OPERATIONAL PLANNING

An alternative view of Doxiadis' project in Riyadh

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Introduction

By the twenty-first century, a number of Gulf cities have become regional powerhouses, competing on the global stage economically, socially, culturally, and politically. This has not always been the case, though; the region's urban construct was different throughout much of the twentieth century when it was distinctly nonurban. In the case of Saudi Arabia, for example, only 10% of the population lived in urban areas in 1950, compared to 70% in 1985 and a staggering 85% by 2005.¹ The typical historical dynamics of the region dramatically transformed during the second half of the twentieth century, largely motivated by the discovery of oil in commercial quantities and by the subsequent economic prosperity, which triggered major regional social, political, and economic changes. What had been a series of small, isolated, self-sufficient towns evolved into today's sites of global practices, contemporary architecture, rich culture, and economic affluence. A common scenario unfolded across the region: Western planners, arriving with full support and considered as a bridging force towards modernity, guided urbanization and modernization efforts. Typically, the planners came with clear tasks: to transform the organic fabric of old cities into a 'modern' one, often associated with Western images of modernity. The trend was region wide: The first ones were Minoprio, Spencely and Macfarlane in Kuwait in 1951. Then A. M. Munro devised Manama's plan in 1968, and later Katsuhiko Takahashi developed designs for Abu Dhabi in 1971. Llewelyn Davis came to Doha in 1974; John Harris made a plan for Dubai in 1960 and 1976; and most recently, CH2M Hill & CEG were engaged to plan Dammam in 1980. While all had a substantial influence in the development of the region, the present chapter focuses on the 1972 master plan of Riyadh, developed by the Greek planner Constantinos Doxiadis, known for its experimental urban design aspects.

Doxiadis' first introduction to Riyadh was in 1968, and timing was an important factor that increased his influence on the city's future development. Riyadh was, at that time, on the brink of development in a critical moment in the city's history that marked its transformation from a small town into today's largest Gulf city. However, there was little in place that would guide and plan this growth. The Greek planner filled that gap, producing the city's first masterplan in 1972, a tool that remained influential in shaping Riyadh's urbanity for the subsequent decades and its growth to become a modern city with global reach. Since its official implementation, the plan has become a subject of debate among urbanists, scholars, policy makers, and citizens. Few extol the plan; most scholars critique it, negatively.

The aim of this chapter is to explore Doxiadis' master plan and his legacy in the city and to provide an alternative understanding to the way he approached planning and influenced Riyadh's urban future. Before examining the project, it starts by

discussing the site and reviewing Riyadh's pre-Doxiadis urban situation. Then, it provides an account of the Greek planner's introduction to the city and the planning process he conducted there. After detailing the plan's characteristics, the plan is critically examined from two contrasting perspectives, that of Doxiadis' adherents who highlight the pros of the plan and that of his critics, who mention the cons. The chapter concludes by considering the legacy of Doxiadis' work, exploring how, in spite of many practical limitations, the 1972 master plan is today still a major guiding force in Riyadh's growth. In addressing this point, the present text suggests that urbanists discussing the project often have a limited lens, resulting in a reductionist perspective that ignores Doxiadis' attitude and understanding of the field. Almost all planning efforts around the world are assessed as spatial exercises and according to physical criteria, be the planner Haussmann in Paris, Moses in New York, or even Harris in Dubai or Munro in Bahrain. Doxiadis' plans to modernize Riyadh are often discussed in a similar manner with a focus on the spatial components of the plan. This chapter, however, argues that the key to understanding the plan is to recognize the process it initiated: it created a flexible mechanism of growth that adapted to changing situations, allowing the city to territorially expand in the years to follow. This aspect reflects Doxiadis' theoretical position towards planning: understanding cities as living organisms that should not be bounded, he believed that the planner's role is not that of a builder or creator per se but rather that of a guide and facilitator for growth. This chapter takes Doxiadis' theoretical position into consideration to provide an alternative reading of the plan, suggesting that its adaptability is one reason why the plan has endured for decades. Rarely is Doxiadis credited for adopting a different approach to urban planning.

The site

The story of Riyadh's urban growth can be divided into distinct phases marked by clear critical moments of transformation. ● The early era is of Riyadh as a small, semi-isolated town. The first reliable record of its urban condition dates to 1902 when it had an area of one square kilometre and a population of 8,000 inhabitants.² Construction of the Murabba Palace in 1938 marked a significant moment in Riyadh's history, not only because it led to Riyadh's expansion beyond its walls but also because, for the first time, it employed motorized vehicles in the construction process. People used to depend solely on mud for construction, but now they were able to transport other materials from different places, making buildings more stable and radically transforming the city's morphology.³ Another significant urban force was a programme to help Bedouins settle in urban areas. Banned at that time from residing within city walls, they resorted to constructing

fig.1

fig.1 Map of Riyadh, 1939 (Source: Arriyadh Development Authority. Reuse not permitted).

their own agglomerations just outside the walls and called them Al-Hilal. Clearly, the city was expanding and growing although in a slow manner. Riyadh's territorial growth was relatively limited, reaching around 3.5 km², and it was only inhabited by about 50,000 people in the 1940s, with a density similar to that of 1902.⁴

1952 was a watershed moment. What was originally a small town would develop into a major global city, a transformation catalysed by two simultaneous key events for the nation. First was the decision by the late King Saud to declare Riyadh as a new location of governmental agencies, issuing a royal decree that ordered their relocation to the city within two years. (In reality, the process took four years according to scholar Yousef Fadan.)⁵ The second moment was when Saudi Arabia signed an oil profit sharing agreement with the United States. A year earlier in January 1951, the Saudi government agreed to a fifty-fifty profit share with Aramco, leading to enormous economic wealth, expansion in the job sector, and intense urbanization processes.

These national dynamics unfolded powerfully in Riyadh and transformed its urban reality. The capital city became the hub of internal and external migration and the country's official portal

to the world, and modernization efforts were impelled by a desire to command higher status and to represent a paradigm shift. Riyadh's territory grew to accommodate the population wave and soon reached 6.5 km²: while the old town remained static, the new neighbourhoods, such as Al-Malaz, Al-Nasserya, and Al-Fouta, sprawled outward and blurred the boundaries of the old city. The population of the city also increased considerably: the growth rate hovered around 4.5% between 1930 and 1950, but it almost doubled, reaching 8% between 1950 and 1970.⁶ As a consequence of this modernization effort, as a reflection of these new economic and social changes, and to accommodate the population influx, Riyadh became a large construction site with development projects in various areas of the city.

The initial pace of modernization efforts did not decrease in the coming years. Consequentially, Riyadh changed dramatically: it was reconfigured from a small city with high density and tight fabric to a new pattern with one-fifth the previous compactness and a street allocation scheme three times greater than before.⁷ Between 1930 and 1968, Riyadh's population grew elevenfold from 27,000 inhabitants to about 300,000, with an urban footprint reaching 24 km² that absorbed the airport, originally located eight kilometres outside the centre.⁸ Saudi Arabia, as a whole, was experiencing a rapid migration to urban centres, especially to the capital Riyadh, the major stakeholder in this dynamic. A significant development early in these efforts was the aforementioned Al-Malaz, a neighbourhood and housing project financed and constructed by the national government in 1953. That project represented the first time that Riyadh experienced the use of a grid as an urban strategy and of the villa as a building unit. Thus, it effectively set a precedent for development of Riyadh as well as of other major cities in Saudi Arabia.

Between the construction of Al-Malaz in 1953 and Doxiadis's arrival in 1968, many projects were under construction simultaneously across a city aiming to control its growth. Developers were arriving from all over the region, and the pace of urbanization increased exponentially. The fundamental challenge during this period became how to develop institutional management frameworks in the face of rapid growth and an increasing demand for services. Also, the definition of a holistic vision for the entire city, that could combine various and sundry efforts into a single whole, proved to be critical.⁹ Aware of these challenges, the government took multiple, consecutive steps to address these issues: the Ministry of Interior created the Directorate of Municipalities in 1953, later upgraded to become the Department of Municipal Affairs (DMA) in 1962. In December 1967, in the face of these new challenges, DMA signed a contract with Doxiadis Associates to commission the city master plan. This decision turned out to be a major moment in the city's urban development path.

The planner

In 1959, Constantinos Doxiadis, a graduate of the Faculty of Architecture at the University of Dresden, Germany, was hired to devise a new capital for Pakistan. The city of Islamabad would be constructed from scratch to grow gradually. In planning Islamabad, Doxiadis employed design elements similar to the ones he would later implement in Riyadh despite the staggering difference in the scale of the two cities: Islamabad's project area was about 1,165 km², making it almost four times the size of Riyadh. He conceptualized a grid using a two-by-two-square kilometre 'superblock,' the same unit with which he would experiment again later, as a modular system to cover the larger extent of the city. The Islamabad plan featured a trademark central business spine, the ability to indefinitely expand, and a prominent natural element, in this case the national park, all aspects similar to those that Doxiadis later envisaged for Riyadh. His project in Baghdad contained the same features. He was contracted at a time when Iraq was in the throes of popular movements and social unrest, and he was brought partially to set the disputes. Hiring the Greek planner indicated political will for change. The Baghdad commission was based on a planning model that emphasized growth, control, and efficiency, principles which would later become the hallmark of his work elsewhere and would be critical to his Riyadh project.

Besides *ekistics*, or the science of human settlements, Doxiadis had a number of key planning principles that he maintained throughout his projects, and they are evident in Riyadh and elsewhere. He always predicted that cities would grow much larger, anticipating that the world's urbanized population would expand from 33% in 1960 to over 97% in 2100.¹⁰ As a response came the idea of *dynapolis*, with the prefix 'dyna' indicating growth or development. It expresses the planner's view of the city as a living organism that should not remain static. He proposed that cities should be permitted to grow, their expansion unfolding along a single transportation axis that alleviates pressures of traffic, without bounds or limits in lockstep with the requirements of an increasing population.

This concept clearly echoes his belief in the 'linear city,' a concept and topic of tendentious debate among planning professionals at that time. To him, the linear city was an attempt to depart from the old, inefficient, static towns built around a centre since, in the current age of the automobile, this obsolete design tended to choke with overuse and traffic. Additionally, much like many of his modernist colleagues at that time, Doxiadis' plans adopted the renowned concept of the 'superblock,' which created neighbourhoods wherein internal vehicular access was controlled or prohibited. This offer of retail and services in close proximity allowed residents to fulfil their daily needs without stepping into a car. Moreover, the superblocks were surrounded by broad highway networks, able to process the traffic of a modern city.

The project

Doxiadis' involvement in projects in South Asia and the Middle East made him known as a modernization agent in economically developing contexts, and this reputation is probably what led him to Riyadh. His initial contact with the Saudis occurred in 1962, but his first formal engagement was not until 1966 with the Ministry of the Interior. In 1968, Doxiadis opened his first office in Al-Malaz neighbourhood in Riyadh. The office's sole focus for the subsequent years became gathering data and information. A milestone of this research was the 1969 production of the first planning document, titled "Riyadh, the Current Conditions".¹¹ It mainly consists of data analyses describing the city: the current situation in Riyadh, physical and social characteristics of the city, and most urgent challenges. Notably, there is neither mention of future plans nor previsions of what would happen in the coming years or of how Riyadh would or should grow. The scope of this document was to study the context before starting to envision the future.

By July 1971, Doxiadis finally disseminated the results of earlier efforts in a document titled "Riyadh, the Masterplan", a scheme that was formally approved by the Cabinet of Ministers in early 1972 and aimed to guide and control the city's growth until 2000.¹² This plan was emblematic of the firm's main planning principles, clearly advocating for the idea of a *dynapolis*, where the physical growth of this ideal city was imagined in a linear pattern. ● The plan's physical footprint of this ideal city was about 304 km², an area large enough – it was thought – to accommodate Riyadh's growth until the turn of the century, by which point Doxiadis anticipated that it would host 1.4 million residents. The document identifies two primary objectives. The first is to improve transportation and circulation at a desired speed, ameliorating transport connections and allowing people to move from base points to their destinations in the easiest and most efficient manner. The second goal is to divide the city into a number of smaller sectors or neighbourhoods, with each sector clearly defined, easy to manage, and self-sufficient in terms of services and uses with some unique aspects. The document has three key elements: highway catalogues that circumscribe superblock typologies and community classes; city-scale regulations that take into account density, zoning, type, height, and other characteristics; and a detailed design for individual action areas within the city centre that explains how the plan would be carried out in those locations, as they were imagined to serve as a model for other areas to follow. ●

Physically, the plan's scope consisted of a main north-south commercial and transportation axis or spine along which the city could grow in a linear manner. The plan justified the decision to direct the expansion of the city towards the north, citing environmental, economic, historical, political, and social factors. From this commercial spine, residential areas would branch out in

fig.2

fig.3

fig.2 Doxiadis Associates, 1972 Final Master Plan: Regulations
 (Source: Constantinos and Emma Doxiadis Foundation, Athens.
 Reuse not permitted).

a repetitive manner along the flanks by means of the two-by-two-kilometre grid. The latter is Doxiadis' main physical legacy in the city, in which each constituent of the grid forms a superblock surrounded by highways that enable through traffic.

Each block represents a self-contained neighbourhood restricted to pedestrians, with services at a walkable distance and tailored for the residents. These blocks demonstrate Doxiadis' ideas of different class communities and their relationships to one

Doxiadis Associates, 1972 Final Master Plan: Highway catalogue, typical cross-sections of roads (Source: Constantinos and Emma Doxiadis Foundation, Athens. Reuse not permitted).

fig.3

another. One of the plan's main considerations was to carefully design and allocate new roads, featuring a hierarchy and outline of functions for each one. It proposed a comprehensive road network with a total length of 457.8 km; the streets would be configured on the grid to define and bound each block. This network was intended to connect the organic lineaments of the old city pattern to the new and highly regular grid, allowing for seamless transit between different parts of the city. Likewise, the built-up area of Riyadh was divided into three density levels: the further one

progresses from the central spine, the lower the density becomes. The proposal's recommendations are also divided into three phases: the most immediate before 1975, the medium-term before 1980, and the long-term scenario envisioned for the year 2000. At the very end of the document, in just a small paragraph, the plan discusses issues of social and practical implementation.

The debate

As the subject of vigorous debate, Doxiadis's legacy in Riyadh is often judged cynically. On the one hand, his few adherents portray him as a hero to the city; the plan was a much-needed tool that arrived at a critical juncture in the city's development and aided its growth.¹³ At that time, Riyadh was expanding rapidly, and this expansion was occurring in a haphazard manner with little planning. According to Abdulaziz bin Thenayan, then mayor of the city:

Many people are building everywhere, they ask for permits, which they are given, but we do not know whether they should really build there, or whether they should go higher up. I cannot stop the people, there are no regulations, no zoning.¹⁴

Clearly, it was a critical moment, and a plan was urgently needed as intense growth was unfolding despite the lack of any clear direction. The new plan was successful in filling that gap and providing a framework for the unplanned growth to follow, and this is the point often emphasized by his supporters. Furthermore, the plan was effective in achieving the criteria that the architect targeted, regardless of the validity of that criteria. It was a plan that aimed to accommodate the city's rapid growth and to allow for a smooth, automobile-dependent, circulation pattern.

On the other hand, the master plan received fierce criticism from Riyadh-focused urbanists such as former Deputy Mayor of Riyadh Faisal Mubarak who often portrayed it as a major source for many of the city's current urban challenges. Their critical perspective wasn't utterly unjustified; much like many modernist planning efforts, Doxiadis' plan did lead to a number of adverse effects on the city's urban construct. It embodied International Congresses of Modern Architecture (CIAM) ideals of a utopian, post-industrial city model, where the built morphology is geared towards achieving efficient circulation and where its public spaces were dominated by automobiles. The plan's proposed form for Riyadh, while accomplishing the desired modernist efficiency, can be seen as extremely detached from the context, generic, and obsolete. Similarly, it also devotes little attention to Riyadh's natural traits. While the data collection phase included a thorough study of the city's topography and natural features, this study had minimum impact on shaping the urban strategy. The plan also contains negligible allocation

of green open spaces; it specifies their significance as an element “of modern developed towns”, yet it designates less than 2% of the city’s territory to that use in one of the future scenarios.¹⁵

The plan’s limitations were not only evident in physical aspects, but the planning process that Doxiadis employed was also itself extremely flawed. He was commissioned to plan for Riyadh up to the year 2000, and a careful, retrospective analysis reveals that it contained a number of misguided assumptions and predictions. In 1970, while Doxiadis’ team were in the process of planning the city, Riyadh was home to 355,000 inhabitants. They predicted that the city’s population would grow to reach 1,400,000 citizens by the year 2000. Unbeknownst to them at the time, by 2000 Riyadh would count 3,800,000 residents, more than two-and-a-half times their estimates. The team also predicted that in 1980, the city would be home to only 685,000 inhabitants, but the city in fact reached that figure close to 1976. Likewise, their predictions of a 1990 population of 1,050,000 were surpassed before 1980. The planners underestimated not only the city’s growth in terms of population but also its physical expansion. It was predicted that the city’s footprint would reach 304 km² by 2000, but the city in fact reached 400 km² by 1976, just four years after the plan was issued.¹⁶

On the one hand, this underestimation is understandable. What Riyadh witnessed in the coming years was an unprecedented boom that rarely occurred in the planner’s experience, making it extremely difficult to anticipate. On the other hand, these unsound assumptions were extremely problematic for the plan and disastrous to the city’s future urban construct. These impacts were accentuated not only because of how far off they were from reality but also because of Doxiadis’ own planning strategies and the way he approached the task in Riyadh. Doxiadis’ talent as a practitioner depended heavily on his ability to generate data and analyse it, and this is extremely clear in the case of Riyadh. It seems that he positioned himself vis-à-vis the city more as a predictor than a designer. His main contribution was in his ability to collect and produce the data and then to analyse and predict the future based on this collection. For instance, the report clarifies its scope in Riyadh in a number of points: to predict growth possibilities and the estimated size as well as to predict and divide the stages of growth through particular future dates. It uses the word ‘predict’ to express its objective and goal, highlighting the role of the team and the way they were positioned. The first document on Riyadh’s current situation was a 429-page report of enormous detail; but the third report, Doxiadis’ actual design proposal, was a relatively scant 171 pages. Even in the shorter document, it is not until page 119 that he moves from local data to the actual plan, when he starts discussing the future density of the

fig.4 Doxiadis' legacy in Riyadh. Left: newer neighbourhoods; centre: neighbourhoods designed immediately after 1972 plan; right: parts of old Riyadh (Source: Faisal Al-Mogren, 2020. Reuse not permitted).

city. The way he positioned himself, and this sheer dependency on data, makes the inaccuracies of his estimates disastrous to the plan and hence the city.

The conundrum

Despite the divergence of perspectives on the plan, the two sides agree on the fact that it played a critical role in shaping the urban growth trajectory of the city. Doxiadis' legacy is evident not only in the city's older parts, which were constructed during the plan implementation phases of the 1970s and 1980s, but also in more recent developments. ● To date, new neighbourhoods are being built according to a strategy similar to that of Doxiadis.

The plan's continuing relevance in Riyadh's current urban environment is a puzzling phenomenon, especially if one considers that the original scope was imagined to guide the city until 2000. Thus, 20 years after the plan's expiry, the city would be expected to have moved beyond the framework that the Greek planner put in place. Certainly, the city has had other subsequent masterplans. For instance, the French company SCET produced a plan in 1978, and the urban strategy MEDSTAR was devised by the development authority in 2008. Nevertheless, apart from simple alternations and updates, the city was not able to escape the original plan's influence and construct, operating within the urban structure that was envisioned for the city in 1972.

This chapter's main aim is to analyse this phenomenon and to propose a different view of Doxiadis' project, a reading alternative to what is common in current Gulf urban discourse. The continuing relevance of the 1972 plan reveals a different approach

fig.4

for which Doxiadis' plan is rarely credited. A typical understanding of any master plan is as a physical unit, where the role of the planner is to design the large picture of what the city ought to look like: its physical size, the locations of its components, the densities and heights, the different pieces and their relations to each other in addition to other physical attributes. Scholars and urbanists discussing Riyadh often focus on that aspect, treating the project as a physical construct and investigating measures such as density, transportation circulation, or territorial expansion; however, this article argues that the aforementioned approach is not entirely able to accommodate the whole complexity of the plan.

Doxiadis' plan likely remained relevant due to its construction of a dynamic growth model, unleashing a process which allowed Riyadh to grow and expand indefinitely, even beyond the physical boundaries that were set in the plan. Treating the urban environment as a living creature, the planner provided city officials with the ingredients needed to guide Riyadh's growth, with little regard to the mix of these ingredients. In the master plan, he suggests that Riyadh will face qualitative and quantitative transformations, and hence

it is necessary to develop a framework that is able to grow and connect the different kinds and levels of functions in an organized manner, and is able to absorb both the anticipated and the unexpected transformation from now. This is what Riyadh needs first and foremost to solve its current and future problems.¹⁷

To that end, he devised spatial tools that are adaptable; they could be incorporated in a number of different plans and could be applied irrespective of the specific or physical placement of urban elements. These strategies extended the life of the plan and heightened its adaptability to various geographical locations. The plan, which could adapt and operate in a city of 500 citizens just as well as it could function in a metropolis of five million, remained relevant despite all of its inaccurate, initial assumptions.

The mechanisms, such as the modular grid, initiated by the 1972 plan remain embedded in the urban fabric of the city, and it is how Riyadh continues to grow to this day. This grid of two-by-two-kilometre superblocks delineated exact parameters according to which each unit could be endlessly regenerated, regardless of the direction or location, creating a system to ensure a hierarchy of streets and an associated catalogue of street types to follow. In addition, the plan also created a ratio between certain typologies, densities, heights, and setbacks based on their proximity to certain elements, allowing for these parameters to guide growth in any direction or shape. ● "The suggested pattern should be open-ended", reads the report, "it should allow the city

fig.5

fig.5 1972 masterplan. Right: detail of the two-by-two km grid. Left: growth mechanism of the superblock (Source: Faisal Al-Mogren, 2020. Reuse not permitted)

to grow as much as the population increases”.¹⁸ Doxiadis also set a formula to determine the percentage of public spaces relative to density and access and created a complex system of connections and networks. All of these specifications exemplify how the plan operated as an enabling tool for growth rather than a detailed physical implementation of a vision.

A major aspect of adaptability is that the plan, while extremely detailed in some respects, is designed in a vague manner in others, leaving certain aspects completely open to interpretation. Though this trait often has negative connotations, it is not the case in this context, where it turned out to be one of the reasons that the plan was able to adapt and remain relevant. In the plan, Doxiadis laid out the general framework for how the city should develop. He believed strongly in certain principles and, as a result, was particularly specific at describing them, such as the limits and characteristics of the superblock or the length and hierarchy of streets. By contrast, there are many other aspects of the plan left purposely vague. These could thus be implemented in several different ways based on the given circumstances and according to interpretation. In Riyadh, and through the different stages of its development, it was apparent that the same elements in the plan were read, interpreted, and applied differently based on the changing situation and the needs of that specific time. This was enabled by the plan’s vagueness. For example, the plan’s

description of “a neighbourhood centre” is open for interpretation as it could mean an open space, civic space, religious space, recreational space, transportation hub, or a hodgepodge of these elements. Another example is that the plan dedicates a section to advocating for the preservation of the city’s unique architectural style, yet neither the nature of this style nor the required modes and mechanisms are clarified. This wide room for interpretation is a key aspect that helped the plan to endure. It meant that the plan could remain flexible and adaptable, that it could always be reinterpreted by local agencies to serve new purposes while keeping the general framework intact.

These characteristics of the plan, its adaptability and its dynamism, should not be considered as a coincidence or as if they are isolated phenomenon; rather, they are conscious and deliberate planning moves that fit within Doxiadis’ ideals and theoretical convictions about cities. The *dynapolis* model allowing for indefinite growth is translated into the mechanisms proposed in his plan for Riyadh, and even though the city outgrew his vision’s anticipated boundaries, these parameters and tools were designed in a way to allow for unlimited territorial expansion. In the report, Doxiadis suggests that understanding Riyadh as a living organism is the grounds on which he based the two, main planning principles: the linear pattern of growth and the arrangement of neighbourhood units. Riyadh is treated in his plan, indeed, as a living creature, a true *dynapolis*.

Notes

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