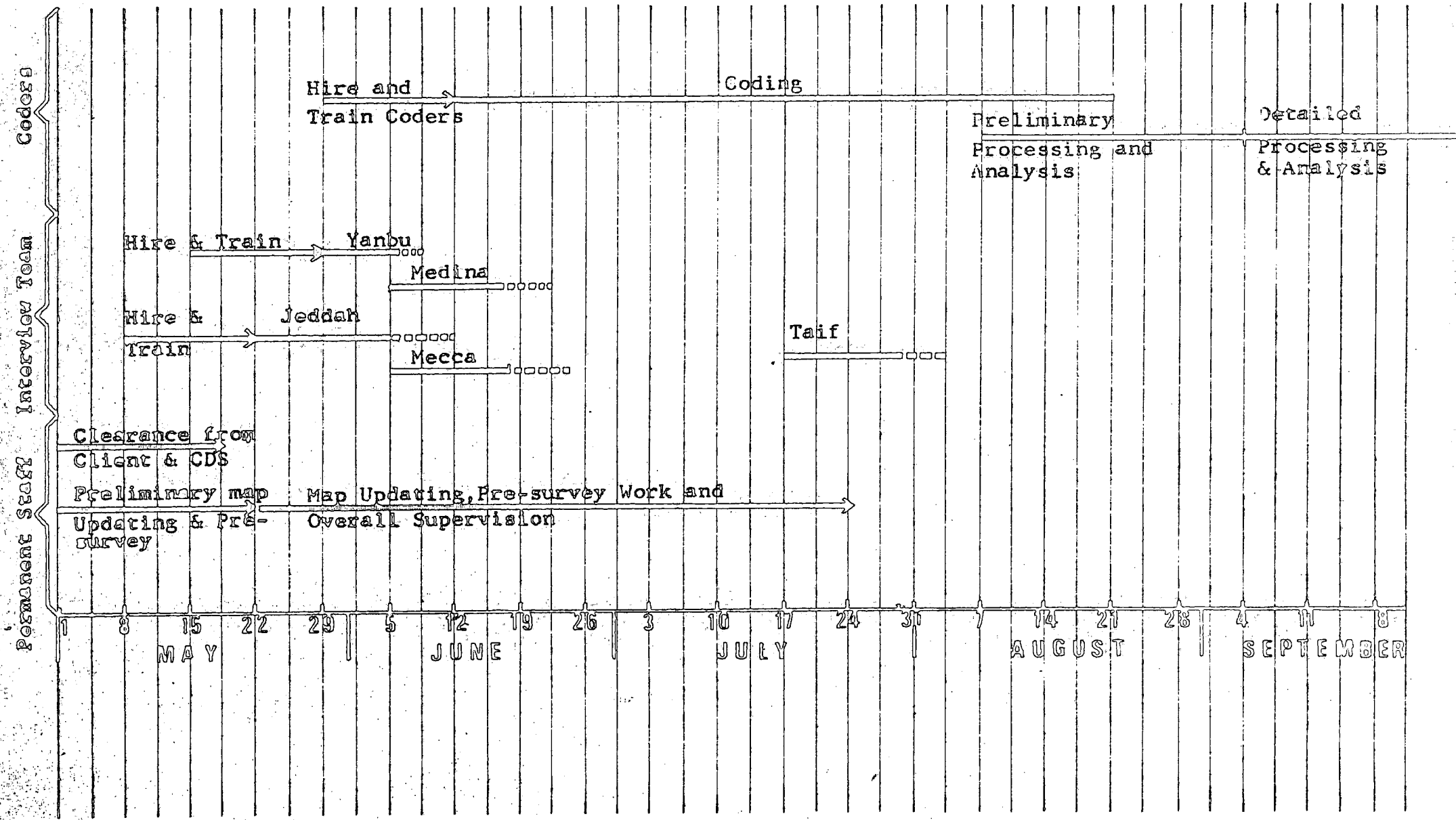
i List of households
ii List of dwellings
iii Divisions of the survey area into 'natural' groups of dwellings which are sufficiently clear-cut to be easily identified from existing maps but not so large as to give rise to serious sampling errors.
iv Divisions of the survey area into areal units of equal size. This is usually achieved by superimposing an arbitrary grid - the technique is know as 'area sampling'.

A.2 It is fortunate that type (iii) is feasible for the purposes of this survey. The cities of Western Saudi Arabia possess a pronounced structure of street blocks. These are sufficiently well defined to form suitable basic units for sampling purposes. There is also a very good coverage of maps and air photos upon which the existing block pattern can be easily identified. Thus type (iii) stands out as the best available sample frame. Here the sample would be a random sample of street blocks. (Our operational definition of the term 'street block' is given in para A.4 below and examples of typical sampling units are given in figs A.1 and A.2). Every household resident in each block would be interviewed.

A.3 Before discussing details it seems worthwhile to deal with a commonsense objection. The number of households per block does vary quite considerably. In some districts (for example the Medina Road area of Jeddah) there are blocks which contain 1 household only, while in more densely developed districts there may be 20 or more households per block. Apartment buildings (which

Socio-
Economic
Survey

Programme



will be treated as single blocks for our purposes) are scattered about the cities and normally contain several dozen households. At first sight, it may appear that this heterogeneity would affect the accuracy of the survey in one of two ways:

a That our 5% survey of blocks would not contain exactly 5% of the households in each survey area.

b That certain types of block (whether defined by size or some other quality) might stand a disproportionate chance of being selected. Thesample would then be biased towards households who live in this type of block. In the first case our estimates of the size of the population would be incorrect; in the second case estimates of the structure of the population would be incorrect.

However, when the objections are stated with this degree of precision, it should be rapidly seen that they are invalid. If the sample is carefully selected by a random process then it will represent a microcosm of the universe. Each type of block should be represented in the sample in proportion to the frequency with which it is found in the survey area as a whole. Individual households will all stand an equal chance of being selected and the sample will be a good cross section of the total population. In short, there is no element of built-in bias in the process.

DETAILED SAMPLING AND SURVEY PROCEDURE

4.4 The detailed procedure will be as follows:

a The existing 1:2500 maps will be updated with the use of recent air photographs. This updating process need only be accurate enough to indicate the block pattern of new development.

b Block boundaries will be drawn in on the maps and each block will be allocated a number, to facilitate sample selection. To remove any element of discretion from this process the following definition of the term block will be rigidly adhered to:

" A building or group of contiguous buildings, which is completely surrounded by public roads or pathways."

Thus if any choice arises between 'blocks' and 'sub-blocks', then the smallest unit consistent with this definition will be taken. This will increase the number of blocks in the sample and thus reduce sampling error.

A.5 ALL blocks will be numbered. The sample will therefore include a proportion of entirely non-residential blocks.

A.6 The 5% sample of blocks will then be drawn by a systematic random process. The selected blocks will be allocated new code numbers for field identification purposes and their location will be marked on 2 sets of maps; one for field use and the other for office control and records. Armed with the field maps a pre-survey team will visit the sites and paint block numbers on the buildings for the guidance of the interview team. They will identify completely non-residential blocks so that these can be eliminated from the work schedule to prevent abortive visits by the interviewers. They will make any other necessary notes for the guidance of interviewers.

A.7 The field maps and notes will then be handed over to the interviewer supervisors who have the following responsibilities:

a They must work out a daily interview plan in consultation with the survey leaders.

b They must direct their interviewers to the selected sample units and make ad hoc decisions about the most economical use of manpower. In most districts the chosen blocks will be close together: the interviewers will then walk from one block to the next and the supervisor will be in close contact with his team. In low density areas a judicious use of motor transport will be necessary and supervision problems will be greater.

c Each interviewer has instructions to write one of 3 code letters on the door of every dwelling he visits. These code letters signify 'interviewed' or 'no contact/refusal' or 'unoccupied'. In large blocks it is quite easy for the interview team to miss out the occasional dwelling. The supervisor must therefore check that all dwellings have been properly tackled and that the interviewers have taken down the required call back information in cases of no contact or refusal.

d The supervisor must check all completed forms. Both this and the preceding operation must be completed as quickly as possible so that it does not become inconvenient to send interviewers back to rectify errors or omissions.

e Whilst performing these duties the supervisor must be ready to deal with any problems which arise during individual interviews. He must also oversee a proportion of interviews to make sure that the interviewers are asking the questions as instructed. These duties will obviously be most important in the early stages of the survey when the interviewers though thoroughly trained will be still relatively inexperienced. For this reason it will be advisable to vary the ratio of supervisors to interviewers throughout the course of the survey.

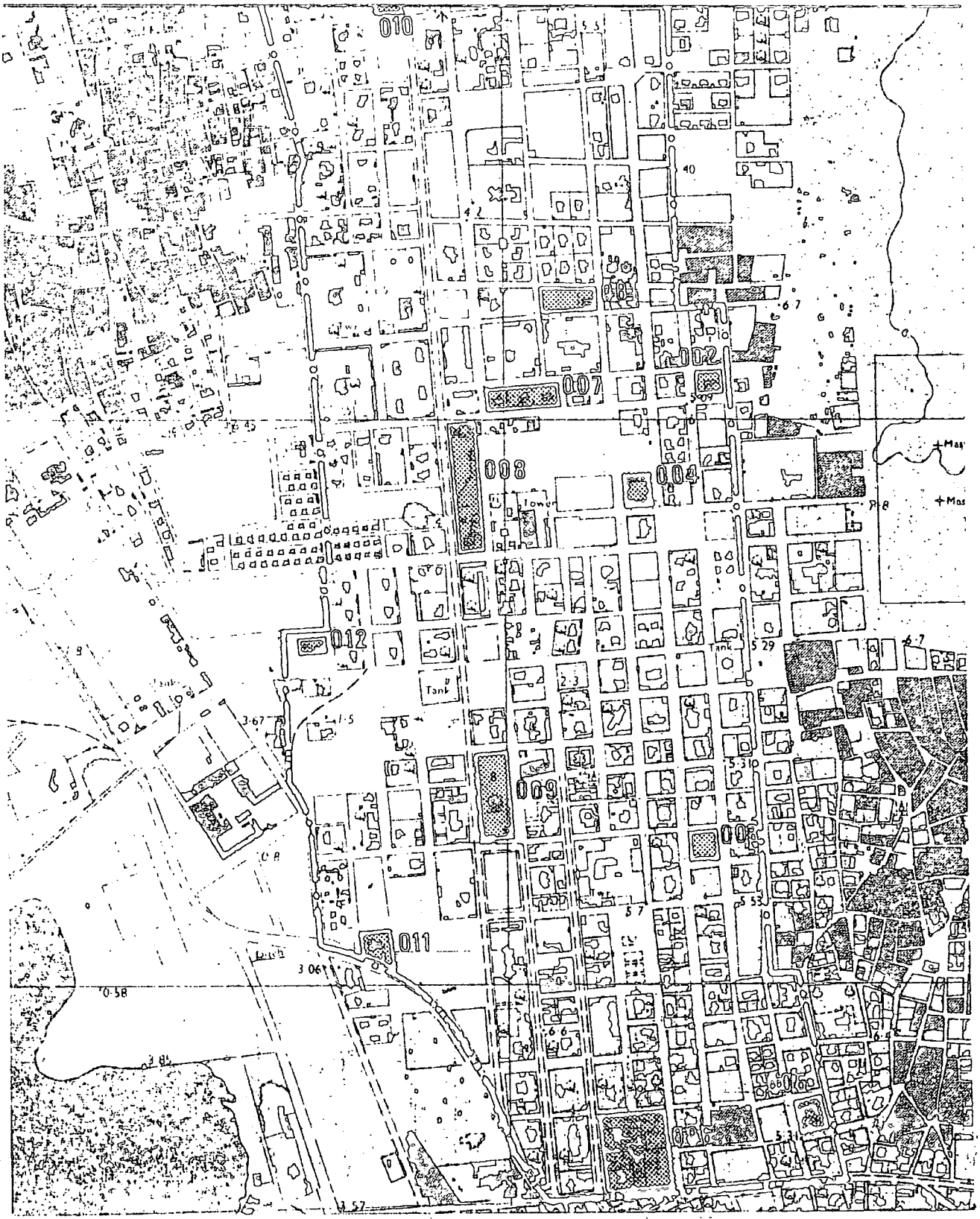
A.8 Special interviewers will make further visits to interview people who could not be contacted or refused to be interviewed on the first occasion. On these visits they will be guided by the interviewers' call-back notes and their chalked code numbers on the dwelling doors.

A.9 We propose to obtain a measure of 'quality control' by re-interviewing a sample of the households. The interviewers used for this will be of a very high standard.

A.10 The pilot survey carried out between March and April employed the procedure outlined above. This survey provided extremly valuable experience and demonstrated that a number of organisational elements (mainly logistical) required to be tightened up, but the basic procedure was shown to be sound.

Appendix A

Survey diagram A1

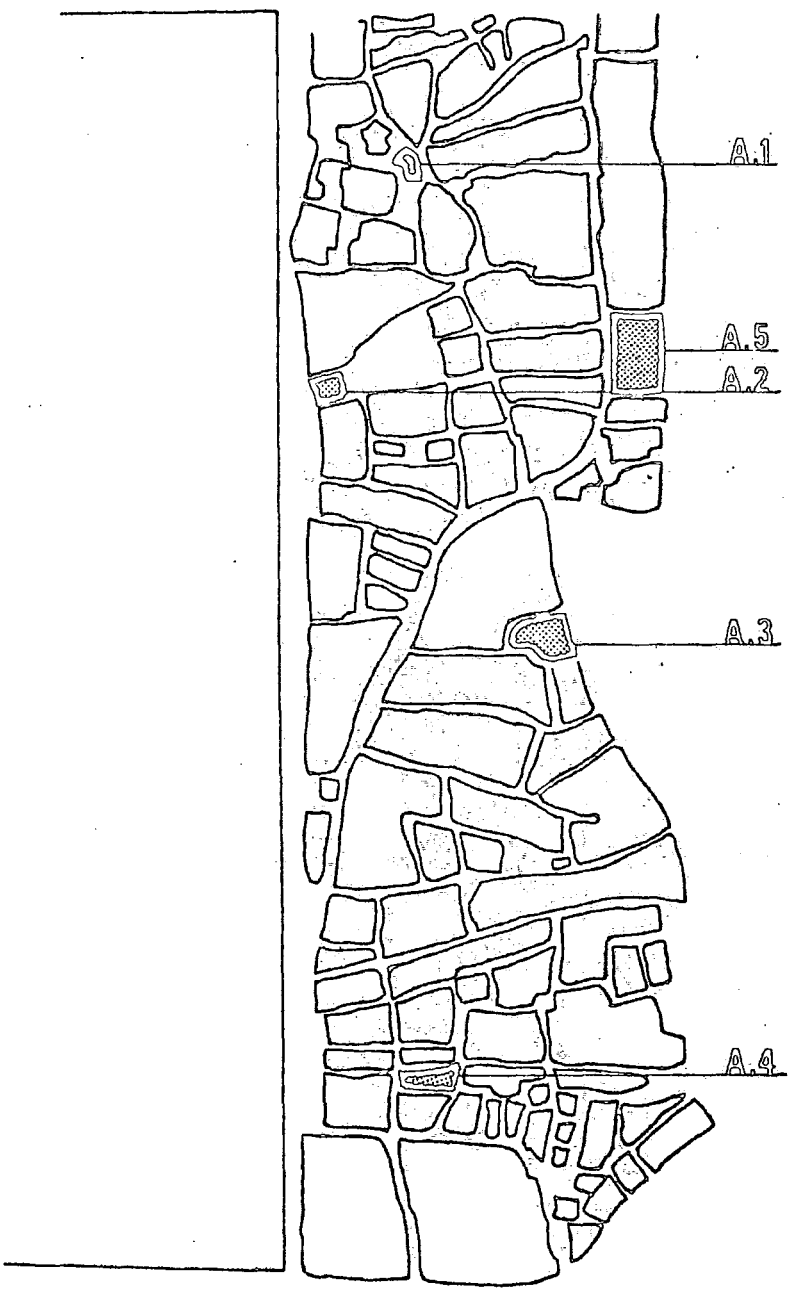


Appendix A.

Survey diagram A2

Base map prepared from Air Photography April 1971

MAP OF GHOLEAL AREA



1:5000

Base map of Goleal area prepared from Air Photography and used for Block Selection in a previously mapped area. April 1971 Neala Y[illegible]ala.

Socio-Economic Survey

Appendix B

Instructions for Interviewers

B.1 A survey team will mark the walls of the dwellings or blocks of dwellings where you must conduct interviews. Your supervisor will have detailed instructions about them. They have been carefully chosen to be an accurate cross section of all the dwellings in Jeddah. Do not carry out interviews at other dwellings.

B.2 First explain the purpose of the survey. Nearly all people will agree to be interviewed. If a person refuses to be interviewed, try to persuade him but do not have a violent argument with him. Ask your supervisor to give you help if necessary.

B.3 You must interview the head of the household. Do not take information from small children. If the head is away from home then try to find out the best time to interview him and write this on your progress sheet.

B.4 Accuracy is more important than speed. Fill in the form carefully and write clearly: your interview will be useless if you do not collect full details or if we cannot read the questionnaire at the office. However, do not take longer than necessary: if people try to delay you with irrelevant information or elaborate hospitality then you must politely tell them that you have more work to do.

B.5 Remember that your attitude can influence the information which people give. They may give the sort of answer they think you want to hear rather than the precise truth. Try to avoid this by asking the questions and receiving the answers in a completely neutral manner. Do not ask leading questions like 'You own a car of course?' or 'Your wife was born in the same village as you, I suppose?'. Instead say 'Do you own a car?' and 'Where was your wife born?'

B.6 Filling in the Form - General

There are 5 questions which apply to the whole household (at the top of the first page and 15 questions for each member of the household). When a question has been precoded you simply draw a ring round the appropriate code number: otherwise write in the answer in the space provided. If you make a mistake then cross out the ring or answer, draw in the new one and mark it with an arrow to avoid confusion e.g.:

1
2
3 - incorrect code number crossed out
4 - correct code number ringed and marked with arrow
5

Use the margin or the comments box at the end of the questionnaire for additional information. In case of doubt always write in additional information but make it clear which question this applies to.

B.7 To save time you can use the following abbreviations.

"	If the answer is the same as the answer in the box above it.
_____	If the answer is 'none' or 'not applicable'.
n.r.	for 'no reply': if the interviewee refuses to answer the question.
d.k.	for 'doesn't know'.

Do not leave any box empty. If you do we shall not know whether the answer is 'none' or whether you have missed the question.

B.8 You must take down information for the 'household' - this is the group of people who live in the dwelling where you are interviewing. 'Household' is not the same thing as 'family': some members of the family may live elsewhere or some of the residents may not be members of the same family (friends, servants, etc.). Thus, you must take full details of all the people who normally live at the house where you are interviewing, but you must not include people who normally live elsewhere. If there is doubt about where a person normally lives then take down his details and record the nature of his residence in the comments box.

B.9 A complete definition of the term 'household' is 'a group of people who live in the same dwelling and eat from the same food'. In a few cases you may find more than one household living in a dwelling.

If so you must interview the head of each household separately. Use a separate questionnaire for each household and write in the comments box ' household shares dwelling with the household whose head is names..... Ask your supervisor for help on this point if necessary.

B.10 When the interviewee has finished giving details of household members always ask him if there are any more. There is a space for 7 members on the questionnaire. If the household has more than 7 members, then use one of the spare sheets provided and staple it securely to the questionnaire.

B.11 Questions 10, 12 and 16 ask where each person was born, where he (or she) lived 5 years ago and where he (or she) works. You must get full details of each of these locations as follows:-

a If the location is outside Saudi Arabia then just take the name of the state, e.g. write 'Jordan', 'Kuwait', 'Ethiopia'.

b If the location is inside Saudi Arabia but outside Jeddah then take the name of the city, town or village. If it is a village which is so small and obscure that the person in the office who analyses your questionnaire may not know about it, then write also the name of the nearest well known city. Always do this if there is any doubt - e.g. write '..... near Taif' or'.....near Yanbu'.

c If the location is inside Jeddah then write 'Jeddah' plus the name of the district within Jeddah. Thus, e.g. write 'Jeddah; Sharafia' or 'Jeddah; Kandara'.

d If the location is in the same house where you are interviewing, then write 'same house'.

This may sound complicated, but it is really quite simple. Just remeber that the nearer the location is to home, the more precise are the details needed.

B.12 Filling in the Form - Details

Question No.

1. Check with the supervisor if you are doubtful.

2. Some people neither own the dwelling they live in nor pay rent for it. For example, some households live rent-free in houses which are owned by distant relatives. Others get free housing from their employer. Code such households under '3' and give details below.

Question No.

5 Many people own very old motor vehicles which do not work and are never likely to run again. Only record those motor vehicles which are available for use at the time of the interview or will become available some time in the following month. A motor vehicle owned by an employer should be recorded if the household has the use of it outside working hours. Insert the number of vehicles owned in each category in the space provided.

6 There is no need to write the name of each person: the relationship to the head is adequate alone.

8 If the age of an individual is not precisely known, then get an estimate within the age brackets shown on sheet A and write in the appropriate code letter.

13 Always get full details of the occupation. It is not sufficient, for example, to write 'office worker' - such a term can cover a wide range of skills. We need to know the level of skill and responsibility involved in the job. Therefore write 'copy typist', 'translator', 'office manager' or some other precise term as applicable.

13-20 Note that the boxes for questions 12-19 have been divided into 2 spaces. If an individual has two jobs you must write details of the first job in the top spaces and details of the second job in the bottom spaces. There is no need to take details of the firms location for the second job.

17 Try and get the actual income. Give the income for the second job in the lower space if there is a second job. Write in a code letter from sheet 'B' if a precise income cannot be given.

18 Try to get actual type of vehicle, e.g. private car, taxi. If journey to work is not by vehicular mode state actual mode, e.g. walk, bicycle.

19 Get usual time of starting work to nearest ½ hour, e.g. 08.15 or 08.30.

13 Before leaving the Dwelling

1 Check the form

2 Write in your code number

3 Fill in the progress sheet

4 Take your piece of chalk and write on or near the door:

"I" for "interviewed"
"A" for "head of household absent"
"V" for "dwelling vacant"

Always check with the neighbours that a dwelling is really vacant. If a dwelling has more than one entrance door, then write the same code letter on all the doors.

PLAN FOR THE WESTERN AREA
Pilot Social Survey
Ministry of Interior, Municipal Affairs
Robert Matthew, Johnson-Marshall & Partners

Interviewers Fig. Nos | Supervisors Fig. Nos

Name and Identification

House No.	Street Name	District	Town

1 Type of Dwelling	
1	Single House
2	Non Single House
3	Apartment
4	Shanty
5	Others (give details below)

2 Type of Tenure	
1	Owned
2	Rent
3	Others (give details below)

3 No. of rooms (excluding bathroom & kitchen)

4 Facilities/ Services	
1	Water installation company supply.
2	Water installation truck delevery
3	Electrical power company supply.
4	Electrical power
5	Room for bath or shower.
6	Flush toilet
7	None of these 6 facilities

5 Vehicle Ownership	No.
Motorcycles	
Private cars	
Jeeps	
Taxis	
Pickups/truks	
Other vehicles	

1 Head of Household	2	3
1	1	1
2	2	2
	3	3
	4	4
	5	5

6 Relationship to head of household	7 Male / Female	8 Age	9 Married / Single / Widowed / Divorced	10 Place of Birth	11 Saudi Citizen / Others	12 Place of Residence 5 years ago	13 Full details of occupation & second job if any.	14 Name of work place & kind of work Office, company etc.	15 Self Employed / Over 5 hrs. work / Under 5 hrs. work / Looking for work / Not employed	16 Address of place of work Situation Street Town	17 Monthly income	18 Means of transport to work	19 Time of departure to work	20 Time of finishing work
1	1 2		1 2 3 4		1 2				1 2 3 4 5					
2	1 2		1 2 3 4		1 2				1 2 3 4 5					
3	1 2		1 2 3 4		1 2				1 2 3 4 5					

Relationship to Head of household	4	5	6	7
7 Male	1	1	1	1
Female	2	2	2	2
8 Age				
9 Married	1	1	1	1
Single	2	2	2	2
Widowed	3	3	3	3
Divorced	4	4	4	4
10 Place of Birth				
11 Irish Citizen	1	1	1	1
Others	2	2	2	2
12 Place of residence 5 years ago				
Full details of occupation & second job if any				

Any person living in the house but not mentioned in schedule (give details) as declared above

Page No.

Notes:

[illegible]		٢ ملكية المسكن		٤ التسهيلات بالمسكن		٥ ملكية وسائل النقل	
[illegible]	١	ملوكة	١	امدادات مائية عن طريق الشبكة	١	دراجة نارية	١
[illegible]	٢	مؤجرة	٢	امدادات مائية بواسطة الوايت	٢	سيارات خاصة	٢
[illegible]	٣	غير ذلك بالتفاصيل	٣	التيار الكهربائي عن طريق الشركة	٣	سيارات جيب	٣
[illegible]	٤			التيار الكهربائي بواسطة مولد خاص	٤	سيارات تكسي	٤
غير ذلك بالتفاصيل		عدد الغرف باستثناء المطبخ والحمام	٣	غرفة للحمام او الدوش	٥	بيك آب او لوري	٥
				مرحاض بخزان ماء	٦	آليات اخرى	٦
				لا يوجد شيء من هذه	٧		

١٣ اعط تفاصيل كاملة عن الوظيفة او المهنة اعط معلومات عن العمل الاضافي اذا وجد في الجزء						
١٤ اسم المؤسسة (نوع العمل الذي تقوم به)						
١٥ [illegible] ١ / موظف يعمل اكثر من ساعات ٢ / موظف يعمل اقل من ساعات ٣ / يبحث عن عمل ٤ / متقاعد غير ذلك ٥	١ ٢ ٣ ٤ ٥	١ ٥	١ ٢ ٣ ٤ ٥	١ ٣ ٥	١ ٢ ٣ ٤ ٥	١ ٣ ٥
١٦ عنوان المؤسسة بالتفصيل الموقع ـ الشارع المدينة .						
١٧ الدخل الشهري						
١٨ وسيلة الانتقال للعمل						
١٩ موعد بدء العمل						
٢٠ موعد انتهاء العمل						

البيان								
٢٠ موعد انتهاء العمل								
١٩ موعد بدء العمل								
١٨ وسيلة الانتقال للعمل								
١٧ الدخل الشهري								
١٦ عنوان المؤسسة بالتفصيل المركز – الشارع المدينة								
١٥ متقاعد ويبحث	٥	٥	٥	٥	٥	٥	٥	٥
يبحث عن عمل	٤		٤		٤		٤	
موظف يعمل أقل من ٥ ساعات	٣	٣	٣	٣	٣	٣	٣	٣
موظف يعمل أكثر من ٥ ساعات	٢		٢		٢		٢	
عمل خاص (حر)	١	١	١	١	١	١	١	١
١٤ اسم المؤسسة [illegible]								
[illegible]								

(٥٣)

Appendix D

TRANSPORTAION

SURVEYS

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Introduction 1

NEED FOR TRANSPORTATION SURVEYS

1.1 In order to expand the nature and extent of information and knowledge of traffic movements in the towns of Jeddah, Mecca, Taif, Medina and Yanbu, we propose to carry out several traffic surveys. The information collected in these surveys will be of considerable help in identifying short-term projects for improvement of the existing traffic conditions, as well as providing information required in order to determine the future traffic movements in these five cities.

PURPOSE OF PAPER

1.2 The purpose of this paper is to outline the information to be collected and the survey procedures for two types of surveys, the Traffic Census; and the Roadside Interview Survey. This outline has been prepared primarily for the guidance and instruction of temporary staff engaged for the surveys. The two surveys mentioned above will measure the movement of vehicles passing the census point. They do not, however, completely explain the movement in the city, as the movement of vehicles should be correlated with certain socio-economic factors which explain why the journey is taking place. Once this relationship has been established the future traffic patterns can be forecasted with some degree of confidence. Appendix C of this paper suggests a method by which the socio-economic travel patterns can be established and a pilot study will confirm the feasibility of the proposal.

TRANSPORTATION

SURVEYS

Traffic Census 2

2.1 A traffic census involves measuring the volume of traffic passing a particular point on a given road. As the traffic passes the survey or census station a vehicle count is made in both directions and flow data is related to half-hourly intervals. The counting process involves identifying the types of vehicles passing the census point. The standard survey form shown at the end of this section has been prepared for use throughout the Survey. Each form is provided with an indentity block so that details such as survey point location, enumerator, time period, direction of travel and survey data can be suitably recorded. Details of these items are given below.

DATE OF SURVEY

2.2 In the survey form, six boxes are provided for recording the date of the survey by numerical definition:

e.g. 6 May 1971 would be recorded 06.05.71
22 October, 1971 would be recorded 22.10.71

LOCATION OF CENSUS POINT

2.3 The location of the census points will be determined prior to the commencement of the field surveys and each census point will be referenced on a plan. Therefore, the survey form need only record the name of the road e.g. Medina Road.

DIRECTION OF TRAFFIC

2.4 In most surveys the direction of traffic will be identified by recording INBOUND for traffic entering the town, or OUTBOUND for traffic leaving the town. In surveys within the town, alternative descriptions will be provided as appropriate to each survey station.

STATION NUMBER

2.5 In general, the number of the census point (station No.) will identify both its location and the direction of traffic movements being recorded. e.g. OUTBOUND traffic on Medina Road could be recorded as 01 - the first digit (0) identifying the direction of movement and the second digit (1) identifying the location of the survey station. Hence INBOUND traffic on Mecca Road could be recorded as 12 - the (1) identifying "INBOUND" and the (2) identifying Mecca Road.

TIME PERIOD

2.6 Throughout the survey the time period should be defined by reference to the 24 hour clock. e.g. 8 o'clock in the morning should be recorded as 08.00. In general the traffic passing the census point will be recorded by half-hour time periods e.g. from 08.00 to 08.30 or from 17.30 to 18.00. and during the survey a NEW FORM MUST BE STARTED AT THE COMMENCEMENT OF EACH HALF-HOUR TIME PERIOD.

PERSON IDENTIFICATION

2.7 The person carrying out the traffic count must record his name in the appropriate space to enable the survey supervisors to identify him should it be necessary to clarify any of the information recorded on the form.

TYPES OF TRAFFIC

2.8 The survey form identifies six types of traffic;

1 motor-cycles	2 private vehicles
3 taxis	4 commercial pick/ups or jeeps
5 trucks	6 buses

In addition, the headings of two columns have been left blank and, when necessary, these columns may be used for any type of vehicle, provided the type of vehicle being recorded is clearly identified on the form.

In order to maintain consistency in the recording of vehicle types, the colour of the vehicles number plate should be used as a guide to identification of vehicle type:

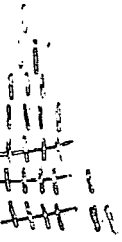
TYPE OF VEHICLE	STANDARD COLOUR OF NUMBER PLATE
Motor-Cycle	White numbers on Black plate
Private Vehicle	White numbers on Black plate
Taxi	Black numbers on Yellow plate

Commercial Pick-up/Jeep	White numbers on Red plate
Trucks	White numbers on Red plate
Buses	Black numbers on White plate

METHOD OF RECORDING TRAFFIC

2.9 We propose to adopt the standard method of recording vehicles, this is known as the five barred gate system. In practice this is a very simple system.

e.g. When the first motor cycle passes the census point record as:



			in column 1
When the second	record	as:	in column 1
When the third	"	"	in column 1
When the fourth	"	"	in column 1
When the fifth	"	"	in column 1
When the sixth	"	"	in column 1
When the seventh	"	"	in column 1

The census form has been divided into boxes within each column for vehicle types and each box must be used in sequence to identify the number of vehicles of that type passing the survey station. DO NOT START a second box for that type until the five barred gate has been completed.

2.10 The heavy line across the middle of the page is for official use by the survey supervisors.

TRANSPORTATION

SURVEYS

Roadside Interview 3

GENERAL

3.1 The Roadside Interview survey comprises direct interview of vehicle drivers passing a survey station on a road. In general only a "sample" of passing traffic will be stopped by police officers and the drivers interviewed will be requested to co-operate by providing information about the journey they are making. The information required is general in character, and does not include personal information such as the name of driver. In any case, the information will remain confidential. The requisite information comprises the type of vehicle; the origin of the trip (journey); the destination of the trip; the purpose of the trip; the number of persons in the vehicle; and the place of residence of the driver.

3.2 A standard survey form has been prepared for use throughout the Survey (see end of section) but as with the traffic census forms an identify block is provided so that various facts essential to the analysis of the information collected can be recorded. Details of the various parts of the identify block are given below.

DATE OF SURVEY

3.3 The date of the survey should be recorded by numerical definition, as outlined in paragraph 2.2.

LOCATION OF SURVEY STATION

3.4 The location of the survey station should be described as indicated in paragraph 2.3.

DIRECTION OF TRAFFIC

3.5 The direction of traffic being interviewed should be recorded as outlined in paragraph 2.4.

STATION NUMBER

3.6 The number used to identify the survey station will be determined in the manner outlined in paragraph 2.5.

TIME PERIOD

3.7 The time period of the roadside interviews will be determined in the manner outlined in paragraph 2.6.

PERSON IDENTIFICATION

3.8 The person carrying out the interview must record his name in the appropriate space, as outlined in paragraph 2.7.

FIRST, THIRD AND LAST COLUMNS

3.9 The first, third and last columns on the roadside interview form are for official use by the survey supervisors and these columns MUST BE LEFT BLANK.

VEHICLE TYPE COLUMNS

3.10 The survey form identifies six types of vehicle and at the commencement of the interview, the interviewer MUST record the type of vehicle being interviewed by INSERTING an X in the appropriate columns.

ORIGIN OF TRIP

3.11 The information required in this column varies according to the location of the survey station, but MUST be sufficiently ADEQUATE to enable the origin to be identified clearly.

a EXTERNAL Survey Stations ; where the survey station is located outside the main urban area of a town, the ORIGIN of INBOUND traffic should be recorded as the name of the town or village the driver has come from. However, when the trip started inside the town the ORIGIN of OUTBOUND traffic MUST BE DEFINED by the name of the Street, or Locality or by reference to a building (e.g. AIRPORT) in order to ensure that the precise location of the trip origin can be identified.

b INTERNAL Survey Stations : where the survey station is located inside the main urban area of a town, the ORIGIN of all 'local' trips (i.e. trips starting within the town) must be defined in detail by name of Street /Locality/Building.

DESTINATION OF TRIP

3.12 Where the destination of a trip lies within the town, the detailed information outlined in paragraph 3.11 (a) must be recorded. Trips with an external destination should be recorded by the

name of the town or village to which the driver is destined.

TRIP PURPOSE

3.13 The survey form identifies five trip purposes which are likely to be the most important, but provides an additional space for OTHER trip purposes. When a driver indicates one of the five trip purposes (work; shopping; school; social or transport of goods) the interviewer should INSERT an X in the appropriate column. When the trip is being made for some other purpose, the interviewer should DEFINE the stated PURPOSE as clearly as possible within the space provided.

VEHICLE OCCUPANCY

3.14 In general, the interviewer should be able to see the number of occupants (including the driver) without having to ask the driver, but it would be more polite to ask the driver and record the total number of occupants in the space provided on the form.

PLACE OF RESIDENCE

3.15 Traffic entering and leaving a town is generated either by residents of the town or visitors to the town. In order to establish this information the interviewer should ask the driver "are you a resident of Jeddah?" (the name of survey town). If the answer is YES - INSERT Jeddah in the space provided, on the form. If the answer is NO - ask "in which town or village do you reside?" and INSERT the town or village name in the appropriate space on the form.

CONDUCT

3.16 INTERVIEWERS MUST ALWAYS BE POLITE and where the driver is unsure of a question, the interviewer should repeat it clearly and give as much help as possible.

3.17 INTERVIEWERS MUST ALWAYS THANK THE DRIVER for his co-operation at the end of the interview.

3.18 INTERVIEWERS MUST OBEY the DIRECTIONS of the POLICE OFFICERS who are responsible for their SAFETY and the safety of the motorists.

3.19 INTERVIEWERS SHOULD NEVER ATTEMPT TO CONTROL THE TRAFFIC, this is the sole responsibility of the traffic police.

TRANSPORTATION SURVEYS

Programme 4

4.1 The collection of the most recent statistics on Airport travel began at Jeddah at the beginning of June. Information about other Airports, Seaports, and Railways in the Region will be collected throughout the period of data collection.

4.2 Hiring and Training of interviewers for the roadside surveys is governed by the university examinations. When these are over on the 12th June approximately recruitment and training of the roadside teams will commence. As shown in Fig. 4.1 Roadside Interviews commence on the 19 June and finish in August. Should a city be completed before the scheduled completion date staff will be employed on data collection or coding of a supplementary home-interview journey survey.

4.3 The pilot study for the home-interview journey survey will take place in the period 26 - 29 June. After an assessment of the results the actual survey will commence about the 6 July and continue through to completion in September.

TRANSPORTATION

SURVEYS

Programme

AIRPORTS SEAPORTS, RAILWAY SURVEYS

RURAL SURVEYS

HIRE AND TRAIN ROADSIDE INTERVIEWERS

ROADSIDE INTERVIEWS AND CODING FOR JEDDAH

ROADSIDE INTERVIEWS AND CODING FOR YANBU

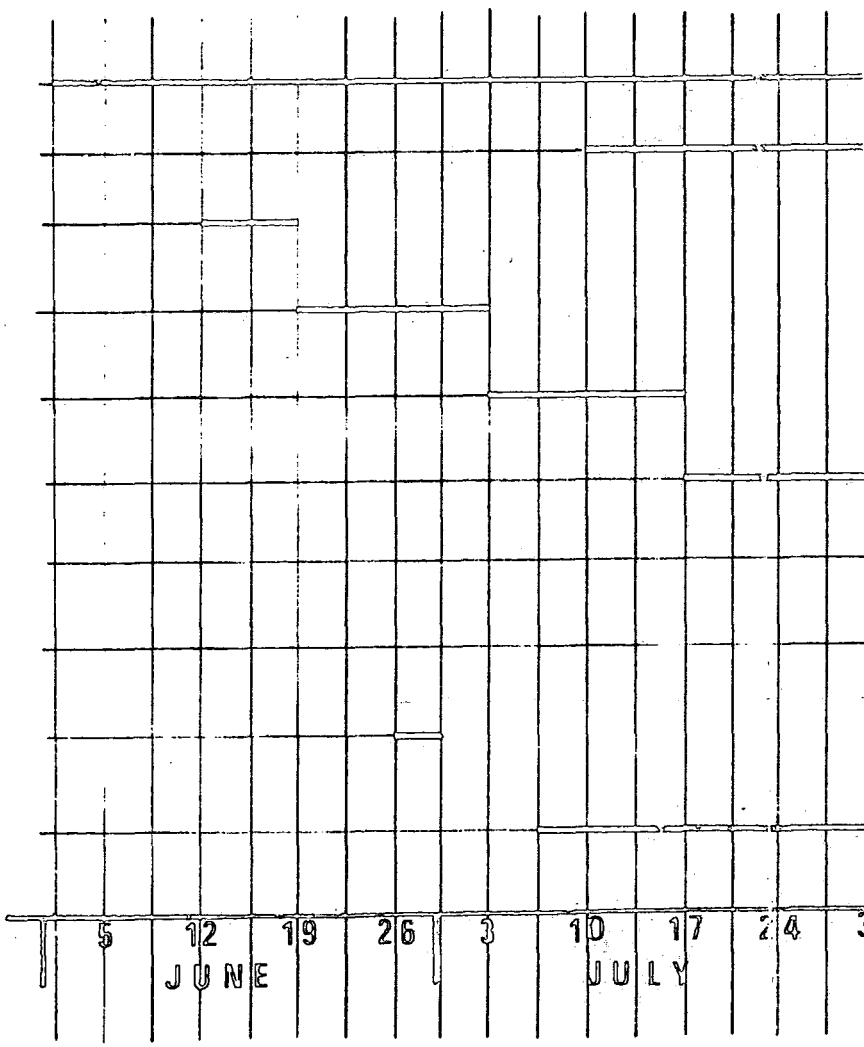
ROADSIDE INTERVIEWS AND CODING FOR MEDINA

ROADSIDE INTERVIEWS AND CODING FOR MECCA

ROADSIDE INTERVIEWS AND CODING FOR TAIF

PILOT HOME INTERVIEW - JOURNEY SURVEY

ACTUAL HOME INTERVIEW - JOURNEY SURVEY.



Appendix A

RESULTS OF PILOT ROADSIDE INTERVIEW

A.1 The pilot roadside interview survey was carried out over a limited period in the early evening of Wednesday 12th May 1971.

A.2 The survey team comprised Abdul Aziz Hussein, Abdul Aziz Abass, Sami Al-Khatib, Hassan Omar Assad, Abdullah Ahmed and Suleiman Saleh; supervised by G.B. Jamieson and D. Howard. Chief Inspector Assad Abdul Karim directed a team of four police officers who controlled the traffic entering and leaving the survey station, which was located at Kilo 14 on the Medina Road. We are indebted to the Police for their willing co-operation and assistance, without which the survey would not have been possible.

TRAFFIC CENSUS

A.3 The total number of vehicles counted passing the census point was:

TIME	OUTBOUND	INBOUND	2 WAY TOTAL
18.15 to 18.30	33	18	51
18.30 to 19.00	56	54	110
19.00 to 19.15	23	23	46
1 Hour Totals	112	95	207

A.4 The composition of traffic during this one hour period was:-

TYPE	OUTBOUND		INBOUND	
	No.	%	No.	%
Motor-Cycles	2	1.8	3	3.2
Private Cars and Jeeps	49	43.7	48	50.5
Taxis	6	5.4	2	2.1
Pickups	6	5.4	14	14.7
Trucks	49	43.7	28	29.5
Buses	-	-	-	-
Other Vehicles	-	-	-	-
Totals	112	100%	95	100%

ORIGIN AND DESTINATION SURVEY

A.5 The origin and destination survey covered the same period (18.15 to 19.15), but only Inbound traffic was stopped and interviewed. The proportion of traffic interviewed was:

TYPE	Total Vehicle	Number Interv.	% Interv.	Expansion Factor
Motor-Cycles	3	2	66.7	1.50
Private Cars /Jeeps	48	37	77.1	1.30
Taxis	2	2	100.0	1.00
Pickups	14	14	100.0	1.00
Trucks	28	25	89.3	1.12
Buses	-	-	-	-
Other Vehicles	-	-	-	-
Totals	95	80	84.5%	1.49

A.6 The trip purposes of the drivers interviewed were:

PURPOSE	NUMBER	%
Work	15	18.8
Shopping	5	6.2
School	-	-
Social	18	22.5
Transport of Goods	18	22.5
Others	24	30.0
Total	80	100.0

A.7 The trip purpose recorded as "others" comprised:

PURPOSE	NUMBER	%
Enjoyment	12	50.00
Returning from work	8	33.30
Restaurant on Medina Road	2	8.35
The Airport	1	4.18
Testing motor vehicle	1	4.18
Total	24	

A.8 The vehicle occupancy data provides an interesting insight into the use of vehicles:

TYPE	Number of Interv.	Total Occup.	Average Occup.	Maximum Occup.
Motor-Cycles	2	3	1.50	2
Private Cars /Jeeps	37	98	2.65	11
Taxis	2	3	1.50	2
Pickups	14	73	5.22	12
Trucks	25	43	1.72	4
Buses	-	-	-	-
Other Vehicles	-	-	-	-
Total	80	220	2.75	-

A.9 Similarly the place of residence of the driver shows an interesting relationship to Jeddah:

Place of Residence	No. of Drivers	%
Jeddah	77	96.25
Mecca	2	2.50
Medina	1	1.25
Total	80	100.00

A.10 The origin and destination pattern of inbound traffic was:

Place of Origin	Number	%
Obhor (The Creek 30 km from Jeddah)	38	47.50
Cement Factory (10 km from Jeddah)	19	23.70
Ain Aziziyah (35 km from Jeddah)	12	15.00
Rabigh Zoo (7 km from Jeddah)	1	1.25
Bahussein Factory (75 km from Jeddah)	6	7.50
Khlais	2	2.50
Totals	80	

PLACE OF DESTINATION	Number	%
Jeddah (Al Sharafiyah)	7	8.75
" (Al Ruwais)	6	7.50
" (The Market)	8	10.00
" (Al Bagdadiah)	5	6.25
" (Bab Mecca)	8	10.00
Jeddah (University)	2	2.50
Mecca Road	9	11.20
Mecca	2	2.50
Jeddah (U.S.A. Embassy)	1	1.25
" (Airport Street)	2	2.50
" (Al Kandarah)	3	3.75
" (Al Sahifa)	4	5.00
" (Lebanese Embassy)	1	1.25
" (Al Amariyah)	1	1.25
" (Origin of Medina Road)	4	5.00
" (Al Hendawiyah)	1	1.25
" (Mahjar Street)	2	2.50
" (Super-Market)	2	2.50
" (Bab Sharif)	3	3.75
" (Quarantine Hospital)	3	3.75
" (SDI Building)	1	1.25
" (Sabil Street)	1	1.25
" (Al Grayat)	1	1.25
" (Bin Ladin Factory)	2	2.50
" (Al Helal Al Ahmar)	1	1.25
Totals	80	

THE INTERVIEW TIME:

Average time	Min Time	Max Time

Appendix B

REVIEW OF PILOT SURVEY

B.1 The percentage of vehicles interviewed was high due to the excellent work of the police and the enthusiasm of the interviewers, plus generally good co-operation form the drivers. Drivers are initially concerned that it is a check on vehicle licences and the lesson to be learnt is to avoid giving advance warning of a census point too early as drivers may then divert to other routes. A sign indicating that the purpose in being stopped is to provide statistics is most important.

B.2 Examination of the results revealed a large proportion of vehicles in the 'other' classification when journey purpose was considered. An analysis of this class was given in A6 where it will be seen that 50% in this group was for Entertainment or Recreation. An additional classification will therefore be incorporated in the final survey forms. Of the remaining interviews in this 'other' class, 33% were given as 'returning from work'. These should have been recorded as work journeys. There is some difficulty in training interviewers to record this question accurately and the problem will be resolved in the final form by giving the classification 'home' and asking the journey purpose at both ends of the journey. A clear record of the journey will therefore be obtained and the desired journey purpose coded in the office at the coding stage. To provide for this extra column the expansion factor which is needed to gross-up the sample of vehicles to the population of vehicles will now be incorporated in the first column reserved for 'office use'. An expansion factor is obtained for each vehicle class by dividing the number of vehicles counted by the ennumerator by the number of vehicles interviewed. This is repeated for each half-hour survey period.

B.3 As the most important peak travel periods occur in the morning and evening the two survey periods per census point will be 0700 hrs - 0900 hrs and 1700 hrs - 1900 hrs.

B.4 Four teams of 6 will be recruited. Two teams will work in the morning on interviewing, followed by coding in the office. The other two teams will code the previous days interviews in the afternoon and interview in the evening. Of the team of 6 one will be appointed supervisor and normally 4 persons will interview with one interviewer on a 15 minute stand-by rest period. Thus after 1 hour an interviewer can expect a break from interviewing for 15 minutes. This period is intended to be used for checking his survey forms to ensure that the sheets are numbered, and that town, station location, date and time-period are given. Also a quick check that all appropriate columns are coded. The supervisor must also cross-check the forms at this stage.

B.5 The pilot survey revealed that the direction of coding was not always being recorded, and to avoid any confusion over this the survey forms will be printed on different coloured forms. One colour will be for Inbound forms and the coding box for direction will be pre-coded as 1. Likewise Outbound will have a different colour and will be pre-coded 0.

B.6 Copies of the original and the proposed final roadside interview survey forms are attached, together with the form used by the ennumerators carrying out the classified vehicle counts.

Appendix C

PROPOSED METHODOLOGY FOR INTERNAL JOURNEYS

C.1 A comparitively recent technique employed in Transportation Studies, known as Category Analysis, has been shown to produce results which explain in a most satisfactory way the travel movements in an urban area. One of the most attractive features of the method is its uncomplicated approach to the subject. Basically all that is required is the grouping of households into a number of categories and deriving a travel pattern for that class of household in terms of number, purpose and mode of journeys.

C.2 In this study the three important factors are:

a Number of Vehicles owned.

b Number of Males 15 yrs and over.

c Household Income

C.3 These factors are sub-divided into High, Medium, Low. The limits of these divisions will be established from the results of the pilot study of the Socio-Economic Survey and the initial results of the main Socio-Economic Survey.

C.4 Having now defined 81 different categories a number of households in each category will be visited to record the journeys made on the previous day. From these interviews journey-rates per household type by certain mode/purpose combinations will be calculated. By predicting the future distribution of categories a new travel pattern for the city, based on the total number of trips produced, average journey length and location of opportunities to meet the requirements of the trip (i.e. a work trip must have an employment opportunity at its end) can be established.

C.5 It may well be that certain categories are not used because the number found in the Social Survey was very small - in this case certain categories will be aggregated. This gives this survey great flexibility in establishing meaningful trip rates. This information will therefore supplement the main roadside transportation surveys in the five cities.

Appendix E

Hijra year	Starts on		
1385	1	May	1965
86	21	April	66
87	11	April	67
88	30	March	68
89	19	March	69
1390	9	March	1970
91	26	February	71
92	15	February	72
93	4	February	73
94	23	January	74
1395	13	January	1975
96	2	January	76
97	22	December	76
98	11	December	77
99	30	November	78
1400	19	November	1979
01	9	November	80
02	28	October	81
03	17	October	82
04	7	October	83
1405	26	September	1984
06	15	September	85
07	4	September	86*
08	24	August	87*
09	14	August	88*

Hirja months

Muharram
Safar
Rabi I
Rabi II
Jumad I
Jumad II
Rajab
Shaban
Ramadhan
Shawwal
Dhul-Qi'dah
Dhul-Hijjah

Gregorian months

January
February
March
April
May
June
July
August
September
October
November
December

* Dates are approximate for future years.

Appendix F

Ayn	Spring
Bab	Gate
Beit	House
Emir	Prince
Harrat	Lava field
Hadj	Pilgrimage (the Fifth Pillar of Islam)
Hara	District of a city
Jaddah	Grandmother
Juddah	Seashore
Khan	Caravanserai
Kishla	Barracks
Liwanat	Colonnaded sanctuary
Majlis	Council
Malik	King
Mihrab	Niche facing the Holy City of Mecca
Musharabiyah	Casement window
Omda	Head man of the Hara
Rais	Mayor (Ottoman)
Rawashin	Bay window
Sabkah	Sand flats, often with saline incrustations
Sahn	Open courtyard
Sha'aria	The Islamic code of law and behaviour
Shara	Street
Sharm	Bay, cove, inlet
Shish	Timber framed balcony
Souk	Market
Sunna	Traditions of the Prophet
Sutoh	Roof top terrace
Tihama	Coastal plain
Wadi	Valley or dry watercourse
Wali	Governor (Ottoman)
Vilayet	Province of the Hejaz (Ottoman)
Vizier	Minister (Ottoman)
Umra	'Small' pilgrimage, i.e. pilgrimage to Mecca at any time other than during the Hadj

Appendix G

BIBLIOGRAPHY APPENDIX G

AL ANSARI, A., History of Aziziah Water Supply, Al Shroug Press, Jeddah, 1972

AL ANSARI, A., History of Arabia, Al Asfahani Press, Jeddah, 1972.

AL FARSY, Dr Fouad, Saudi Arabia, a case study in development, Stacey International, 1978

AL MAGHRABI, M.J., Transport in the Arab Countries, Vol 1, Al Rawdah Press, Jeddah, 1979

AL-QUHTANI, M.B., Preliminary Classification and Geotechnical Investigation of the Soils - Rocks of the City of Jeddah, unpublished MA Thesis, Department of Earth Sciences, King Abdulaziz University, Jeddah, 1979

ANON, Afforestation of Jeddah: The Red Sea Bride, Tihama publication, Jeddah, 1980

ANON, Prince Fawwaz Cooperative Housing Project, Dar Ah-Asfahani for Press, Jeddah

ANON, Saudi At King Abdulaziz International Airport, Saudia Printshop, Saudia, Jeddah

THE ARABIAN PENINSULA - A selected, annotated list of Periodicals, Books and Articles in English. U.S. Govt. Printing Office, Washington 1951 (reprinted New York 1969).

ARAMCO HANDBOOK, Oil and the Middle East, revised edition, Arabian American Oil Company, Dhahran, 1968

ARDELAN, NADER and LALEH BAKHTIAR - The Sense of Unity, Chicago: University of Chicago Press, 1973

ASSAF, N.M, Airports in Arabia, Al Asfahani Press, Jeddah, 1983

AZZI, R, Saudi Arabia : The Kingdom and its power. National Geographic Vol 158, No 3, 1980

BAJUNAID, B.A. and HAMMOUDA, G.H., Technical Specification of a turnkey contract of the city of Jeddah cleansing services. Municipality of Jeddah Publications, 1981.

BAJUNAID, B.A. and HAMMOUDA, G.H., Controlled refuse dispo-sal by sanitary landfill and incinerators for Jeddah City. Proceedings of the Fifth Annual Conference of Applied Research and Practice on Municipal and Industrial Wastes. PP: University of Wisconsin - Extension, Madison, USA, September 22-24, 1982.

BALLARD, G.A. - Rulers of the Indian Ocean, Boston - New York 1928

BECKINGHAM, C.F. - Some Early Travels in Arabia, Journal of the Royal Asiatic Society, London 1949 (p.156-176)

BIBLIOGRAPHY OF THE ARABIAN PENINSULA - American Georgr. Soc. of New York, New Haven 1956

BOKHARI, A.Y. - Jeddah: A Study in Urban Formation, unpublished Ph.D. thesis in Architecture. University of Pennsylvania, 1978

BRENDON, J.A. - Great Navigators and Discoverers, London 1929

BROWN G.F. and JACKSON R.O. - The Arabian Shield, International Geologic Congress Vol 21 Part 9

BUCHANAN, C.D - Traffic in Towns, Penguin, 1964

BUNBURY, E.H. - A History of Ancient Geography, London 1879

BURCKHARDT, John Lewis - Travels in Arabia, vol 1, London: Henry Colburn, 1829

BURTON, Sir Richard F. - Personal Narrative of a Pilgrimage to Al-Madinah and Meccah. London 1893; rpt New York: Dover Publication, 1964

CARTER, H. - The Study of Urban Geography, Arnold 1972

CARY, M and WARMINGTON, E.H. - The Ancient Explorers, Harmondsworth 1963 (rev. ed)

CHEESEMAN, R.E. - In Unknown Arabia, Macmillan, London 1926

CLARKE, J.I. - Contemporary Urban Growth in The Changing Middle Eastern City, G.H. Blake and R.I. Lawless, ed Croom Helm, London 1980

COOK, M.A. (Ed.) - Studies in the Economic History of the Middle East from the Rise of Islam to the present day, London 1970

COSTELLO, V.F. - Urbanization in the Middle East, Cambridge University Press, Cambridge, 1977

CRAFTS ADVISORY COMMITTEE - Conservation Sourcebook, Londn 1979

CRICHTON, A. - History of Arabia, Edinburgh 1833

CULLEN, G. - Concise Townscape, Architectural Press 1971

DE GAURY, G. - Rulers of Mecca, London 1951. - Faysal, King of Saudi Arabia, London 1966

DE SOMOGYI, J. - A Short History of Oriental Trade, Hildesheim 1968

DOUGHTY, C.M. - Travels in Arabia Deserta, Jonathan Cape, London 1964

DOXIADIS ASSOCIATES - Formulating a Housing Program for Saudi Arabia. Ekisties, Vol 44, No 261, 1977

EL-MALLAKH, R. - Saudi Arabia Rush to Development. Croom Helm. London 1982

EVANS, A.W. - The Determination of the Price of Land, Urban Studies, Vol 20, No 2, 1983

FARSI, M.S. and HAMMOUDA, G.H. - Management of municipal solid wastes of Jeddah City. A paper presented for the First International Symposium on Environmental Technology for developing countries; organized by Bogazici University, Institute of Environmental Sciences and Technology and Systems Research Institute, Istanbul, Turkey, July 1982

FATHY, Hassan - The Arab House in the Urban Setting. London: Univ of Essex, 1972

FATHY, Hassan - Architecture for the Poor. Chicago: The Univ of Chicago Press, 1973

FAYED, Y.A. - The Climate of Jeddah. Journal of the Faculty of Arts and Humanities, Vol 2, King Abdulaziz University, Jeddah, 1982

FELEMBAN, Abdulaziz Hussain - An Approach to Regional Planning in Saudi Arabia . Unpublished report, Kuwait Institute of Economic and Social Planning in the Middle East, 1968.

FISHER, W.B. - The Middle East: A Physical, Social and Regional Geography, 6th revised edition, Methuen, London 1971

FITZGERALD, D.F.V.- The Vegetation of the Red Sea Coast North of Jeddah, Saudi Arabia, 1956

FORSTER, C. - The Historical Geography of Arabia, London 1844.

GANS, Herbert - People and Plans. New York: Basic Books, Inc, 1968

GAY, J. - Bibliographie des ouvrages relatifs a l'Afrique et l'Arabie - San Remo 1875.

GEDDES, P. - Cities in Evolution, Williams & Norgate 1949.

GEOLOGICAL SURVEY PROFESSIONAL PAPER 560 D - Geology of the Arabian Peninsula, Sedimentary Geology of Saudi Arabia, United States Government Printing Office, Washington, 1966

GIBBERD, F. - Town Design, Architectural Press, 1970

GIEDION, Sigfried - Space, Time and Architecture, 5th ed, 1974; rpt. Cambridge, Mass: Harvard Univ Press 1974

GUTHEIM, F. - The Future City and its Transportation. C.1970.

HAJRAH, H.H. - Public Land Distribution in Saudi Arabia, Longman, London 1982

HARIRI, M.M. - Aerial Photographs : their use in guiding pilgrims and pointers for developing countries, Planning Outlook 27, 1, 27-33.

HART, H. - Sea Road to the Indies - New York 1950

HARTMANN, R. - "Djudda" - Encyclopaedia of Islam, 1965 ed.

HEAP, D. - An Outline of Planning Law, Sweet and Maxwell, 1978

HENIN, C. - Financial Infrastructure of Saudi Arabia, International Development Studies Group (IDSEC). University of Ottawa, 1980

HEYWORTH-DUNNE, J. - Bibliography and Reading Guide to Arabia, Cairo, 1952

HILL, A.G. - Population Growth in the Middle East Since 1945. IN: Change and Development in the Middle East. ed: Clarke J.I. & Bowen-Jones, H. Metheun, London 1981.

HOLDEN, D. - Farewell to Arabia, London 1966

HOPPER, H. - Jiddah - Lands East, Feb 1956

HOPWOOD, D. (Ed.) - The Arabian Peninsula: Society and Politics, London 1972

HOWARD, E. - Garden Cities of Tomorrow, edited by Sir F.J. Osborn, Faber, 1965

HOWELL, D. - Jeddah, City of the Red Sea, 1985

HUD INTERNATIONAL COUNTRY PROFILE - Housing and Urban Development in Saudi Arabia, Washington D.C. U.S. Government Printing Office, 1977

JAYNE, K.G. - Vasco da Gama and his Successors, London 1910

KEEBLE, L. - Principles and Practice of Town & Country Planning, London, The Estates Gazette Ltd, 1969

KHAN HADJI and SPARROW, W. - With the pilgrims to Mecca - The great pilgrimage of AH 1319; AD 1902, London 1905

KIERNAN, R.H. - The unveiling of Arabia: the Story of Arabian Travel and Exploration, London 1937

LAWRENCE, Thomas Edward - Seven Pillars of Wisdom, London, Jonathan Cape, 1935

LAURENT, D. Kessle, M., Berton, Y. and DEHLAVI, N. - Map of Engineering Geology and Hydrology of Jeddah. Ministry of Petroleum and Mineral Resources, Jeddah, 1973

LICHFIELD, N. - Economics of Planned Development, London. The Estates Gazette Ltd, 1969

LIPSKI, G.A. - Saudi Arabia, its people, its society, its culture, New Haven 1958

LOONY, R.E. - Saudi Arabia's Development: Application of Islamic Growth Model. Lexington Books, Lexington, 1982

LYNCH, K. - The Image of the City, MIT Press, 1960

MACRO, E. - Bibliography of the Arabian Peninsula, Coral Gables 1958

MAKIN, W.J. - Red Sea Nights, London 1932

MANSFIELD, P. - The Arabians, Doubleday, 1976

MARR, P.A. and HARTMANN, R. - Djudda (entry in the Encyclopaedia of Islam, New Edition, p.571-573)

MARSTON, T.E. - Britain's Imperial Role in the Red Sea Area, 1800-1878, Hamden (Connecticut) 1961.

MINISTRY OF HOUSING AND LOCAL GOVERNMENT - Development Plans : A Manual of Form and Content, HMSO, 1970

MORELAND, W.H. - The Ships of the Arabian Sea about 1500, Journal of the Royal Asiatic Society, London 1939 (Jan and April).

MUIR, (Sir) W. - The Mameluke or Slave Dynasty of Egypt, London 1896

MUMFORD, Lewis - The Culture of Cities. New York: Harcourt Brace Jovanovich, Inc. 1970

MUMFORD, Lewis - The City in History. New York: Harcourt Brace and World, Inc., 1961

NAVAL INTELLIGENCE DIVISION - Western Arabia and the Red Sea. Oxford: The University Press, 1946

NIEBUHR, M. Carsten - Travels Through Arabia and Other Countries in the East. Trans. Robert Heron. Edinburgh 1792; rpt. Beirut, Lebanon: Librarie du Liban, n.d.

O'LEARY, DE LACY - Arabia before Muhammed, London 1927.

OXFORD REGIONAL ECONOMIC ATLAS - The Middle East and North Africa, Oxford University Press, 1960

PALGRAVE, William Gifford - Narrative of a year's journey through Central and Eastern Arabia 1862-63. 2 volumes, new edition. Macmillan, London, 1868

PASCAL, A.H. - Thinking About Cities, Dickenson Publishign Co., Belmont, California, 1970

PESCE, Angelo - Colours of the Arab Fatherland, Riyadh 1972

PESCE, Angelo - Jiddah - Portrait of an Arabian City, Falcon Press, 1974

PHILBY, H. St John B. - The Heart of Arabia, Constable, London, 1922

PHILBY, H. St John B. - The Empty Quarter, Henry Holt, New York 1933

PHILBY, H. St John B. - Arabian Jubilee, Robert Hale, London, 1952

PHILBY, H. St John B. - Saudi Arabia, Ernest Benn, London, 1955

PHILBY, H. St John B. - Arabian Oil Ventures, Middle East Institute, Washington, 1964

PLANNING ADVISORY GROUP - The Future of Development Plans, HMSO, 1965

PONAFIDINE, P. - Life in the Moslem East, London 1911

PRESTAGE, E. - The Portuguese Pioneers, London 1933

PRICE, D. - Essays Towards the History of Arabia, London 1824.

PRINCE FAWWAZ COOPERATIVE HOUSING PROJECT: JEDDAH, SAUDI ARABIA - Preliminary Planning Report. Jeddah: Prince Fawwaz Housing Project, 1976

RICHARDS, D.S. (Ed.) - Islam and the Trade of Asia, University of Pennsylvania Press, 1970

RICHARDS, J.M. - Gateway to the Hedjaz, Architectural Review, 102

RIHANI, A. - Around the coasts of Arabia, London 1930

ROSENTHAL, E. - From Drury Lane to Mecca, London s.d.

RUTTER, E. - The Holy Cities of Arabia, London, Putnams, 1928

RYAN (Sir) A. - An account of the European Cemetery in Jedda (Unpublished Report), British Legation, Jiddah 1934

SADHAN, A.S. - Water Plan for Wadi Fatimah Basin, Saudi Arabia, Unpublished MSc Thesis, Department of Agricultural Engineering, University of Wyoming, 1980

SANGER, Richard - The Arabian Peninsula, Cornell University Press, New York, 1954

SAUDI ECONOMIC SURVEY - Vol XVII, No 810 April 6, 1983, Jeddah

SAUDI ECONOMIC SURVEY - Vol XVII, No 817 May 25, 1983, Jeddah

SAUDI ECONOMIC SURVEY (1983) - Employment and Wage Levels in Privately Owned Establishments, Riyadh

SEARJEANT, Robert Bert - The Portuguese off the South Arabian Coast, Oxford: Clarendon Press, 1963

SHIBER, Saba George - The Kuwait Urbanization. Kuwait: n.p. 1964

SHIBER, Saba George - Science and the Planning of Arab Cities. Kuwait: n.p. 1963

SMITH, G. REX and 'UMAR AL;ZAYLA' I.U. - Bride of the Red Sea. A 10th/16 Century Account of Jeddah, Centre for Middle Eastern and Islamic Studies, Univ of Durham 1984

SPARROW, G. - Modern Saudi Arabia, London 1970

STEVENS, J.H. and KING R. - A Bibliography of Saudi Arabia. Centre for Middle Eastern & Islamic Studies, Durham, 1973

STRIPLING, G.W.F - The Ottoman Empire and the Arabs 1511-1874, Urbana 1942

SYKES, (Sir) P. - A History of Exploration, London 1949 (3rd edition)

TALIB, Kaizer - Shelter in Saudi Arabia, Academy, London 1984

THESIGER, Wilfred - Arabian Sands, Book Club Associates, London, 1959

THOMAS, Bertram - Arabia Felix, Scribner's, New York, 1932

THOMAS, Bertram - The Arabs, Butterworth, London 1937

THOMSON, J.O. - History of Ancient Geography, Cambridge, 1948

TIBBETTS, G.R. - Arab Navigation in the Red Sea, The Geographic Journal, Vol CXXVII Part 3, Sept 1961.

TIBBETTS, G.R. - Arab Navigation in the Indian Ocean before the coming of the Portuguese, London 1971

TOMKINSON, M. - Seaside City for Mecca's Pilgrims. Geogr. Mag. 42(2). 95-104, 1969

TOY, B. - The Highway of the Three Kings, London 1968

TOZER, F.H. - History of Ancient Geography, Cambridge, 1897

TURNER, J.F.C - Uncontrolled Urban Settlement : Problems and Policies, In the City in Newly Developing Countries, by G Breese (ed) Prentice Hall, INC. Englewood, N.J. 1972

TWITCHELL, K.S. - Saudi Arabia, Princeton 1958 (3rd edition).

VAN DER MUELEN, D. - Faces in Shem, London 1961

VINCENT, W. - The Commerce and Navigation of the Ancients in the Indian Ocean, London 1807

WALPOLE, N.C. et al - Area Handbook for Saudi Arabia, Washington 1971 (2nd ed).

WELLSTED, J.R. - Travels in Arabia, John Murray, London, 1838

WILSON, R. - Private Enterprise and State Support in Saudi Arabia. Paper presented to the 1981 British Society for Middle Eastern Studies Conference in Durham, 1981

WINDER, R. Bayly - Saudi Arabia in the Nineteenth Century, St Martin's Press, New York, 1965

ZAKIR, F., BAKER, R. and ALWASH, M. - Urban Mapping of the City of Jeddah, Kingdom of Saudi Arabia on the basis of High Resolution Satellite Data, Faculty of Earth Sciences, King Abdulaziz University, Jeddah, 1986

SOURCES OF TECHNICAL INFORMATION

ONE : MINISTRIES AND GOVERNMENT DEPARTMENTS

CENTRAL DEPARTMENT OF STATISTICS, Ministry of Finance and National Economy (CDS), Statistical Year Book, Issues 1965-1982, Al-Riyadh

CDS - Results of the Establishments Survey in the Western Province 1971, Al-Riyadh, 1973

CDS - Population Census of 1974, Adminstrative Area of Makkah. Al traki Press, Damman

CDS - Detailed Results of Business Establishments in the 61 Major Cities in the Five Main Regions in the Kingdom, Al-Riyadh, 1976

CDS - Summary Results of Census of Establishments in the Kingdom 1976. Al-Riyadh, 1978

CDS - Summary Results, Census of Private Establishments. Al-Riyadh, 1981

EDUCATIONAL DIRECTORATE OF JEDDAH DISTRICT - Directory of Jeddah Educational District. Statistics and Finance Department, Jeddah, 1975

JEDDAH CHAMBER OF COMMERCE AND INDUSTRY - The Economic Advantage of the Hotel Industry in Jeddah, Research Section. Research No. 1, Jeddah, 1980

JEDDAH ISLAMIC PORT - Container Handling, Summary of Development Facilities and Future Plans, unpublished report, Jeddah, 1982

JEDDAH ISLAMIC PORT - Paper Submission for Saudi Ports Authority Annual Report No. 5 published Report, Jeddah, 1982

JEDDAH OIL REFINERY COMPANY - Unpublished Report, Jeddah, 1981

MINISTRY OF AGRICULTURE AND WATER - Operating and Maintenance Project of Jeddah Water. Statistical Paper of Product and Water Transfer in Jeddah

MINISTRY OF AGRICULTURE AND WATER - Jeddah Water Project, Dar Al-Asfahani, Jeddah

MINISTRY OF AGRICULTURE AND WATER - Jeddah Water Project.

MINISTRY OF COMMUNICATION - King Faisal Port. Dar Al-Asfahani Press, 1973

MINISTRY OF COMMUNICATION - Roads Network and its Role in Development. Middle East Press, Al-Riyadh, 1981

MINISTRY OF COMMUNICATION - Land and Marine Transportation, National Offset Printing Press, Al-Riyadh, 1982

MINISTRY OF DEFENCE & AVIATION, GENERAL DIRECTORATE OF METEOROLOGY - Annual Environmental Report, Al-Riyadh, 1977

MINISTRY OF DEFENCE & AVIATION, INTERNATIONAL AIRPORTS PROJECT - King Abdulaziz International Airport, Yamut Promotion Vic Press, Beirut, 1982

MINISTRY OF DEFENCE & AVIATION, INTERNATIONAL AIRPORTS PROJECTS - KAIA, Tihama, Jeddah

MINISTRY OF EDUCATION - Progress of Education in Saudi Arabia, A Statistical Review 1965-1977. Centre for Statistical Data and Educational Documentation, Al-Riyadh, 1979

MINISTRY OF HEALTH - Statistical Report 1981-1980. Statistical Section, Al-Riyadh, 1980

MINISTRY OF INDUSTRY AND ELECTRICITY - Senotic Engineering Consultant Company - The Basic Plan for the Industrial Estate of Jeddah, 1977

MINISTRY OF INDUSTRY AND ELECTRICITY - Industrial Estates in the Kingdom, Al-Riyadh, 1982

MINISTRY OF INTERIOR, TRAFFIC DEPARTMENT - Annual Report, Jeddah, 1984

MINISTRY OF MUNICIPAL AND RURAL AFFAIRS - Annual Report, Western Region, Jeddah, 1983

MINISTRY OF PETROLEUM AND MINERAL RESOURCES DIRECTORATE GENERAL OF MINERAL RESOURCES (1976) - Progress of Geologic Mapping and Mineral Exploration under the First Saudi Arabian Five Year Development Plan. Mineral Resources Activities 1970-1975, Jeddah.

MINISTRY OF PETROLEUM AND MINERAL RESOURCES, DIRECTORATE GENERAL OF MINERAL RESOURCES (1968) - Mineral Resources of Saudi Arabia. A guide for Investment and Development, Bulletin No. 1, Second Printing, Jeddah.

MINISTRY OF PLANNING - Third Development Plan 1980-1985, Al-Riyadh

MINISTRY OF PLANNING - Achievement of First and Second Development Plan 1970-1980, Al-Riyadh

MINISTRY OF PLANNING - Second Development Plan 1975-1980, Al-Riyadh.

PORTS AUTHORITY (1979) - Jeddah Islamic Port Handbook, Dar al-Asfahani Press, Jeddah, 1979

PORTS AUTHORITY - Annual Statistics, Safir Press, Al-Riyadh, 1981

PORTS AUTHORITY - Report 4. Safir Press, Al-Riyadh, 1981

PORTS AUTHORITY - Ports Information. Safir Press, Al-Riyadh, 1981

REAL ESTATE DEVELOPMENT FUND - Seven Year Review 1975/76-1981-82. Al-Riyadh

SALINE WATER CONVERSION CORPORATION - Desalting Plant in Jeddah. The Third Stage. Dar Al-Asfahani, Jeddah, 1979

SALINE WATER CONVERSION - Water: Unlimited, Falcon Press.

SAUDI ARABIAN AIRLINES - History of Saudi Arabian Airlines. Unpublished Report, Jeddah, 1973

SAUDI ARABIAN AIRLINES (SAUDIA) - 30 Years of Saudia 1945-1975, Grafiche Trevisan. Italy, 1976

SAUDI ARABIAN MONETARY AGENCY - Annual Reports 1960-1981, Jeddah and Al-Riyadh, 1976

SAUDI PUBLIC TRANSPORT CO - Facts About the Saudi Public Transport Co. 1981. Al-Riyadh, 1981

TWO : ROBERT MATTHEW, JOHNSON-MARSHALL & PARTNERS

The following chronological bibliography presents the titles of the reports relevant to Jeddah submitted to the Ministry of Interior, Municipal Affairs, Regional and Town Planning Department by RMJMP.

Title of Report	Submission Date
Socio-Economic Survey Methodology (Urban)	13.5.71
Special Report on Airport Road Jeddah	20.6.71
Socio-Economic Survey Methodology (Rural)	23.6.71
Transportation Survey Methodology	23.6.71
Second Special Report on Airport Road Jeddah	8.7.71
Initial Appraisal, Jeddah	13.7.71
Interim Regional Survey Report	19.8.71
Regional Survey Report	4.11.71
Immediate Action Report, Vol 1	17.2.72
Immediate Action Report, Vol 2: Urban Design	17.2.72
Immediate Action Report, Vol 3: Water	17.2.72
Initial Report on Hadj Survey	19.3.72
Regional Framework Report	4.7.72
Alternative Urban Strategies: Jeddah, Taif and Yanbu	11.9.72
Action Area Selection Report	29.10.72
Hadj Survey Special Action Area, Final Report	20.11.72
Socio-Economic Survey Report	29.1.73
Transportation Survey Report	29.1.73
Medina Hadj Survey, Interim Report	6.2.73
Draft Master Plan for Jeddah	17.3.73
Draft Action Area, Jeddah and Taif (Residential)	2.6.73

Final Reports	Submission Date
Regional Development Plan	1972
Master Plan for Jeddah	1973
Action Area Report for Jeddah	1973
Medina Hadj Survey	1973

Further Study Reports	Submission Date
Jeddah Corniche Central Sector	1974
Jeddah Corniche North Sector	1975
Jeddah Corniche South Sector	1975
Urban Public Transport (Jamieson Mackay & Partners as lead consultants)	1976
Street Naming and Numbering, Jeddah	1977
Jeddah Historic Area	1978
Jeddah Historic Area, Review of Progress	1983

THREE : CONSULTANTS

ITALCONSULT - Water Supply Surveys for Jeddah, Makkah Taif Area. Report No. 6 Rome, 1976

SERT JACKSON INTERNATIONAL, SAUDCONSULT (SJI) - Socio-Economic Data. Deputy Ministry of Town Planning, Technical Report No. 5, Vol. 3, 1978

SJI - Evaluation of Existing Master Plan. Deputy Ministry of Town Planning, Technical Report No. 4, 1978

SJI - Revising and Updating of the Existing Master Plan. Deputy Ministry of Town Planning, Technical Report No. 9, 1979.

SJI - Jeddah Action Master Plans. Final Report. Deputy Ministry of Town Planning No.14, 1980

WATSON, J.D. & D.M. - City of Jeddah, Report on Storm Water, London, 1968