وزارة الشـــؤون
البلدية و القروية
Ministry of Municipal & Rural Affairs

RIYADH
City Profile

مستقبل المدن السعودية
FUTURE SAUDI CITIES

UN HABITAT
FOR A BETTER URBAN FUTURE

Future Saudi Cities Programme
City Profiles Series: **Riyadh**

King Fahd National Library Cataloging-in-publication Data

Ministry of Municipal and Rural Affairs
Riyadh City Profile./ Ministry of Municipal and Rural Affairs
Riyadh, 2019
..p ; ..cm

ISBN: 978-603-8279-25-0

1-City planning- Riyadh
I-Title
309.2625314 dc 1440/8317

L.D. no. 1440/8317
ISBN: 978-603-8279-25-0

Ministry of Municipal and Rural Affairs
P.O. Box : 935 - King Fahd, Riyadh, 11136
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www.unhabitat.org

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ACKNOWLEDGEMENTS

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The Future Saudi Cities Programme is a jointly implemented project managed by the Deputyship of Town Planning of the Ministry of Municipality and Rural Affairs of the Government of the Kingdom of Saudi Arabia and the United Nations Human Settlements Programme (UN-Habitat).

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RIYADH

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FUTURE SAUDI CITIES PROGRAMME

CITY PROFILE


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1

INTRODUCTION

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1.1 About the Future Saudi Cities Programme

The Future Saudi Cities Programme is a joint programme developed by the Saudi Ministry of Municipal and Rural Affairs (MoMRA) and UN-Habitat, implemented in close cooperation with the municipalities of 17 major Saudi cities. The cities have been selected based on their different population sizes, geographic distribution, and a range of criteria based on capacities and economic potential to create a more balanced regional development among the cities of Saudi Arabia. The chosen cities include Riyadh, Makkah, Jeddah, Taif, Madinah, Tabuk, Dammam, Qatif, Al-Ahsa, Abha, Najran, Jazan, Hael, Arar, Al Baha, Buraidah, and Skaka.

After undertaking city-level reviews in the 17 cities, five cities were chosen as a representative cross-section, for in-depth analysis. The city-level reviews considered the linkages between urban and territorial planning by examining the city within the relational context of its sub-region and exploring specific issues at the neighbourhood level. These reviews, when referenced with City Prosperity Index (CPI) reports and validation processes in the Rapid Planning Studio workshops, were used to extrapolate strong, evidence-based conclusions that relate to the planning system as a whole.

Applied research, with a strong focus on action-oriented conclusions, was used to collect evidence to diagnose the strengths and weaknesses of the planning system and local planning practices in each city. The methodology utilised design tests and demonstration projects as avenues to apply and analyse potential solutions, before concluding on policy recommendations.

UN-Habitat's three-pronged approach considers spatial planning in relation to legal and institutional frameworks, in addition to financial mechanisms. In this way, success criteria for the sustainable implementation of a spatial plan should include flexible but enforceable rules and regulations, in addition to a financing strategy and projections.

As a pragmatic explication of this approach, three local demonstration projects, representing essential elements of a strengthened and improved planning system, have been developed. These were elaborated to include schematic designs and feasibility studies, that can later be transformed into implementation plans. Such implementation plans are projected to be undertaken by MoMRA, in collaboration with other partners in the Kingdom.

In order to facilitate this process, a joint "FSCP Urban Lab" was created as a vehicle to strengthen endogenous capacities and to develop tailored tools, and instruments. The Lab, composed of international expertise from the planning, legal and economy branches of UN-Habitat Nairobi office, has been working with Saudi-based staff in the UN-Habitat Riyadh office (selected by MoMRA), to enhance knowledge exchange and to apply a learning-by-doing method to the programme.

As such, all 17 cities have been simultaneously engaged in a capacity-building strategy that included foundational learning, and 'on the job' training, culminating in Saudi-specific advanced training. This training was based on the planning-system conclusions and recommendations, that the FSCP produced. Thus, the Urban Lab functions as a tool to generate evidence whilst additionally strengthening capacities through a process of learning-by-doing.

1.2 Saudi Initiatives for Sustainable Urban Development

The Saudi Government, along with the respective Ministries, and in line with a larger country-wide transformation process, has made several efforts aimed at the sustainable development of its growing cities. These contributions vary from plans at the national level, like the National Spatial Strategy (NSS), to strategies and plans at the regional level, cutting across various sectors towards realising Vision 2030. The FSCP recognises these efforts as positive, supporting Vision 2030 goals to realise a sustainable urban environment for the Kingdom of Saudi Arabia. The FSCP acknowledges and builds upon the current tools, plans, and strategies as part of a comprehensive assessment and suggests variations and improvements where appropriate.

1.3 Objectives of the City Profile Report

1.3.1 Scope of the city profile

The city-profile combines MoMRA's new strategy, with a review of existing studies, plans, and strategic documents, such as the review of the Kingdom of Saudi Aarabia (KSA) National Spatial Strategy (NSS) to identify and address the root causes of problematic conditions outlined in the preliminary findings. The report acknowledged low uptake of the NSS by regions, utilities and ministries, as a key weakness. The issue of horizontal (sectors) and vertical (scales) integration is thus a key challenge that the FSCP aims to address going forward.

Policy recommendations for improving urban planning frameworks and practice shall be structured through a multi-scalar lens, considering the city as a continuum in the urban fabric, that should grow from the neighbourhood to the wider city-region, whilst influenced by dynamics and regulations at the national and supranational levels. This ensures that policy recommendations for these cities do not operate in isolation from the city's envisioned role in the administrative region and the national system of cities.

1.3.2 Objectives of the city profile

The City Profile Report brings together diagnostic urban analysis and aligns that analysis with the UN-Habitat sustainable

Riyadh heritage sites

development framework and the Saudi Vision 2030. It performs as a thinking tool that constitutes together an assessment tool and guidance for the current and future planning of the city, whilst defining a clear strategy for sustainable development.

The definition of an ad-hoc strategy is rooted in an evidence-based approach to the issues, building upon both primary and secondary data collection and analysis. The profile, as well as the Programme as a whole, uses the data collected by the City Prosperity Initiative (CPI), to identify significant trends and challenges at the city level. This evidence is then combined with reviews of existing planning documents, and cross-referenced with multi-scalar GIS spatial analysis, to define the above-mentioned ad-hoc strategy.

1.4 City Profile Methodology

1.4.1 Evidence based input approach

The evidence-based planning approach creates a deeper understanding of the spatial dynamics of the urban area, by combining and comparing urban datasets such as demographics, density, land use, natural features, and accessibility analysis.

The evidence (data) is reflected in the form of indicators that can be compared with best practice standards and benchmarks for sustainable urban development. Not only does this provide a clear perspective on the main developmental issues, but it also quantifies the projected effect of future development proposals on the indicators applied in the analysis.

The programme recognises that the methodology, on which policy recommendations guiding improvements and adjustments in the planning system are based, needs to be evidence-based. For this purpose, different methods were integrated to first provide the necessary body of evidence on which to build an understanding, and full assessment of issues before making recommendations for the respective cities.

The elements constituting the evidence-based approach are primarily constituted of the following:

- Reviews of existing policy documents and plans;
- CPI;
- GIS spatial analysis.

All of these elements are utilised in a cross-scalar diagnostic methodology that incorporates quantitative and qualitative evidence. The method used to generate evidence-based policy recommendations, which develops capacities and engages stakeholders in all 17 cities, provides

Riyadh workshop with local authorities and stakeholders

conclusions derived from both top-down and bottom-up approaches, cross-cutting all scales of planning.

By analysing how the structures of spatial, socio-environmental and economic issues interact at different scales of influence, the diagnostic methodology moves from the national to the neighbourhood scale, tracking the interdependencies within the city's physical development patterns, and seeking to decrypt the reasons behind them.

1.4.2 The reviews

Several reviews of existing policy documents and plans were undertaken with the purpose of a) extracting information useful to the understanding of the context, and the city itself, and b) assessing their contents based on three criteria: content relevance, process integration, and effectiveness. The reviews focused on assessing the:

- National Spatial Strategy;
- The Strategic Plan for the Riyadh Region (SPAR);
- Arriyadh Metropolitan Structural Plan;
- Riyadh Local Plan and Action Area Plans.

1.4.3 The city prosperity index assessment report

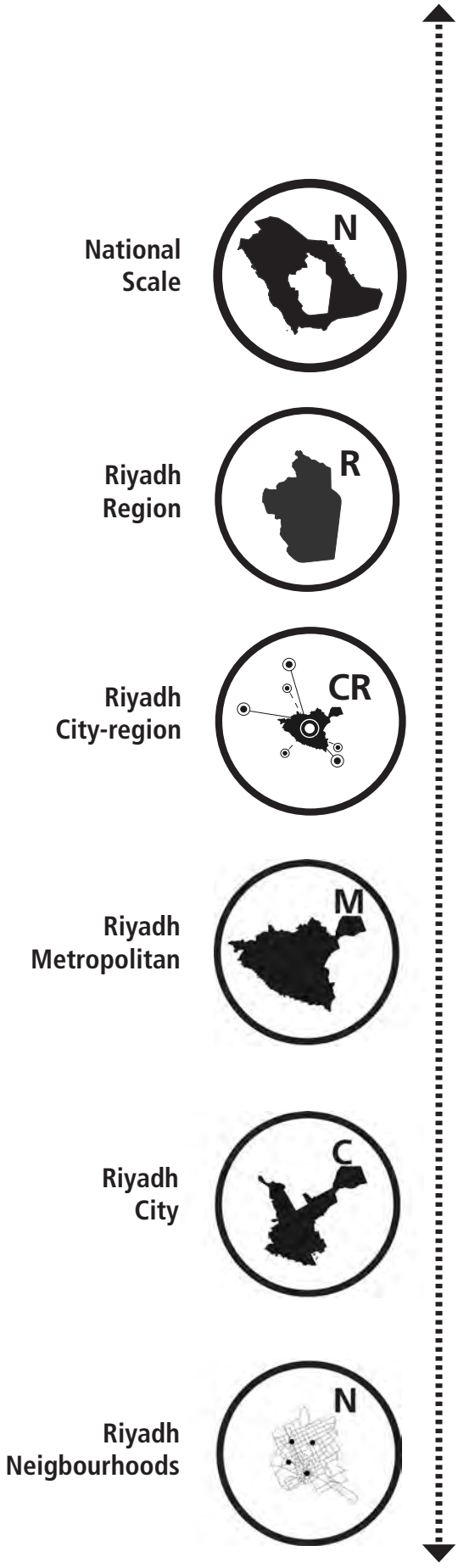
The City Prosperity Index is made up of six dimensions that serve to define targets and goals that can support the formulation of evidence-based policies. These include the definition of city-visions and long-term plans that are both ambitious and measurable. The six dimensions are:

- Productivity;
- Infrastructure;
- Quality of life;
- Equity and inclusion;
- Environmental sustainability;
- Governance and legislation.

These dimensions have been assumed as guiding principles in the spatial assessment of Riyadh. There are ten detailed spatial indicators at the FSCP city profile level that link into the 72 flexible indicators of the CPI assessment.

1.4.4 The GIS spatial analysis

The spatial reflection of the above indicators highlights detailed patterns of development and the interactions and dynamics associated with movement, densities, and land use within the urban system. This process enables a dynamic understanding of the physical expressions of weaknesses and strengths in the urban system and the main issues to be addressed. The effect of proposals for future development can also be assessed by use of the same indicators.



CROSS SCALAR DIAGNOSTIC METHODOLOGY

2

NATIONAL AND REGIONAL SPATIAL CONTEXT

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2.1 The Region's Role in the Kingdom of Saudi Arabia

2.1.1 Historical background

The name Riyadh is derived from the plural of the Arabic word ("rawdah") meaning a place of gardens and trees, owing to the natural fertility provided by its location in a place with many wadis (water courses, now dry) in the vicinity.[1] Up until the mid 20th century, Riyadh City's role was confined to the main trading centre for the neighbouring towns and villages of the Al Najd Region. It has grown from a relatively small settlement into a great modern city whose roots can be traced back to when it was raised to royalty status and made the capital of the Kingdom. By 1955 (1375H), all ministries and government offices had been moved to or established in Riyadh. Its scope of responsibility was greatly enhanced and its resources increased to enable it to cope with its growing size and population. Riyadh is the capital city of The Kingdom of Saudi Arabia and also the capital city of Riyadh Region. Riyadh is the seat of government and houses all the ministries, embassies, diplomatic missions, educational, financial, agricultural, cultural, technical, commercial, and social organisations. Riyadh is now a high-tech oasis of glass, steel, and concrete, home to big hotels, even larger hospitals, and one of the biggest airports in the world; its road network is amongst the best in the world. Today, Riyadh has six government owned/public universities, five privately owned universities, and some middle-level colleges, specialised institutes, cultural information centres, sports facilities and stadiums, and public libraries.[2]

2.1.2 Geography and location

Located in the geographic centre of the country, the Riyadh Region has an area of 404,240 km² and a population of 6,777,146 (2010), making it the second largest region in terms of both area (after the Eastern Region), and population (after Makkah Region). The region shares its borders with seven other administrative regions of the Kingdom, namely the Eastern Region in the East, Al Qassim Region in the North, Asir, Makkah, and Madinah in the West, and Najran in the South.

The Riyadh Region is characterised by a desert climate, dry and hot in the summer, and cold in the winter with low rainfall. The average temperature in Riyadh is 25°C, rising in the summer to more than 50°C and dropping in the winter to 0°C, with a humidity of 33.1% and an annual rainfall of 84.4 mm. The area is also exposed to recurrent sandstorms being surrounded by desert sand dunes.

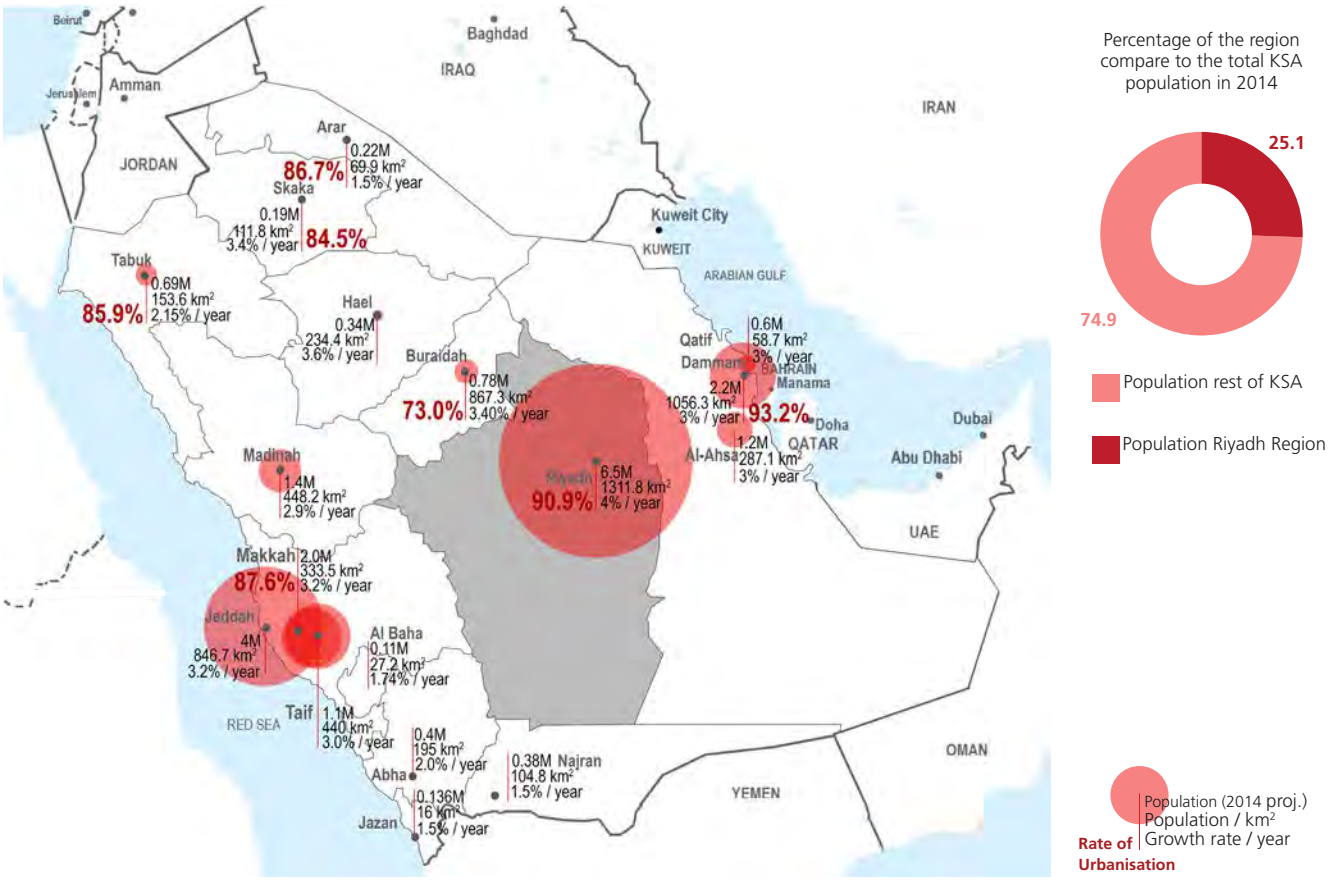


Fig. 1. Population distribution, growth rate and urban areas within the Kingdom of Saudi Arabia

Riyadh skyscrapers in the main spine of the city

2.1.3 Demographic background

More than 75% of the population of the region resides within Riyadh. According to the 2004 Census, 1,728,840 of the region's population was non-Saudi (approximately 31%), with 1,444,500 of those living within the provincial capital, Riyadh.

According to the 2010 census, the city of Riyadh had 5.2 million inhabitants, while the Riyadh Household Survey 2016, conducted by the Arriyadh Development Authority (ADA), recorded the population at 6.5 million in 2016. Riyadh is the largest and one of the fastest growing cities in the Kingdom of Saudi Arabia with an annual growth rate of 4%, higher than the national average estimated at 2.11%. The average household size in Riyadh is projected at 5.7 people per household, down from around 6.6 in the 2010 census. The population density of the city of Riyadh has increased to about 4,659 p/ha, an increase from 4,000 p/ha in 2010. According to the 2010 census data, the population comprised of 56% male and 44% female, whereas non-Saudi males represent 63% compared to 37% females, in line with the national trend.

The distribution of non-Saudis with respect to age and gender is explained by the fact that majority of them are in the country to work, mostly without their spouses. Riyadh City has a young population, with people below 24 years of age constituting 46% of the total city population, while a population of 60 years and above constitutes 4.19%. The average life expectancy in Riyadh is 72 years. The population pyramid for Saudis shows a wide base and gets narrower as you go upwards, which indicates an overpowering number of youth. Additionally, the under-15's alone make up 30% of Saudis and 19.7% for non-Saudis.[3]

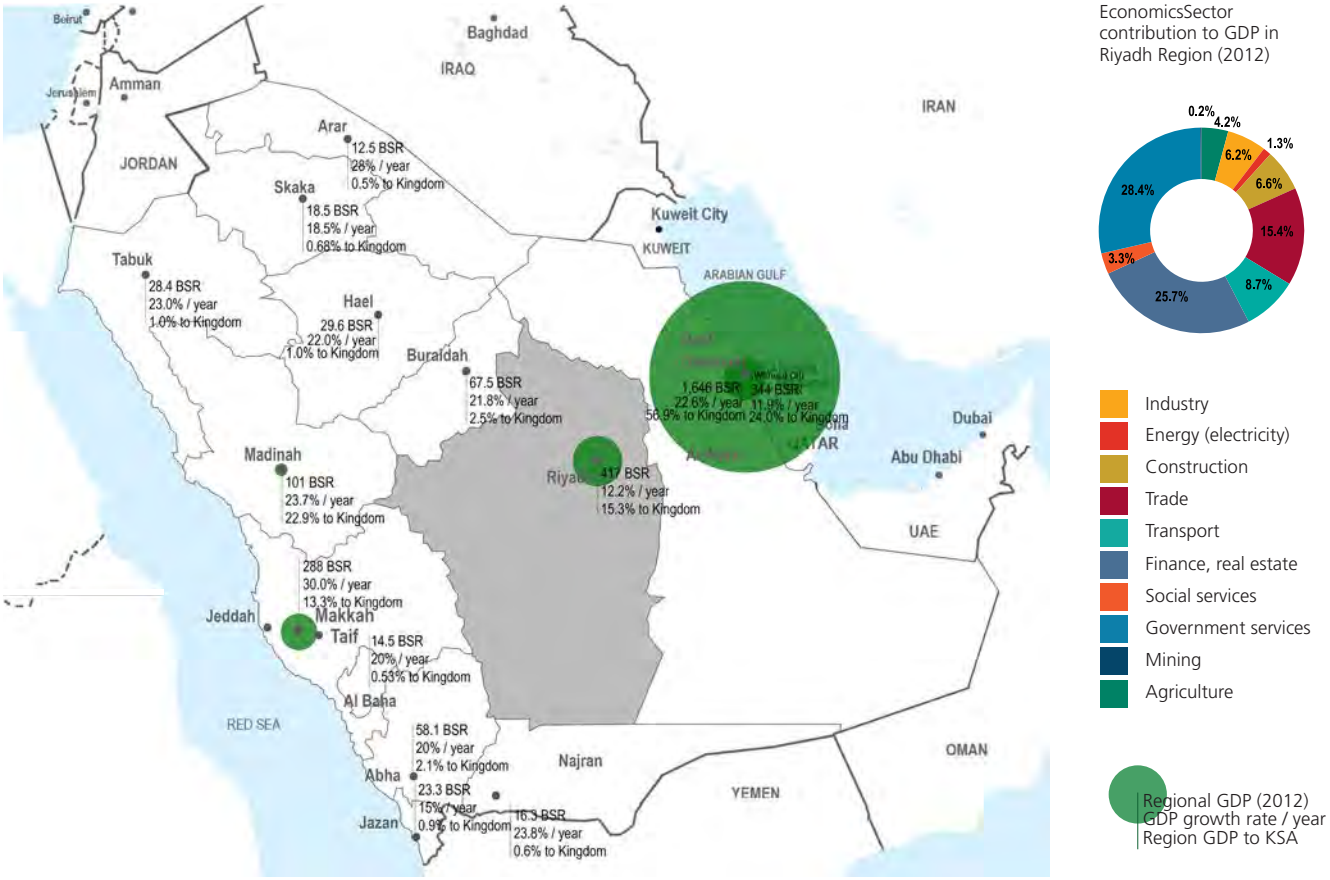
2.1.4 Socio-economic background

The economy of Saudi Arabia and the revenues of its government are mainly dependent on oil and gas. This applies to the Riyadh Region and its administration, although most petroleum liquids are produced in the Eastern Region of the country. Considering the limited amount of oil and natural gas, and because of their non renewability, it is crucial for the country and Riyadh Region to prepare for the time beyond petroleum.

Gross Domestic Product

The Gross Domestic Product (GDP) in 2012 of the Riyadh Region amounted to about SR 417 billion, representing 15.3% of the GDP of the Kingdom and 29.2% of the GDP of the Kingdom without crude oil and gas. The average annual growth rate of the GDP of the region was about 12% during the period 2009-2012. Real estate and financial services sector ranks first in terms of contribution to the output of the Riyadh Region, with 25.7% contribution, followed by the trade sector with 15.4%, transport, storage and communications sector with 7.8%, construction and building sector with 6.6%, industrial sector with 6.2%, and agricultural sector with 4.2% contribution.

Wadi Hanifa runs for a length of 120 kilometres from Northwest to Southeast, cutting through the city of Riyadh

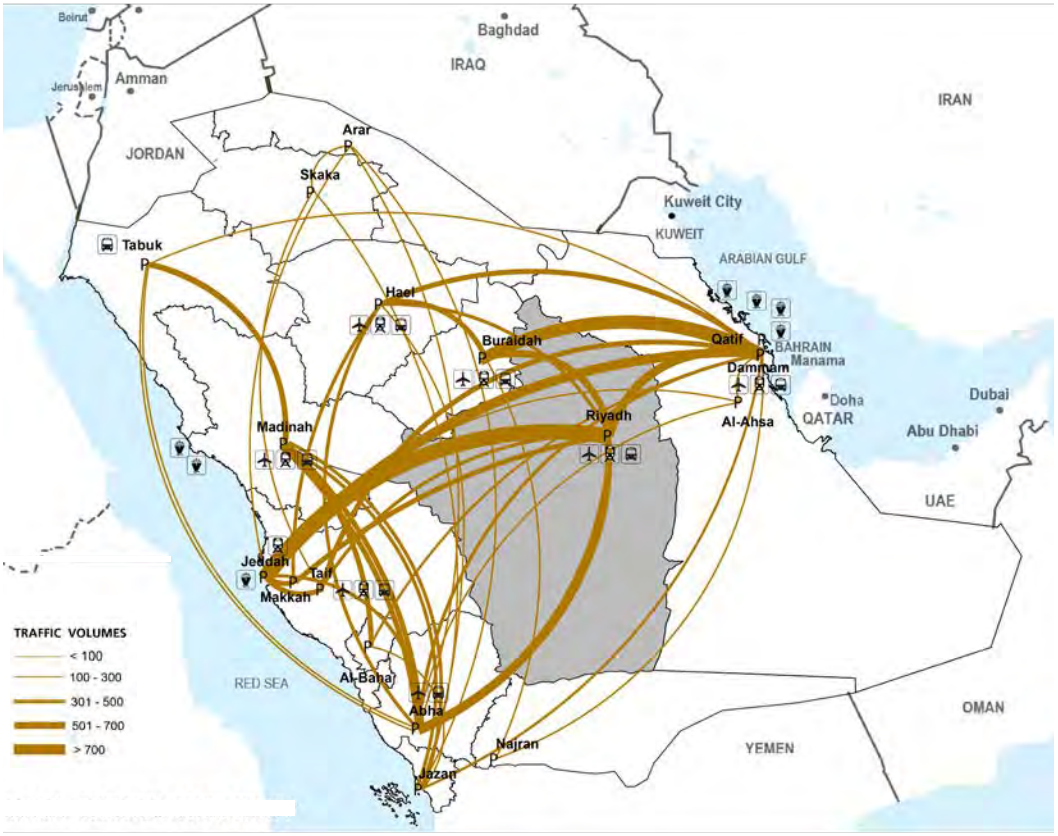


EconomicsSector contribution to GDP in Riyadh Region (2012)

- Industry
- Energy (electricity)
- Construction
- Trade
- Transport
- Finance, real estate
- Social services
- Government services
- Mining
- Agriculture

Regional GDP (2012)
GDP growth rate / year
Region GDP to KSA

Fig. 2. Regional Gross Domestic Product and economic sector contribution



Dammam: King Fahd International Airport (Passengers 9,567,000);

Jeddah: King Abdulaziz International Airport (Passengers 30,000,000);

Riyadh: King Khalid International Airport (Passengers 22,300,000);

Madinah: Prince Mohammad Bin Abdulaziz International Airport (Passengers 6,500,000);

Buraidah: Prince Nayef Bin Abdulaziz International Airport (Capacity 550,000).

Dammam-Abqaiq-Riyadh
Al Qassim-Majma'a-Riyadh
Makkah-Jeddah-Madinah

Arabian Gulf Ports:
King Abdulaziz Port, Dammam
King Fahd Industrial Port, Jubail
Jubail Commercial Port
Ras Al Khair Port
Ras Tanura Port

Red Sea Ports:
Jeddah Islamic Port
King Fahd Industrial Port
Yanbu Commercial Port

Fig. 3. Transport connectivity between Saudi cities

2.1.5 National Connectivity

Air Transport

There are three airports in the Riyadh Region, including an international airport, King Khaled International Airport in Riyadh, and two regional airports; King Salman Airport in Dawadmi, and Wadi Al Dawasir Airport. The number of passengers using the airports of the Riyadh Region aboard internal flights made up 31% of the total air traffic in the Kingdom in 2012. King Khaled International Airport is considered one of the most advanced airports in the Middle East and one of the fundamental and important pillars on which the region depends for the growth of transport movement and air freight.

Railways Transport

The Riyadh Region is linked to the Eastern Region by a passenger railway line, which connects the city of Riyadh to Dhahran, Baqiq, Al Hofuf, and Dammam. The length of this rail line is 449 kilometres. There is also another 556 km of railroad dedicated to cargo transportation, starting from King Abdulaziz Port in Dammam and terminating in Riyadh, passing through Abqiq, Al Hofuf, Hardh, and Kharj. The North-South line starting from Riyadh City extends to the North-West side towards Al Haditha city, adjacent to the Jordanian borders and passing through Qassim, Hail, and Al-Jouf Regions, and is now partially operational. So far the portion from Riyadh-Qassim-Hail is operational. Six stations on the North-South train project have been allocated for passenger transport services. This includes the King Khalid International Airport station in Riyadh, in addition to the stations of Al Majmaah, Al Qassim, Hael, Al Jouf, and Al Hadithah. New lines of railway are also being implemented in the Kingdom, the most important of which is the Land Bridge, (East / West line), connecting the Riyadh Region with the Holy City of Makkah.

2.2 Regional Structure and Dynamics

2.2.1 Regional organisation

Administrative Boundaries

The region is divided administratively into the Region capital in the city of Riyadh, and nineteen governorates: Diriyah, Al-Kharj, Dawadmi, Al Majma'ah, Al-Quai'ya, Wadi Al Dawasir, Al Aflaj, Al Zulfi, Shagra, Hotat Bani Tamim, Afif, As Sulayyil, Al Mezahmiya, Derma, Heremla, Thadiq, and Al Ghatt.

The Regional Plan for the Riyadh Region

The Regional Plan for the this region was developed under the name Strategic Plan for the Riyadh Region (SPAR). Its development was requested in 1422H (corresponding 2001G) by His Royal Highness Prince Salman Bin Abdulaziz, who served at the time as the Arriyadh Governor and Chairman of the Regional Council and became King of Saudi Arabia in 2015. His Royal Highness instructed the Arriyadh Development Authority (ADA) to consider the Regional Council's opinion on the need for a Strategic Plan for the Riyadh Region.

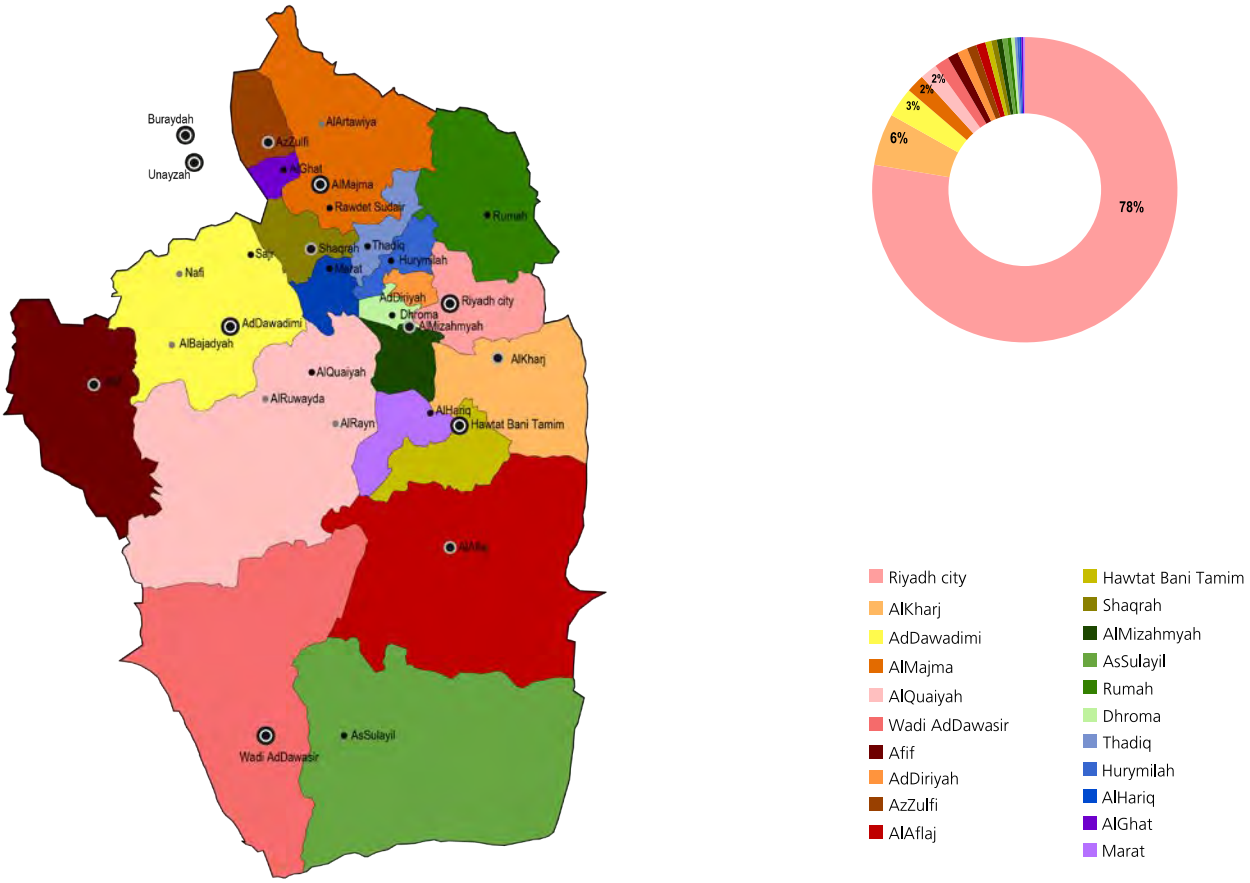


Fig. 4. Administrative boundaries and population distribution in the governorates

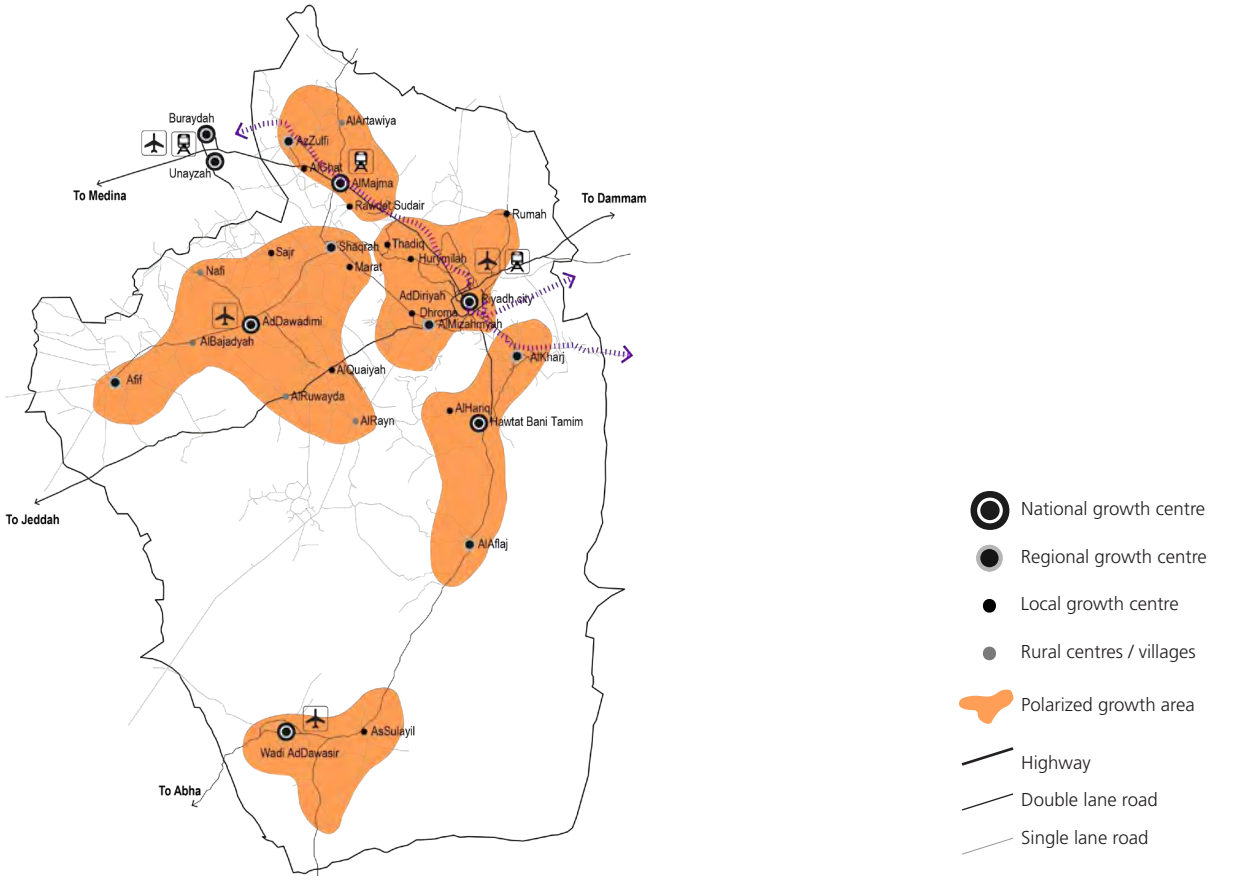
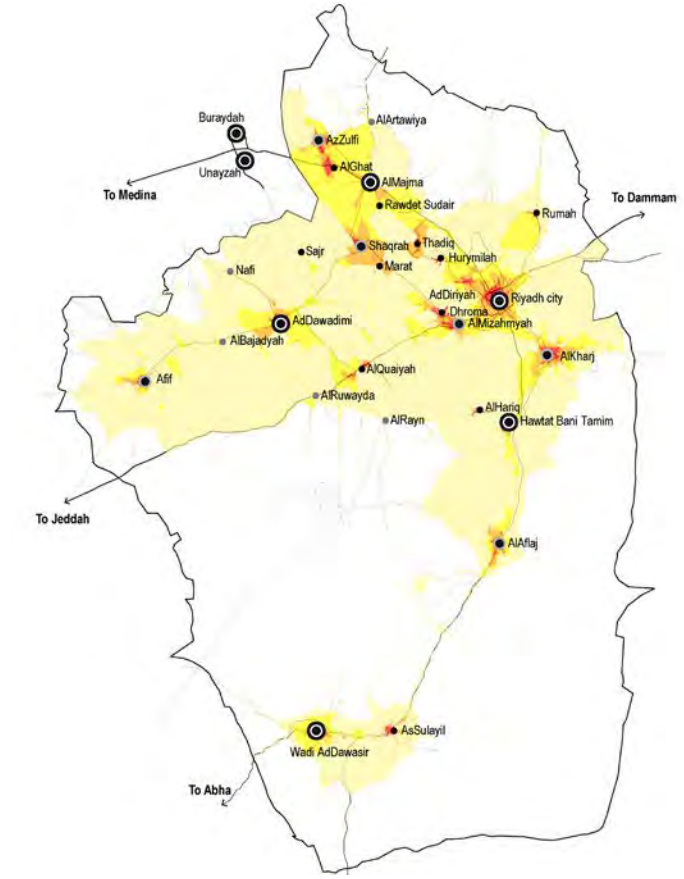


Fig. 5. Development areas according to the Regional Plan for the Riyadh Region



Drive time	Population	Percentage of Total
15 Minutes	2,414,820	31.3%
30 Minutes	4,548,322	58.9%
60 Minutes	5,144,917	66.7%
> 60 Minutes	7,720,000	100.0%

Fig. 6. Accessibility in the Riyadh Region

SPAR's Urban Development Strategy emphasiszes the need for balanced decentraliszed development to spread development revenues in the governorates. The strategy adopts the concept of polariszed areas and identifies five areas in the region where new settlement and urban growth could be concentrated most effectively. SPAR also defined a hierarchy of settlements in line with national standards and identified the future development needs for the major public services such as universities, institutes and hospitals for each of the identified areas.

The concept of polariszed centres is also in line with the National Spatial Strategy's (NSS) of 2011 interest in a more balanced form of urban development. SPAR has adopted a hierarchy for communities aimed at encouraging decentraliszation. According to this classification, the city of Riyadh has a special status as national capital, and is also one of the identified polar centres.

2.2.2 *Regional structure and resources*

Movement Infrastructure

The Riyadh Region enjoys a modern and developed network of highways and bridges, linking the major cities to the industrial, commercial and agricultural facilities and connecting Riyadh to the neighbouring regions. The region is currently witnessing new projects and expansions in its internal road network, as well as the roads linking the region with other areas. According to our analysis, the percentage of people living within a 60-minute drive from the major urban centres in the region amounts to 66.7% of the total population.

Environmental and Topographic Elements

The Riyadh Region is characteriszed by a variety of topographic elements that differ from the West of the region to the East. As illustrated in figure 7, the Riyadh Region contains wadis through the middle, sand dunes in the North and South, mountainous terrain on the Western side and scattered agricultural lands. There are many agricultural communities in the area, such as the Wadi Al Dawasir, and nearby Alkharj. The area is also characterised by a group of unique flora and fauna that are under threat from the expansion of urban activity. It is, therefore, important that the environmental dimension be taken into account as a priority in any regional plan for the Riyadh Region to achieve sustainable development

The process of rapid urbanisation of Riyadh has put heavy pressure on the environment. The exploitation of non-renewable sources like oil, natural gas, and water aquifers are outstanding features which challenge any efforts to integrate the economic, social and environmental development into a balanced and sustainable development process. The map in Figure 9 marks the different protected areas, priority areas, and sensitive areas. Comprehensive and sensitive regional planning practices offer an opportunity to better coordinate related developments, and to make the most effective and sustainable use of existing strengths and opportunities.

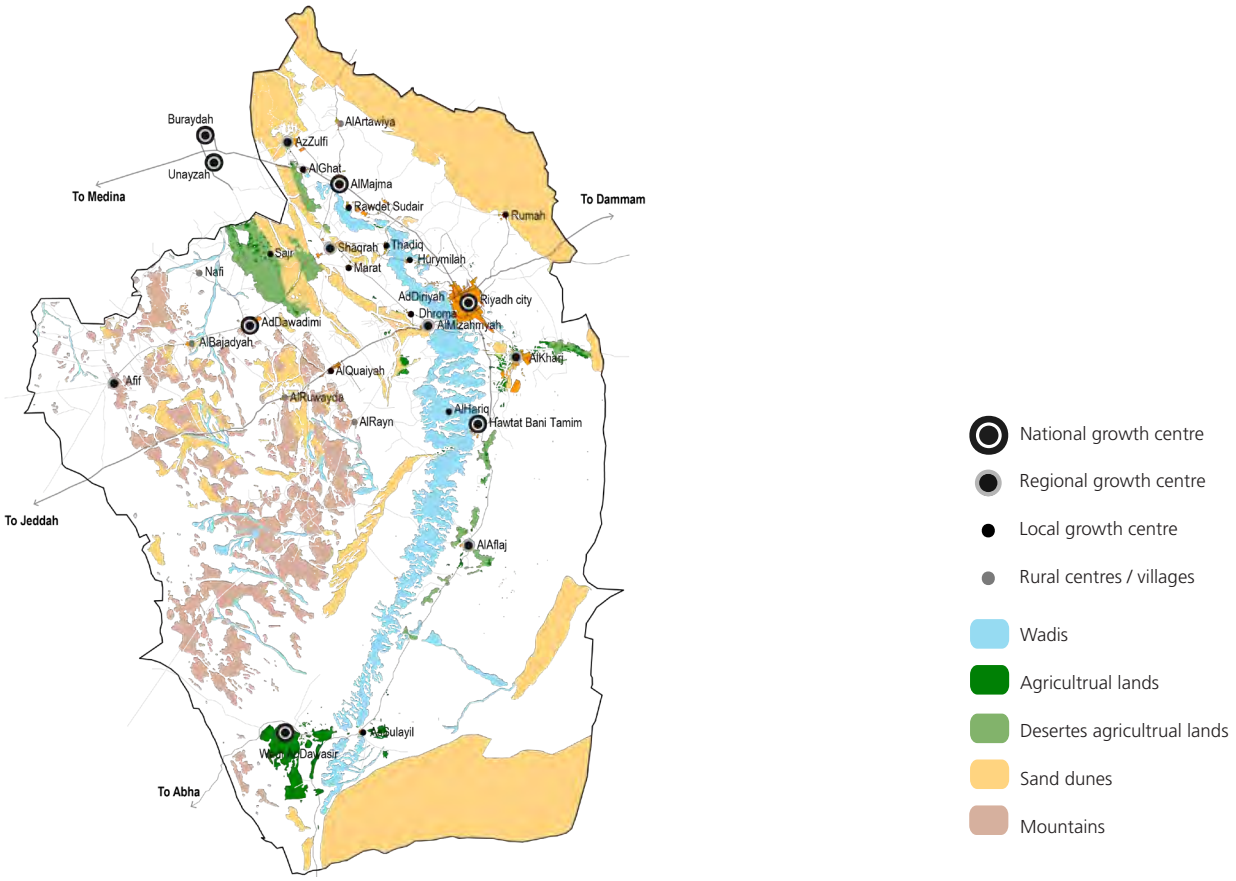


Fig. 7. Natural resources

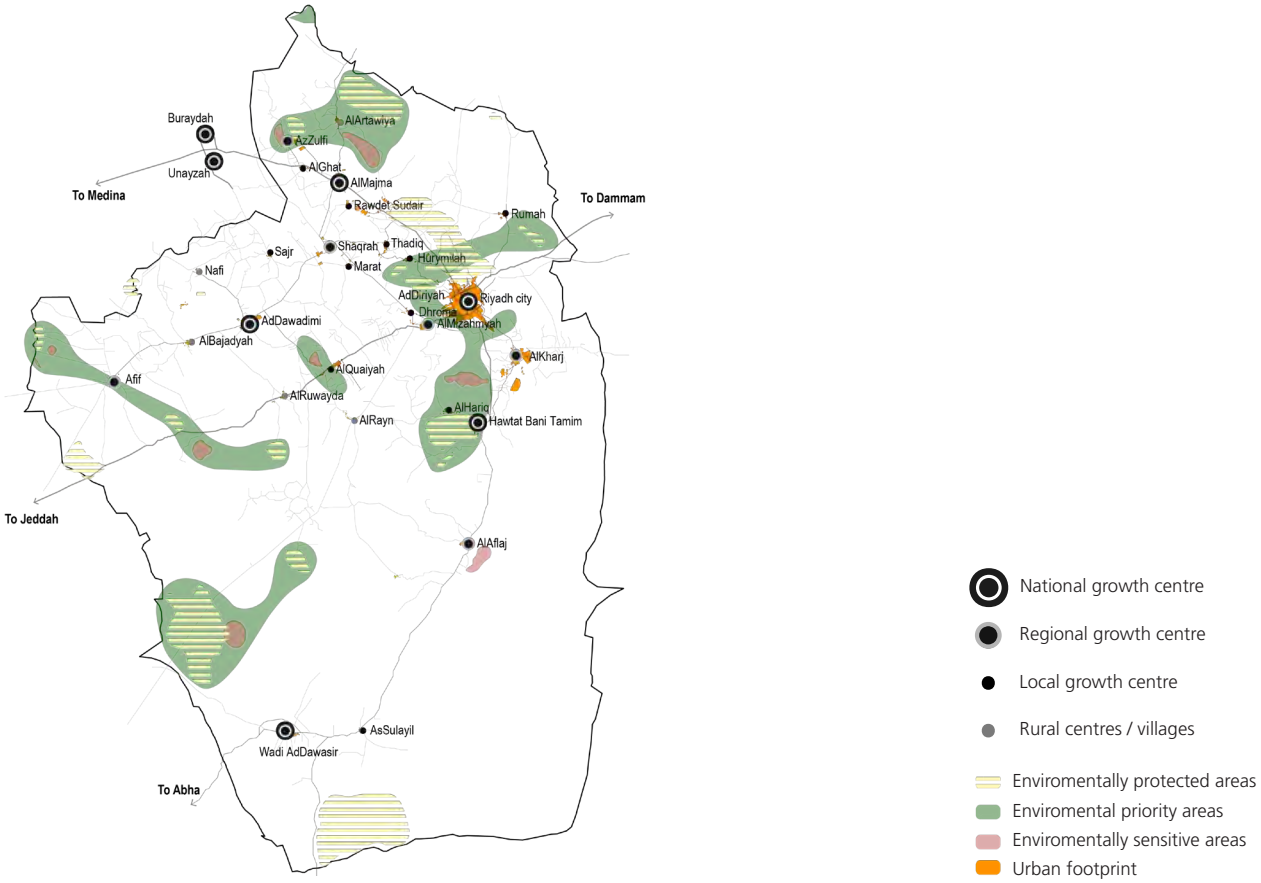


Fig. 8. Environmentally protected areas

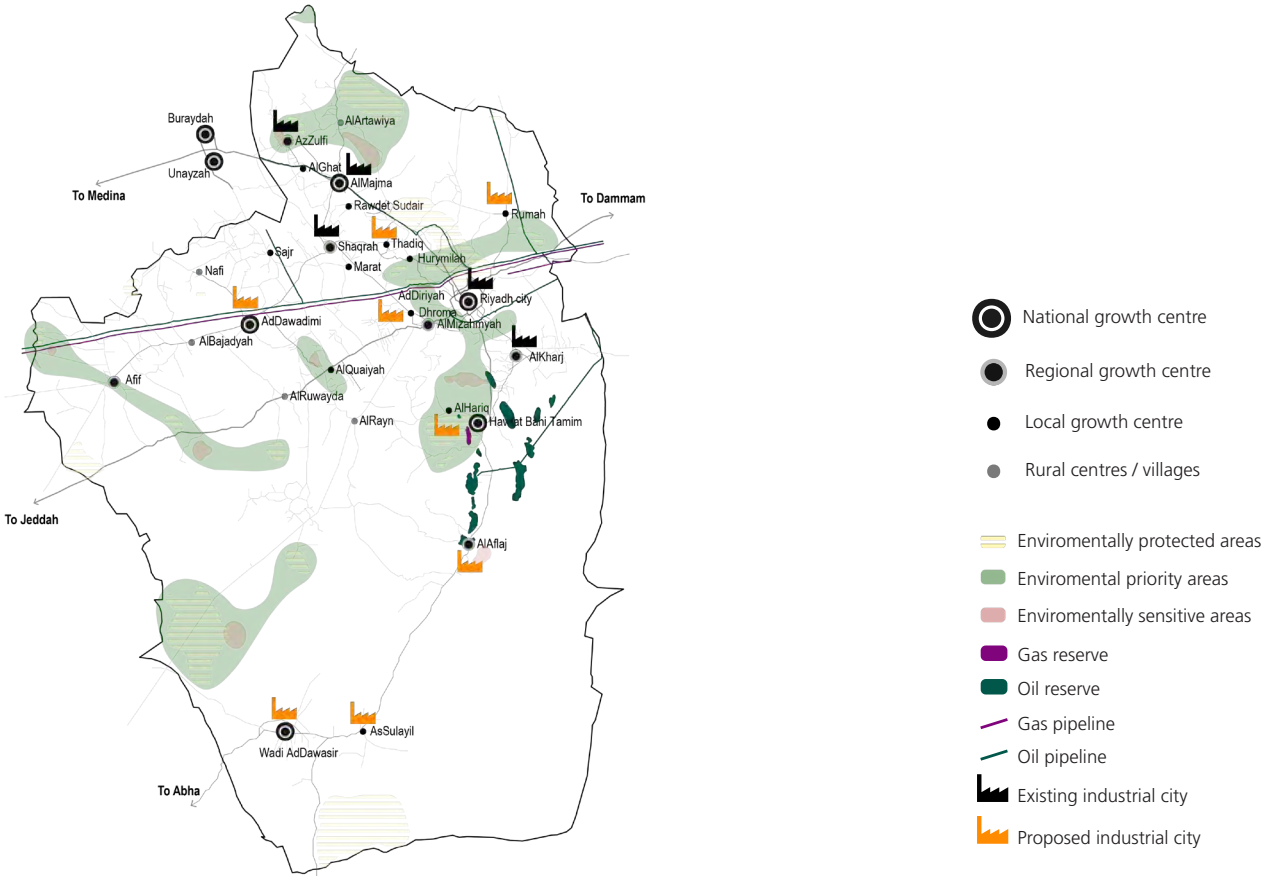


Fig. 9. Oil and gas reserves, industrial cities and environmentally sensitive areas

The Regional Plan for the Riyadh Region has identified 25 environmentally protected areas and 14 environmentally sensitive areas with conditional uses throughout the region as areas that require special protection and care. Additionally, systems for the protection and development of water resources and combating desertification have also been set in place at the regional scale.

Economic Resources

Economic indicators for the Riyadh Region are summarised by the High Commission for the Development of Riyadh (HCDR 2012) which shows that metropolitan Riyadh captures around 84.2% of the GDP of the Riyadh Region, and the GDP per capita in metropolitan Riyadh is around SR 31,000, while in the governorates of Riyadh it is at approximately half this amount.

The city of Riyadh depends on the import of all kinds of products and services from its surrounding areas. Municipalities and rural areas in the Riyadh Region are strongly dependent on the development of the capital city. In return, the proximity to Riyadh provides access to economic opportunities and many public utilities in the health, education and other sectors.

Financial and banking services is one of the largest economic sectors and the most influential on the structuring of economic growth in Riyadh Region, given the services it provides to the private sector and the investment opportunities it offers for projects and enterprises, through the large number of banks and branches as well as the insurance companies and their branches, operating in Riyadh. The trade sector in Riyadh Region is also an important sector, because of the high volume of the companies and establishments represented and operating in the sector. The total number of enterprises and businesses in the Riyadh Region in 2012 amounted to about 30% of the total trade establishments in the Kingdom.

The building and construction sector in the Riyadh Region is another major economic sector in view of the vital role it plays in the economic growth; and also as a driver for physical development for the region itself. In Riyadh, a large number of major Saudi, joint, and foreign contracting companies operate in the implementation of these projects and contribute to the completion of infrastructure facilities. The total number of classified contractors in Riyadh Region in 2012 amounted to 44% of the total number of classified contractors in the Kingdom. The construction and building sector in Riyadh accounts for about 23.9% of the total volume of this sector in the Kingdom as a whole.

Manufacturing industries sector is one of the important productive sectors in the Riyadh Region. The Riyadh Region has seven industrial cities, affiliated to the Saudi Industrial Property Authority (MODON). Two of these industrial areas in Riyadh are fully functional with services and facilities, while the other five industrial cities are still under development. The total number of producing factories in Riyadh Region were about 44.3% of the total number of producing factories in the Kingdom by the end of 2013. Agriculture is an important economic sector in the Riyadh Region, with a total crop area amounting to about 247,000 hectares, representing approximately 31% of the total crop area in the Kingdom in 2011.

2.3 City-region Structure and Dynamics

The Riyadh City-region mainly consists of Riyadh as a major national urban centre surrounded by small and medium sized cities that are overshadowed by the dominant Capital. The role of those small and medium-sized cities in Riyadh City-region is too often overlooked, and underestimated due to imbalance in the hierarchy of cities in the region. It is important for the regional authorities in the Riyadh Region to reassess and redefine what unique roles and functions can compliment the cities in this system.

These cities (see figure 10) now face significant challenges; a function of their peripheral nature – perceived and actual – in relation to Riyadh as a larger urban centre, and of their ongoing transitions from their rural pasts. Evidence suggests that the problems of their peripheral nature can be overcome by maximising the benefits of local economic resources, strengthening human capital, addressing regional institutional weaknesses, and enhancing collaboration and connectivity with Riyadh and other major cities such as Buraidah in close proximity.

Buraidah is the regional and national centre for agricultural activities and its link with Riyadh is a significant one. The link between Riyadh and Buraidah is strengthened by the railway connection and corridors connecting the major growth centres like the Buraidah-Majrra-Riyadh-Hawtat Bani Tamim corridor.

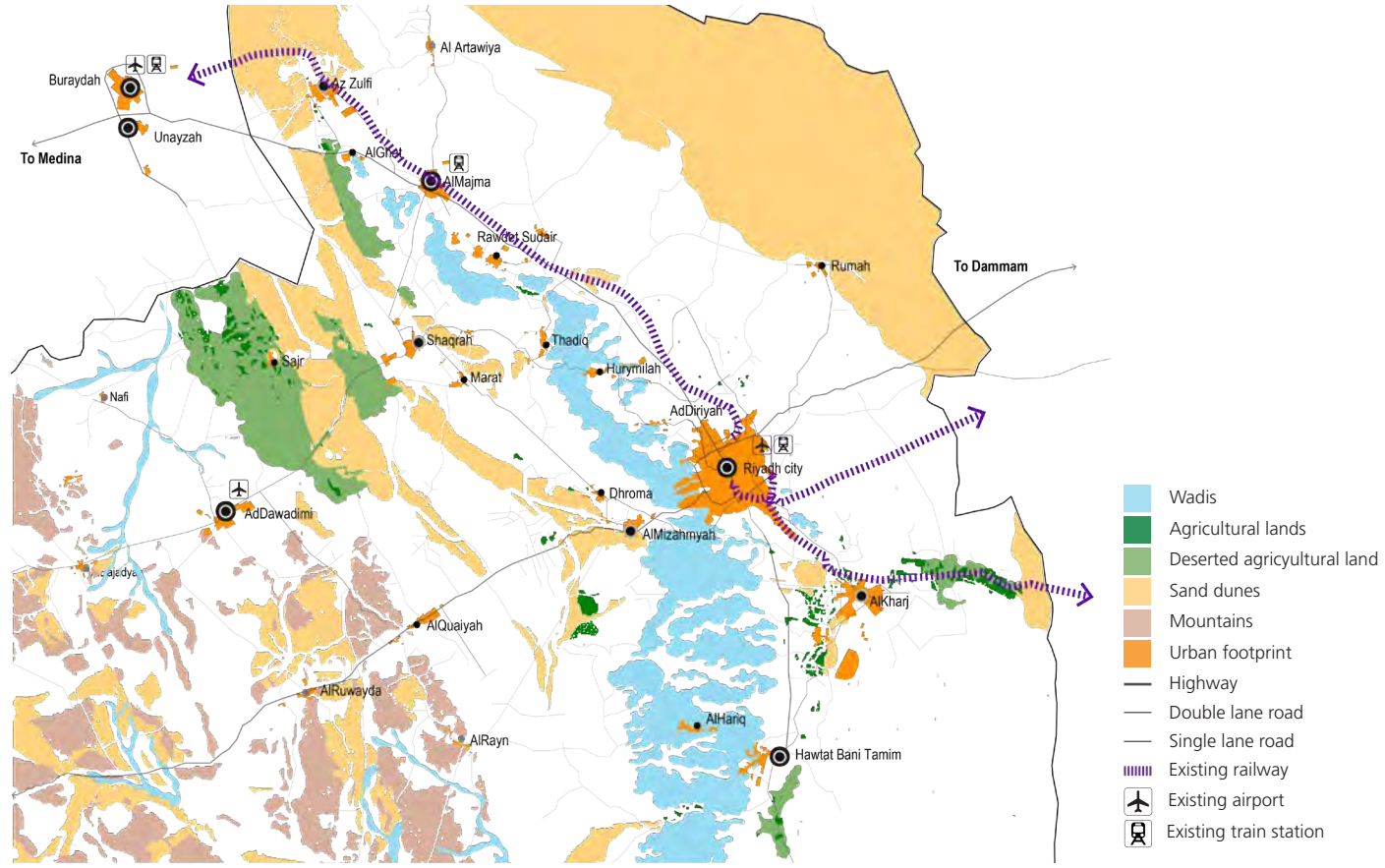


Fig. 10. Natural resources in the city-region

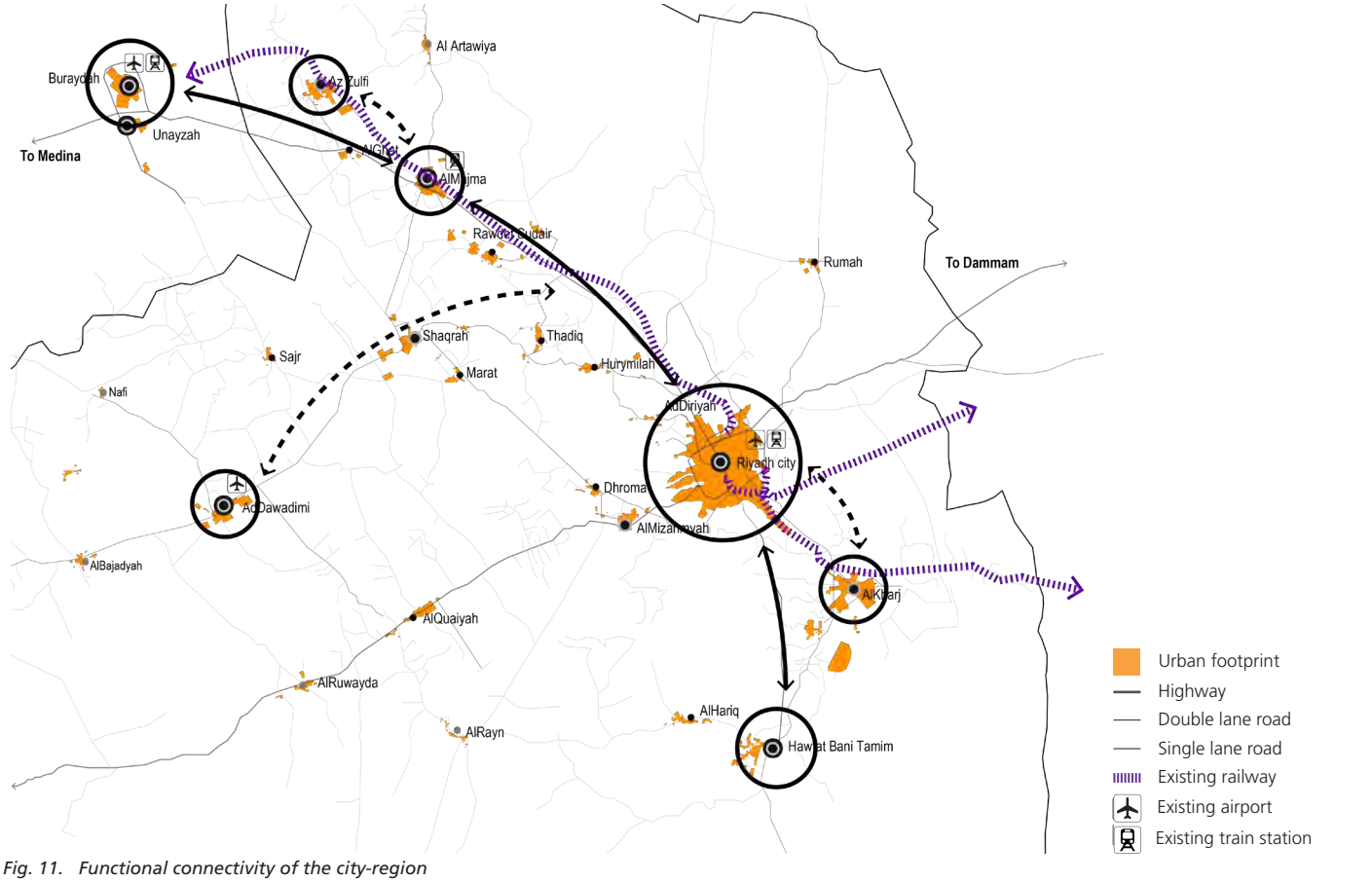
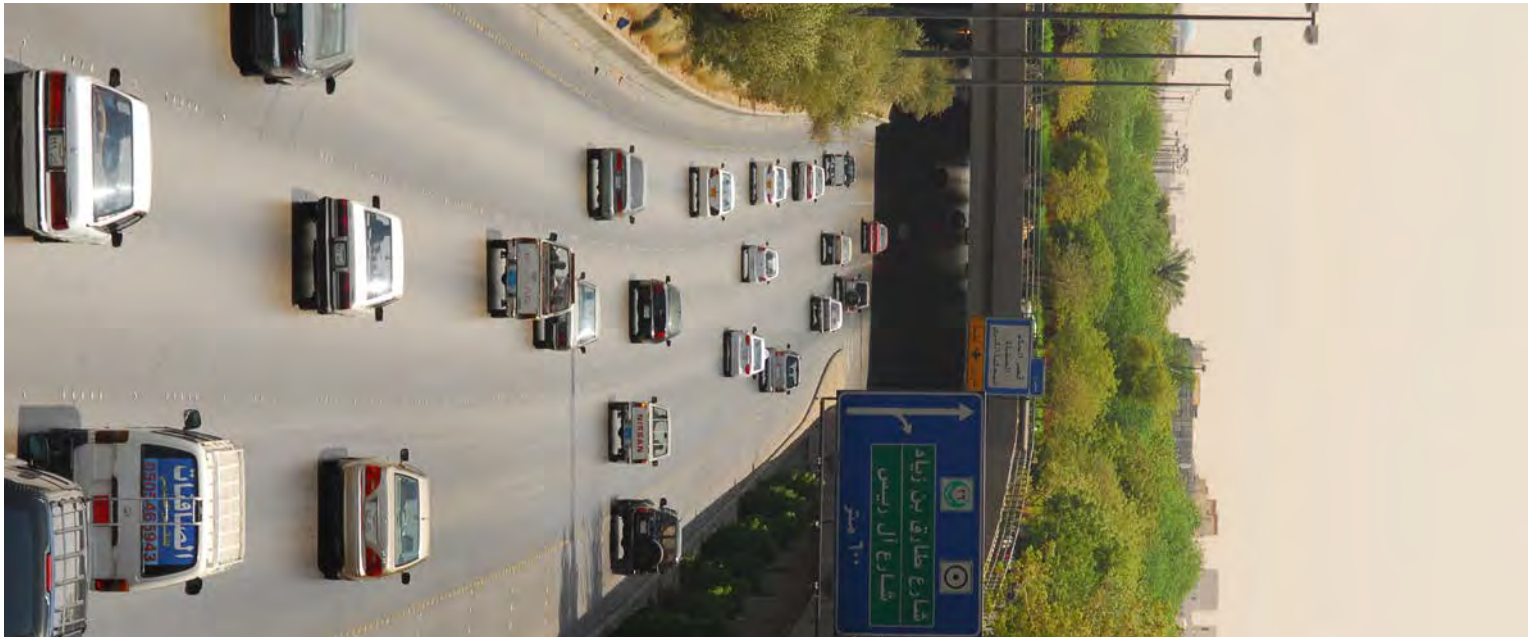


Fig. 11. Functional connectivity of the city-region

3 GOVERNANCE AND FINANCIAL FRAMEWORK



© SeeSaudi

3.1 Legal and Institutional Context

Riyadh's legal planning framework is shaped by the Kingdom's legislative environment, which is based on Islamic Sharia Law. The law-making authority is vested in four entities; the King, the Shura Council, the Council of Ministers and the Ministerial departments. Consequently, there are five legislative instruments (Royal Order, Royal Decree, Supreme Order, Council of Ministers Resolution, and Ministerial Decree) that function in a hierarchical order, underpinning their authority and validity.

Given this non-centralised law-making process, the city of Riyadh is guided by over 500 existing urban planning related instruments with most of these having been promulgated at the lowest administrative level (Circulars),[4] that lack authoritative legal force.

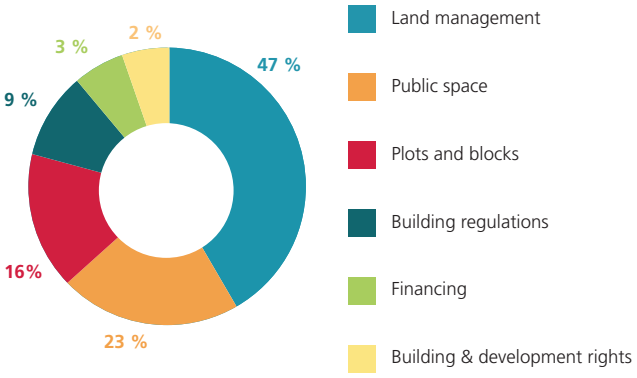


Fig. 12. Number of urban laws in KSA based on the main themes of urban planning legislation (UN-Habitat)

The Arriyadh Development Authority (ADA), which was recently renamed Riyadh Development Authority (RDA) to better reflect the new extended role over the Riyadh Region, plays a significant role in Riyadh's growth and development patterns because it is legally entrusted with the task of conducting urban planning of Riyadh City.[5] The Municipality of Riyadh (Amanah) handles permitting for all types of construction activity, and it is an implementing entity for RDA. The Ministry of Municipal and Rural Affairs (MoMRA) plays a limited role in the urban planning of Riyadh by setting the Urban Growth Boundary. The institutional budgetary system is also centralised, meaning that Riyadh's development intervention is reliant on funds allocated from the MoMRA through annual line item budgeting, which is the sole fiscal means available.

The Kingdom's planning system, which follows a hierarchy of spatial level and is predominantly top-down, influences the spatial system of Riyadh. The National Spatial Strategy (NSS) of 2001 is the guiding plan for the Kingdom. The Arriyadh Metropolitan Structural Plan (MEDSTAR), 2009 highlights the pivotal role that Riyadh, as the regional capital, can play as the economic engine of the Riyadh Region. This plan is supported by the 2021 Arriyadh Metropolitan Zoning Plan and Planning Provisions, as well as both the Local Plan and Action Area Plans. The former identifies the types and sizes of current and future uses, including housing, commercial, public services, public utilities, transport, and other private activities, and their distribution spatially at the city level. The latter plan identifies strategic land use and infrastructure networks within the metropolitan area, and applies urban controls to urban land use and building regulations within the municipal boundary. The Urban Growth Boundary and the Development Protection Boundary aim to prevent urban sprawl in the outskirts of the city without adequate urban infrastructure, while the Land Subdivision Plans are the basic building blocks that guide Riyadh's development.

Additionally, planning for urban development in Arriyadh city is guided by certain guidelines formulated by RDA, such as the urban design guideline or the new Transit Oriented Development guidelines for areas around the Metro stations. [6] However, within Riyadh, there is evidence to suggest that land use and building control regulations have facilitated urban sprawl. For example, a very high percentage of areas have been approved for low-density detached houses with a height limit of two floors, which has resulted in large amounts of land being used for residential purposes. Despite the high level of household income in Riyadh, residential pricing has excluded a large section of the population, particularly the poor and the youth. It has also been suggested[7] that regulations have been waived to allow development activities that are incompatible with the zoning requirements, which has contributed to significant social, economic, and environmental unsustainability.

Riyadh benefits from relative jurisdictional decentralisation whereby RDA hosts local planning power, authority, and function however, due to the size of the capital, further devolution of these functions may be needed to address local priorities of the satellite suburbs efficiently. The city would also benefit from fiscal decentralisation to facilitate independent and innovative solutions to urban social problems. This should give autonomy to the RDA and Amanah to source funds to finance development activities. Revenue generation activities may also include taxes and levies, and the collection of property taxes to fund development activities. The recent White Lands Act that imposes fees on undeveloped plots in urban areas to tackle land speculation, housing shortages, and indiscriminate land development shows that regulatory mechanisms can be leveraged to generate revenue while fostering an efficient development framework. Moreover, the opening of avenues for actors including the private and voluntary sector, and the general community should be encouraged, so that they participate in decisions regarding projects that affect them.

Consolidation of the legal planning instruments would also support development intervention in Riyadh and add legitimacy. These laws additionally require review and updating,

King Abdulaziz historic centre

in order to bring them in line with the current development paradigm. For example, some land was earmarked in Riyadh at the neighbourhood level for recreational or green areas. This land became public after the approval of the land subdivision, however, the private sector has been unable to support its development because the existing laws and regulations link ownership with the right to develop. The reform process should also entail a re-thinking of the lawmaking process, to limit the number of actors. The legal framework needs to enshrine an acceptable level of public participation in decision making, to foster equality and inclusion. The consolidation of the urban legislation would also give legitimacy to the plazns that Riyadh City relies on.

Revising the Urban Growth Boundary Law to include clear criteria for its definition would enhance technical and vertical accountability. The Law also needs to place more emphasis on establishing the Development Protection Boundary as a no-development zone, not only to prevent haphazard development but also to discourage the advantage taken by private interests from laxity in the legal text. These initiatives will strengthen policy formulation designed to move the city towards a more sustainable, compact and dense future. Primarily, a post-legislative scrutiny of the urban growth boundary law should be undertaken to assess whether or not it has met its policy objectives. This could, in turn, inform the legal reform process as well as planning policy options.

3.2 Planning Instruments and Procedures

3.2.1 Hierarchy of plans - Riyadh

The planning system of Riyadh is derived from the de-facto planning hierarchy of the Kingdom. In this framework, there are four different levels of spatial plans: national, regional, local and district. Figure 13 highlights the planning instruments in force in Riyadh.

Unlike other cities in KSA, where MoMRA plays a key role in planning and urban development, Riyadh has its own institutions for this purpose. The High Commission for the Development of Arriyadh was established by the Council of Ministers Resolution (No.717) of 1974 as an organising, planning, executive, and coordinating body responsible for the development of Riyadh.[8] In 1983, another Resolution (No. 212) was enacted that created an executive, technical, and administrative arm of the Commission; the Arriyadh Development Authority (ADA), now RDA. Its functions include:

- To undertake development and formulate policy for the entire city;
- Comprehensive strategic planning;
- Implementation of the strategic development programs;
- To support and coordinate various public bodies operating within the city to enhance implementation of joint development plans; and
- To research the various positive and negative phenomena, opportunities and potential developmental challenges faced by Riyadh.

In 2018, the ADA, pursuant to Resolution (No. 475) assumed broader functions traditionally associated with the Amanah and MoMRA concerning the approval of land subdivisions and the implementation of building and zoning regulations. The Commission oversees the functions of the Authority by endorsing their activities, as well as their fiscal expenditure. As mentioned, recently, in line with the establishment of new regional authorities, ADA became de facto RDA, signaling the change of focus form the city to the entire Riyadh region.

Mahkama Park, an open space in the centre of Riyadh City

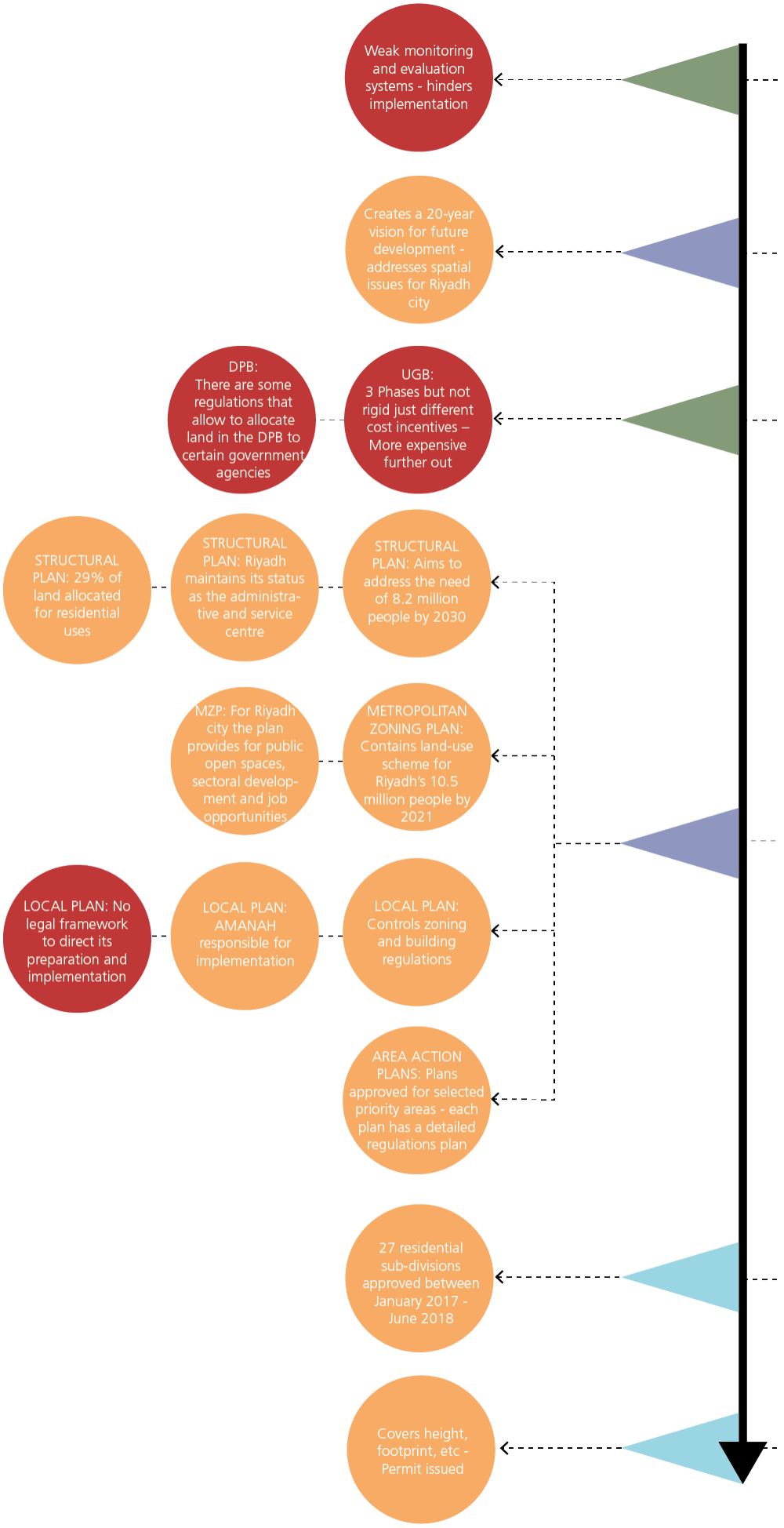
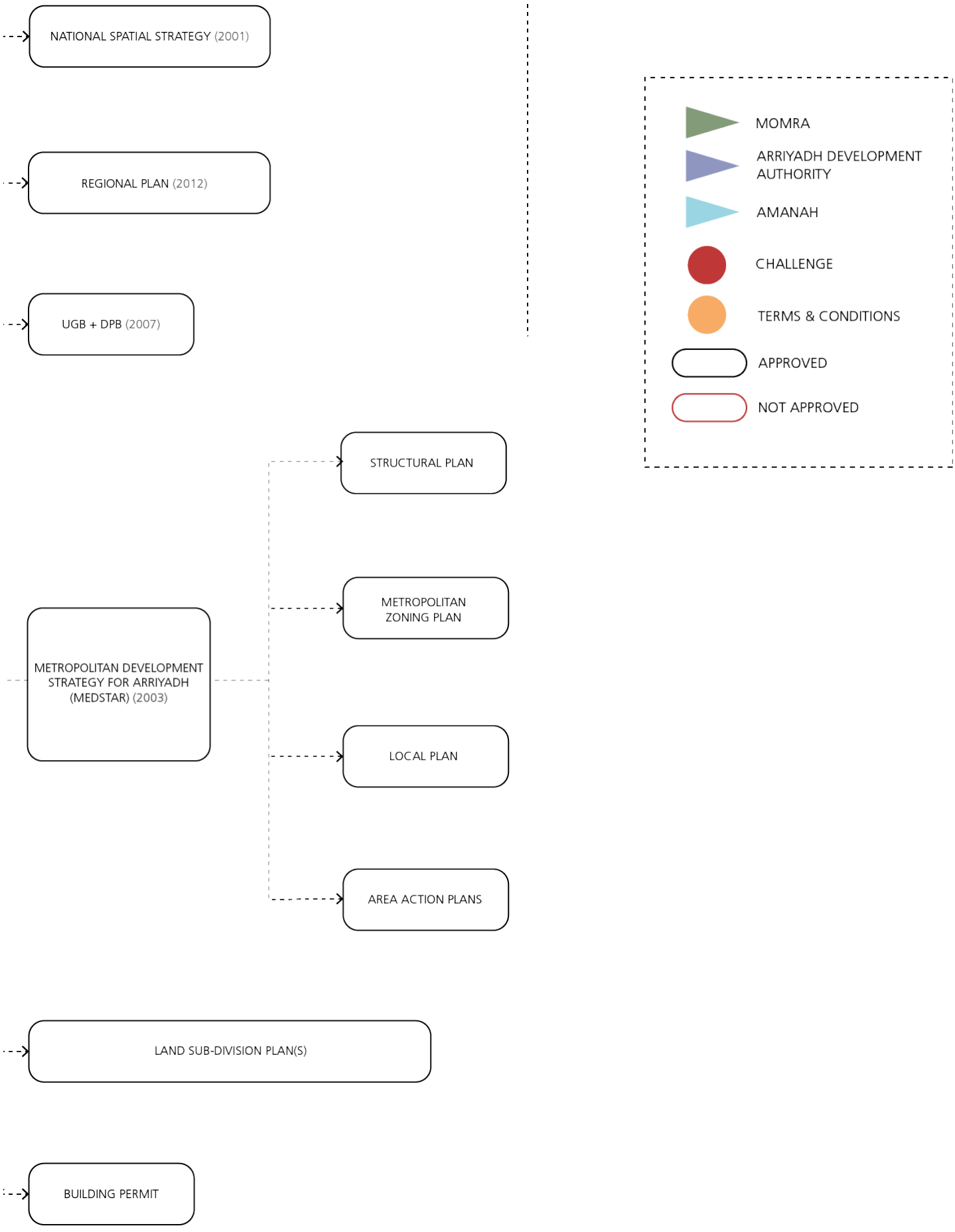


Fig. 13. FSCP simplified representation of hierarchy of plans and the planning instruments for the city of Riyadh


NATIONAL SPATIAL STRATEGY (2001)
REGIONAL PLAN (2012)
UGB + DPB (2007)
METROPOLITAN DEVELOPMENT STRATEGY FOR ARRIYADH (MEDSTAR) (2003)
STRUCTURAL PLAN
METROPOLITAN ZONING PLAN
LOCAL PLAN
AREA ACTION PLANS
LAND SUB-DIVISION PLAN(S)
BUILDING PERMIT
MOMRA
ARRIYADH DEVELOPMENT AUTHORITY
AMANAH
CHALLENGE
TERMS & CONDITIONS
APPROVED
NOT APPROVED

3.2.2 Strategic Plan for Riyadh Region (SPAR)

Regional planning represents the second-tier of spatial planning in the KSA, which aims to address the natural, urban, social, and economic regional development aspects. The Strategic Plan for the Riyadh Region was prepared and approved by ADA (now RDA) in 2012. This plan aims to address the different development issues and provide solutions via a 20-year vision that implements programmes and sectoral policies for future development.

3.2.3 Metropolitan Development Strategy for Arriyadh (MEDSTAR) 2030

The MEDSTAR, which is the strategic component, is composed of four key planning instruments:

- The Arriyadh Metropolitan Structural Plan 2030;
- The Arriyadh Metropolitan Zoning Plan and Planning Provisions;
- The Local Plan that applies city-wide; and
- The Action Area Plans for selected areas in the city.

The hierarchy of these plans, the nature of each plan and the responsible institution for their implementation is shown in figure 14 below. The scope of these plans includes:

- Long term strategy for the city;
- Identification of relevant development areas;
- Identification of urban/non-urban land;
- Main mobility system;
- Environmental protection;
- Infrastructure provision;
- Detailed land use;
- Urban regulations; and
- Detailed proposals for selected areas

The Arriyadh Metropolitan Structural Plan 2030

The 2030 Arriyadh Metropolitan Structural Plan, approved by ADA in 2003, is the strategic plan for the city and outlines the key principles that will guide the development of the city. This plan, in line with the Regional Plan, highlights different objectives for the different cities that are located within the metropolitan area. For instance, the city of Riyadh remains the administrative and services centre.

The Structural Plan 2030 shows the broad intentions for urban infrastructure and land use. It provides the basis for policies and actions for the physical development of the city and these elements are:

- The Urban Regeneration of the Central City Centre Area as a symbolic centre in Riyadh as the Capital City of the Kingdom;
- The development of a high profile Central Business District;
- The development of strong sub-centres, which provide a focus for jobs, services, and entertainment in the suburbs,

PLAN	DESCRIPTION	REVIEW	RESPONSIBILTIY FOR IMPLEMENTATION
Arriyadh Metropolitan Structure Plan 2030	➢ Strategic plan for the city showing the broad development intentions for the city and important principles for city development: important development areas, what is urban and what is not, general land use intent and major areas for residential, industrial, government, conservation and other uses.	▪ Every 5 years	▪ **High Commission** ▪ ADA ▪ Amanah ▪ Government Departments ▪ Servicing Authorities
Arriyadh Metropolitan Zoning Plan and Provisions	➢ Defines the intended future land use zoning structure and land use area allocations for the Metropolitan area. ➢ Land use areas are defined and zone boundaries are definite. ➢ General provisions apply to zone areas - usually relating to allowable uses, development density, building height and building setbacks.	▪ Annual recording of zone changes with major review every 5 years	▪ **High Commission** ▪ ADA ▪ Amanah ▪ Government Departments ▪ Servicing Authorities
Local Area Plans	➢ Apply to specific investigation areas where detailed physical and infrastructure planning is required e.g. the development of the CBD district, historic areas, high density areas, new development areas. Development staging is often required for larger areas. ➢ Contain specific development provisions and plans which override the general provisions of the Metropolitan Zoning Plan.	▪ As required	▪ **Amanah** ▪ ADA ▪ Other agencies where relevant

Fig. 14. The hierarchy of the MEDSTAR plan, functions and the responsible institution for implementation

including a major employment node at the Airport Precinct;
- The development of the Northern and Eastern New Cities in accordance with their approved Structural Plans;
- The construction of major freeways and arterial roads and public transport (LRT) connections between centres along central transport spines, which form the basis for higher-density commercial and residential development;
- Provision for higher, medium, and lower density residential areas with higher-density focused on spines and centres;
- The continued development of the Southeast industrial area at Al Sulay together with general industrial areas around the city and a new Mixed Industry and Business Area within the Airport Precinct;
- The creation of major public utility corridors and areas, which provide the city with water, sewerage, and electricity;
- The provision for major environmental and recreation reserves of Wadi Hanifa and city parks, including the proposed Major City Park on the old Airport site, and the improvement of Wadi Sulay;
- The designation of localities as Investigation Areas where detailed planning is required before any major development occurs; and
- Acknowledging the development limits to the City defined by the Urban Limits Boundaries of 2015 and 2030.

The Structural Plan covers the area of land that falls within the Development Area (over 5000 square kilometres), which will meet the needs of 8.2 million by 2030 The plan reflects the spatial and functional aspects of the urban policies. The plan also specifies the distribution of the main land uses, activities, business centres, transport system, public facility network, environmental requirements, and open areas. Sub-centres are among the main elements of the Structural Plan, and they are specified within the plan so that they can serve the city's Northern, Southern, Western, and Eastern sectors.

In terms of land use, this plan identifies strategic land use and infrastructure networks within the metropolitan area of the 2030/1450 Urban Growth Boundary (UGB). Within this, 29% (216.7 square kilometres) of land is allocated for residential land use. Mixed land use (Commercial - Residential) are mostly proposed along the major corridors and main spines. However, the new proposal suggests that mixed land use will also be concentrated in sub-centres throughout the city.

The 2021 Arriyadh Metropolitan Zoning Plan and Planning Provisions

This plan is one of the implementation mechanisms for the urban development strategy of Riyadh City, which includes the future vision, goals, and the resulting urban policies and structural plans prepared in the first and second stages of the strategy project. This plan is used as a link between the goals of the planning process, as a document and reference for the most detailed stage of the planning process, and implementation of development at the local level, particularly in relation to the system of land subdivision, development control, and the local plans, which constitute a comprehensive planning of the urban area.

This plan identifies the types and sizes of current and future uses, including housing, commercial, public services, public utilities, transport, and other private activities, and their distribution spatially at the city level. It also shows the city's population density that is required to achieve a balanced distribution of population and employment opportunities in different sectors of the city. These uses have been illustrated on a scale of 1:25,000 along with a report that details these distributions and any spatial relations between them. This chart is used as a reference document for local planning.

The land use scheme describes the future spatial organisation of Riyadh in terms of location, size, and intensity of the applications related to development, conservation, and change considering the determinants of natural and non-natural development within and outside the urban area.

The main features of the Arriyadh Metropolitan Zoning Plan, at the city level, include:

- Hierarchical classification of centres;
- New economic activities;
- Recreation and open areas;
- General services; and
- Transport and public utilities.

The Land use Plan covers all land located within the boundaries of the protection of development, which covers an area of about 5,000 square kilometres and a population of 10.5 million in the year 2021. Due to the large geographical size of the city and the planning challenges associated with mapping, the city has been divided into sectors, and the development of each sector is separate, and then assembled to form a complete scheme of the city. This trend is consistent with the planning of the city to six geographical areas which include the Northern Region, Eastern, Southern, Western, Northwestern (shield), in addition to the central area of Riyadh.

The Local Plan

The Local Plan, which guides the development control system for the entire city, is prepared jointly by RDA (previously ADA) and the Amanah. The Local Plan contains the Urban Atlas, which details the allowed land uses for every part of the city. It is complemented by a report of regulations, which contains specifications on the permitted development rights, such as floor area ratio, street dynamics, building heights, areas of special building regulations, etc. Riyadh has a unique

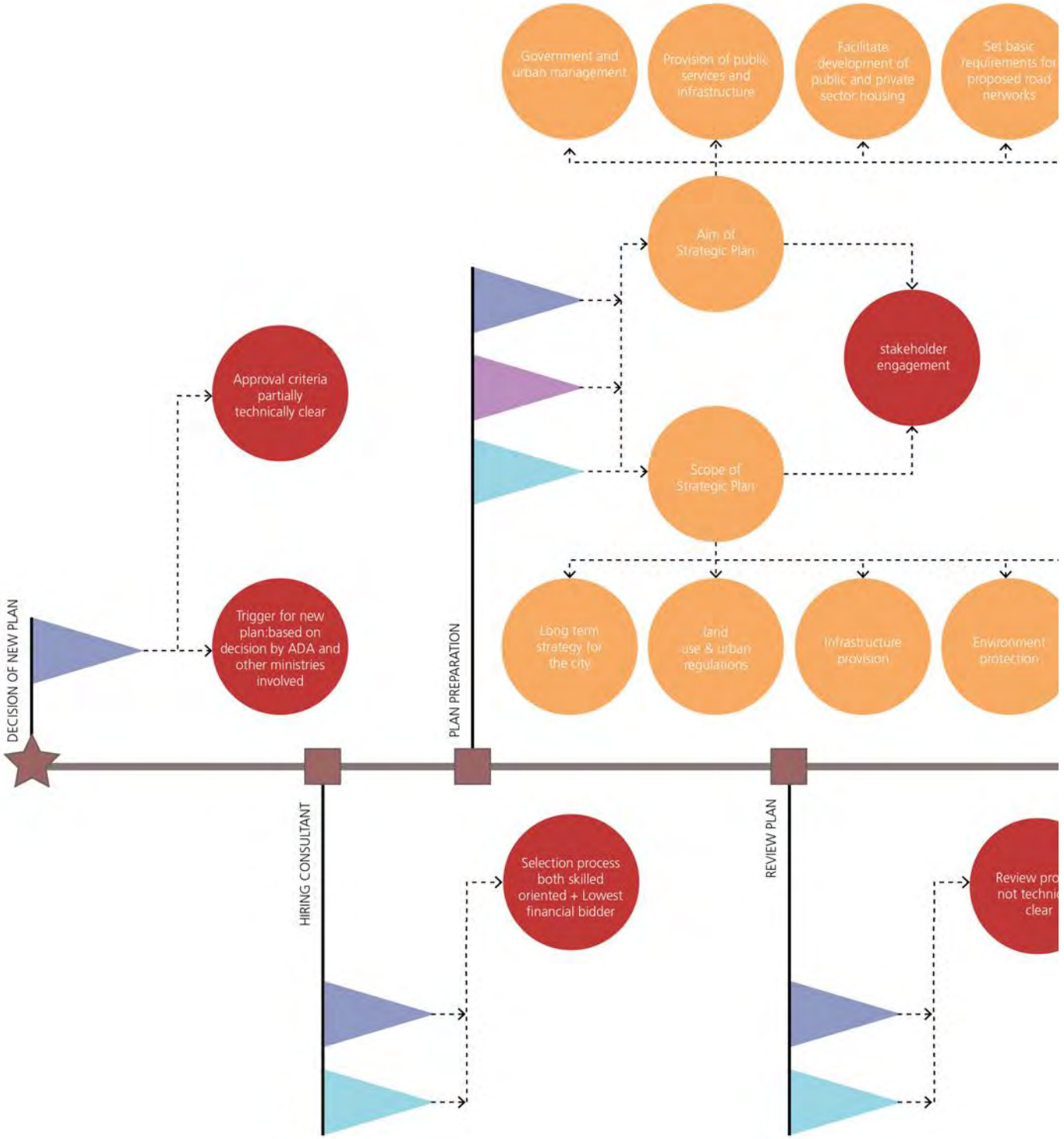
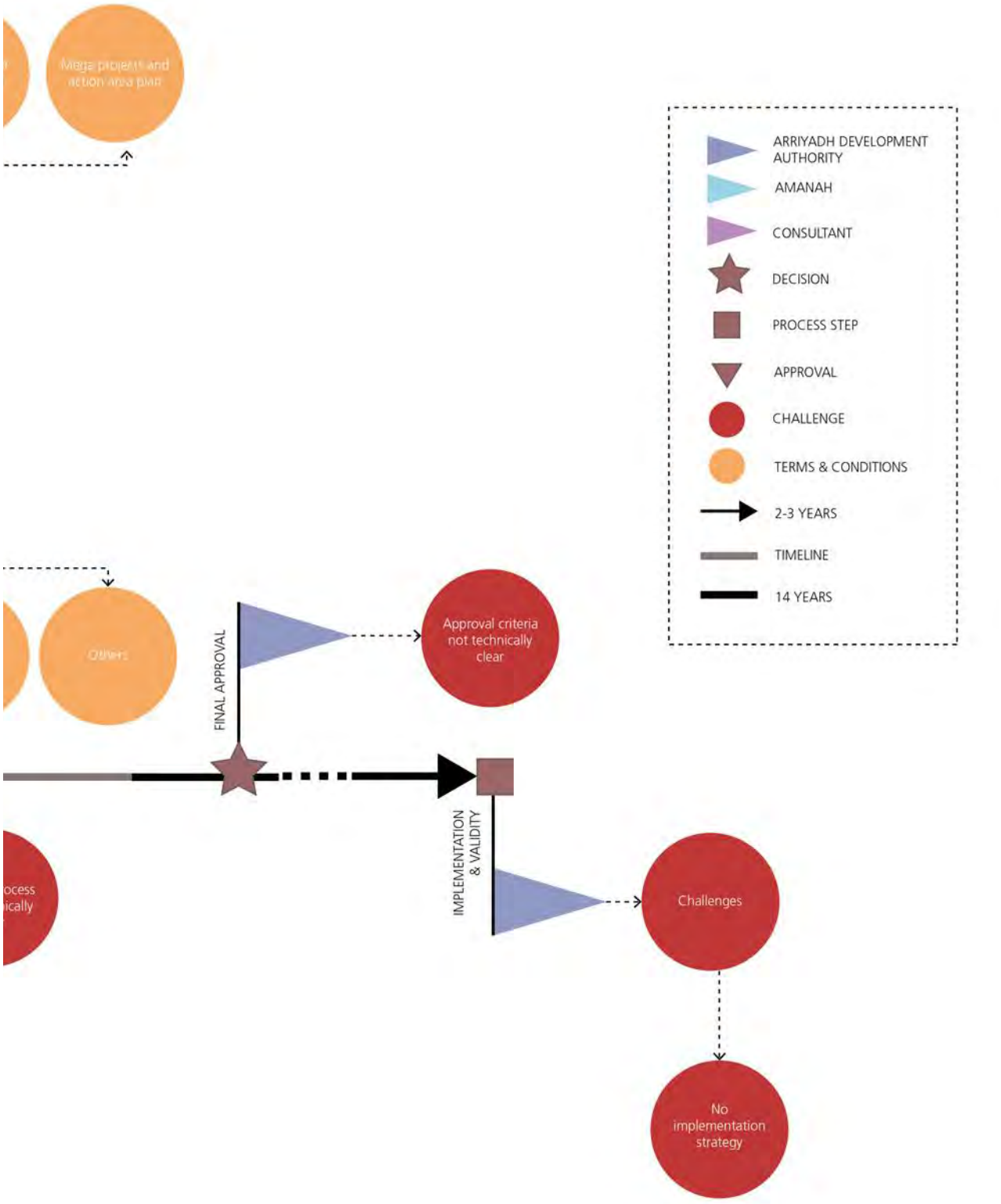


Fig. 15. FSCP simplified representation of Planning Process and Actors involved in the preparation of the Metropolitan Development Strategy for Riyadh (MEDSTAR)


Mega project and action area plan
ARRIYADH DEVELOPMENT AUTHORITY
AMANAH
CONSULTANT
DECISION
PROCESS STEP
APPROVAL
CHALLENGE
TERMS & CONDITIONS
2-3 YEARS
TIMELINE
14 YEARS
Others
FINAL APPROVAL
Approval criteria not technically clear
IMPLEMENTATION & VALIDITY
Challenges
No implementation strategy

interactive digital map for building regulations and land use.[9] The aim of the Local Plan is to a) apply controls to urban land use and building regulations; b) to provide public services and infrastructure in a cost-effective and integrated manner; c) set basic requirements for proposed road networks; and d) help facilitate the development of public and private sector housing. The local plan is prepared by various consultants following the "Booklet of the Terms of Reference for the Preparation of the Local Plan" which is formulated by MoMRA. This Booklet was updated in 2015 and one key technical change is the requirement that the lifespan of new plans should be 14 years (2015-2029). However, this booklet has no legal standing and there is no accompanying legal framework to support the enforcement of the local plans. The Amanah of Riyadh is responsible for the implementation of this plan.

The Action Area Plans

Riyadh has several action area plans that emanate from the Structural Plan of Riyadh. For each action area plan, there is a detailed plan with thorough regulations.

3.2.4 The Riyadh Urban Growth and Development Protection Boundaries

Legal Framework

In 2008, the Prime Minister issued decree No. 157, which sets the overall regulations for both the Urban Growth Boundary (until 2030) and the Development Protection Boundary. The executive regulations were issued in 2010 by the MoMRA Ministerial Decree No. 11769 followed by the current revision (MoMRA Ministerial Decree No. 66000) which was enacted in 2014. The UGB is intended to control urban expansion and prevent sprawl in the outskirts of cities without adequate urban infrastructure, whereas the DPB sets a long-term plan for future development of cities beyond the 2030 UGB while supporting the role of the UGB in preventing sprawl.

The 2014 Decree stipulates several general development principles including:

1. Strategic development projects that are part of the spatial strategies, including major road and railway networks passing through private lands, should be prioritised over any other development projects;
2. Development projects outside of the boundary are only permitted with the approval of MoMRA; and
3. Large-scale development projects should follow specified detailed standards.

The Law also defines development standards that a developer

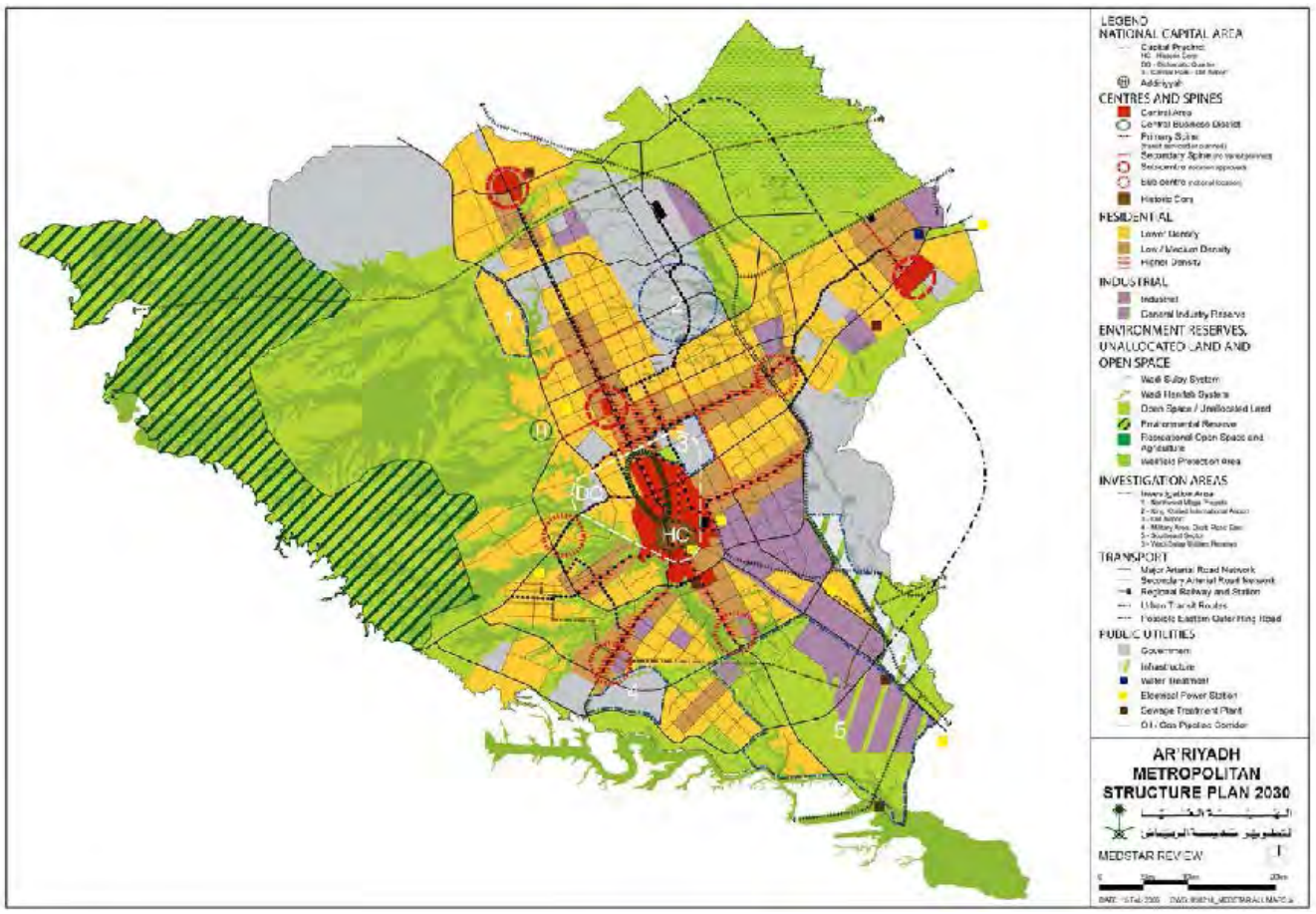


Fig. 16. The 2030 Arriyadh Metropolitan Structural Plan

is obliged to comply with based on strategic categories of national, regional, and local centres and the size of the lot. Riyadh is categorised as a National Growth Centre, (see figure 17).

Legally, the area between the Development Protection Boundary and the 1450 (2030) Urban Growth Boundary is protected and not earmarked for development; however, the Law also outlines mechanisms for building mega or national-regional economic projects therein. For instance, the Qiddiya project[10] which is in the Southwestern part of Riyadh City.

Moreover, given the law, certain agencies have the rights to land situated in such areas, where approval of development projects is routinely controlled by set of regulations in this regard. Additionally, given the legal flexibility around the definition of "mega" or "strategic" projects, private residential developments exist outside the 1450 (2030) Urban Growth Boundary. These factors have undermined the functional effectiveness of the regulations, the rule of law as well as compact development of urban areas.

Setting the Boundary

The Urban Growth Boundary for Riyadh, along with other cities, was set simultaneously by MoMRA, through a Committee under the Unit of Coordination and Projects. The composition of the committee is not clear but, for instance, it did not involve ADA, which is responsible for planning at city level. There is an understanding that the calculations were based on some factors, such as historical growth and expected population growth in the city; however, there are no accurate published criteria on how the size of the boundary was calculated. Spatially, the Committee was not guided by existing infrastructure and services, as the boundary was set symmetrically so that "all sides of the city" can benefit.

Challenges

Although the growth boundary regulations set very clear rules for development not to happen outside the boundaries, there are some exceptions, such as housing projects which undermine the effectiveness of the law. For example, in Riyadh, there is evidence to suggest that some land were given for citizens outside the UGB in 2014-2019. Accordingly, this has caused a socio-ecological and economic imbalance (incompatible land uses & land speculation), as well as unbalanced growth and development patterns (sprawl).

The disparity between the size of the boundary and the

URBAN BOUNDARY CLASSIFICATION OF LAND SUBDIVISION APPROVALS AND THE URBAN BOUNDARY PHASES

EXECUTIVE REGULATION ISSUED BY THE MINISTERIAL DECREE NO 66,000 IN 20/12/2014

1ST PHASE (2014-2018)	2ND PHASE (2019-2024)	3RD PHASE (2025-2030)
NATIONAL GROWTH CENTRES (MAKKAH, RIYADH, MADINAH, JEDDAH AND DAMMAM)		
MORE THAN 500,000 SQM		
- Tarmacking of internal roads - Water, sanitation and electricity - Median light poles - Storm water infrastructure	- Tarmacking of internal roads - Water, sanitation and electricity - Median light poles - Storm water infrastructure - Connect to closest main road - Percentage of residential area completed not less than 50% - Provide land for social services (schools, kindergartens, hospitals, etc.)	- Tarmacking of internal roads - Water, sanitation and electricity - Median light poles - Storm water infrastructure - Connect to closest main road - Percentage of residential area completed not less than 50% - Provide land for social services (schools, kindergartens, hospitals, etc.)
- Tarmacking of internal roads - Sanitation and electricity - Provide land for social services (schools, kindergartens, hospitals)	-	-

Fig. 17. Matrix showing the development options within the phases of the urban boundary in the National Growth Centres (including Riyadh)

demographic dynamics of Riyadh City, based on the Committee's calculations, undermines densification. In other words, based on current population growth projections, the 2030 density will be 26.6 p/ha, which is well below any recommended target, including the UN-Habitat density recommendation of 150 p/ha.

Permitting

Development within the UGB is closely linked to permitting and development control. The process is as follows:

- A developer submits a land subdivision plan, including detailed implementation plans for the instalment of the requisite infrastructure to the Amanah of the Riyadh Region;
- The Amanah will then assess the application in accordance with the provisions of the Law on the Urban Growth Boundary; except those cases defined by MoMRA Ministerial Decree No 17777. This Decree delegates certain roles to the mayors in regards to approving land subdivision, solely in relation to the size of residential projects. The Mayor of Arriyadhl is an approval authority under this Law;
- The application is then sent to MoMRA for review in accordance with development standards and applicable building codes, and building permits are either refused or granted by MoMRA;
- A developer whose permit has been refused has two options of appeal: a) recourse to the Amanah and MoMRA calling a re-study of the application; or b) file the case in the relevant jurisdictional administrative court;
- The decision in the above appeal processes is final and binding to all the parties.

White Lands Act – Riyadh

The percentage of undeveloped land ("white lands"), in Riyadh is high; there is 45% of total land available for urbanisation. The existence of "white lands" has been a major contributor to a growing housing shortage particularly for the youth and the growing population as owners choose to hoard property to maximise value rather than develop it. The government recently issued the White Lands Tax Law[11] that imposes an annual land tax of 2.5% of its value on "white land," which is defined as vacant land located in 'populated areas'; zoned for residential or for dual residential and commercial use. This Law aims to: a) increase the supply of developed land to better address housing shortages; b) make residential land available at reasonable prices, and c) combat monopolistic practices. The Ministry of Housing, which is the implementing authority, will enforce the Law starting with Riyadh as one of the first three cities, (see figure 18).

3.2.5 Land Subdivision Plans

The land subdivision plans are the basic building blocks for KSA cities' growth and development. The Mayor of the Amanah of Riyadh has the power to approve the land subdivision in accordance with the following criteria (Ministerial Decree No. 17777 of 2010):

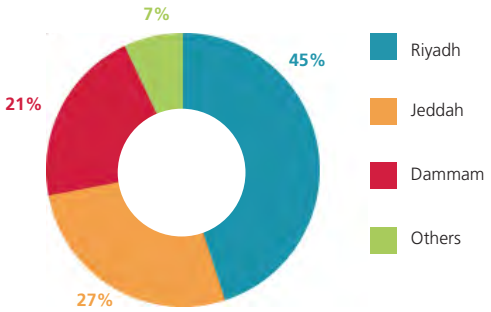


Fig. 18. Percentage of white lands – first phase of implementation of the White Lands Law

- The land must be within the approved urban boundaries;
- The land use specified for the land is consistent with the instructions and regulations governing it;
- The subdivision will not result in cancellation or modification of an approved regulation, planning or authorised land use.

All necessary planning procedures have been completed and the Deputy Ministry for Town Planning (DMTP) has been issued with a certified copy of the plan after its approval.

The Amanah has approved 27 residential land subdivisions between January 2017 to June 2018.[12]

3.3 The Institutional Context

3.3.1 Urban institutions in KSA

Riyadh's growth and development pattern is impacted by the planning institutional framework of the ADA. ADA is entrusted with the task of conducting urban planning of Riyadh City, while the Amanah provides the necessary roads and fixtures, maintenance and cleanliness of the environment, as well as of licensing all types of construction activity.[13] ADA is mandated to coordinate with "concerned bodies" in charge of planning to achieve comprehensive urban development. In practice, there is little coordination between these departments, and the Amanah and this affects service delivery and project implementation.

3.3.2 Regional context - Riyadh Region

According to the Ministry of Interior administrative classification, the Riyadh Region is divided into 20 governorates (12 are class A while 8 is class B) and 454 centres (172 are class A while 282 are class B). Riyadh, being the regional capital, is not included in this classification, instead is governed through a "municipality" (Amanah), headed by a Mayor. This delineation

King Abdulaziz historic centre

is provided for by MoMRA, with Riyadh's actual status being a 1st class Amanah.[14] Given this structure, the Amanah is allocated funds by MoMRA, for development action and municipal services through an annual line item budgeting,[15] which is the sole fiscal means available to Riyadh.[16]

There are additional institutions in the Riyadh Region that manage and regulate the development process. The newly established regional authority, and the Amarah. The Amarah of the region, headed by the Regional Prince who, pursuant to the Regional Law,[17] reports to the Ministry of Interior.

The Regional Council[18] is based in the Amarah, and is required to:[19]

- Identify the needs of the region and propose their inclusion in the National Development Plan;
- Identify beneficial projects for the region, and submit these as activities requiring funding. These requests are vetted, and viable projects are selected for funding. Funding is provided as part of the National Development Plan and yearly budget of the country, which is the sole means available to municipalities;
- Study the organisational arrangement of the regional administrative centres, follow up implementation of any modifications; and
- Implement the provisions of the development and budget plan, and carry out the needed coordination.

The Municipal Council, also located in the Amanah, with two-thirds of its members elected by citizen's votes, while the rest are appointed by MoMRA, supervises the activities of the Amanah and municipalities, to make sure they conform to the Local Plan, as well as meet the current needs of the region. It approves:

- The municipal budget sourced from the cash allocation from national government. This is constantly subject to revision as it is based on the agreed priorities between the Council and the Mayor;
- Examines the residential plans focusing on whether any procedural violation occurred;
- The scope of municipal services; and
- Expropriation projects based on the priorities of the Mayor.

As mentioned earlier, the High Commission for the Development of Arriyadh and the Riyadh Development Authority (previously ADA), coordinate and execute the urban development of Riyadh.

Local Context - Riyadh city

The Riyadh Region is composed of several cities including Riyadh, which is the capital and largest city. As earlier mentioned, the city is managed by the Amanah, which is headed by a mayor. The Minister of MoMRA appoints the mayor, and the Civil Service Bureau appoints the rest of the Amanah's executive members based on their professional qualifications.

The Riyadh Construction and Projects Agency (RCPA), ensures compliance with MoMRA's outline for the Kingdom's cities, rural areas, streets, and construction designs. The RCPA has roughly 40 planners and architects distributed in five administrations: a) urban planning; b) implementation and supervision; c) operation and maintenance; d) plots and properties, and e) designs and studies. The ADA established a Local Urban Observatory, which is monitored by the National Urban Observatory[20] (MoMRA Ministerial Decree No. 1280 of 2007). This observatory supports the RCPA by measuring, every three years, the progress of:

- Achieving Vision 2030;
- Achieving Goal 11 of the SDGs; and
- City Prosperity Index indicators and other contextualised urban indicators.

The private sector and various autonomous governmental entities also play a vital role in Riyadh's land development projects. For instance, the Public Investment Fund (PIF), while functionally independent, is directly overseen by the highest levels of Government.[21]

3.3.3 Legal and institutional implications for Riyadh

The majority of technical decisions and approvals passed in the local governance system, including planning decisions, are made on a discretionary basis according to the priorities set by the Mayor, ADA and the Municipal Council. This affects the system's technical accountability, predictability, and practical clarity. Coherence cannot improve until measures are taken to instill legal mechanisms that harmonize and guide the planning system.

3.4 Financial Context

The region of Riyadh hosts approximately 40% of the total number of productive factories in the Kingdom.[22] The contribution of this region to the Gross Domestic Product (GDP) is around 29%, followed by the Eastern Region and Makkah, which account for 24% and 21%, respectively.[23]

In terms of the job market, the region's key economic sectors are (1) construction, (2) financial, insurance, and real estate, (3) community and social services, (4) information and communication, and (5) manufacturing. These sectors employ more than 70% of the region's manpower.[24]

In order to foster economic diversification and innovation in Riyadh, the government is working to identify new economic

leverages focusing on industries, transportation, tourism, and tertiary sector.[25] Economic development is considered to be key in achieving the national economic goals of the Vision 2030.

Consequently, the development of public infrastructure (e.g., transportation), serving Riyadh's key economic sectors (e.g., industry and tourism), is a priority for the government to increase market access, to spur competition, to harness the urban productivity, and to its contribution to the national economy.

The government's strategy to achieve its goals includes a renewed commitment to providing quality education, health services, and affordable housing, keeping in pace with the needs of the population, as it represents 78% of the total population of the region.[26] By strengthening the feedback loop between (1) regional and local needs, (2) education and training, and (3) the local economy, municipal governments promote growth in human capital and generate better market conditions that lead to research, innovation, and economic diversification.[27]

3.4.1 Financial system

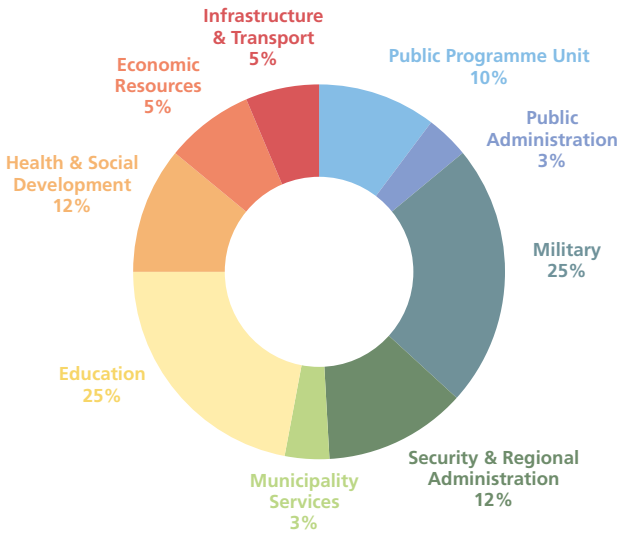
Sustainable urban and local development requires a sound and resilient municipal public financial management system. Currently, Riyadh's public finance system directs the National Development Plan. This system is highly centralised and depends on intergovernmental transfers to fund local activities and projects. In 2017, the central government allocated 5% of the total budget to municipal services, which also covered projects and programs managed by the Ministry of Municipal and Rural Affairs (MoMRA), (see figure 20 and figure 19).

MoMRA, via the Amanahs, is responsible for financing activities categorised as "municipal services," such as urban planning, building licensing, sanitation, and road maintenance. In addition to MoMRA, several other government ministries and entities, such as the emir and regional councils fund, implement projects at the municipal level (e.g., the Ministry of Education provides direct funding for city schools).

MoMRA, via the Amanahs,[28] is responsible for financing activities categorised as "municipal services," such as urban planning, building licensing, sanitation, and road maintenance. In addition to MoMRA, several other government ministries and entities, such as the Emir and regional councils, fund and implement projects at the municipal level, (e.g., the Ministry of Education provides direct funding for city schools).

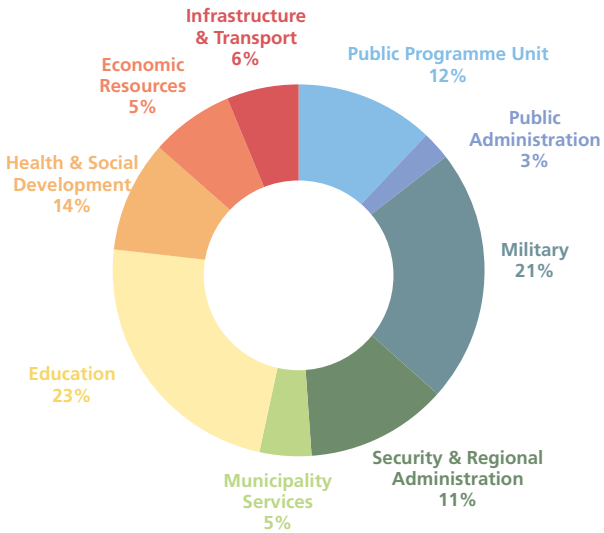
3.4.2 Municipal revenue

Currently, the Amanahs have few sources of revenue and limited authority to collect fees. Although MoMRA introduced municipal fees, which expanded the own-source revenue base (all revenues collected by local government excluding federal/central government transfers), local revenues remain insufficient. Consequently, the Amanahs continue to rely support from the central budget.



Source: Bhatia, R. (2017). Saudi Arabia Budget 2017. The Gulf's International Bank.

Fig. 19. Saudi Arabia national expenditure by sector, 2016



Source: Bhatia, R. (2017). Saudi Arabia Budget 2017. The Gulf's International Bank.

Fig. 20. Saudi Arabia national expenditure by sector, 2017

Intergovernmental transfers from the MoF are based on annual budget proposals submitted by the various ministries. Within MoMRA, the budget drafting process tends to be influenced by local needs and priorities. Municipal governments submit project proposals for the next budgetary cycle, which are then submitted to MoMRA's leadership for final approval. The projects approved are included in the MoF's budget review and submitted for approval to receive funding.

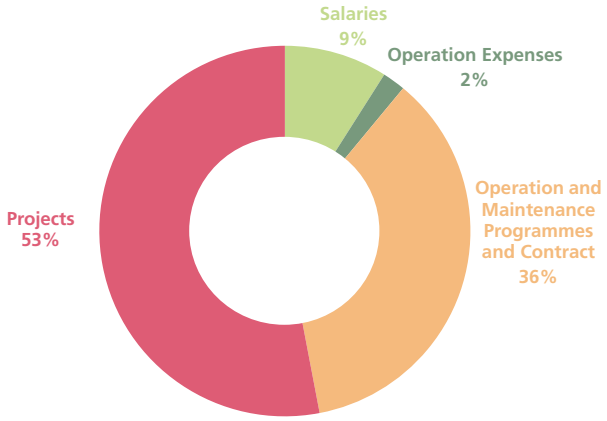
3.4.3 *Financing municipal operating costs*

In 2016, Riyadh collected SAR 1.3 million in own-source revenue, corresponding to 15% of the city's budget.[29] Intergovernmental transfers funded the remaining resources and other financial resources provided by the central government.

Figure 22 shows a breakdown of Riyadh's 2016 budget by expenditure categories. Operation and Maintenance Programs and Contact category made up the largest portion of the budget followed by projects, salaries, and operation expenses.

In general, this category represents a large share of total expenditures for many of the Amanahs in the Kingdom of Saudi Arabia, recording on average a budget share of 36%, (see figure 22).

In an effort to improve municipal finance management and reduce dependency on the central government, the National Transformation Programme (NTP) directs local government in the establishment of sound fiscal policies through the introduction of new financial instruments.[30]



Source: Ministry of Finance, Saudi Arabia (2016).

Fig. 21. Amanah budget breakdown (2016)

Budget Category	SAR (thousands)
	661,355
Salaries	118,667
Operation Expenses	2,678,914
Operation and Maintenance Programmes and Contracts	3,947,246
Projects	7,406,182
Total Budget	

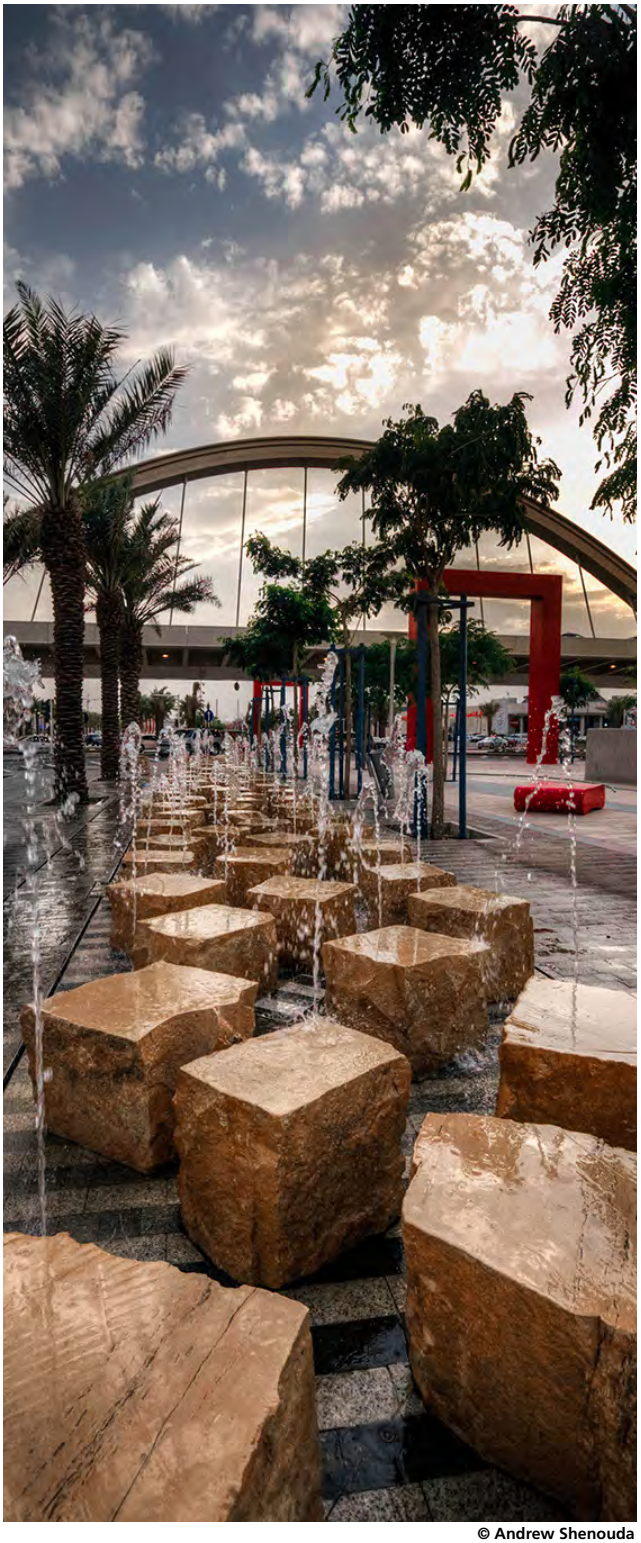
Source: Ministry of Finance, Saudi Arabia (2016).

Fig. 22. Amanah budget, Riyadh (2016)

White land in the core of Riyadh

4

THE CURRENT CITY



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4.1 Urbanisation Patterns

4.1.1 The city's development patterns

Riyadh is the capital of the Kingdom of Saudi Arabia and geographically lies in the centre of the Arabian Peninsula, developing along the bed of Wadi Hanifa. Over the last few decades, the city has experienced vast expansion due to the rapid population growth, high national and international migration rates, and because of its strategic offer of economic and educational opportunities. In early history, the city comprised of a chain of settlements for trading caravans. These settlements were surrounded by hills, slopes, and valleys, including the most significant Wadi Hanifa. The wadi has retained its importance as a natural water resource and is a major environmental asset for the city. The fertile valley along the wadi still supports farming and agricultural activities along its path. At Turaif, one of these first settlements forming old Riyadh, was the original residency of Al-Saud Family. An important historic building in Riyadh is the Masmak Citadel, one of the oldest buildings in the city, located in the Northwestern part and built in 1865 by the Prince of Riyadh, Abdulrahman Ibn Sulaiman Ibn Dabaan. The Citadel was recently recognised as a UNESCO World Heritage Site, due to its historical value that preserves the traditional Najd architecture, and it is now open to the public after recent restoration efforts. Together with the adjacent Al Bujairi Park, it serves as the cultural and recreational centre along with Wadi Hanifa. Other historical elements lending a unique identity to the city include the Al Murabba Palace (Qasr Al Murabba), the remains of the historic city wall, and the ancient camel trail.

In the 1960's, the city of Riyadh started expanding with a steady increase of population linked to the oil boom. The most substantial growth happened in the 1980's. Since then, every 20 years, the city has nearly doubled its population and built-up area. While the dominant direction of growth till the 1980's was towards the East and West, in the late 1990's, the city began to expand in all directions. This was also the time-frame during which the city experienced a significant population increase, reaching 2.3 million people within ten years, from 1980 to 1990.

During this expansion, the city grew following a sprawling development pattern, where the land-area expanded about 218 times from 1940, while the population increased only 130 times in the same period. This has resulted in reduced densities and greater land allocation per capita, straining the limited natural resources, and leading the city towards an unsustainable growth and development pattern.

The availability of mostly flat land, as well as the concentration of economic activities, have led to the growth of two business centres towards the North and the North-East. Here, the expansion process is taking place at a much slower rate than in other parts of the city. However, the expansion to the West is naturally limited by the Wadi Hanifa, while the expansion to

POPULATION

6,506,700

POPULATION DENSITY on built-up area

71 p/ha

AGE PROFILE

58% < 30

POPULATION GROWTH RATE

4 %

RIYADH CITY COMPARED TO **PARIS MUNICIPALITY**

Population: 2,206,488
Area: 10,500 ha
Density: 210 p/ha

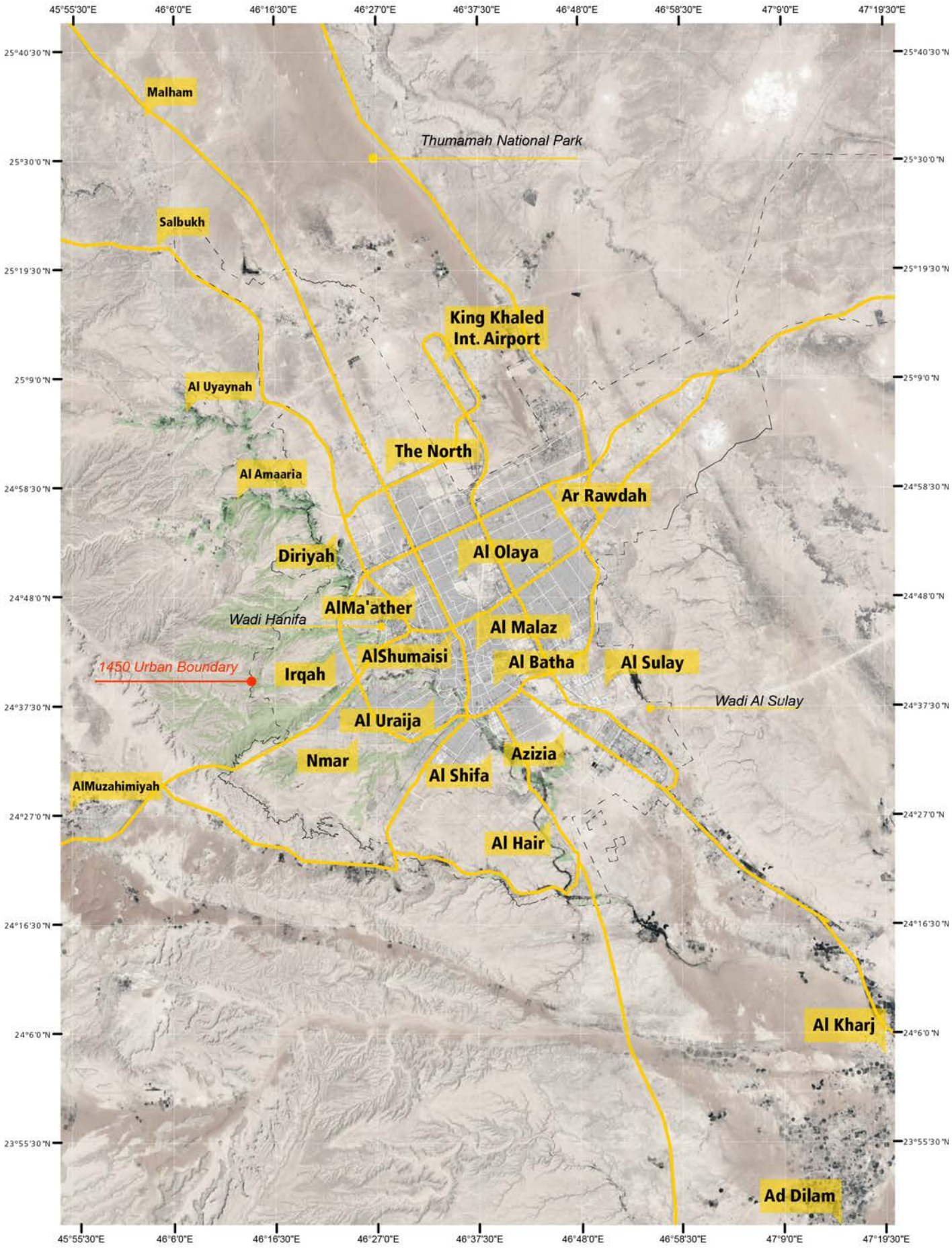
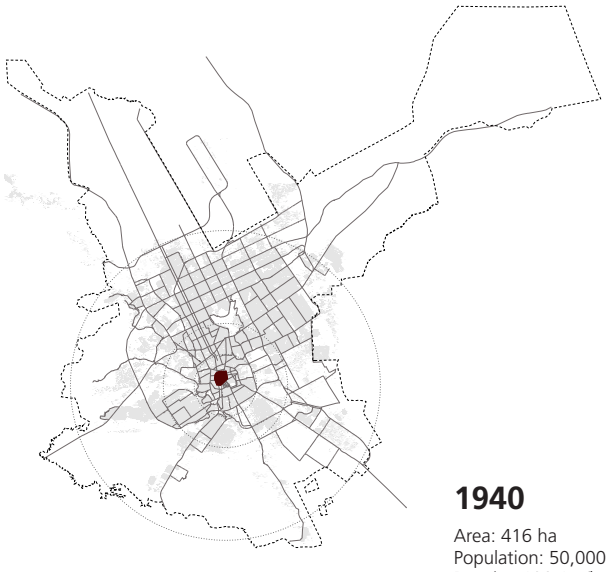
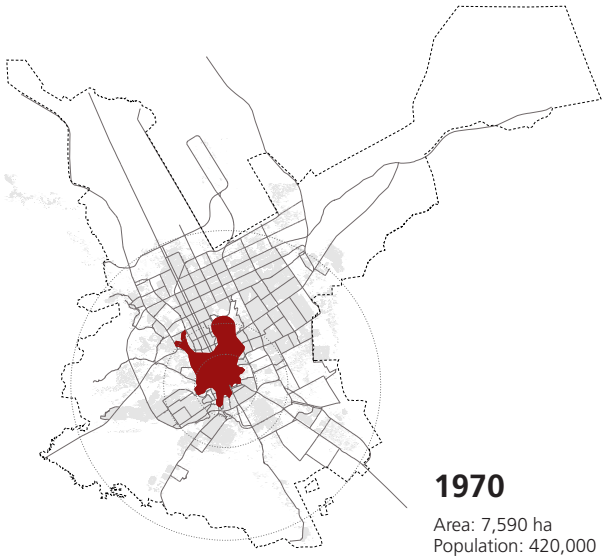


Fig. 23. Boundaries, neighbourhoods and key infrastructure



1940

Area: 416 ha
Population: 50,000
Density: 120.1 p/ha



1970

Area: 7,590 ha
Population: 420,000
Density: 55.3 p/ha

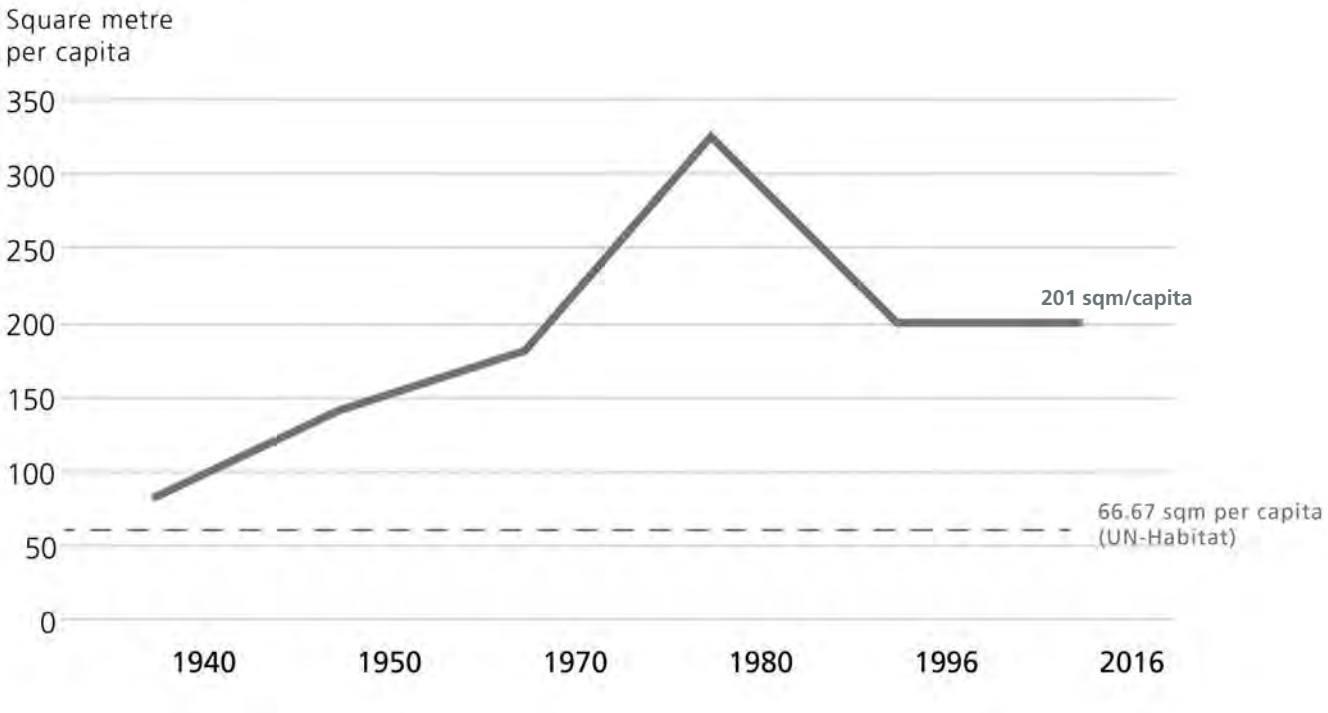


Fig. 24. Land allocated per capita

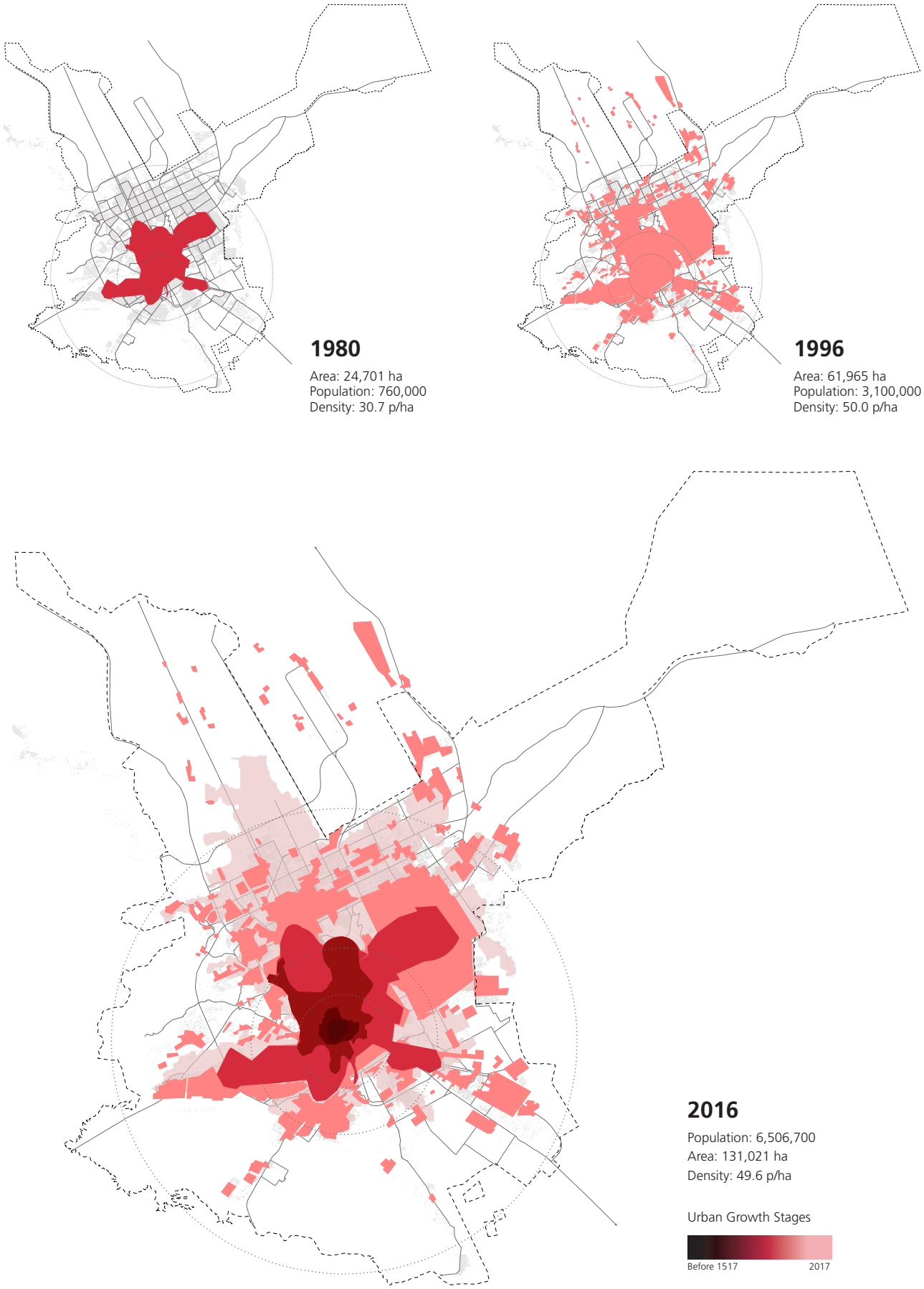


Fig. 25. Urban growth pattern

the East is limited by the current urban boundary, preventing further sprawl. The development to the South of the city is less attractive, especially for residential development, as all major industrial areas are clustered there.

4.1.2 Administrative boundaries

The governance of Riyadh is quite distinct, being more decentralised than other Saudi Arabian cities, mostly because of its importance as the national capital and main economic hub. Several governmental agencies are engaged in the urban development of the city. The most important entities directly related to planning are the Riyadh Development Authority (RDA, previously known as ADA), Ministry of Municipal and Rural Affairs (MoMRA), Amanah, and the Ministry of Housing (MOH).

The UGB's are supposed to guide the urban expansion of the city based on its prospective needs according to population growth, required services, and public infrastructure, as well as areas necessary for investment to create sufficient employment opportunities. The UGB's in Riyadh, like most of the other Saudi Arabian cities, overestimates the growth and assigns an overly-generous quantity of land for development within the UGB, which encourages low-density and sprawl rather than fostering higher-densities in new developments.

In the city of Riyadh, three growth boundaries are in place:

- The 1435 Urban Growth Boundary
- The 1450 Urban Growth Boundary
- The Development Protection Boundary

Administratively, the RDA is responsible for development within the UGB (1435 and 1450), together with the Amanah, and MoMRA for administering and delimiting the DPB.

Considering the current population growth rate, and the UN recommended densities of 150 p/ha, together with the land available between the existing built-up area and the proposed 1435 boundary extension, the city would have sufficient land for another 35 years, or for 22 million inhabitants.

Along the same lines, the 1450 UGB could provide an additional 284,659 ha for future development, which, at the UN recommended density of 150p/ha, would result in a total population of 42 million inhabitants and 48 years to fill in. This means that both the 1450 and 1435 UGB allocate more land than necessary to accommodate the city's population growth. This over-dimensioned amount of land and general alignment of the boundary can be problematic for sustainable development. The proposed expansions planned in the North and the East extends outwards from the city like two protruding arms, moving development further away from the city centre, rather than developing adjacent to existing fabric, and close to public facilities, services, and other amenities. Creating access and connections to the newly proposed expansions will further aggravate the issue of sprawl and will be a resource-

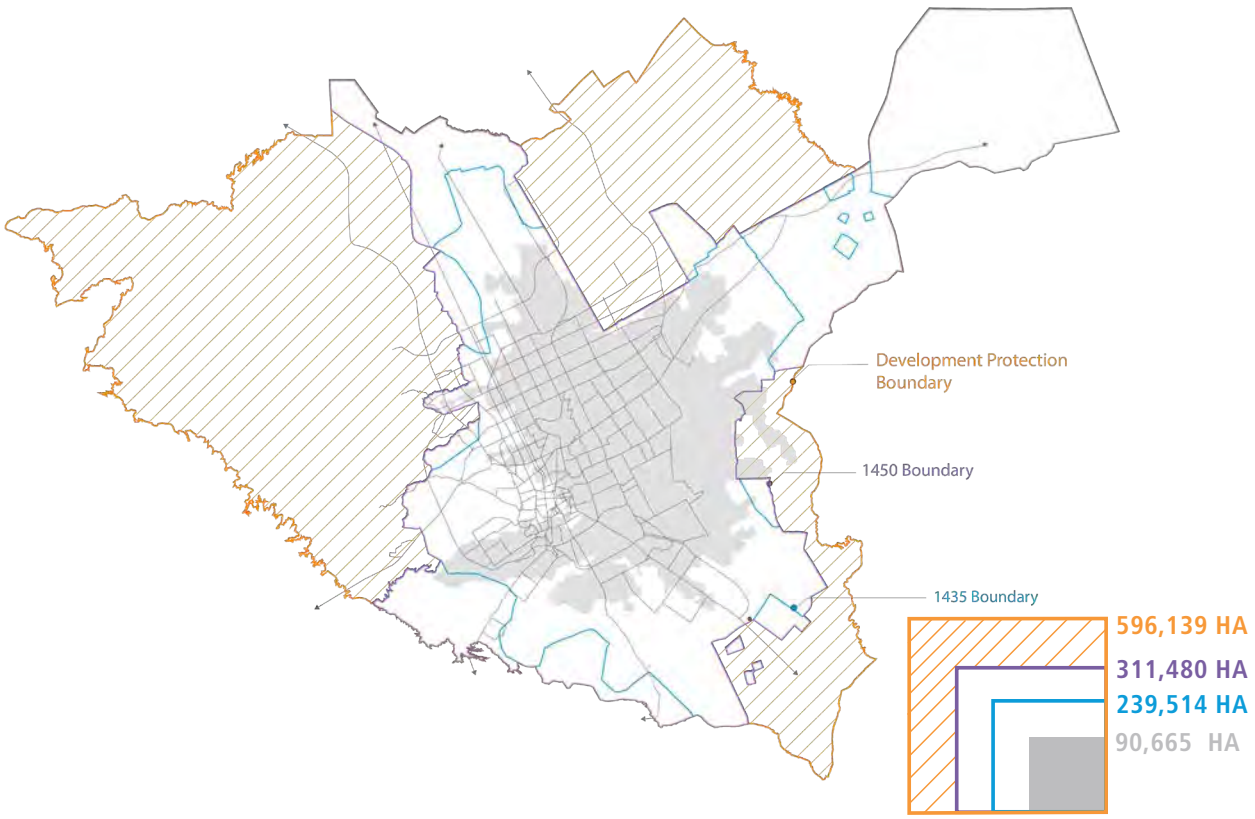


Fig. 26. Riyadh's boundaries

Al Bujairi Square

intensive process.

4.1.3 Urban density

Today, the city hosts 6,500,700 people, about 19% of the total population of the Kingdom of Saudi Arabia. However, the average density of 71.8 p/ha does not reflect the status of Riyadh as a capital city, even though the densities are slightly higher than the average of the country.

As mentioned, the city formed when several smaller agglomerations merged, which over time formed what the present-day Riyadh is. The urban fabric of Riyadh that developed between 1940 and 1950 was compact, hosting a much higher-density of 70-120 p/ha and was well-integrated with the natural landscape, tightly woven into the wadi that provided green open spaces. The architecture of these structures used the typical Najd style and followed a climate responsive urban pattern. It was during that time that Riyadh was named the "Garden City."

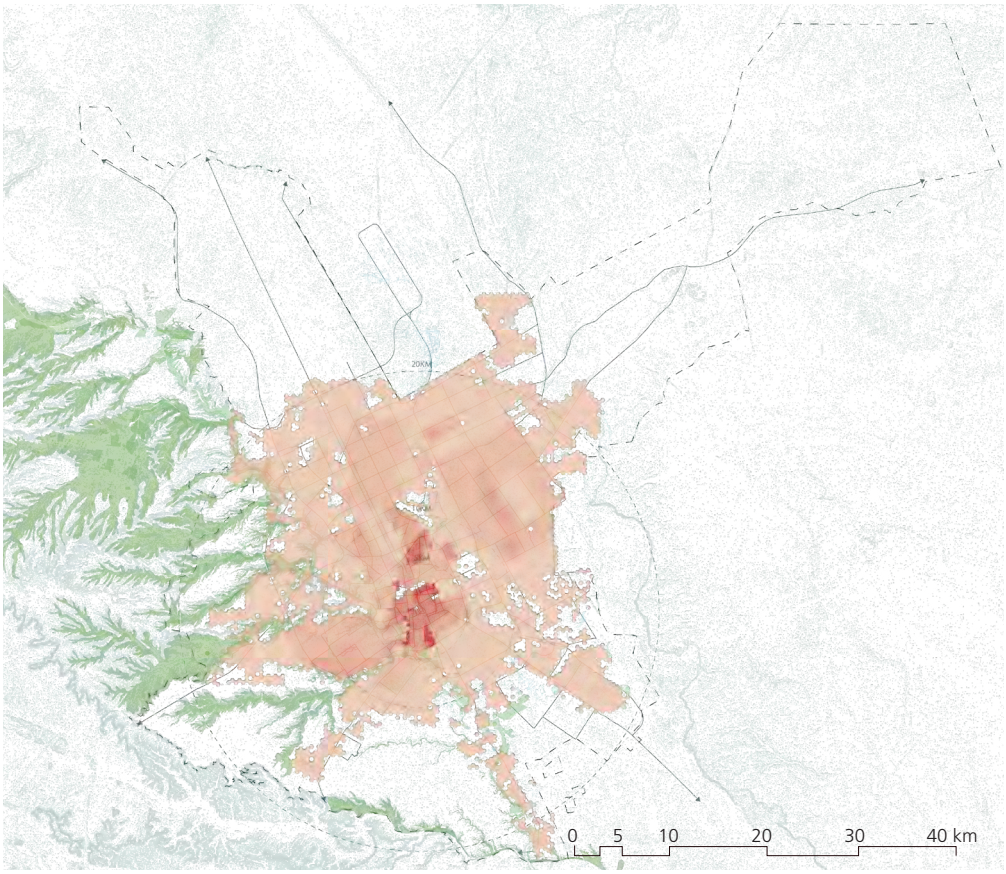
High and medium urban density patterns can be found within the old city, which represents today's urban core, where density can be up to 400 p/ha, although this is only true for a small share of the city; approximately 4% of the total built-up area. Overall, only 16% of the urban fabric performs at or above 150 p/ha. Current development initiatives are focusing on the revitalisation of this central area as it fosters diverse spatial qualities and a unique character. The layout of the urban fabric is denser and more diverse with narrow, human scale streets. However, these inner city areas lack decent open spaces at the neighbourhood and district level.

Some medium-density developments can be found within a ten kilometre radius around the city centre. However, most of the area within the 1435 UGB is developed at very low densities, hosting approximately 40-50 p/ha.

Since the 1980's, the city has expanded following a sprawling pattern, in an attempt to cope with the rapid population growth, and more recently, this growth pattern represents the majority of the built-up land, especially for residential areas. This pattern is reserved for purely residential development, without any mixed-use, and characterised by introverted design characters that lack connectivity with the surrounding areas. These aspects impact the accessibility to services, which are located at a distance, and are only accessible by private vehicles via wide roads that further divide and fragment the city's fabric. Although it was foreseen, the majority of central open spaces planned for in these areas have never been developed or are incomplete, and therefore, do not provide quality public open space, and impact the quality-of-life of its residents. The accessibility within the neighbourhoods is another crucial obstacle as no safe and well-connected pedestrian environment is provided.

Another kind of low-density, disconnected and sprawling pattern, is represented by the large monofunctional development clusters that are generally reserved for economic activities or gated communities. These large developments are major dividers, preventing a well-linked and coherent urban fabric, and, being served by large road-infrastructure corridors rather being spatially divisive. In addition, the concentration of these large monofunctional economic areas causes traffic congestion and creates a lack of diverse and vibrant mixed-use urban centres.

Considered together, the average density of Riyadh is close to 71.8 p/ha, which is less than half of the UN-Habitat recommended density of 150 p/ha, and also significantly lower than most cities across the world. However, as it is experiencing an annual population growth rate of 4%, the city holds potential to create a dense and vibrant urban form.



Residents:
6,506,700
Average population density:
71.8 P/HA

0 - 50 p/ha
50 - 100 p/ha
100 - 150 p/ha
>150 p/ha

Fig. 27. Population density distribution

2.5 2.5

Low density neighbourhoods

4.1.4 Land use

Riyadh is mostly characterised by large areas of monofunctional land uses, mostly residential, spreading from the city centre across vast areas. Due to limited mixed and commercial uses in these areas, most of these neighbourhoods lack vibrancy, quality open spaces, and access to services. Such unequal distribution of land use creates an imbalance in the urban structure and increases travel time and number of journeys in order to access employment opportunities and services. In general, residential land use represents more than one-fourth of the built-up area within the 1450 UGB; 39% to be more accurate.

Being the capital city, a large percentage of land is dedicated to governmental and public facilities in Riyadh. In total, governmental institutions and public facilities occupy approximately 21% of the entire land area inside the boundary. Overall, the city hosts a low distribution of mixed-use, commercial, and retail areas. They are mostly concentrated along the secondary roads enclosing the residential neighbourhoods or in monofunctional clusters, which are inconsistently distributed across the city but can be accessed by major highways.

The financial district, located 15 kilometres North of the old city centre, and 30 kilometres from the airport occupies an area of 75 hectares. Single-handedly, this district could hold the potential to allocate all the major office and business facilities for the city. By concentrating single-uses in one part of the city, such developments may become a deterrent to the diversity of uses offered in the smaller centres disrupting the balance of access and movement patterns in the city.

The majority of the industrial and logistical uses, which account for 11% of the total built-up urban area are concentrated in the South, which adversely affects the quality of urban life in the adjacent residential neighbourhoods. The highway that connects Al Kharj with the industrial zone is experiencing new developments, which will increase its importance in the future.

King Fahd National Library

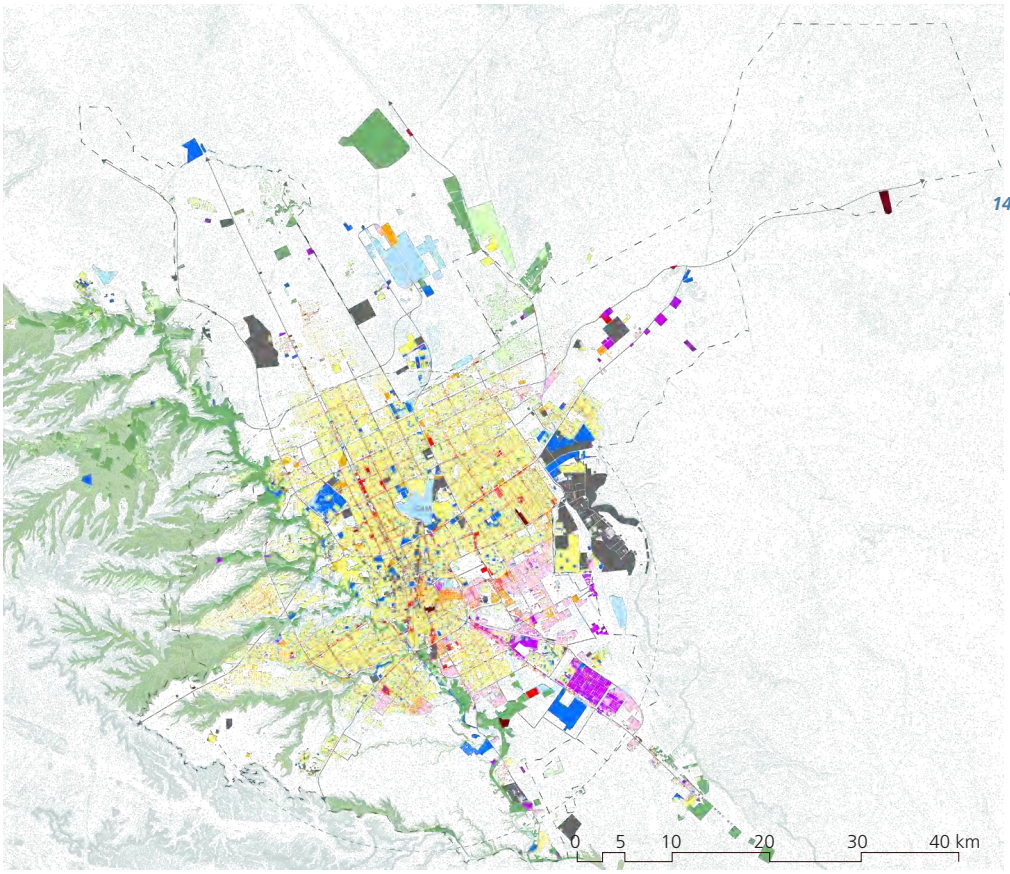


Fig. 28. Existing land use

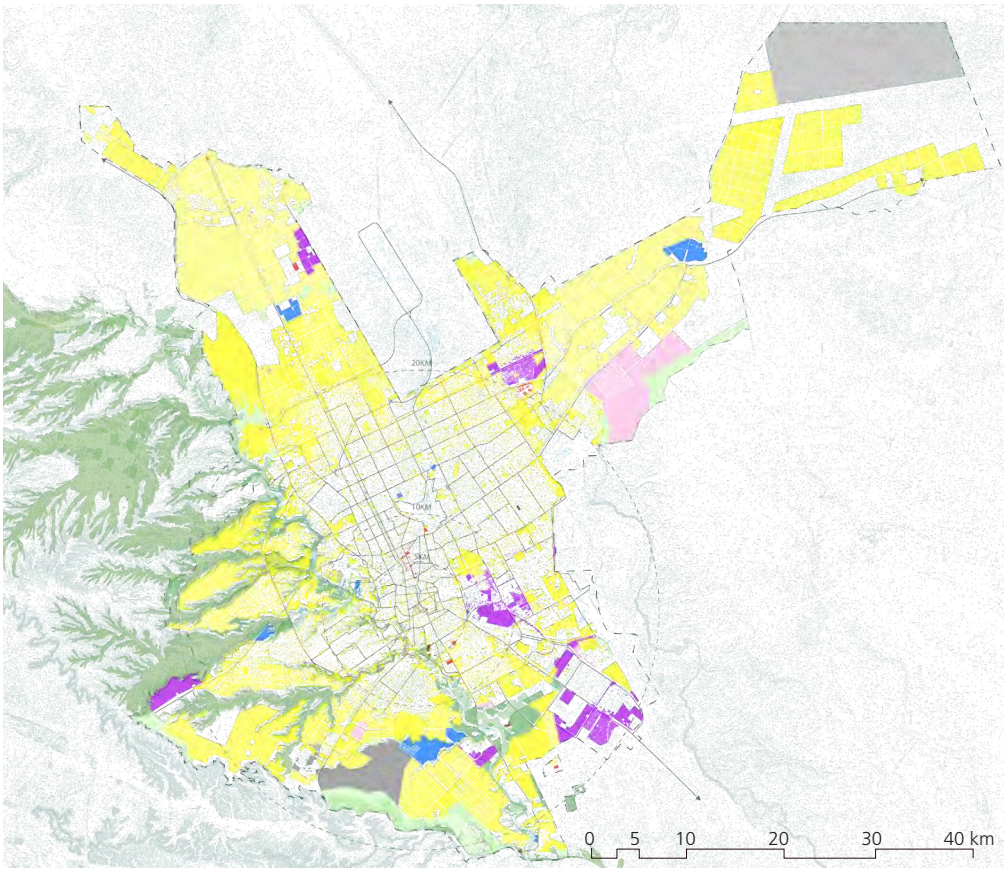


Fig. 29. Proposed land use in the Riyadh Plan by Amanah

4.1.5 Vacant land

Historically, Riyadh grew in a concentric pattern from the city centre along major road corridors.

The pattern of future urban expansion is determined by three main growth directions, towards the Southwest, North, and East. The Eastern and Northern extensions, where the majority of vacant land within the urban boundary is located, are proposed to become two new major sub-centres, functioning as satellites of the central city. Due to the disconnect from the rest of the city and the linear alignment of these extensions, the provision of services and integration of the road and transportation infrastructure will create challenges and economic strain on the city.

The vacant land area within the built-up urban area, without considering several fragmented large-scale military lands within the city, accounts to 51,884 hectares, compared to an additional 11,922 hectares, which would be needed when coping with future population growth based on the recommended UN-Habitat density of 150 p/ha. Within the 1450 UGB, the entire developable land area is 230,833 hectares, and this represents 5% of the potential expansion area.

The White Lands Tax was introduced to develop inner-city vacant land. However, the pressure to develop these lands is not often translated into high-density, vibrant economic centres. More often than not, high-end, low-density developments or large retail and commercial areas are preferred forms of development on these vacant parcels with revenue being the main focus. As a result, the anticipated higher-density mixed-use areas, which provide quality and diversity of open spaces to its residents, are not achieved. The future development proposals on vacant land must be carefully analysed and streamlined to encourage a coherent, contiguous, and dynamic urban form.

4.2 Structuring Elements

4.2.1 Major infrastructure and economic nodes

Riyadh is considered the financial and administrative hub of the kingdom. Consequently, the public sector, which includes numerous ministries and national headquarters, represents one of the largest employers, providing jobs to more than one-third of the population, representing about 21% of the built-up area within the 1450 UGB.

Due to its national importance, the infrastructure of the city is well developed and connected on a regional and city scale. Riyadh largely benefits from its multimodality, having access to air and rail freight, as well as to the main national highways

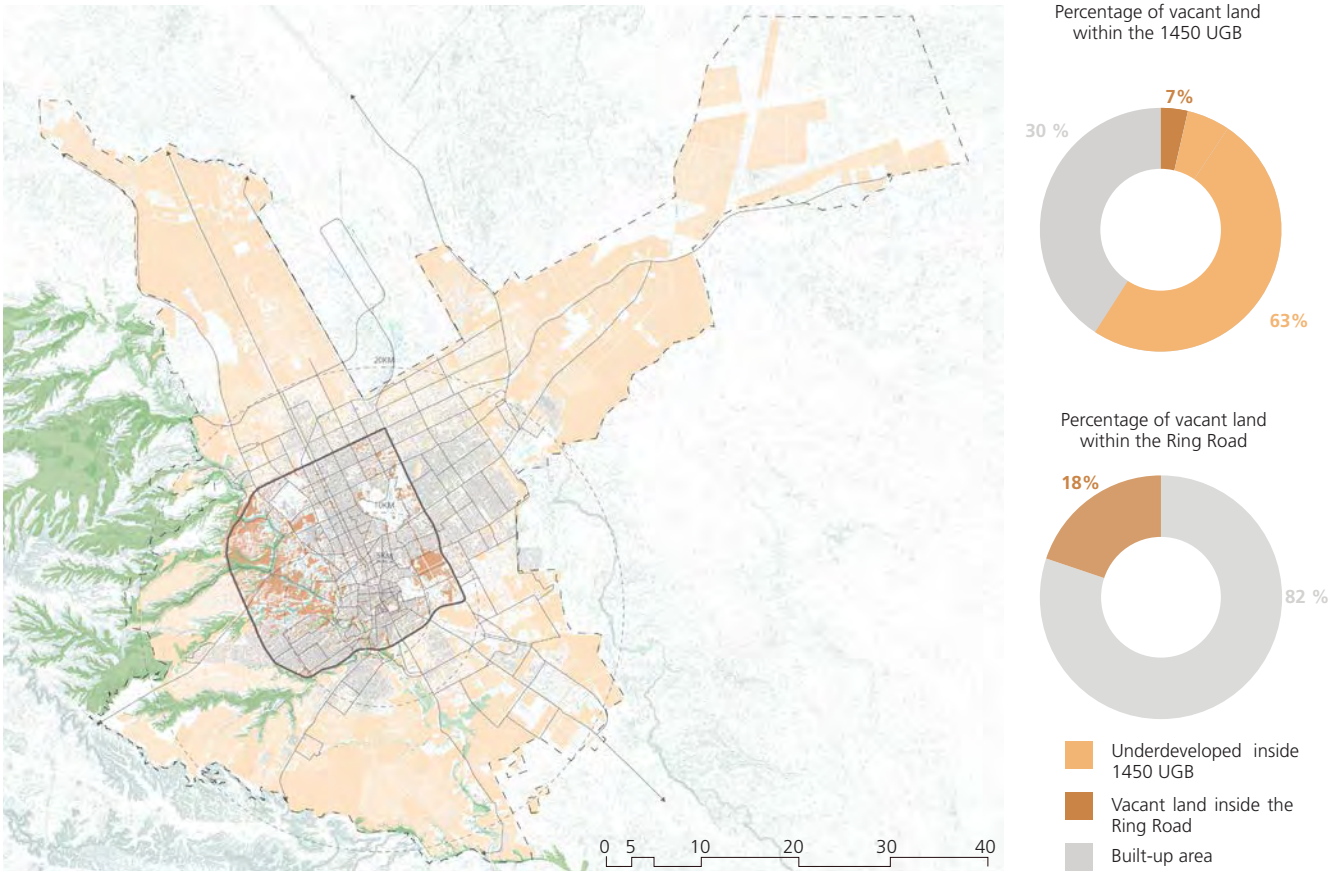


Fig. 30. Vacant land and undeveloped area

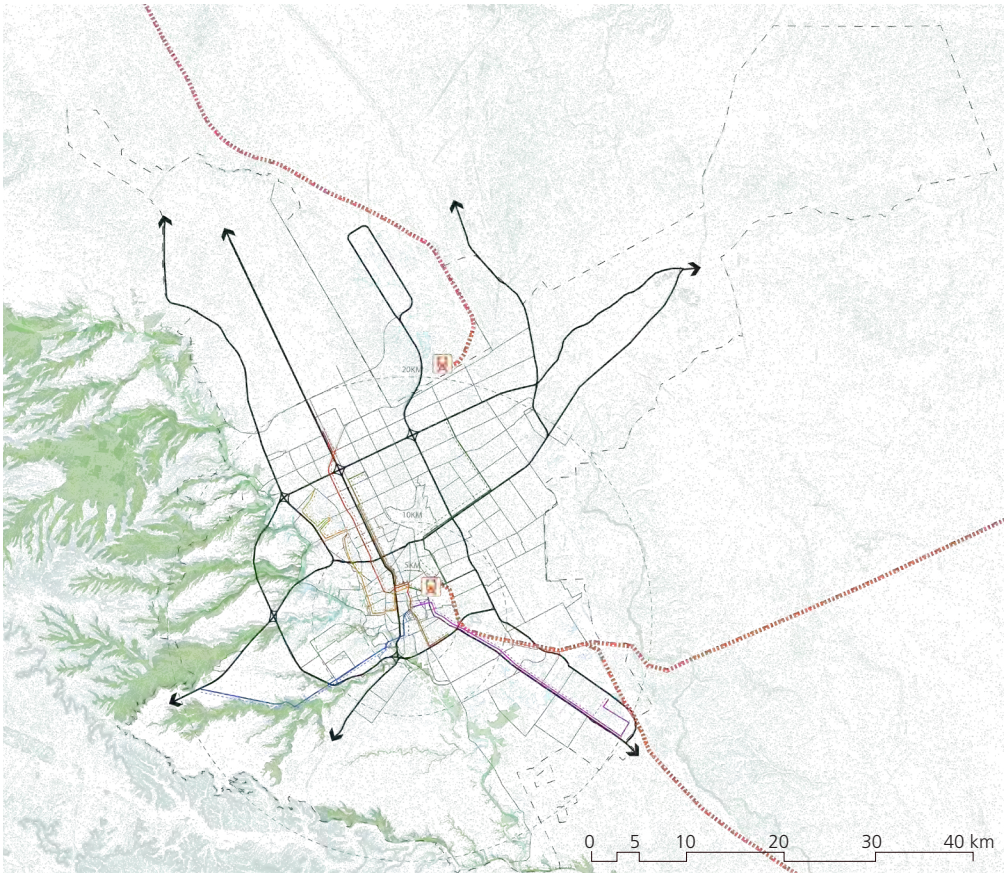


Fig. 31. Transportation infrastructure

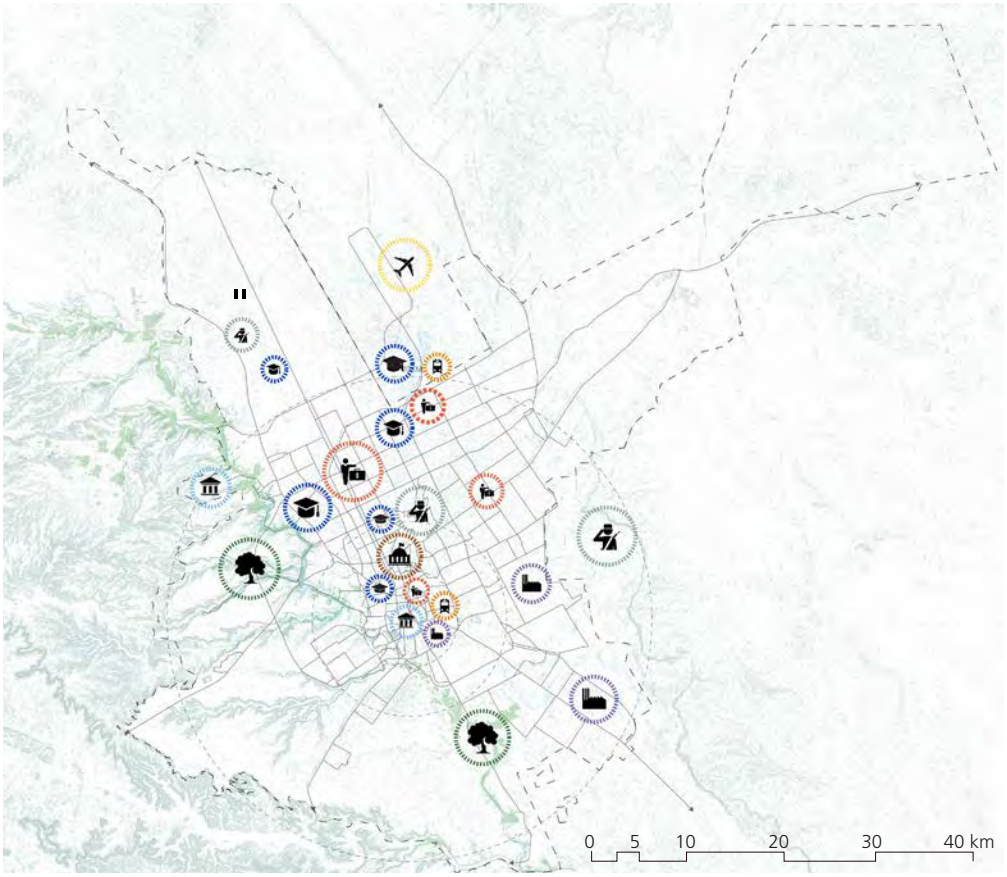


Fig. 32. Economic nodes

of the Kingdom. Of great importance is Highway 40, which connects the city towards the East, 400 kilometres from Dammam and towards the West, 954 kilometres from Jeddah via Makkah, the economic centres of the Eastern and Makkah Regions.

The mobility within the city is mainly car-dependent as Riyadh currently offers only a few bus lines to its residents. Within the next two years, the city's ambitious public transportation system, which consists of several BRT and Metro lines will be implemented. This development will drastically change the cityscape and the character of the city, providing an opportunity to create integrated networks. The proposed public transportation systems are discussed in detail in Section 4.2.5.

The international King Khalid Airport, 43 kilometres North of the city, is the second largest passenger airport in the Kingdom, serving more than 20 million passengers per annum. Once the Metro system is active, the airport will be well-connected to the city centre by public transportation. In the future development plans, the large vacant land surrounding the airport are dedicated to the development of governmental functions. Such development is feasible as supportive and required infrastructure already exists; however, a monofunctional development of this large-scale area needs to be prevented.

Another benefit of Riyadh is its accessibility to the national railway system, offering a valuable option to the abovementioned mode of transportation. The current railway system consists of two terminals, one within the city centre and another one to the North; the North-South Railway Station. Both of these stations serve as passenger terminals, connecting the city to various cities of the Kingdom such as al Hofuf, Dammam, Burayiah, and Al Haditha which are located at the border to Jordan.

4.2.2 Environmental and topographic elements

Riyadh City is 600 metres above sea level, in the centre of the Arabian Peninsula, and is mainly characterised by flat desert lands. The areas which feature the steepest grade can be found towards the Southwest and North of the city, also known as the escarpment of the Jubail Tuwaiq. Wadi Hanifa runs along the Western edge of Riyadh, and Wadi Sulay to the East, both act as natural growth boundaries..

Existing since the city developed and still one of the leading environmental assets of the city is Wadi Hanifa. The width of the wadi varies between 300 to 500 metres, stretching for more than 80 kilometres in length from Southwest to the Northeast. It is potentially a quality open space for residents and has, therefore, been designated as a protected area. Additionally, the fertile lands along the wadi are being used for agricultural activity, and to help combat climate change, making the wadi an important green asset for the urban city.

The Wadi Sulay to the East is presently only used for stormwater management / drainage system without providing any recreational benefit to the citizens of Riyadh. It is anticipated to develop in a similar way to Wadi Hanifa, providing public open space to the residents and restore the ecological balance of the region. The current course of Wadi Sulay is not as distinct as Wadi Hanifa and cannot be considered a structuring element. However, the proposed development plans for Wadi Sulay can transform it into an integral organisational element which belts the city to the East.

Historically, the urban footprint of the city was a sustainable ecosystem, tightly intertwined with its existing ecological structures, such as the wadi, parks, and agricultural lands. However, those features, which created the unique identity of the city, have been lost over time. Small-scale open spaces within the individual neighbourhoods, if existing, are not well maintained and lack integration into a citywide open and public space network with a clear hierarchy ranging from pocket parks, neighbourhood parks to city scale and district parks. Most of the well-designed spaces in the city are either privately owned or belong to public entities which restrict access to the general public. This lack of open spaces, within the existing urban fabric, results in disproportionate distribution and access. In general, the accessibility of open spaces is limited and for majority of the residents of the city, only reachable by private modes of transport.

Another environmental element is the former agricultural zone South of Riyadh, which is currently underdeveloped and highly polluted by industrial activity in the area. Studies on how to restore those areas are being undertaken. If successfully implemented, the agricultural land could connect to Wadi Sulay, Wadi Hanifa, and further Southeast to the Alhayer Lakes area. The aim is to achieve an active regional open space network which encompasses the city and attracts recreational/ leisure businesses.

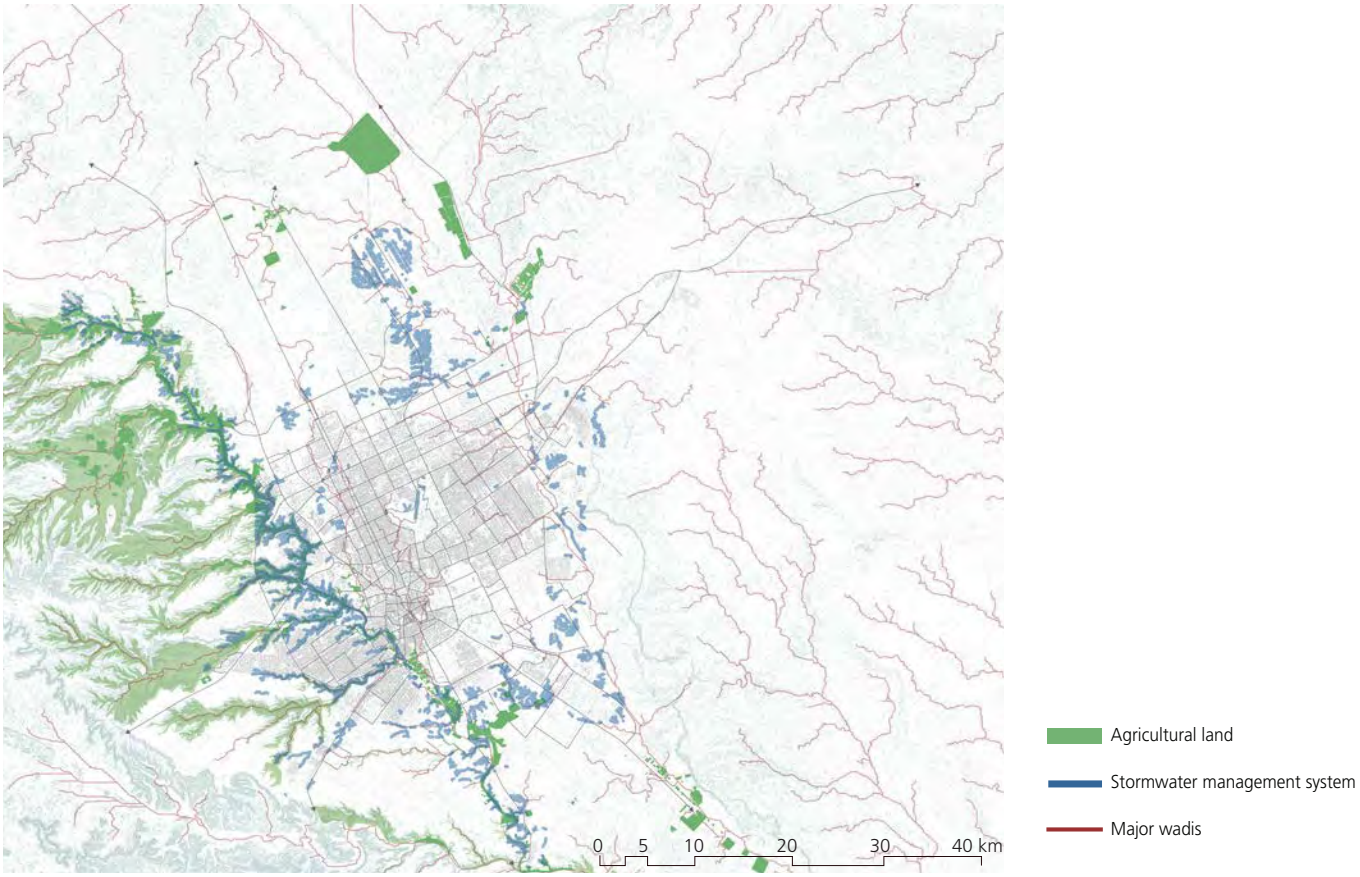


Fig. 33. Blue and green networks

Wadi Hanifa is a succesful case of how to renovate a degradated space

4.2.3 Movement and accessibility

Riyadh, being the capital city, is an intermodal hub which is well connected to all major economic centres of the Kingdom by rail, road, and air.

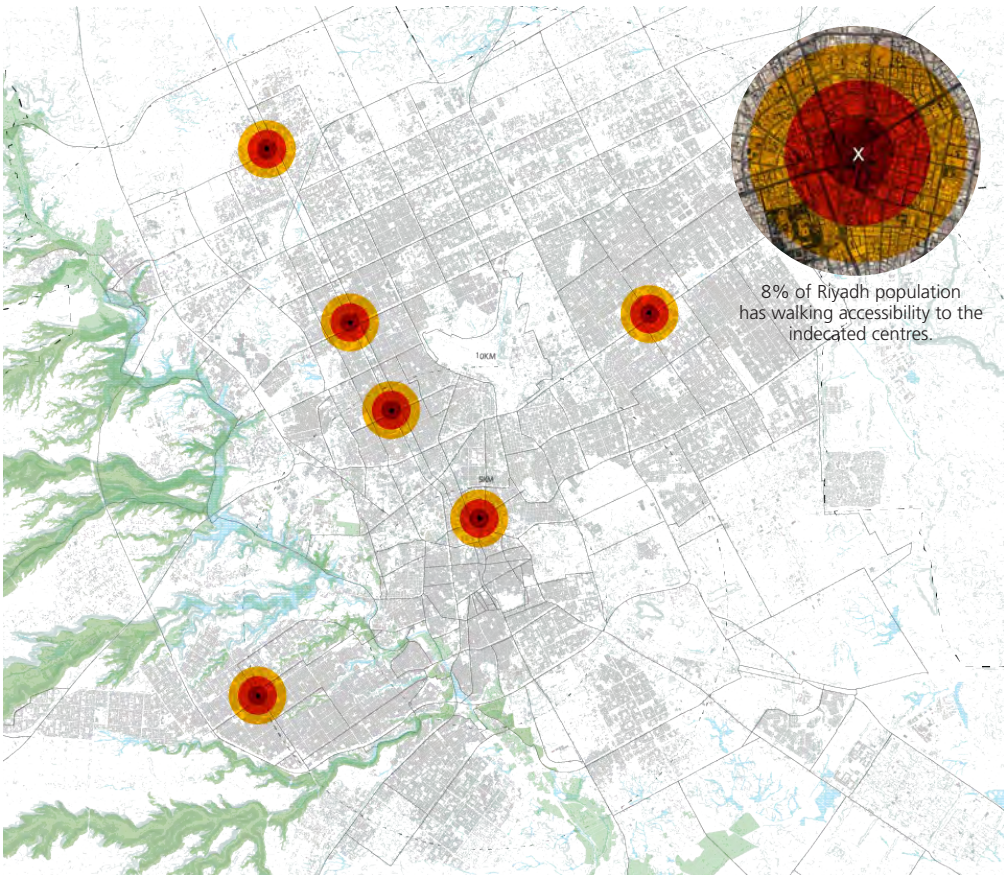
The most critical regional highways run through the city allowing people and goods to move in and out of the city. Most of the economic activities are located along these primary spines, especially in the North-South direction. Several smaller infrastructure corridors, where commercial services are located, saturate the city's residential neighbourhoods. The internal city road network is based on a rectangular pattern, connected by several ring roads. However, ironically, these connections can be divisive in nature, acting as physical barriers by forming large intersections, which divide the city into different fragments. In many cases, the dimension of these significant roads exceed a Right of Way (ROW) of 60 metres, increasing to 90 metres in some instances. Without supporting pedestrian-friendly infrastructure, hostile and unsafe urban environments are developed.

Due to the monofunctional clusters, which are fragmented by large infrastructure corridors, the accessibility of urban cores can be accessed by only 1% of the population within a 5-minute walk. Within a 15-minute walk, the accessibility of the urban cores increases to capture 8% of the total population of Riyadh. This study is directed towards the need to improve infrastructure for pedestrians and to decentralise the concentration of nodes by increasing secondary centres in residential districts to provide services and daily goods.

The current public transportation system consists of six bus lines with 43 stops, which are operated by the Saudi Public Transport Company (SAPTCO). While the lines are spread in all directions, interchanges are only possible within two areas of the city centre reducing the population served along different routes. Moreover, the lines do not connect the commercial centres, which would improve access to jobs and services reducing dependency on cars. The Eastern parts of the city are also underserved by public transportation.

King Khalid International Airport is located North of the city, approximately 43 kilometres from the city centre and connected to the centre of Riyadh, via the central axis of King Fahd Road or the Eastern Ring Road. Furthermore, Riyadh has two main train stations, one in the North in proximity to the airport, the other one in the city centre. Both of them are used as passenger and freight rail terminals. The Northern station is connecting Riyadh to Al Majmaah, Al Qassim, Hael, Al Jouf and Al Qurayyat, and the central station connects Riyadh to the Eastern Region towards Abqaiq, Al Hofuf, and Dammam.

People cycling as an alternative transport mode in the urban core



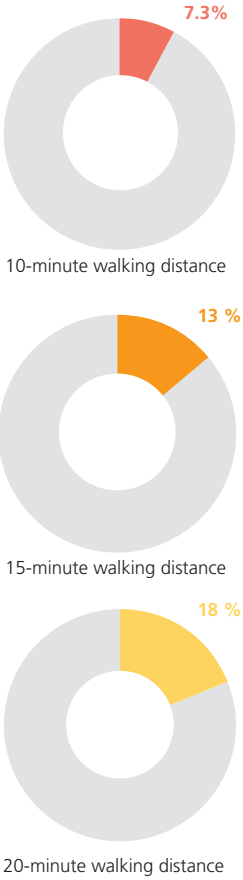


Fig. 34. Walking accessibility to the city centre

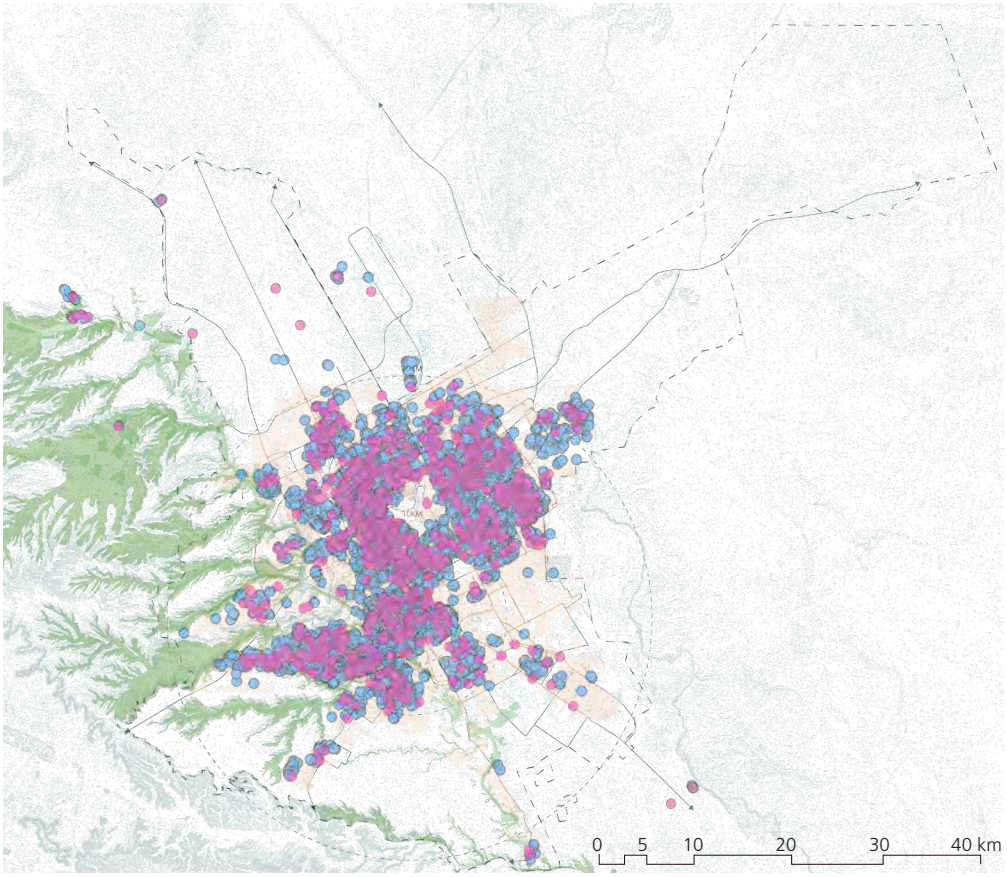


Fig. 35. Distribution of public facilities

4.2.4 Riyadh Local Plan (MEDSTAR)

The MEDSTAR (Metropolitan Development Strategy for Riyadh Region) was set up in 2003 to guide the future planning of Riyadh City and the Metropolitan Region, consisting of a set of plans, programs, and general implementation guidelines, focusing on four main areas:

- The metropolitan structure;
- The development of the central Riyadh area;
- The Northern and Eastern city extension; and
- The densification of the significant spines.

It is anticipated to be an integral and cross-sectoral planning tool which only exists for the capital of the kingdom.

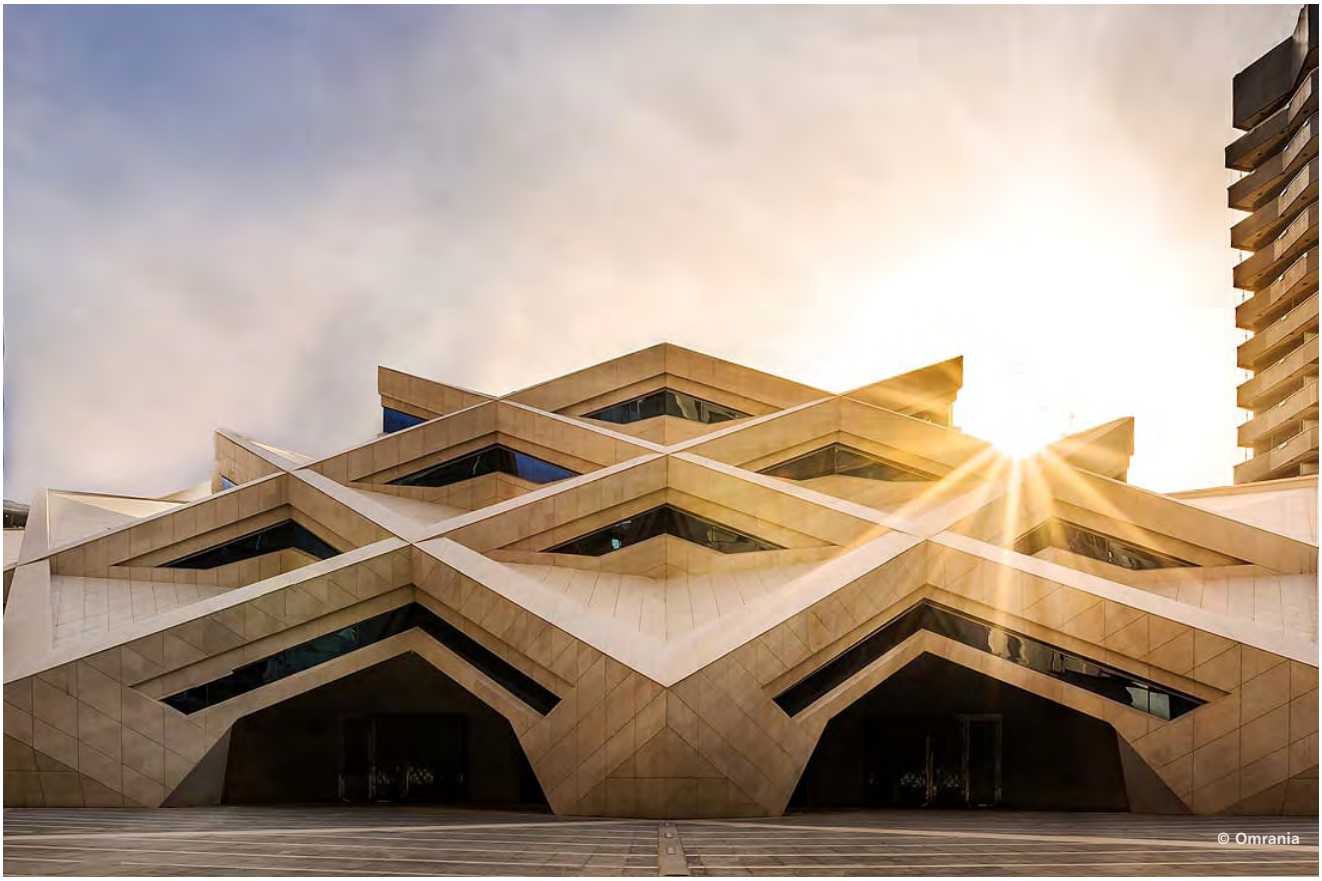
The proposed future city extension foresees 31% of the future land use to be residential, which would result in 60% of the total land use of the city to be allocated for housing. The mainly low-density residential areas are imagined as monofunctional, neglecting the fact that small-scale commercial and retail can help activate individual neighbourhoods and create jobs. Mixed-use areas are mainly foreseen along the major arterial roads.

In general, the plan mostly strategic and does not prescribe substantial guidance to planning entities that can promote programs for sustainable city growth and implementation mechanisms. The plan also lacks strategies for improvement on the neighbourhood scale. The Strategic Plan for the city should set policies to create a better quality of life with diverse job opportunities, equitable access to services, inclusive development, and incentives to reduce car dependency.

The plan acknowledges the need to improve design and management of open spaces within the city. However, the implementation processes needed to achieve this goal are not set in place, including the urgency to improve existing open spaces and streetscape within the residential neighbourhoods, and the walkability within the city, in general.

The Strategic Plan proposes two satellite cities, one in the East and one in the North, with 500,000 inhabitants each, to become new sub-centres in the long-term future expansion plan of Riyadh. However, the projected population growth of the city for the next few decades is much lower than the planned capacity of these new centres. These extensions can thus be pushed further in the future and phased over time when deemed necessary.

While the first edition of the MEDSTAR focussed mainly on planning, the second edition, is expected to focus on the importance of economic development, governance, and administrative structures to achieve long-term sustainability, and is currently under revision by the Riyadh Development Authority (RDA).



KAFD Grand Mosque

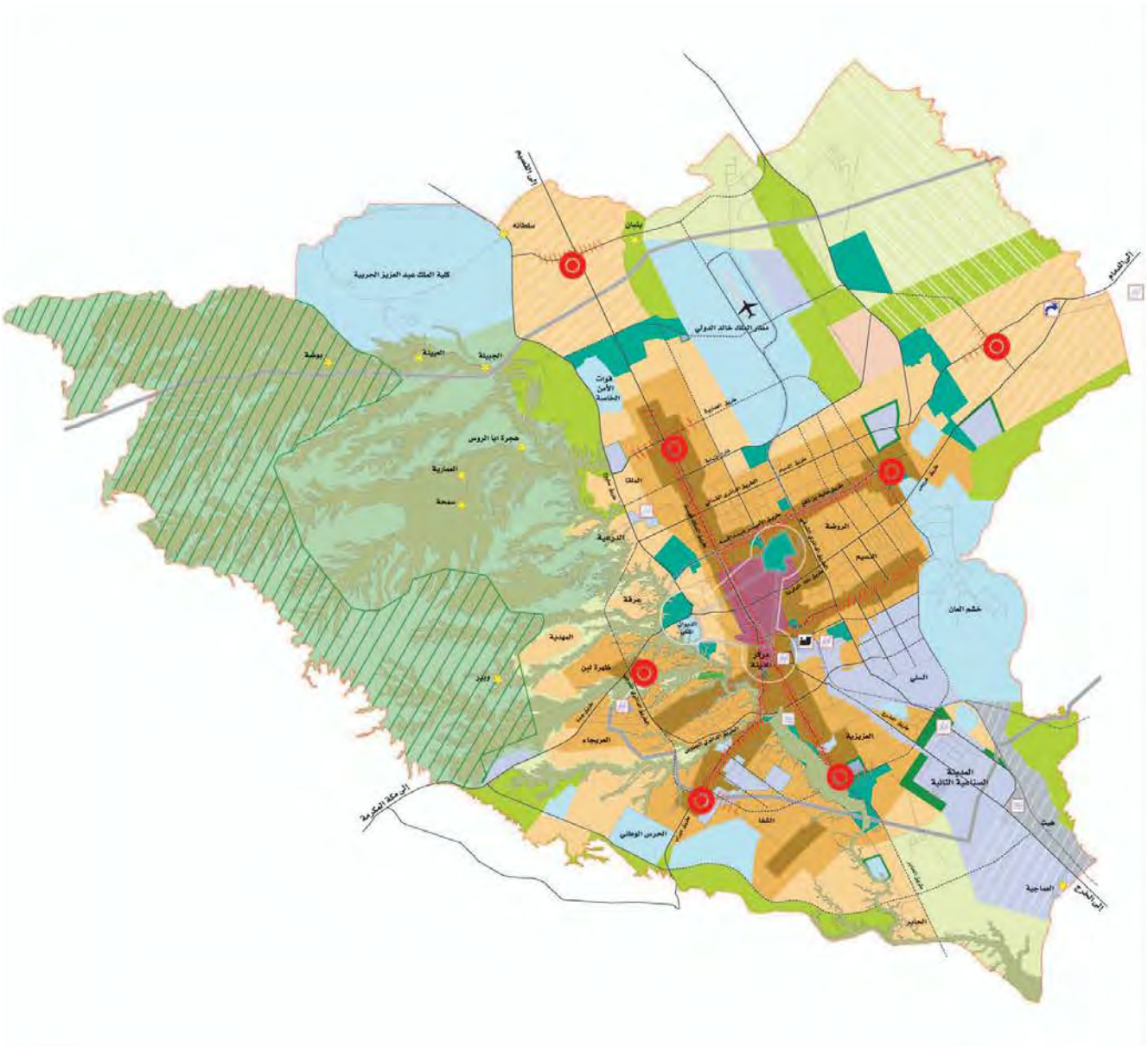


Fig. 36. Riyadh Local Plan (MEDSTAR)

4.2.5 Assessment of proposed transportation systems

The current city structure, in the absence of a robust public transportation system, experiences heavy traffic congestion as the inbound and outbound streams get concentrated in specific areas of the city. Without a safe, comfortable, and reliable public transportation alternative, the residents are dependent on personal modes of transport, adding to the congestion, and pollution. To mitigate this situation, the city's public transportation system is currently under construction and is expected to be completed by 2021. Once the system is implemented, the residents will have access to six Metro lines and three BRT lines, in addition to the operational bus lines. Feeder systems to connect residents to the stations are being developed and several modes, such as autonomous vehicles, are currently being tested. Alongside the proposed public transportation system, walking, and other forms of non-motorised modes should be promoted to improve last mile connectivity. The current streetscape designs need to be reconfigured to incorporate safe walking and cycling infrastructure.

Proposed along these lines are 93 metro stations, that once implemented, will provide access to 50% of the population within a 10-minute walking distance. Additionally, the proposed BRT network will be accessible to about 23% of the population because of fewer stops and the alignment of the lines that pass through less-dense or uninhabited areas.

Supplementary to the commercial sub-centres, intermodal stations, based on Transit Oriented Development (TOD) principles, are proposed within the development of the public transportation system and are anticipated to feature higher-density ratios and various mixed-use functions. The aim is to create an individual identity for each station, incorporating flexibility in their design to adjust to changing needs. Select committees are being introduced to manage the development process.

The overall vision is to intermix origin and destination for employees and residents to activate the areas continually. Therefore, the mix includes residential, services, and offices as well as cultural and entertainment services. However, those commercial sub-centres are only accessible tot 1% of the population within a 5-minute walk, and when considering current urban densities the main intermodal station will have slightly higher catchment rations with about 6% of the people accessing the stations within a 5-minute walk. This demonstrates the importance of increasing the current built-up area by introducing mixed-use developments of varying significance to improve services and their access to residents.

The proposed transport network connects the new intermodal stations within the city. However, the challenges that may

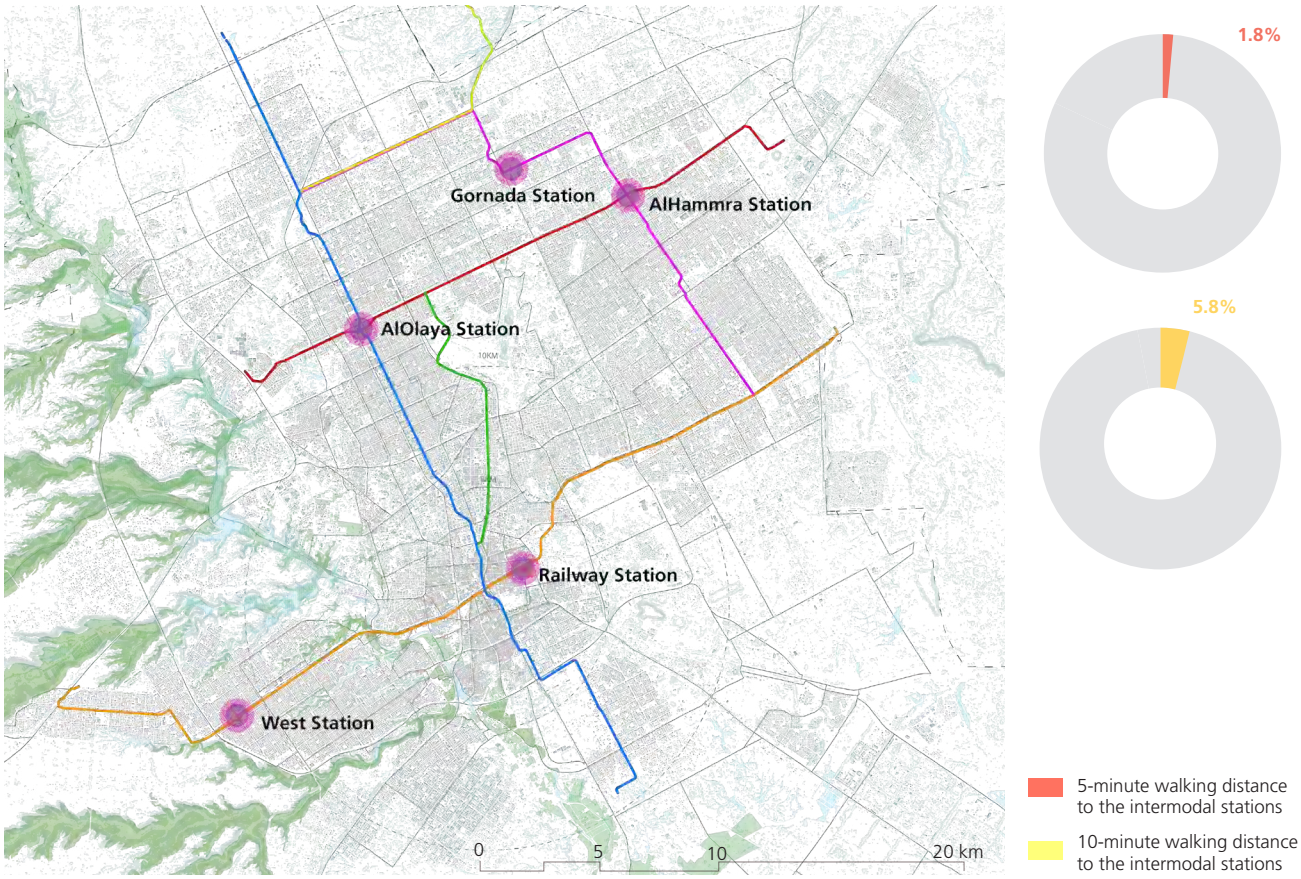


Fig. 37. Public transport intermodal stations

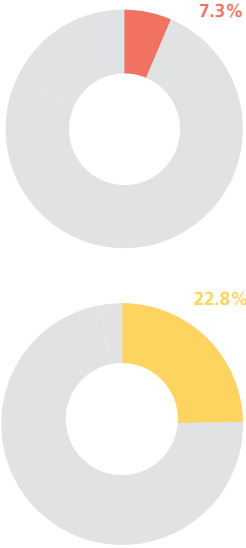
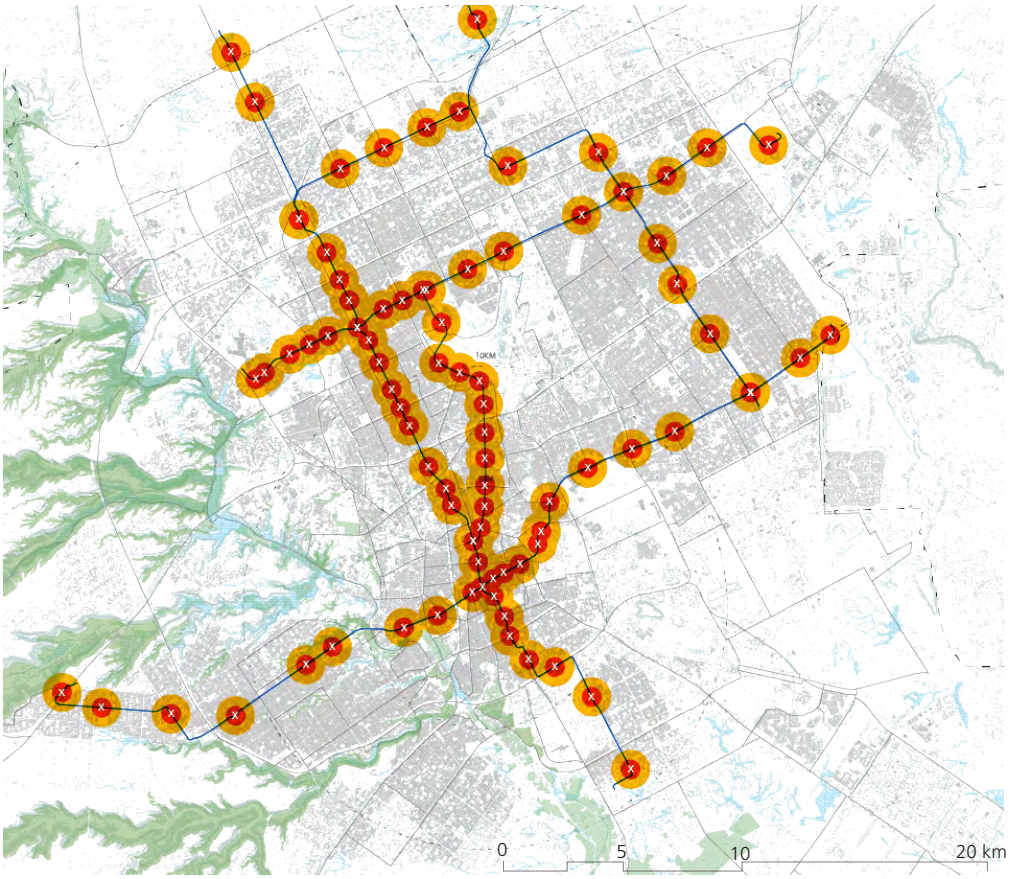


Fig. 38. Walking accessibility to the BRT stops



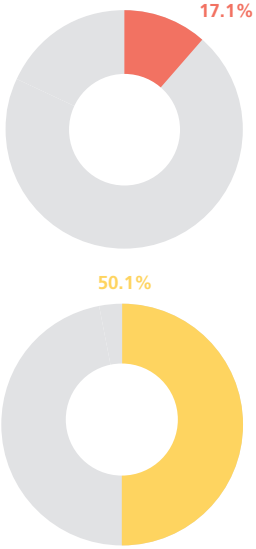


Fig. 39. Walking accessibility to metro stops

prevent its success are the connections to the existing city centre and sub-centres, and the economic feasibility of the lines in areas of low population density that will require subsidies from the government.

The public transportation lines must provide connections to jobs from where people live, work and study. By switching to the public, shared, and non-motorised modes for daily commutes, the city will witness reduced levels of congestion and pollution. However, the industrial areas to the South, which create a large share of blue collar jobs, are not well connected to the primary system yet and will need to depend on an internal feeder system to encourage the modal shift among the workers.

The analysis of the proposed public transportation system further highlighted that the metro network, in some cases, does not traverse along important and highly commercialised corridors, such as the Makkah Al Mukarramah Branch Road and the Northern Ring Branch Road. The metro lines servicing these corridors are located at a further distance, due to the availability of land and space, which creates a lack of accessibility for visitors to these pedestrian-oriented commercial corridors. Additionally, there is a potential risk that a shift in vibrancy and development will occur due to a migration of activities from the current commercial corridors to the new corridors where the metro line is being implemented.

It is recommended that currently developed commercial corridors should be directly serviced by a high capacity transit mode, such as a BRT or trackless tram line. Further analysis and studies need to be conducted to select the best solutions, as space and land ownership along these commercial corridors are major issues that need to be resolved.

4.3 Urban Density Scenarios

Crosscutting the diagnosis of the current urban conditions and the approved/submitted projects proposals, FSCB conducted a scenario-analysis for increased urban density, based on different choices. The scenarios depict three conditions: the current situation, the situation developed in line with the approved planning instruments, and a situation where density distribution is allocated following our recommendations, and based on the UN-Habitat standards. The UN-Habitat scenario is based on the Five Principles for Sustainable Neighbourhood Planning, which are as follows:

1. Adequate space for streets and an efficient street network: The street network should occupy at least 30% of the land and at least 18 kilometres of street length per km²;
2. High density: At least 15,000 people per km², that is 150 p/ha or 61 p/acre;
3. Mixed land use: At least 40% of floor space should be allocated for economical use in any neighbourhood;
4. Social mix: The availability of houses in different price ranges and tenures in any given neighbourhood to accommodate different incomes; 20% to 50% of the residential floor area should be for low-cost housing, and each tenure type should not be more than 50% of the total;
5. Limited land use specialisation: This is to limit single function blocks or neighbourhoods; single function blocks should cover less than 10% of any neighbourhood.

Current Condition

The current population of Riyadh is 6,506,700 people. The relatively low-densities of 71.8 p/ha result from the sprawling residential developments, which represent 35% of the urban fabric, and only a few areas with higher-density developments exist around the urban core. Applied to the 1450 UGB, the density further reduces to 3.44 p/ha.

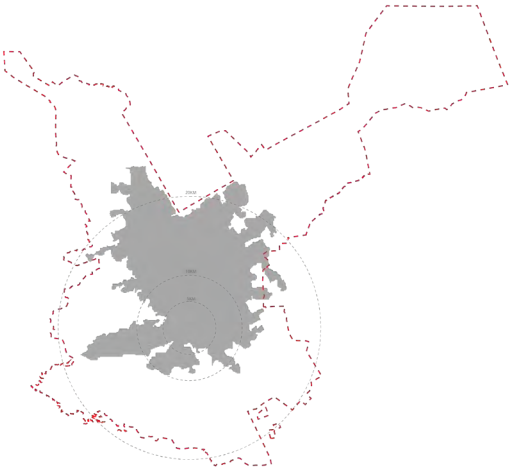
Scenario 1: 2011 Riyadh Plan

To accommodate a total population of 8,295,00 until 2030, the Plan provides a total area of 311,480 hectares for urban development, including the Northern and Eastern sub-centres. The majority of the proposed district is dedicated to residential development, allocating limited land for economic functions. This low-density development approach encourages urban sprawl and will lead to decreased densities of 26.6 p/ha in the built-up urban mass, which is extremely low for a city of such importance and risks long-term sustainability.

Scenario 2: UN-Habitat Recommendations

To improve the physical urban structure of the city, UN-Habitat advises adopting the UN-Standard Density of 150p/ha to densify the existing centres and for new developments at the urban fringes to limit further urban sprawl. Considering the UN-Habitat recommendations and an increase of 1,788,300 inhabitants, the city only needs to provide 11,922 hectares for future expansion, which accounts for 12% of the proposed area in the 2011 Plan. It implies the need for another tool to guide the urban growth in addition to the 1450 UGB.

CURRENT CONDITION

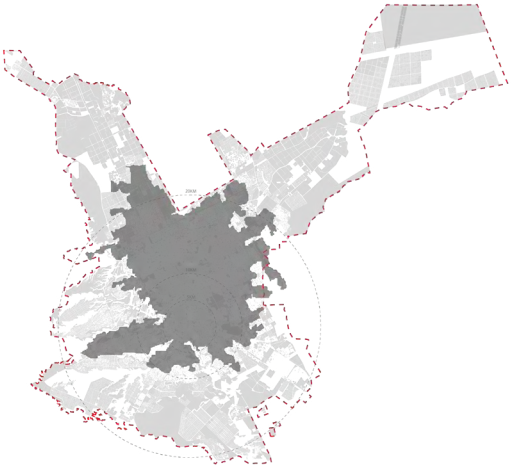


population 6,506,700

built-up area 90,665 ha

average density on built-up area 71.8 p/ha

SCENARIO 1: 2011 RIYADH DEVELOPMENT PLAN

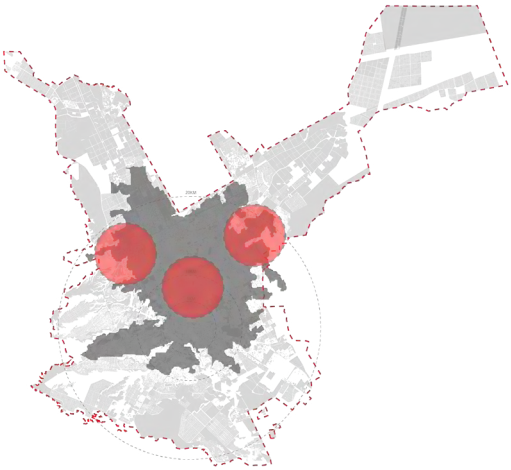


population 8,295,000

planned built-up area 189,018 ha

average density on planned built-up area 43.8 p/ha

SCENARIO 2: UN-HABITAT RECOMMENDED SCENARIO



population surplus 8,295,000

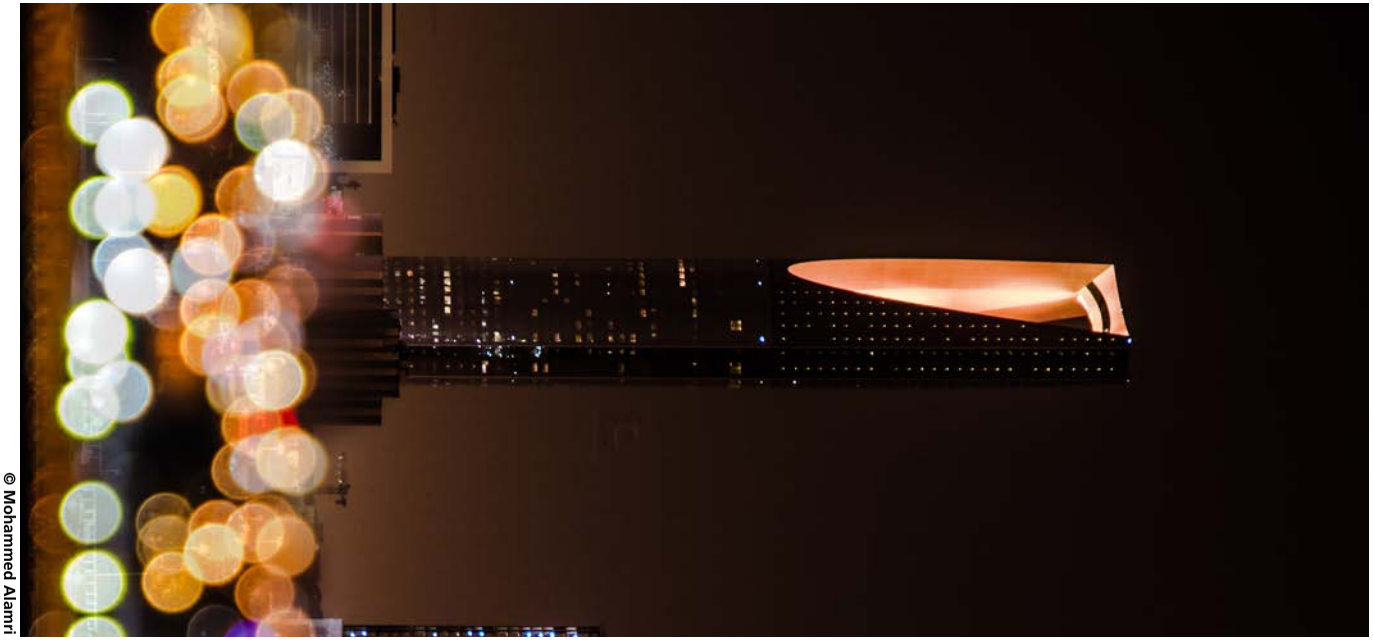
built-up area needed according to UN-Habitat recommendations 55,300 ha

vacant land needed to accommodate population growth 11,922 ha*

average UN-Habitat recommended density 150 p/ha

* 12% of the built-up area proposed by the 2011 Plan

STRATEGIC DIAGNOSIS



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5.1 Identifying and Defining Main Strategic Issues

During the evidence-based and cross-scalar analysis undertaken, four main issues affecting the sustainable urban development in Riyadh were identified. These issues represent the strategic framing of a complex diagnosis, synthesised through four conceptual lenses. These lenses are firstly defined in their conceptual nature, and later contextualised by an examination of their spatial manifestation in Riyadh, at different scales.

5.1.1 Unbalanced growth and development patterns

This often happens when a city grows rapidly, presenting a widespread sprawl phenomenon, and inharmoniously manifesting unbalanced developments across its territorial extension. Dysfunctionalities in urban management, both institutionally and experientially, are brought to light. the city showcases low-density and does not perform effectively, its services and facilities are not well-balanced in distribution and accessibility, and therefore citizens do not equally benefit from the advantages of urban life. This condition additionally makes the provision and maintenance of basic services and transport infrastructure costly and challenging.

1

[SPRAWL]

5.1.2 Divisions and lack of cohesion in city structure

In cases of unbalanced growth, sprawl, and inharmonious development, forms of non-contiguous and non-cohesive city structures tend to co-exist, without integration. Pockets of leapfrog development are widespread. Undeveloped land, overdimensioned infrastructures, and/or large extensions of monofunctional developments hinder the continuity of the city's fabric, and therefore, its social, economic, and ecological performance. As in cases of sprawl, this renders the equal provision of infrastructure and services to the entire city as difficult and costly. Additionally, the fragmentation phenomenon spatially affects the social dimension of sustainability, creating urban inequalities and segregation in areas that lie at a distance to the larger hubs and become isolated by a discontinuous urban landscape.

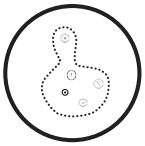
2

[FRAGMENTATION]

5.1.3 Monofunctional and polarised development

When a city showcases a predominance of extended monofunctional zones and lacks mixed-use areas, it implies a polarised development. This is particularly acute in cases where monofunctional developments are distantly scattered and isolated from the rest of the city. In Riyadh, the urban structure is characterised by monofunctional clusters of economic or social activity that amounts to socio-spatial polarisation, creating inequality with highly variable levels of access between different urban areas. Overall, various forms of polarised development result in inequality within a city, the most obvious example of which can be characterised by socio-economic segregations. Examples of this includes private compounds and gated communities with a high quantity and quality of services when compared to the majority of the consolidated city, in which they are lacking.

3



[SPATIAL INEQUALITY]

5.1.4 Socio ecological and economic imbalance

Each city is formed by complex social, economic, and ecological systems. In a sustainable city, the balance between these three interrelated systems is maintained and enhanced over time. If any one system is given continued preference over the others, over time, a structural imbalance will emerge that alters the sustainable trajectory of the city's growth and development. This misalignment generates an issue in terms of water provision and food security, heavily impacting other socio-spatial aspects of the city's health. Segregation between agricultural lands and the urban fabric is a good example of this condition. The city does not interact with green space and is disconnected from farmlands by a strong boundary. A resilient city would integrate its natural and built elements, ensuring their balanced coexistence.

4

[LACK OF RESILIENCE]

Al Masmak Fortress

5.2 Analysing Riyadh's Four Issues in Depth

5.2.1 Riyadh's unbalanced growth and development patterns

Riyadh is experiencing rapid sprawl of low-density residential developments, especially to the Northern and Eastern parts of the city. The growth to the West is limited because of the alignment of the Wadi Hanifa and its escarpment edge. To the South, the town faces development obstacles due to the high pollution caused by the large industrial areas, which make the area unsuitable for housing and leisure.

The city has large swathes of vacant land within its built footprint, most of which have approved development plans or requests for design proposals, and will be implemented in the coming years. Without a comprehensive vision and strategy to create a dense and balanced urban fabric, the city faces the threat of ad-hoc developments that encourage exclusive enclaves without integrating with the city framework. The White Lands Act, while on the one hand incentives the development of vacant land within the city as a priority to create a contiguous urban form, it can act as a double edged sword if these development decisions are made in haste and without critical assessment of their impacts. The current private developer trends foster high-class low-density developments instead of infilling the vacant land with higher density mixed-use developments which would be more sustainable. hence, this law must be supplemented with supporting policies that promote successful, dense urban spaces and negate the need to sprawl onto new lands.

Continuous sprawl also complicates the provision of services in the newly developed areas. Large amounts of infrastructure investments are needed to serve a small population making it economically inefficient reflected by the increased costs the government has to pay for the provision of infrastructure and public services. Further, it decreases the quality-of-life by creating long commuting distances to services, open spaces and jobs, hindering the creation of vibrant urban life. Improving the city based on sustainability standards as by, e.g. offering public transit, requires a specific catchment population within a particular area to become profitable. A sprawling settlement is thus detrimental to the environment as well as to the quality of life of the residents.

Considering this, the current urban boundaries are not in line with actual growth demands and therefore do not serve as regulating boundaries to guide the urban growth process sustainably. Due to the over-dimensioned expansion area, it instead of limiting, encourages low-density sprawl. According to governmental officials, the growth of the city has decreased compared to the expected projections. The future growth around the proposed Northern and Eastern sub-centres as anticipated by the MEDSTAR will unnecessarily increase further sprawl at the fringes of the city. Current densities within the built-up area currently reach 71.8 p/ha which is low compared to other major cities like, e.g., Toronto or Barcelona where densities in the urban core can reach up to 150 p/ha.

1. Urban sprawl moving towards Northern suburbs

2. Spread of Chalets "Esteraha" on the edges of the city

3. Emerging residential development and infrastructure

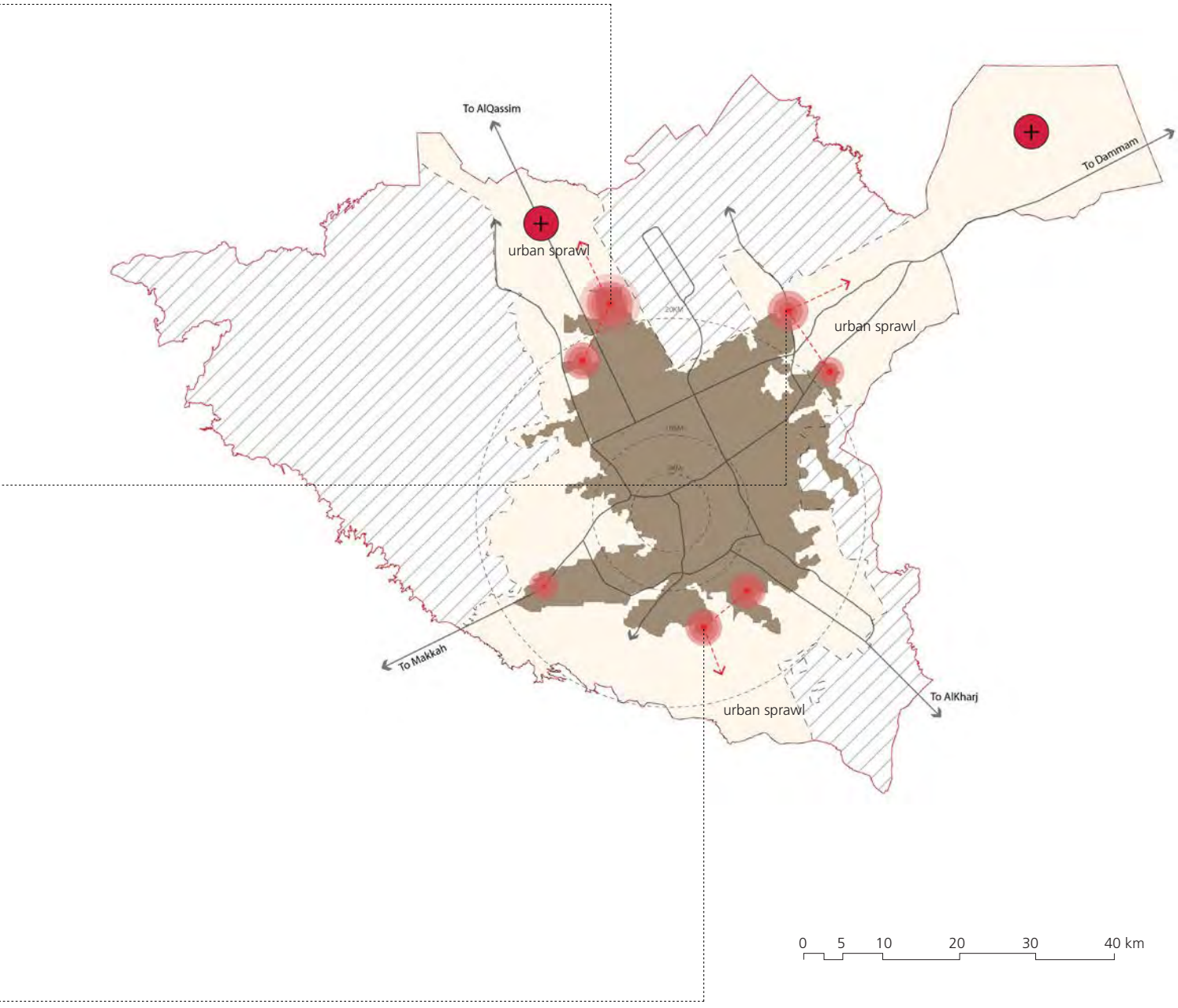


Fig. 40. Riyadh's unbalanced growth and development patterns

5.2.2 Divisions and lack of cohesion in Riyadh's city structure

The divisive spatial pattern of Riyadh can be attributed to natural and man made elements. Four main elements have been identified to cause the fragmentation of the city - the wadi, the over-dimensioned road infrastructure, the vacant lands and large-scale gated, impermeable developments within the existing urban fabric.

The wadi acts as a natural dividing element, separating the areas of the inner city with the regions West of the wadi up until the limits of the urban boundary. However, it fosters excellent potential to be integrated into a future open space network of the city, and can act as a connector rather than a divider in the city. Further, the integration with the new and existing developments around the wadi edges will boost the quality-of-life in these areas tremendously by restoring the ecological equilibrium in the city.

Among the human made cause, fragmentation is caused by the distribution of sizable monofunctional development clusters, which are usually surrounded by significant road infrastructures to allow vehicular access. These developments completely cut off the human interaction with the urban form making the spaces inaccessible and increasing dependency on cars to move around. Without human scale interventions at the street level that support diverse activities, the city will continue to be hostile to pedestrians and lead to more pollution and pollution in the city.

Nevertheless, the most crucial elements for fragmentation are the large infrastructure corridors, mainly the auto-centric road corridors with up to 90 metres ROW, which disconnect the urban fabric and hinder any pedestrian movement. Pedestrian walkways or slow mobility corridors are so far not foreseen or integrated, neither on the neighbourhood nor the city scale.

As the city's development is not based on a coherent and integrated development strategy, individual developments, which are usually large-scale gated projects with internal open spaces, leisure activities and small shops, increase the disconnect with the outside city street life and thus hinder the creation of vibrant urban life. Urban blocks must interact with the city at the interface to avoid unsafe, deserted, and unwelcoming environments. Programmes and design guidelines to incorporate mixed-use within residential neighbourhoods and increase densities will help to limited further fragmentation and to activate the individual areas to become more vibrant and liveable.

1. Over-dimensioned infrastructures fragmentating the city structure

2. Riyadh Air Base land lacking integration

3. Wadi dividing the Western side of the city

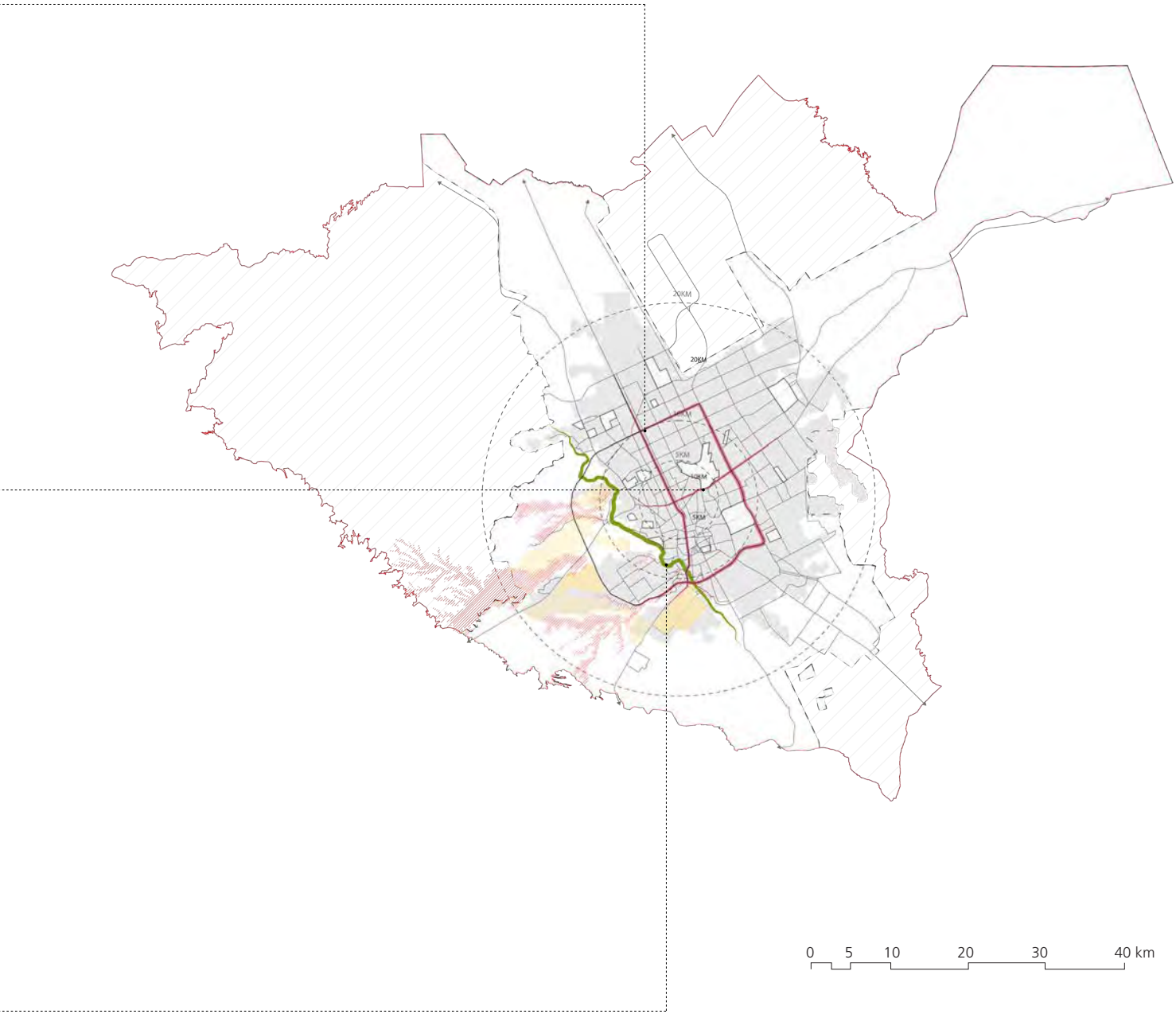


Fig. 41. Divisions and lack of cohesion in Riyadh's city structure

5.2.3 Monofunctional and polarised development in Riyadh

As mentioned previously, the MEDSTAR and the proposed land use plan prescribe a monofunctional development approach. Most Saudi cities, are currently plagued with single land use over large areas resulting in lack of access, diversity, and opportunity in the urban realm. These large plots of land dedicated to monofunctional land use are also physically disconnected to the different parts of the city. At present, only the main centre, major road axis and several commercial sub-centres are allowed integrated mixed-use functions.

This monofunctional approach in city planning becomes even more crucial to the functionality of the city as most of these economic anchors are concentrated in one area, generating massive traffic in and outflows which cause congestion within the town at peak hours. Often times, the solution to this congestion is sought after in increasing capacity of the infrastructure, like widening roads, which seldom resolves the issue, but rather exacerbates the divisive nature of the infrastructure.

This polarised allocation of services leads to a lack of diversity within the individual communities and increases the need to commute by car, which negatively contributes to the environmental pollution of the city. It should be anticipated to redistribute and balance the services of daily necessities and some of the jobs within specific service ratios instead of allocating them in clusters and closed up areas, which are not integrated into the overall city context. This multi-nodal city structure can diffuse the traffic conditions while improving the vitality of the neighbourhoods.

Taking such actions, and promoting higher-densities, will reduce further sprawl and diversify the residential areas which support the city to become more resilient and economically sustainable in its expenditures as it decreases investments in provision of extensive public services and infrastructure.

1. Monofunctional zoning causes car-dependent communities, should be reduced to no more than 10-15% of the overall land.

2. Industrial land use of large areas resulting in lack of access, diversity, and opportunity in the urban realm.

3. Concentrated commercial uses "mega malls" generating traffic in and outflows which cause congestion.

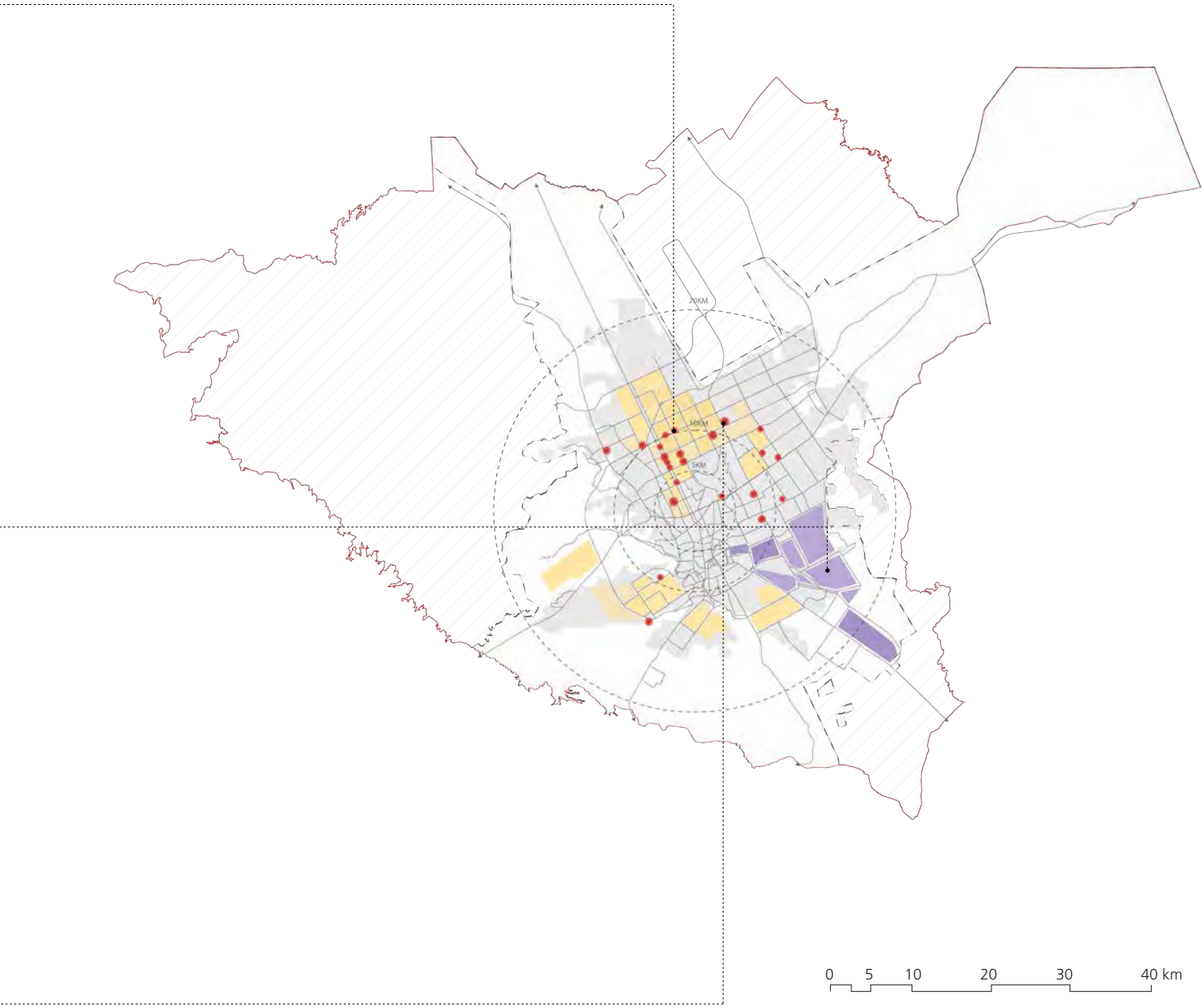


Fig. 42. Monofunctional and polarised development in Riyadh

5.2.4 Socio-ecological and economic imbalance in Riyadh

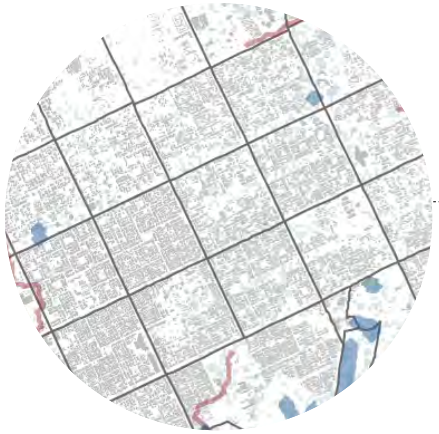
Riyadh has historically been expanding in between the two wadis, the Wadi Hanifa and the Wadi Sulay, located in the centre of the Arabian Peninsula, which is a predominantly deserted area. The relatively flat territory in this region makes it very suitable for development, except at the edges of the city, along with the wadi escarpments of the Wadi Hanifa, where the city experiences some topographical challenges and steep slopes.

Even though the flat terrain is beneficial for development, the city faces several natural environmental challenges which are reinforced by climate change. The negative impact can be experienced by an increasing number of sandstorms and extended period of extreme heat during summer time, the access to fresh-water, and an overall natural-resource scarcity. All these issues increase the environmental, socio-ecological, and economic imbalance of the city.

The areas most vulnerable to environmental pollution are the areas South of the city where the major industries are located. The unpleasant odour and poor air quality make the surrounding areas unsuitable for residential development. In general, there is a lack of awareness towards environmental issues within all classes of society, especially towards water consumption and waste disposal. Raising awareness will be critical not only for the future development for Riyadh, but also for the KSA. To further improve sustainability within the city, measures such as grey water reuse and suitable waste management models need to be explored.

The development of the Wadi Hanifa has been proven to have tremendously improved the quality of life for all residents and visitors. However, it is necessary for the city to enhance the accessibility to more open and public spaces, which are currently non-existent or underdeveloped. Introducing a hierarchy of public spaces, ranging from the regional level to the neighbourhood level, such as little pocket parks, is needed. It is important to create a network connecting points of interest where people can meet and interact, as well as to make public facilities accessible by walking. It is in line with the Vision 2030 to create a healthier and more liveable environment.

In this regard, the ratio of the built-up area to open space allocated per capita in the city should be redressed. Open spaces like parks, sports facilities, and recreational venues are supposed to balance the built-up areas but usually includes a higher percentage of roads and parking than actual quality public open spaces for the residents. These issues need to be addressed by developing citywide improvement programmes and measures, to achieve higher resilience.



1. Lack of green public spaces in most populated areas increases the urban heat island effects.

2. Example of a good connection between green and blue network in Wadi Hanifa

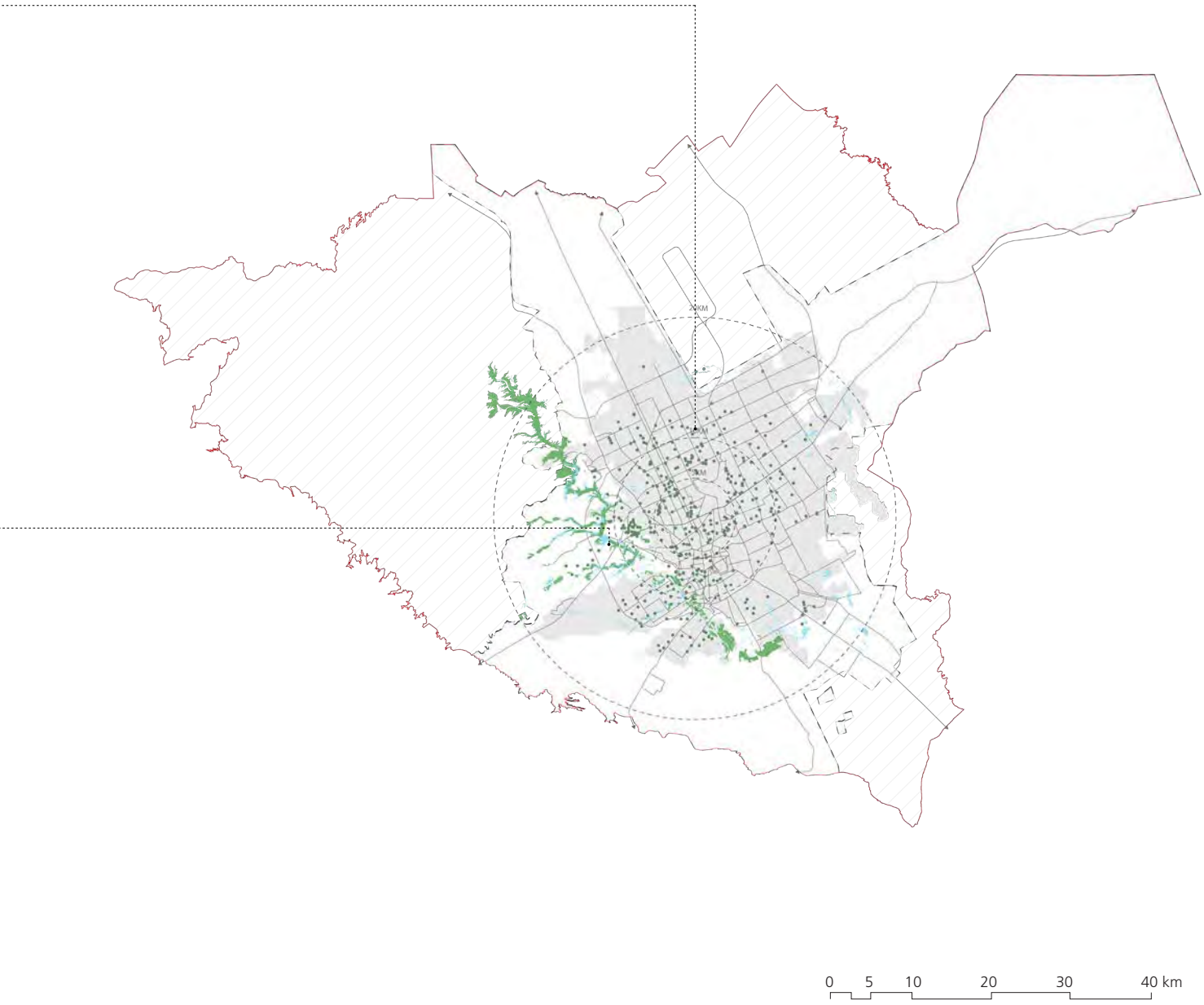


Fig. 43. Socio-ecological and economic imbalance in Riyadh

6

THE FUTURE CITY

© SeeSaudi

6.1 Strategic Responses

After performing a strategic diagnosis, and identifying four main issues affecting the urban development of Riyadh, four strategic recommendations were identified in response. Akin to the four strategic issues, the above-mentioned four strategic recommendations define the conceptual framing for a systemic and strategic level of solutions. Once defined in their conceptual nature, they are developed into a more detailed description, spatially interpreted and contextualised in Riyadh, at the various scales. This is followed by a roadmap to implementation, in the form of an articulated Action Plan.

6.1.1 The Compact City

According to UN-Habitat principles, cities need to encourage spatial development strategies that take into account the need to guide urban extension, prioritising well-connected infrastructure and services. A Compact City is envisioned as a high-density urban settlement, characterised by mixed-use development, dense and vibrant urban areas, and well-distributed services and facilities, (such as hospitals, parks, schools). Establishing spatial and legal mechanisms to consolidate a Compact City can increase accessibility and walkability, therefore increasing use of public transport and public space, reducing congestion, boosting the local economy, and increasing interactions across society. Policies to promote urban compaction involve the promotion of urban regeneration, the revitalisation of town centres, restraint on development in rural and peripheral areas, promotion of higher densities and mixed-use development, and the concentration of urban development around public transport nodes.

1

[CONSOLIDATE]

6.1.2 The Connected City

The Connected City is envisaged as a continuous, well connected, and well-balanced network of neighbourhoods, each with its parks and public spaces, and accommodating a diversity of overlapping private and public activities, shaping a healthy and vital urban environment. Most importantly, these neighbourhoods create opportunities and conveniently accessible facilities which, in turn, reduces the need for private vehicles. In large cities, mass transit systems can provide high-speed, cross-town travel by linking one neighbourhood centre with another, leaving local distribution to local systems and foot traffic. This reduces the volume and impact of traffic, which can be calmed and controlled, particularly around the public cores of neighbourhoods. Local trains, light railway systems, and electric buses become more effective, and as a result, cycling and walking become more pleasant. Moreover, congestion and pollution are drastically reduced, and a sense of security and conviviality in public spaces is increased.

2

[RE-STITCH]

6.1.3 The Inclusive City

The New Urban Agenda (NUA) requests a commitment from cities in the promotion of diversity in cities and human settlements, to strengthen social cohesion, intercultural dialogue, understanding, tolerance, mutual respect, gender equality, innovation, entrepreneurship, inclusion, identity, safety, and the dignity of all people, while fostering liveability and a vibrant urban economy. Riyadh needs to implement the UN-Habitat Principles and develop a vibrant, sustainable, and inclusive urban economy, building on endogenous potentials, competitive advantages, cultural heritage, and local resources, as well as resource-efficient and resilient infrastructure. This can be achieved through the promotion of sustainable and inclusive industrial development, and sustainable consumption and production patterns. This should be considered in parallel with fostering an enabling environment for businesses and innovation for the provision of sustainable livelihoods.

3

[REBALANCE]

6.1.4 The Resilient City

A Resilient City takes into consideration appropriate built form, and physical infrastructure to increase resilience to the physical, social, and economic challenges that arise from depleting carbon-based fuels, and climate change. A Resilient City can be defined as "a sustainable network of physical systems and communities."[31] These physical systems consist of both the constructed and natural environmental components of the city. They include roads, buildings, physical infrastructure, communications facilities, soils, topography, physical features, geology, waterways, population density, etc. In sum, the physical systems act as the body of the city, its bones, arteries, and muscles. Resilient cities are cities that are capable of withstanding severe shock and stress without either immediate chaos/damage, or permanent deformation, or rupture. Rebalancing the urban system, to consider stress conditions, is therefore key for Riyadh.

4

[PROTECT & IMPROVE]

A view from Wadi Hanifa

6.2 Appropriate Models for Riyadh Urban Development

6.2.1 The Compact City: Consolidating development and densifying centres in Riyadh

Redefining the urban boundary is the first step which needs to be taken in parallel to a more detailed urban development plan that functions as an integrated and comprehensive planning tool. The plan must set the principles to guide urban growth, defining main suitable land uses, anticipated densities and ensure equal access to services and opportunities. The findings of MEDSTAR should be integrated into this comprehensive plan. However, the plans and programs have to become more specific for other entities and the private sector to adopt and implement.

The reduction of the expansion areas within the urban boundary will increase the pressure to accommodate higher density developments to meet the future housing demands of the city. When realigning the urban edges, the development around the airport should be taken into consideration first before developing the city to the far North or far East. The surrounding land provides potential to be developed as special use areas, which can contribute to the economic development of the city, e.g., by establishing industries which are complementary to the context and needs.

Riyadh is constantly under high pressure to develop. To grow sustainably, efforts should be emphasised on densification of the existing urban fabric by filling in vacant land with the recommended UN densities and a diverse mix of uses on the ground floor level. Further, discouraging car-oriented urban design that promotes road infrastructure will lead to the more compact design and building typologies. Compacting the city will lead to reduced emissions and traffic congestions, and will decrease costs to provide infrastructure to help make the neighbourhoods more vital and vibrant. In combination with elements of the open space network and increased walkability, Riyadh will become even more efficient and liveable.

In line with the implementation of the public transportation network, several main TOD stations have been proposed. The anticipated design approach of origin and destination calls for higher density mixed-use areas which activate those areas throughout the day, creating vibrant centres of urban life with improved access to social and cultural infrastructure. For example, the Al Olaya station is to become a hybrid station, a combination of infill and greenfield development, while the Gornada Station will mostly be an infill project.

Minimising further urban sprawl also calls for the reformation of existing tools to regulate and guide urban growth, explicitly the urban boundary. Detailed calculations are required to determine how much expansion area is needed, for example, land for residential land uses after applying recommended densities and land area necessary for services, business and industrial uses to provide sufficient employment opportunities. The White Lands Tax can be considered another measure to densify and develop inner-city vacant lands to compact the city. However, it needs further specifications, such as, minimum and maximum densities, a mix of land uses or share of open space, to fulfil its anticipated role.

1.

Pedestrian boulevards like Tahlia Street are good cases to activate those areas throughout the day, creating vibrant centres of urban life with improved access to social and cultural infrastructure.

2.

Densifying in the residential area will improve the quality of life and activate vibrant urban centres.

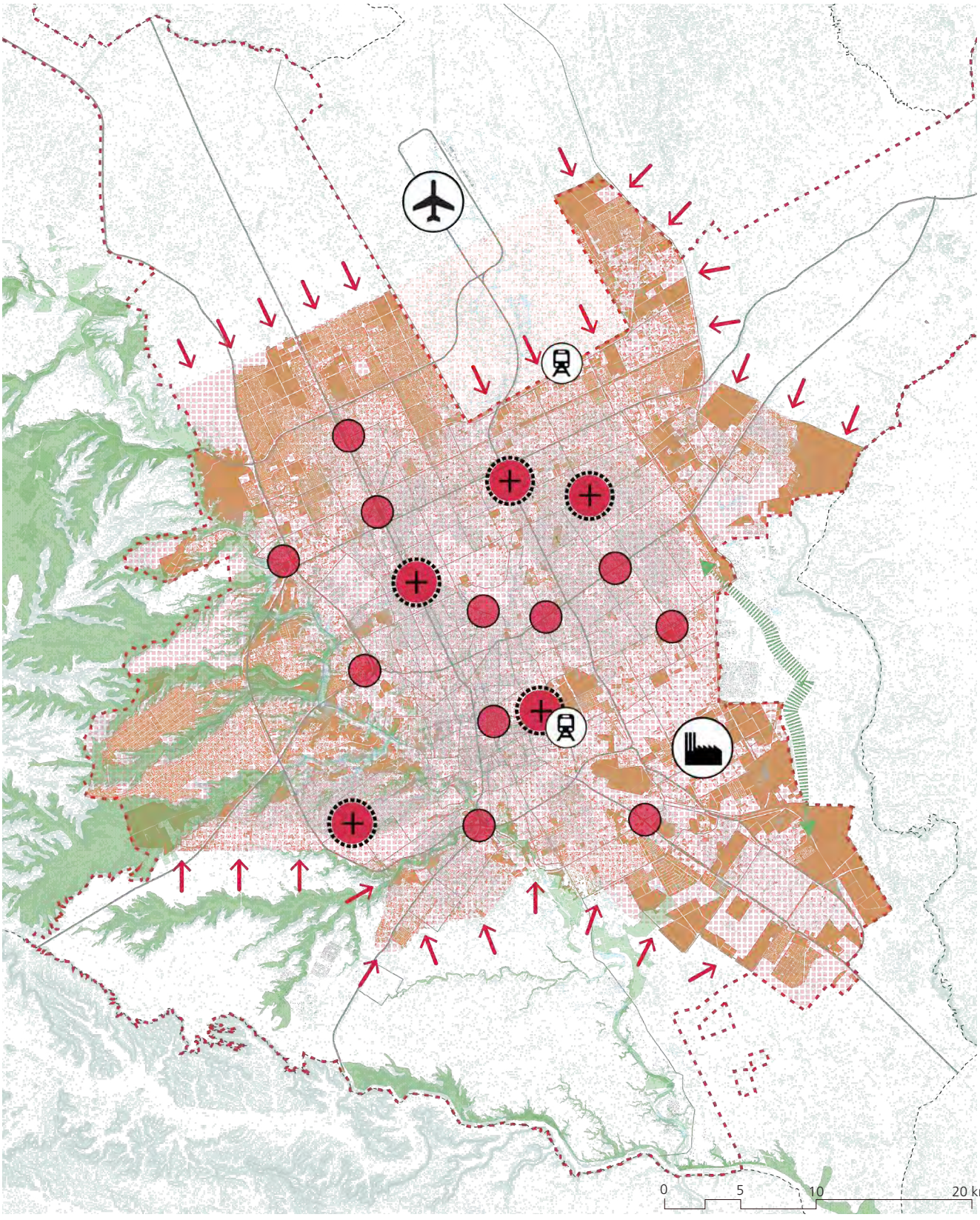


Fig. 44. The Compact City: Consolidating development and densifying centres in Riyadh

6.2.2 *The Connected City: Linking Riyadh through public transport*

In a highly fragmented and car-oriented city like Riyadh, measures on several scales have to be taken to improve the connectivity and accessibility. Once implemented, these measures will create a better connected and more inclusive capital city.

Implementing a public transportation system, which consists of six metro and three BRT lines, within an existing urban fabric in retrospect was a significant challenge for the city. However, it is a crucial step towards reducing traffic by offering a viable and sustainable alternative to the residents of the town. The system, with its current alignment and orientation, lacks the integration with the existing urban context, and is missing connections to all the significant points of interest and areas where the majority of jobs is located. Some of the current commercial areas will potentially relocate to the TOD areas, however, the special use areas and the centres of economic activities will require further feeder systems to be connected to the citywide main public transportation network. Without a supporting feeder system, citizens are unlikely to make a modal shift away from their personal vehicles.

In addition to the transportation network under construction, a successful connectivity network needs supporting infrastructure for non-motorised forms of transport like walking and biking for the last mile connectivity. Wide roads which encourage high speed vehicular movements and large intersections make the environment unsuitable and unsafe for pedestrians. To promote walking and biking, the over-dimensioned road corridors should be redesigned, for example, by reducing lanes to integrate slow mobility corridors for biking and by adding more space to the pedestrian zone. It will activate shop frontages as mixed zones to allow for shared spaces for movement and leisure. Pedestrian boulevards like Tahlia Street are good cases to implement this approach.

The proposed main TOD centre and the smaller TOD sub-centres will have a significant impact on the sustainable development of the city. With higher densities close to transit connections, and a variety of uses, these centres will connect to the residential neighbourhoods and improve the quality of life of the residents.

1. High density mixed-use developments close to public transport nodes will improve the accessibility of services and the quality of life.

2. The over-dimensioned road corridors should be redesigned to integrate slow mobility corridors for bikes and pedestrians.

3. Creating connected and well-balanced network of neighbourhoods with public spaces will results in a healthy and vibrant urban environment.

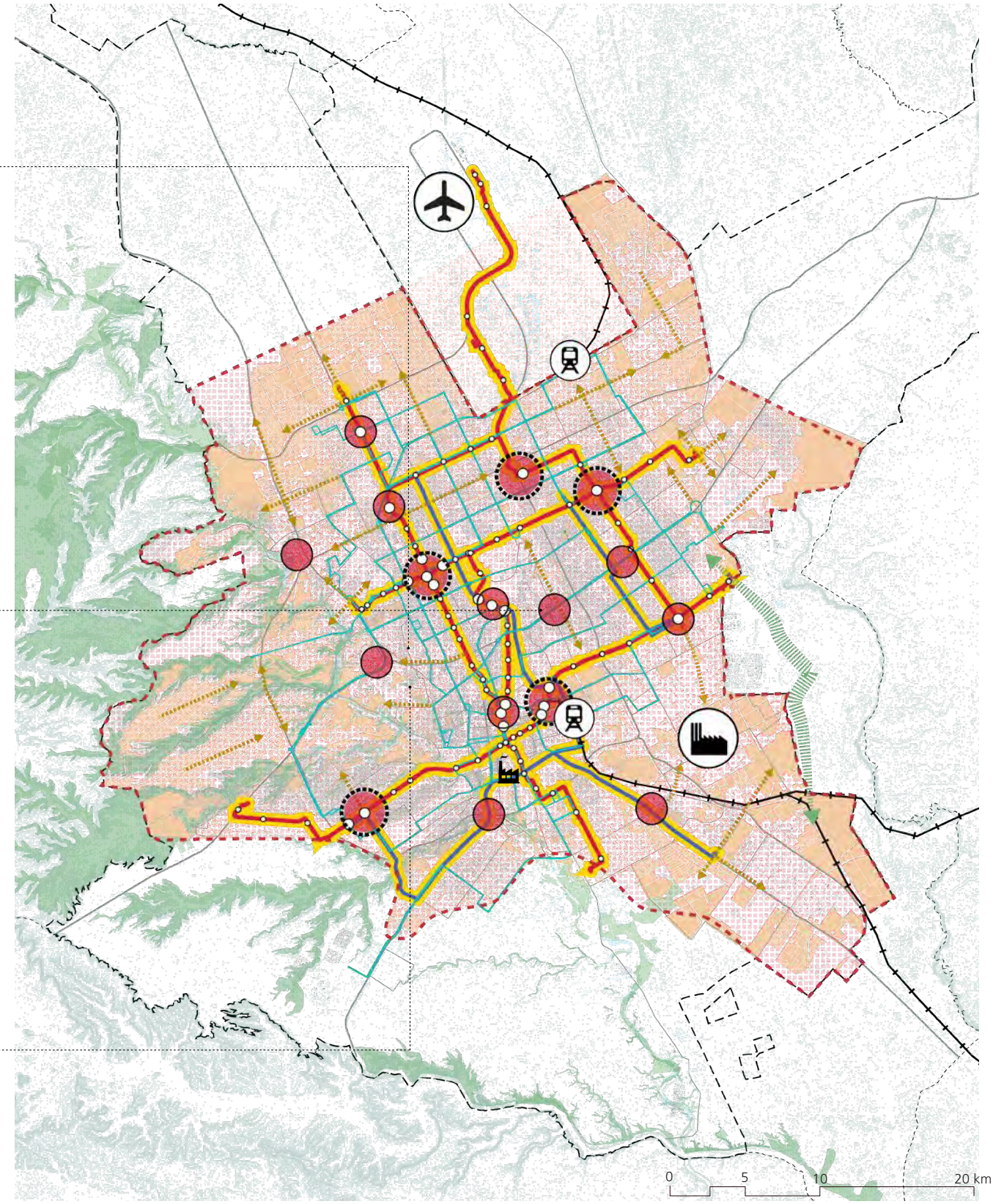


Fig. 45. The Connected City: Linking Riyadh through public transport

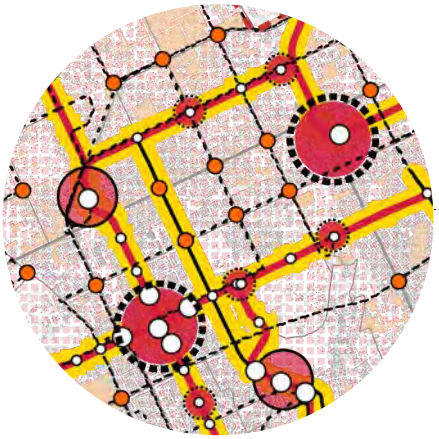
6.2.3 *The Inclusive City: Redistributing access to services and opportunities of Riyadh*

One of the main development goals for the city should be to provide equal access to services, public spaces, and employment opportunities for all residents. Considering the dimension of the city and the number of inhabitants, the city needs to create more centres and sub-centres to increase opportunities, services and redistribute access to all parts.

Compacting the city is strongly related to the distribution of services. Therefore the development of a polycentric growth model, which promotes new higher density mixed-uses areas as well as the densification of existing centres is highly desirable. A polycentric approach, consisting of several hierarchical levels, which redistributes economic activities evenly throughout the city will help create an inclusive environment. Currently, all major services and jobs are currently either located in isolated islands of monofunctional clusters or in service areas which are lined up along the major roads. This pattern of distribution is socially exclusive and environmentally unsustainable encouraging long commute hours among the users.

The lack of services, leisure areas and jobs within the existing urban fabric is caused by the monofunctional development approach the city has been following for the last few decades. It is important to strengthen existing and potential sub-centres, preferably in close proximity to the public transportation network to connect points of interest and provide access for the people to enhance urban life. Diversifying those residential clusters will improve the quality of life and activate vibrant urban centre while providing services, employment opportunities and public realm in proximity to the residents. On the contrary, the distribution of public and health facilities is well-balanced within the city. Only a slightly lower coverage can be experienced at the fringes of the town, which is caused by the monofunctional low-density developments that are not fully developed yet.

A good example of an inclusive urban form is the historic centre of Riyadh where services, housing, public spaces and other amenities together form a vibrant urban area. This organic planning framework must be carefully analysed and adopted in the new proposed developments. The continuation of the current urban development strategy, that encourages sprawl steadily increasing the commuting times and limiting the access to opportunities, will prove to be unsustainable for the economic prosperity and quality of life.



1. Strengthening existing and potential sub-centres in close proximity to the public transportat network will increase the accessibility of opportunities.

2. The historic centre of Riyadh is a good example where services, housing, public spaces and other amenities together form a vibrant urban life.

3. Riyadh needs to create more centres and sub-centres to redistribute opportunities and services.

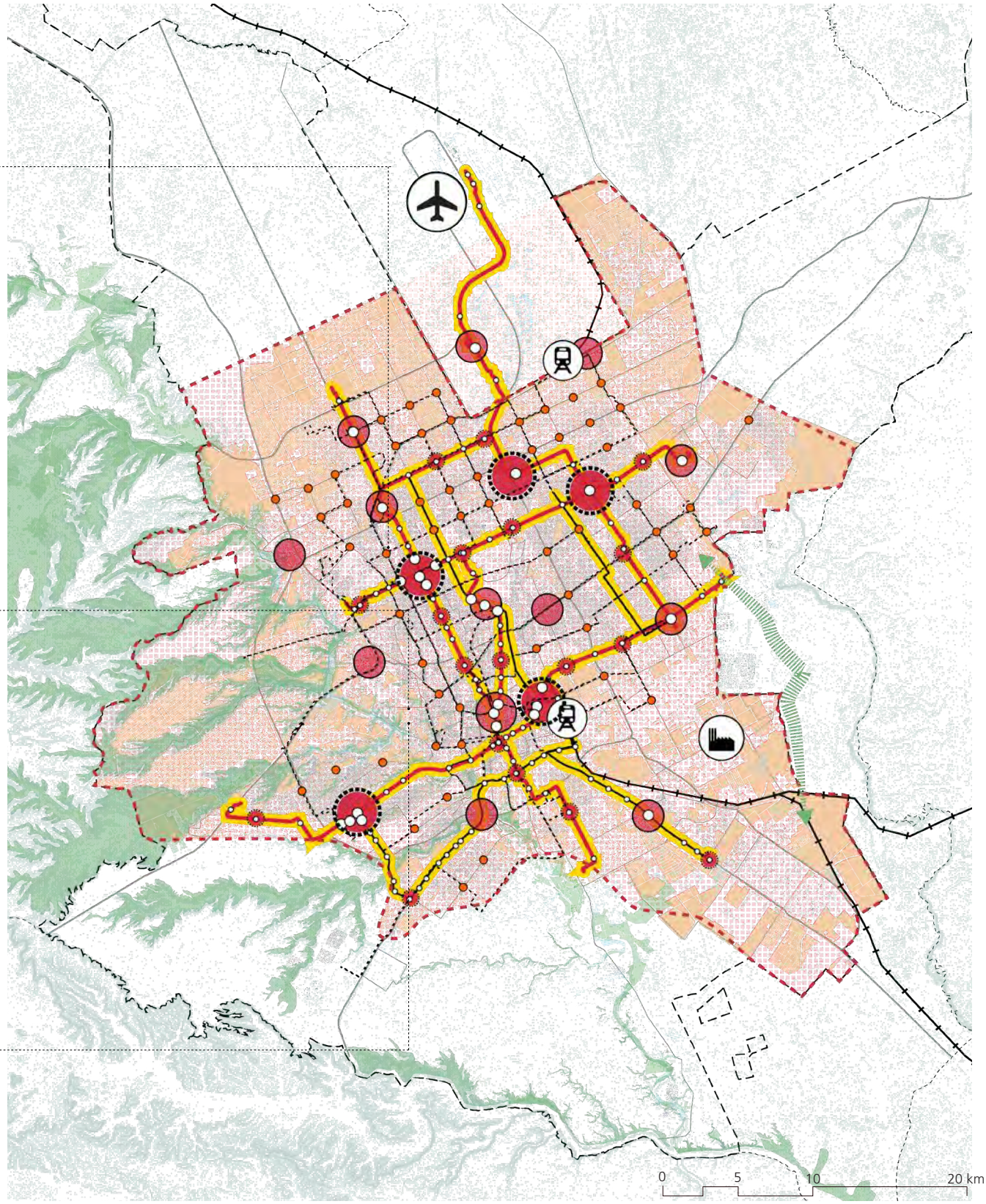


Fig. 46. The Inclusive City: Redistributing access to services and opportunities of Riyadh

6.2.4 *The Resilient City: Rebalancing Riyadh's social-ecological and economic systems*

Vision 2030 aims to create healthy urban environments with ample green open spaces, walking infrastructure, and pollution-free urban life. To achieve this ambitious goal, Riyadh must invest in the creation of new green spaces and in restoring the ecologically sensitive areas to combat natural and man-made environmental threats, as it continues to grow into a metropolis.

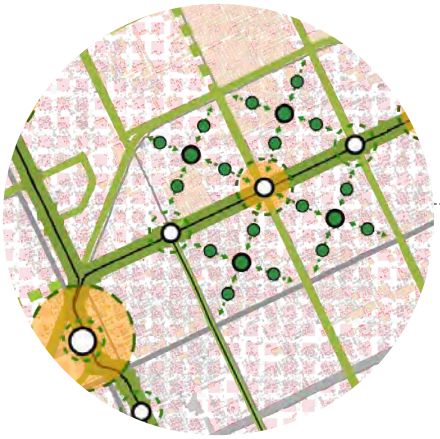
Being located within a mainly desert area, the access to natural green space is rather limited. In terms of open space, Wadi Hanifa is the main feature in the city. However, Wadi Hanifa and other green spaces like Salam Park and the most recent King Abdullah Park, neither compensate for a diffused lack of green space and networked green elements, nor do they reach the recommended minimum of 9 sqm of green space per capita, as advised by the World Health Organization (WHO), for a 6,506,700 inhabitants city.

Instead, the city should develop a network of well-integrated, open spaces that link and integrate the natural elements with the urban form, while providing residents with spaces for social engagements and recreational activities. This will balance the urban setting with natural features and contribute to a healthier urban life. Increased green areas and the planting of shade-inducing vegetation along the sidewalks will reduce of the urban heat island effect. Well-designed open spaces and green urban areas will experience reduced temperatures, creating a more pleasant environment for the inhabitants. Connecting the well-maintained Wadi Hanifa system and the soon to be redeveloped Wadi Sulay to the network of diverse open spaces at the various scales, and the network with the overall urban fabric will improve the environmental quality of the city.

While strategic densification and infill of vacant land will help to increase efficiency and economic prosperity, new guidelines and regulation on the provision and distribution of open space in urban extensions and new urban developments should be introduced to prevent insufficiency of open space for future developments. Furthermore, some of these new green, open spaces should function as retention areas to host excess rainwater during sudden heavy rain events, helping to prevent floods in affected urban areas. As majority of the city is sealed and made of impermeable surfaces, and stormwater management is not well-advanced, heavy rains are currently not absorbed and are increasingly leading to flooding, which harms the ecological and socio-economic environment.

Besides the physical improvement, the city will need to introduce awareness campaigns and programs to encourage environmentally-friendly behaviour and sustainable consumption patterns. These programs should also include the improvement of air quality by reducing high levels of dangerous emission caused by cars and industries, which negatively affect the quality of life within the city, as well as the potential reuse of grey water from residential neighbourhoods to irrigate the open spaces.

1.



This intervention creates more diverse public spaces and green parks within the existing urban fabric, which will increase the square metres of green space per capita in Riyadh.

2.

Improve the quality-of-life of the individual neighbourhoods of Riyadh by converting suitable vacant lands into different types of open spaces and connect these with the city wide network.

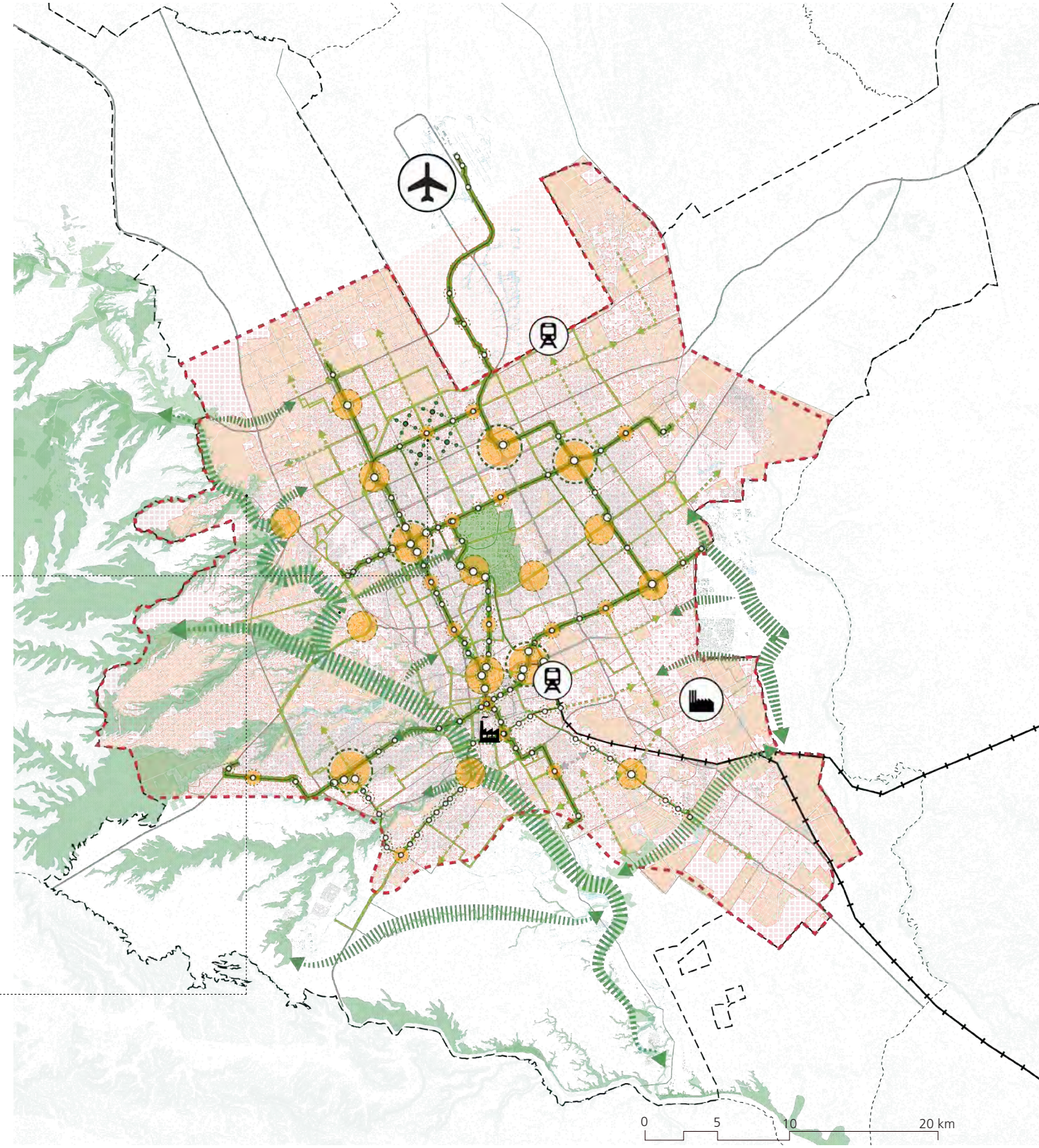


Fig. 47. The Resilient City: Rebalancing Riyadh's social-ecological and economic systems

6.3 An Action Plan for Riyadh

6.3.1 From strategy to action

Transforming conceptual recommendations into concrete and implementable strategies requires detailed systemic and incrementable actions that can trigger the envisaged spatial, economic, and social transformations. An Action Plan that is rooted in the strategic recommendations and grounded in a series of systemic and incremental interventions for Riyadh will serve to guide the building of a compact, connected, inclusive, and resilient city. The Action Plan outlines three systemic actions, envisaged specifically for Riyadh, and defined as:

- **ACTION 1: Implement foreseen public transport system improving capillarity and intermodality**
- **ACTION 2: Promote strategic densification and define a new hierarchical system of centralities (TOD)**
- **ACTION 3: Protect, improve, and relink green and blue networks**

Actions 1 and 2 address the need for a system of distributed interventions that respond to the issue of sprawl and segregation, as both the implementation of the public transportation network and the strategic densification based on TOD principles, act at the city scale. At the same time, Action 1 and 2 act at the neighbourhood level, indirectly, by providing intermodal connectivity for the neighbourhoods and a system of sub-centralities supporting them, providing diffused access to services and facilities. Action 3 focuses on both urban and micro-scale interventions aimed at fostering socio-ecological rehabilitation through the development of consistent, interlinked, and well-articulated green and blue networks.

Overall, the Action Plan creates impact at two scales: the city and the neighbourhood scale. It fosters connectivity and integration by improving transport networks, rebuilding relationships between different city users, promoting strategic densification, and improving integration of the urban outskirts to the rest of the city. To achieve this, it is essential to promote the densification and infill of vacant land within the existing urban fabric and to support this densification with an efficient public transport system. Simultaneously, the actions focus on the creation of related planning frameworks, which will guide the urban growth in an integrated and sustainable manner, and will redefine the expansion area/UGB to limit urban sprawl. If implemented, these actions have the potential to readdress Riyadh's urban development towards a more sustainable trajectory.

Vibrant open space in King Fahd Library Square

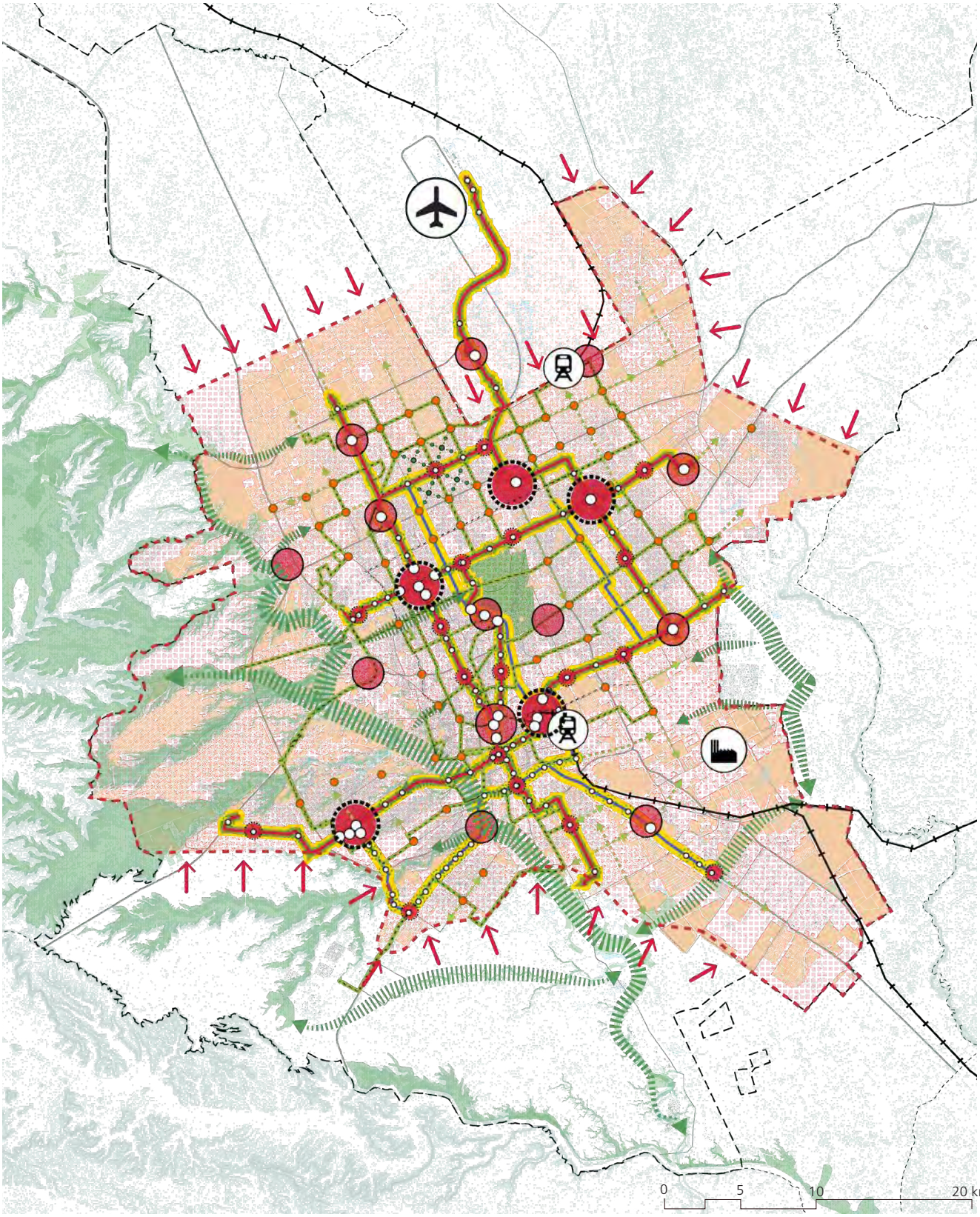


Fig. 48. The strategic recommendations for Riyadh

6.4 Four Systemic Actions for Structural Change

6.4.1 Action 1: Implement foreseen public transport system improving capillarity and intermodality

Riyadh is the only Saudi city that is currently building a public transport system, but there is still space to improve the system. As discussed in 4.2.5, the current system is aligned based on the availability of land, and not necessarily based on the intention to create functioning networks. Not to mention, the planned transport system does not always follow corridors of commercial activities or aligns with potential new centres as they were not taken into consideration while developing the networks. Overall, connectivity between points of interest is not adequately linked or dimensioned with needed high capacity transportation modes. For example, while the underground metro line (Blue Line) along Olaya Road, is supplement by a bus service on a North-South direction, there are no bus services in the opposite direction, South-North along King Fahd Road. This results in a disconnected and less integrated metro line. To maximise the functionality of the system, the King Fahd Road commercial corridor should be provisioned with a supporting secondary mode, such as a bus or trackless tram line, to increase accessibility and intermodal transfer connectivity to the major public transport system. Additionally, feeder systems are inconsistent, especially on the urban fringes, and the industrial areas are under provisioned. The overall aim of Action 1 is to improve the networking aspect of the proposed public transport. This will give the city the opportunity of maximising the investment, creating integrated systems that connect different modes of transport with points of interest and important services and facilities at the urban scale, and residential to commerce and job areas at the neighbourhood scale.

1.1. Improve capillarity and intermodality of foreseen public transport system

Creating networks is key to improving the connectivity within the city. As such, Riyadh needs to establish an integrated system of all public transportation modes and connect the areas of interest to ensure a decrease in car-dependency. The proposed metro lines, bus routes, and BRT corridors must be interlinked and well-connected, in order to form a robust and capillary transport network. To maximise the full potential, intermodality and accessibility of the transportation network have to be enhanced, including establishing a pedestrian and slow mobility network that can be integrated into the overall strategy.

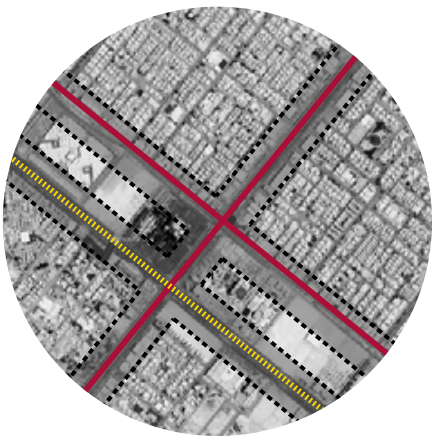
1.2. Strengthen the first and last mile approach

Even though the city's metro and BRT system is under construction, one of the main obstacles remains widely unsolved; the first and last mile connectivity. Without improving walkability by creating a pedestrian-friendly environment, a modal shift to public transportation cannot be successful. Within this framework, it is important to reduce road corridors where permissible and enlarge pedestrian zones, green, and pedestrian-friendly streets like boulevards, especially in the centres and sub-centres. Walkability should be promoted, not only at the urban level but also at the neighbourhood level, where the new mixed-use nodes should allow residents to access basic facilities by walking distance. Commuting by cars will become more time-consuming than using public transportation, and walking is seen as more pleasant, the choice to switch to public transport should prevail.

1.3. Upgrade technical infrastructure

Due to rapid growth and because of the strategic densification (TOD) necessary for sustainable growth (see Action 2), Riyadh would need to upgrade its basic infrastructure networks (water supply, electrical supply, sewage, etc). The current development of transport infrastructure presents the opportunity to do so, coupling the upgrade of basic technical infrastructure with the construction of various public transport infrastructure. By improving and enlarging the dimensions of the existing technical infrastructure, the city will be prepared for implementing strategic densification, as it will be able to provide the necessary capacities for future higher density developments within the areas served by public transport.

1. First and last mile approach to improve walkability and integrate slow mobility corridors



2. Upgrading infrastructure along proposed main public transportation lines

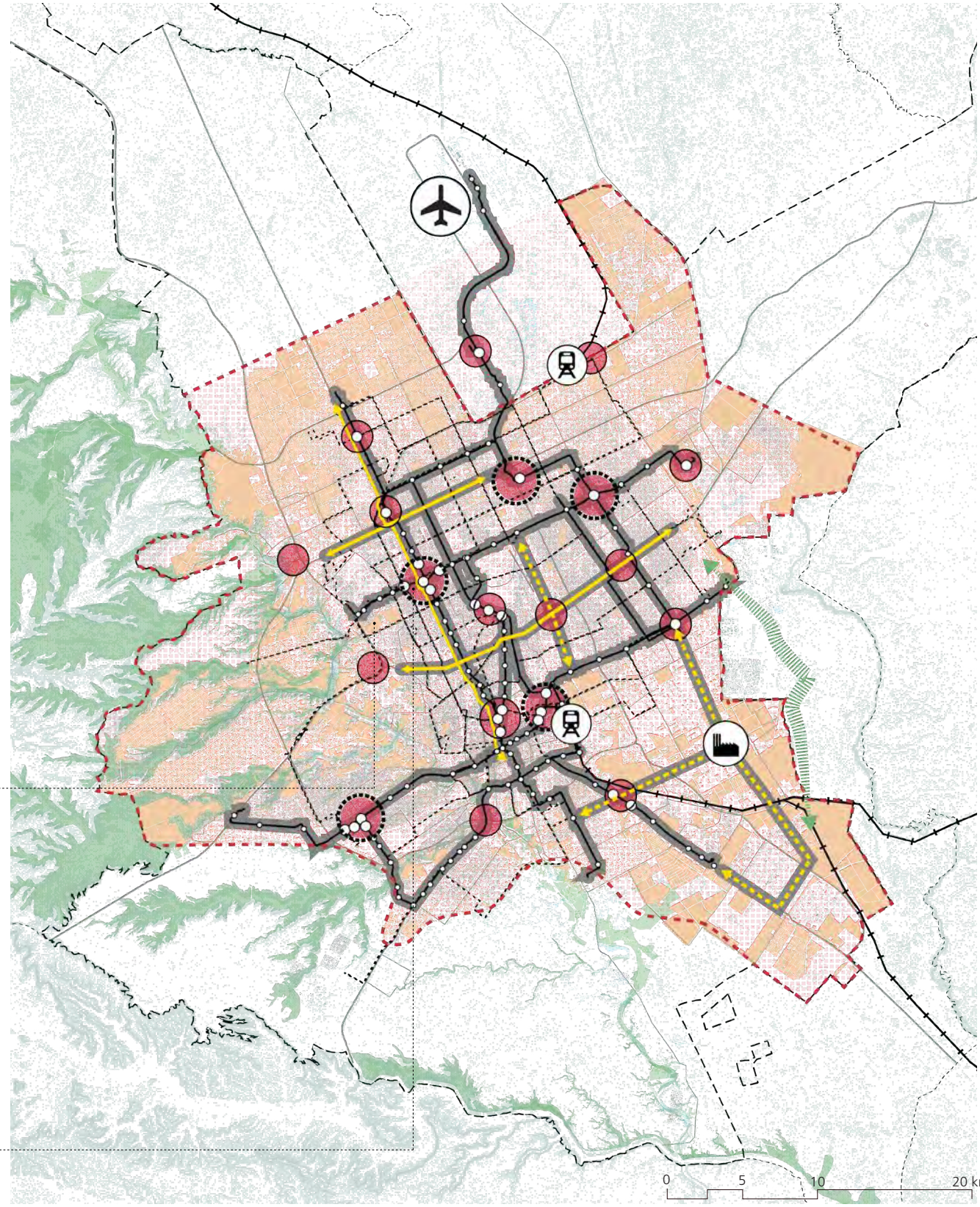


Fig. 49. Action 1: Implement foreseen public transport system improving capillarity and intermodality

6.4.2 Action 2: Promote strategic densification and define a new hierarchical system of centralities

Riyadh has an average density of about 71.8 p/ha and a 4% annual growth rate. The city should take advantage of the implementation of the public transport system to promote strategic densification as the primary mode for accommodating its further growth. Action 2 guides this densification process following the Transport Oriented Development (TOD) principles, consolidating and compacting the urban fabric while providing a new hierarchical system of mixed-use centralities. In parallel to determining ways to make the urban form more sustainable and compact, it suggests establishing alternative UGB's and redirects future growth towards the North and Northeast directions. Applying higher densities on a reduced urban expansion area, instead of creating unsustainable satellite towns, is an alternative and more sustainable growth model.

2.1 Densify main nodes and define a system of new centralities, including existing centres

By building on the improved public transport system, as per Action 1, a new hierarchical system of high-density, mixed-use centralities should be developed starting from the main intermodal nodes. Second-tier centralities should be identified around other important nodes, and strategic densification should also be promoted around them in order to establish an organic, hierarchical, and well-distributed network of centres at the citywide scale and capillary access to jobs, services, and facilities at the neighbourhood scale. This includes the densification of the current centres, as well as the identification of suitable areas for the development of potentially large and smaller sub-centres. Once implemented, this will help establish vibrant urban clusters with different roles and identities, while rebalancing the distribution and enhancing the accessibility to services and opportunities, thus promoting social inclusion in the city.

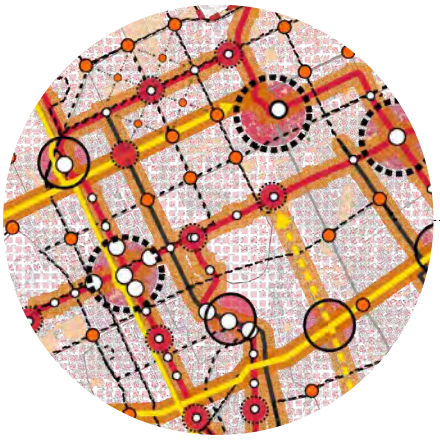
2.2 Complete strategic densification along main transport corridors and on available vacant land

To complete the incremental and strategic densification process, new mixed-use and high-density development should be promoted along the main transport corridors by creating incentives for redeveloping underutilised and low-density areas adjacent or in proximity to the public transport axis. Along the same lines, the infill of developable vacant land within the existing urban fabric can take advantage of existing services and infrastructure laid out in the city and should be given priority. Tools, like the White Lands Tax, will help the government to foster the development of vacant land; however, existing tools will need to be adjusted or complemented by other measures. This process will have to take place in parallel while improving the planning hierarchy, and its associated frameworks to promote mixed-use and dense development across the city.

2.3 Promote compaction by redefining the urban growth boundary and pre-determining future growth paths

The identified future land demands should mainly be allocated within the existing urban fabric by infill development or by making underused lands available and promoting mixed-use, high-density development. However, as Riyadh is the capital, it will always be subjected to high pressure for expansion from the private development market. As this action focuses on contrasting the urban sprawl by promoting strategic densification in line with TOD principles, when the city implements this policy, new measures to better direct future expansions and limit urban sprawl should be set in place in parallel. Reducing land for urban expansion will automatically force higher-density development to match the required demand. As such, it will be necessary to redefine a more appropriate UGB, planned with the intention of incrementally achieving higher-density within the city's boundary. This should become part of the planning frameworks mentioned above promoting densification, compaction, and mixed-use, which should primarily function as legal tools to enforce the physical limits of the urban boundary and guiding future growth paths for the city.

1. The first action aims to densify and diversify the areas around the proposed main intermodal stations and along the public transit lines.



2. Creating a diverse hierachy of centres will improve the accessbility and provide opportunities.

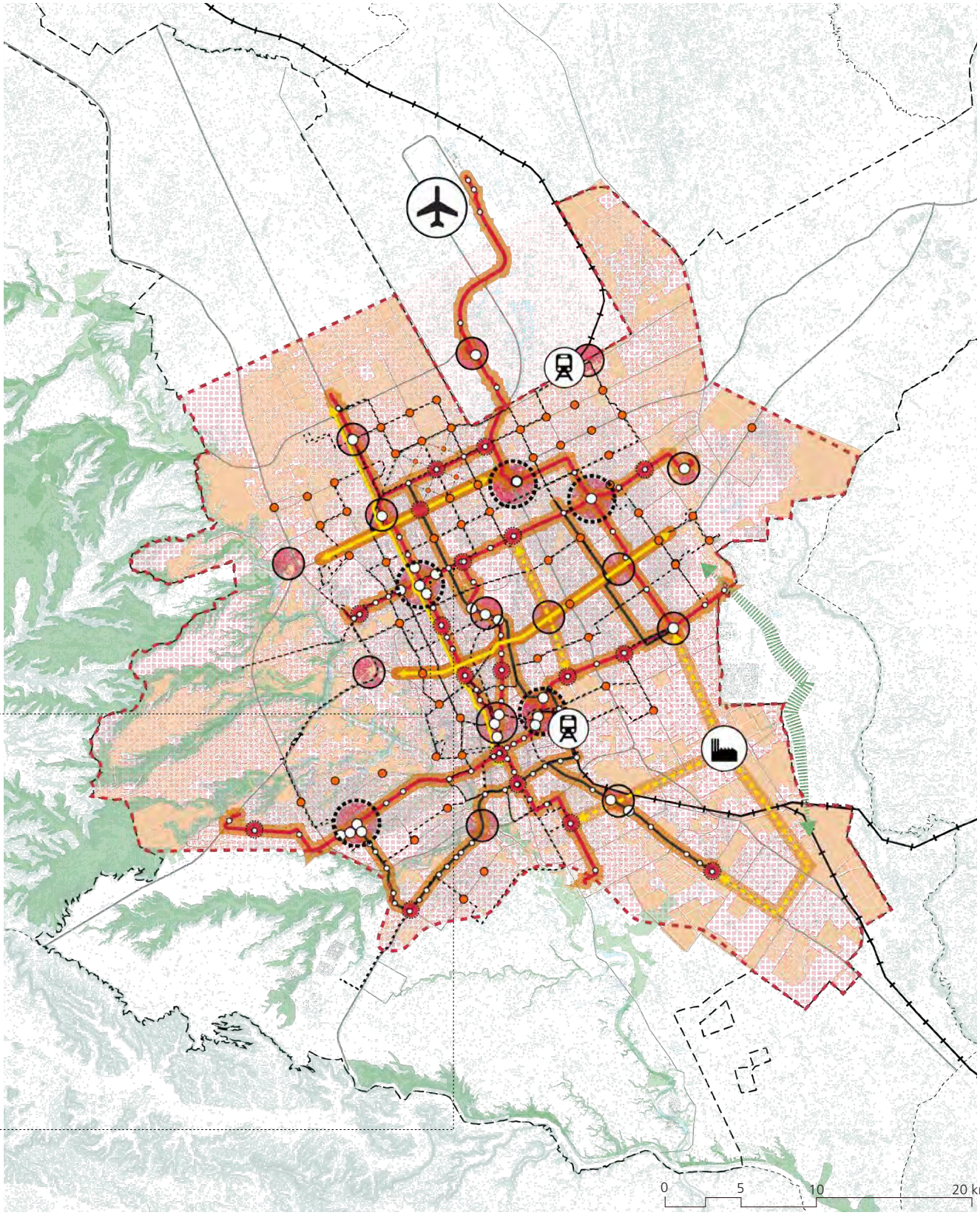


Fig. 50. Action 2: Promote strategic densification and define a new hierarchical system of centralities

6.4.3 Action 3: Protect, improve, and relink green and blue networks

Action 3 focuses on the need to create an extensive, capillary distributed, and a well-linked network of green, public spaces permeating the city and supporting the increased residential density. It also targets environmental protection and the enhancement of the blue network and its integration with green spaces, promoting social interaction and delivering ecosystem services.[32] This will help to build a strong socio-ecological infrastructure that functionally supports the city in reducing the impact of sandstorms, contrasting the heat-island effect, and manage stormwater more naturally. This new socio-ecological infrastructure, consisting of various green, open spaces interlinked across the city, will also define a green buffer to the city by connecting to Wadi Hanifa to the West, and Wadi Sulay to the East.

3.1 Define a well-structured and capillary distributed green network

An efficient network of green, open spaces that include diverse typologies and sizes, hierarchically structured, and interlinked at different scales should be set in place across the city. A balanced distribution of diverse green areas will provide a social and active environment for a variety of uses and audiences, while connecting natural open spaces, such as the wadis with the inner city through a network of open, public spaces, which will increase the city's liveability and diversity, as well as improve its environmental performances. Suitable vacant land within the built-up area should be converted to public space following a climate adaptive design approach, from large neighbourhood parks to smaller pocket-parks. In particular, the provision of additional public green space should be targeting in particular the areas subjected to densification. Lastly, the green network should connect to the public transport network in order to allow easy access from anywhere in the city.

3.2 Protect, enhance and integrate blue and green network amongst them and to the city

The two wadis are the main natural features shaping the city's environmental character, and therefore, should be protected and enhanced. Wadi Hanifa already constitutes one of the best examples in the region in terms of treatment of a wadi as a linear, multi-functional public space; however, it lacks integration with the adjacent neighbourhoods. Along similar lines, activating the Ad Diriyah area with its distinctive urban structure along the wadi would add diverse uses and vibrancy to the public area, enhancing its attractiveness as one of the major recreational destinations. Also, the two wadis and the overall natural water system (blue network) should be connected to overall city's fabric by building on the previously defined green network. Open spaces along the blue network will further serve as retention areas during sudden heavy rain events, supporting the city in flood-risk reduction. Furthermore, existing unique features, such as fragments of the old city wall or other historic structures within the city offer great potential to become a part of this open space network by creating free and public spaces of historical value/ characteristics. As previously mentioned, aspects related to walkability and accessibility by public transport will have to be enhanced to create a safe environment and ensure equal access, while further connecting major parts of the enhanced and extended green-blue networks to other significant areas of interest in the city.

3.3 Support improvement of urban environment through ad-hoc programs and environmental awareness campaigns

While protecting natural resources and spatially enhancing and integrating natural features, programs, and environmental awareness campaigns should be set-up to gradually improve citizens' approach to urban ecology and sustainability, encouraging the reduction of emissions by the use of public transport, increasingly promoting renewable power-generation, and the reduction of over-consumption patterns. As air pollution caused by emissions of both cars and industries is of significant concern in Riyadh, the highly polluting industrial areas should be separated from the residential ones by creating green buffers, and by relocating the logistic zones away from the city to reduce traffic and pollution impacts. Other mitigation measures will also need to be explored to reduce the emissions from heavy traffic and industries, such as campaigns promoting different modes of mass transportation to enforce the usage of filters.

1. The first step is to like the existing natural features with the existing built-up area.

2. The second action focuses on creating networks of different qualities of spaces, which form a city wide network from neigbourhood to regional scale, improving the quality of life. The conversion of vacant lands into parks and open spaces plays a key role.

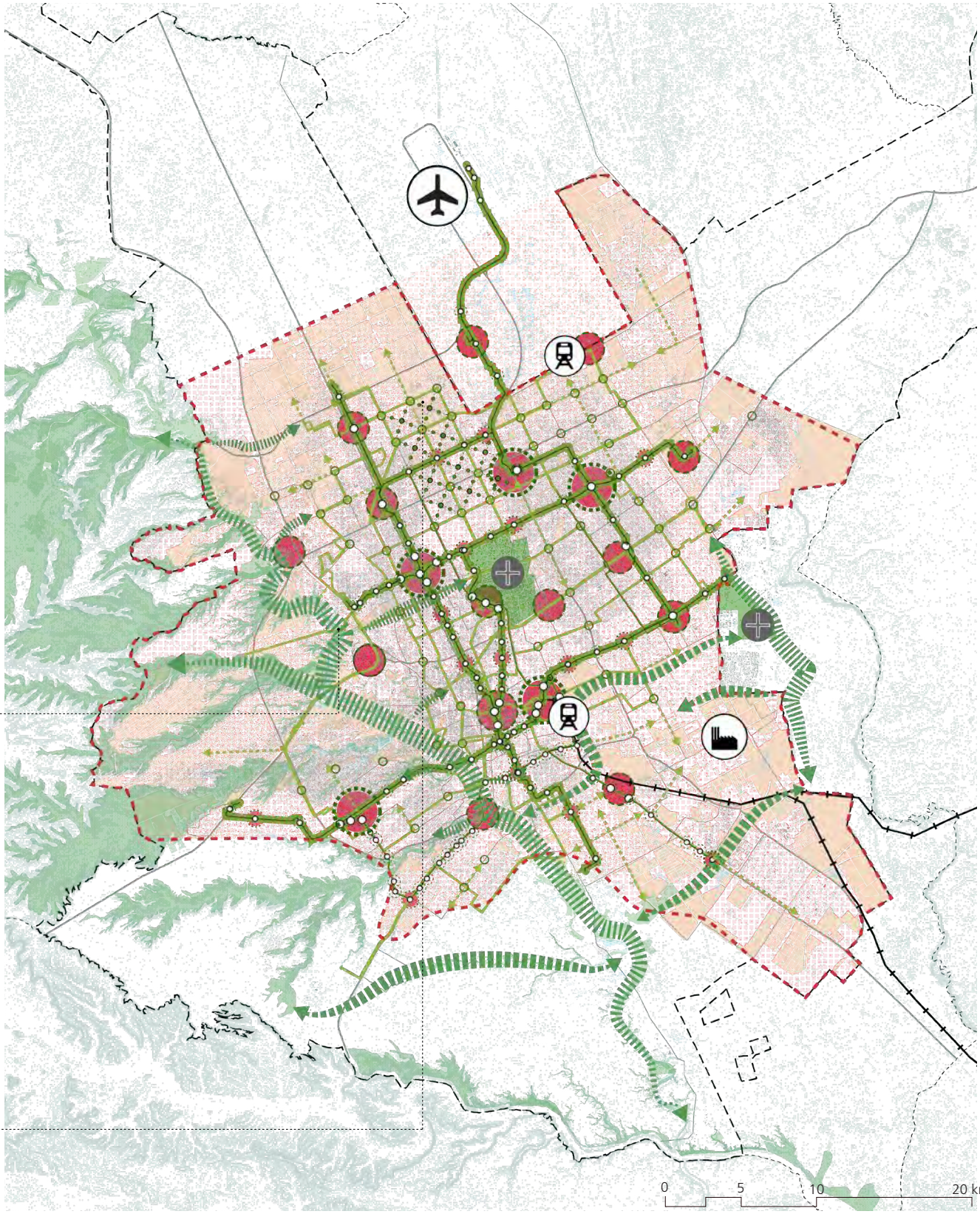
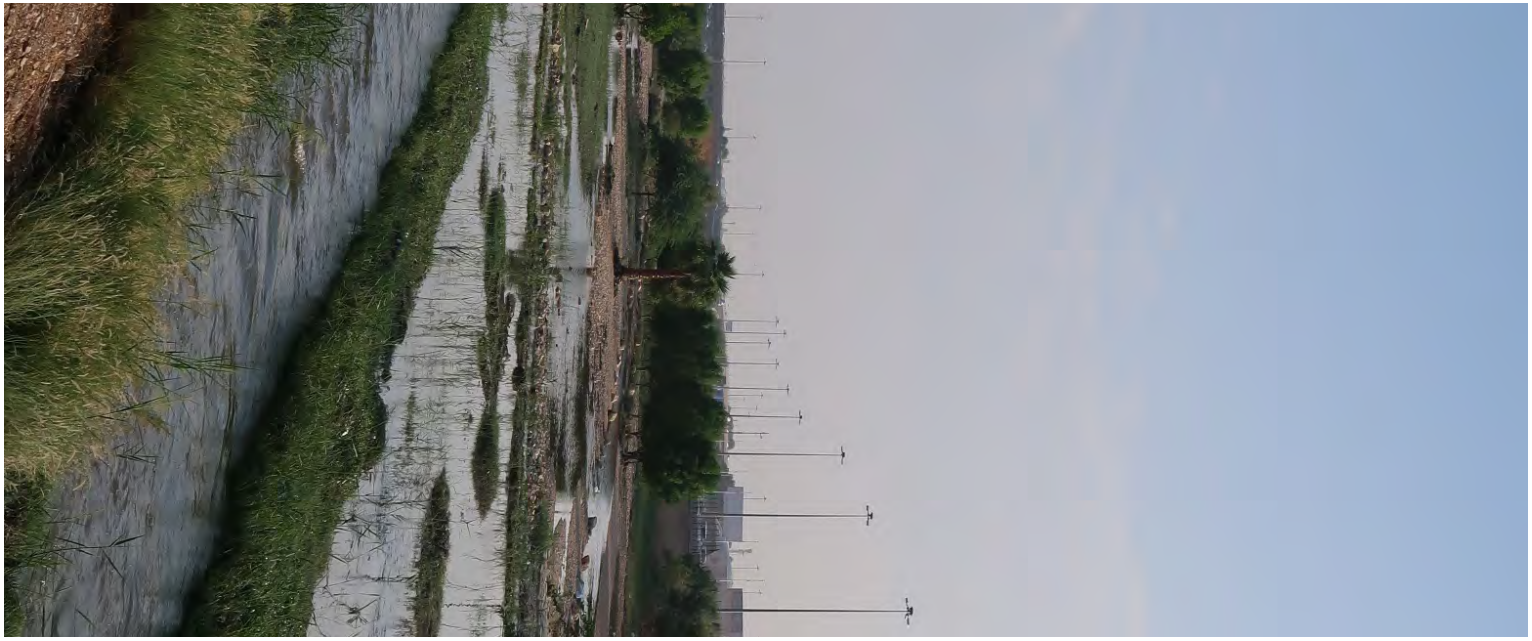


Fig. 51. Action 3: Protect, improve, and re-link green and blue networks

FINAL RECOMMENDATIONS: THE THREE-PRONGED APPROACH

7



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7.1 Spatial Recommendations

7.1.1 A strategic view of the Riyadh Region

The Riyadh Region, as the Kingdom's capital, has large potential to drive development not only at the regional scale but also at the national level. SPAR points to the disproportionate share of residents in the city of Riyadh compared to the region, which also manifests in the unbalanced economic development of the region with a higher concentration of opportunities and amenities in the city of Riyadh. Accordingly, SPAR aims to strike a balance between the development pattern of the city of Riyadh and other governorates.

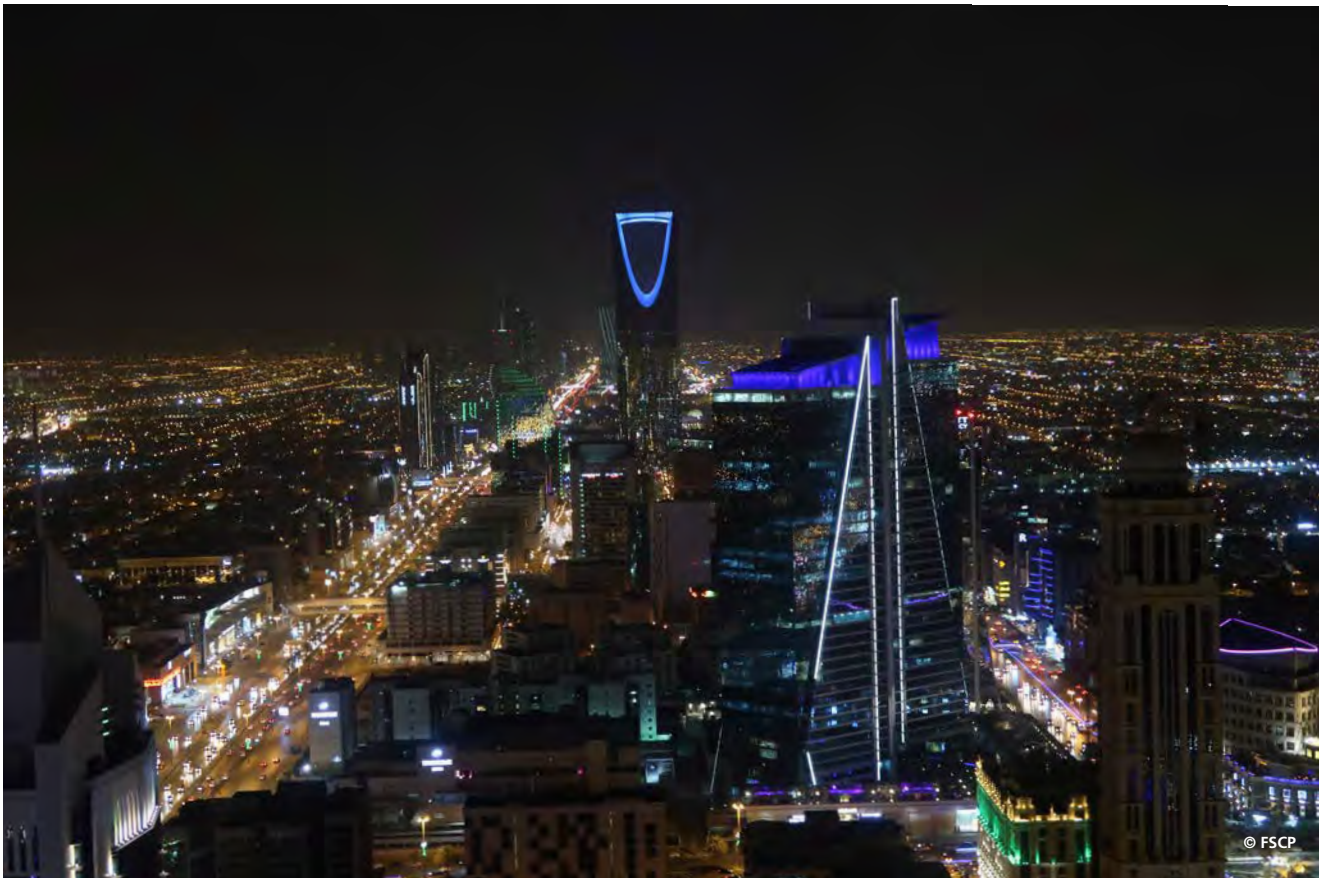
It is certain that Riyadh City and its surroundings are developing at an accelerated pace; however, the developments are not always is in line with SPAR. When looking at the goals of SPAR, and specifically its main feature, which is balancing the development in the region, it seems to still bel off target with severe polarisation in population distribution.

Providing highly efficient access between the capital Riyadh City and national growth areas by establishing safe and active public transport linkages through successful implementation of operational measures could aid in positively creating the necessary synergy to boost the economic base of the region.

The NSS aims to capitalise on a couple of key economic opportunities in terms of development corridors in the Riyadh Region, such as the existing development corridors from Al Kharj to Riyadh, to the Al Qassim Region. It also targets medium-term development through a stretch of the existing corridor between Riyadh to Buraidah, extending to Hail and Tabuk, with potential investments in agricultural, mining and tourism along the corridors.

This means targeting long-term development corridors, like the Riyadh to Makkah corridor, including the growth centres to the West of Riyadh, and the Riyadh to Dammam corridor through Al Al Hofuf. Also important for the future of the region is rethinking the Riyadh to Najran corridor, which emphasises the importance of creating and strengthening some of the medium and small cities as growth centres in the low-density regions along this corridor. This, coupled with specific city level interventions can work towards creating a balanced and vibrant region.

According to SPAR, the economic development strategy of the Riyadh Region aims to improve the competitive ability of the region through the provision of job opportunities and to improve the balance of economic development between the city of Riyadh and other polarised areas, including rural and urban areas. It is, therefore, timely to reorganise regional development in the region, in a way that to capitalise on the major developments in the capital to try and devolve influences towards greater regional advancement.



King Fahd Road, major spine that runs through Riyadh in the North-South direction

FSCP workshop in Riyadh

A coherent and comprehensive approach to regional economic strategy that reassesses the system of cities such as Riyadh will help drive regional prosperity utilising the vital role played by a big city like Riyadh. The strategy should devote more attention to the complementary strengths of small and medium-sized towns and cities surrounding Riyadh, such as Al Kharj, Al Majmaa, and Ad Dawadimi.

Moreover, when considering a system of cities within the Riyadh Region, the administration (ADA at the city level), must consider the city of Buraidah as part of that system, (as demonstrated in the system of cities map). The strong connection between Buraidah and Riyadh is strengthened by the railway line that influences the system of cities in terms of commuter and cargo volumes beyond administrative boundaries.

7.1.2 Towards Riyadh, Sustainable Global Capital

The strategic vision for Riyadh, with the actions described in Chapter 6, aims to promote sustainable urban development through the development of urban spatial frameworks that redistributes appropriate compactness and density around polycentrism and mixed-use. As such, Riyadh's Action Plan illustrates three sequential steps to trigger structural change, activating an incremental system for spatial modifications to the fabric of the city, which will also modify its social, economic, and environmental structure. By enacting the systemic transformations depicted in the Action Plan, Riyadh would become more compact, connected, inclusive, and resilient, exemplifying positive growth for other Saudi Arabian cities.

- **Riyadh Compact City**

A more compact city is structured along a well established public transportation system. In Riyadh, densification along the public transport corridors will be supported by a hierarchical system of centralities, fostering high-density and mixed-use development. Alongside it, densification of existing built-up areas and incremental development of vacant land within the city's footprint should be heavily promoted, and most importantly, the expansion of the urban area must be restricted. In order to realise this, the city needs to establish planning tools and frameworks, which support phased growth based on actual spatial requirements, promoting overall densification, compaction, and mixed-use.

- **Riyadh Connected City**

The coordination and integration of more than one mode of transport, creating a connected and compact city with wide and easy access to most of its functional cores and areas is key for the sustainable development of Riyadh. Along these lines, the foreseen intermodal public transport system plays a central role in supporting compactness and granting connectivity across the city. However, an improvement of the intermodal connectivity to the major centres and commercial corridors, as

Fig. 52. Al Masmak Fortress in Riyadh, an example of vibrant square in the city centre

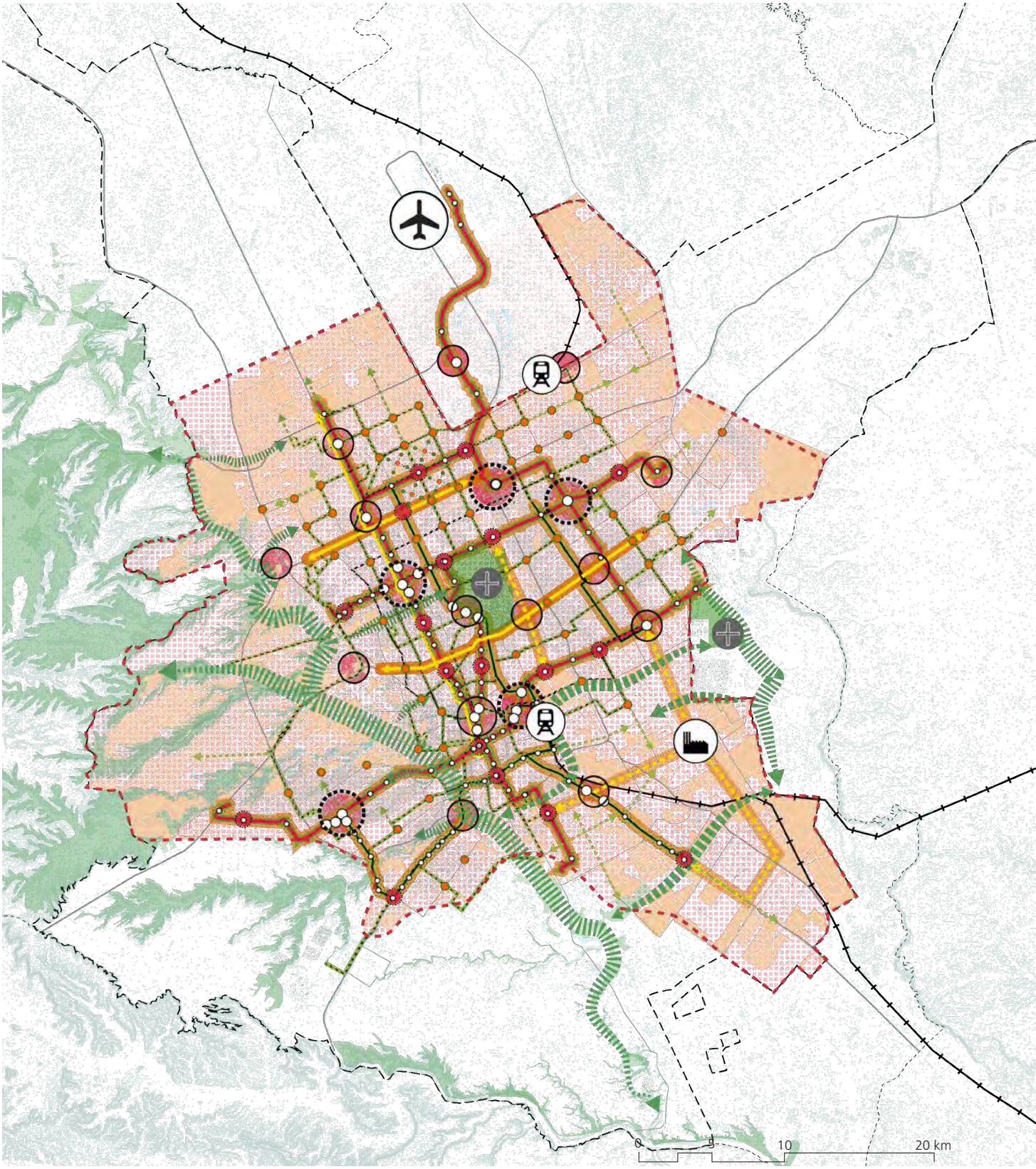


Fig. 53. Action plan for Riyadh

well as to private mobility (such as cars or bicycles), is needed. A well-established public transportation network and feeder system would support the densification of the urban fabric and increase accessibility and walkability within the revitalised central areas. The implementation of such a system further provides the opportunity to prepare by investing in the provision of higher capacity technical infrastructure to serve the future needs of the higher densities developments along the public transportation corridors and the TOD stations, reducing posterior expenditures.

- **Riyadh Inclusive City**

A densified and connected city pertains to higher levels of efficiency and equitability. By extending access to services, facilities, and job opportunities to a wider population and fostering economic prosperity, it increases the living standards of citizens. The soon-to-be implemented public transport system linked to the proposed major centralities and secondary sub-subcentres, will be key in changing the city's socio-economic landscape, offering diverse and mixed-use areas with work, leisure, and commercial activities with a more even distribution across the city. Integrating the open space networks within the public transportation system will be crucial to have a significant spin-off effect on the socio-economic development of the city.

- **Riyadh Resilient City**

The city-wide open space network needs to be extended and improved, enhancing even distribution and connectivity within the green network and to the blue network. Suitable inner city vacant land should be utilised to develop open spaces and create a hierarchical network of green, open spaces at different scales; from the regional to the city, and neigbourhood scale, linking to major existing public spaces within the city, and the system of centralities. Along the same lines, Wadi Hanifa must be protected and connected to the green network, and Wadi Sulay should be redeveloped with similar principles. Punctual interventions should be promoted to establish a well-connected and well-balanced network, including a tree planting strategy on streetscapes to improve widespread walkability and its experience by citizens. By incrementally greening the city, whilst re-establishing a healthy and functioning relationship between the built and natural environment, Riyadh can enhance and rebalance the ecological, social, and economic dimensions of its fabric, providing a healthy and productive urban environment for its inhabitants. Efforts to restore ecological balance will help combat climate change, and ensure a healthy environment for future generations.

Riyadh, being the capital of the Kingdom, is strategically important for the country's economy and identity in the world. Being open to business from all markets and ensuring a variety of options in housing, transport, services, and amenities are fundamental drivers for success and development of the city and the region. The introduction of Vision 2030 and newly related policies on the country's development can support Riyadh in becoming a central force in bringing about change to the country. As such, Riyadh must embrace opportunities to diversify and include all sectors in its development plans, without overlooking aspects related to environmental sustainability and ecology. This combined effort will enable the city to lead the way for sustainable urban practices throughout the Kingdom while fulfilling the city's aspiration of becoming a major Global Capital.

However, to accomplish the goal of becoming one of the top 100 global cities, the Strategic Development Vision for Riyadh needs to set the directives for sustainable development not only by focusing on spatial recommendations but by providing clear guidance concerning the integration of urban planning and design, urban management, urban economics, as well as resilience and resource efficiency. Such an approach will potentially require the restructuring of urban governance to enhance coordination across the different planning entities and systematising the related distribution of responsibilities.

7.2 Institutional and Legal Recommendations

In terms of reform, compared to other cities in Saudi Arabia, Riyadh benefits from relative jurisdictional decentralisation whereby ADA holds local planning power, authority, and function. However, due to the size of the capital, further devolution of these functions may be needed to address local priorities of the satellite suburbs efficiently. The city would further benefit from fiscal decentralisation to facilitate independent and innovative solutions to urban social problems. This should give autonomy to ADA and the Amanah to source funds to finance development activities. Revenue generation activities may also include taxes and levies, and the collection of property taxes to fund development activities. The recent White Lands Act that imposes fees on undeveloped plots in urban areas to tackle land speculation, housing shortages, and indiscriminate land development, shows that regulatory mechanisms can be leveraged to generate revenue while fostering an efficient development framework. Moreover, opening avenues for actors such as the private and voluntary sector, and the general community should be encouraged, so that they participate in decisions regarding projects that affect them.

Consolidation of the legal planning instruments would also support development intervention of Riyadh, along with the review, update, and modernisation of these laws to make them relevant to the current development situation. This should also entail re-thinking the lawmaking process to limit the number of actors. The mere existence of the laws in the KSA will not guarantee sustainable urban development as they must be functionally effective, i.e., precise in achieving their intended results, clear, consistent, and simple to understand. There is a need for a functionally effective urban planning law that, inter alia:

King Abdullah Road in Riyadh

- Introduces incentives/requirements that will enable more compact city growth;
- Defines clear institutional roles and responsibilities at each level;
- Enforces linkage between all levels of plans (national-regional-local);
- Provides effective coordination and monitoring mechanisms; and
- Increases meaningful public participation and engagement in planning.

The legal framework also needs to enshrine an acceptable mode of public participation in public decision making to foster equality and inclusion. The consolidation of the urban legislation would also give legitimacy to the plans that Riyadh relies on.

Revising the Urban Growth Boundary Law to include clear criteria on how it is set would enhance technical and vertical accountability. The Law also needs to place more emphasis on establishing the Development Protection Boundary as a no-development zone to not only prevent haphazard development but also avert private interests from taking advantage of the laxity in the legal text. These initiatives will strengthen policy formulation designed to make the city more sustainable, compact and dense. Primarily, a post-legislative scrutiny of the urban growth boundary law should be done to assess if it has met its policy objectives. This could in turn inform the legal reform process as well as the planning policy options.

7.3 Financial Recommendations

In 2015, the KSA began implementing reforms aimed at creating sustainable local public finance. The central government continues to promote strategies to increase own-source revenue at the local level, through improved tax administration and economic diversification.

Riyadh's public finance priorities are closely aligned with Saudi Arabia's larger national development goals, which include supporting SMEs in key sectors such as industry, tertiary, and tourism.[33] Therefore, expanding the public sector's capacity to finance essential local infrastructure and projects supporting development in these areas is imperative for Riyadh.

International experience with enhancing own-source tax mechanisms represents the optimal set of financing instruments that harness local revenues (specifically, through the taxation of the real estate value capture strategy) that support sound fiscal policy.[34]

Although Riyadh has experienced new property taxes, such as the White Lands Tax, it will be a priority to explore other tax instruments in order to generate a diverse income stream portfolio.[35]

Introducing land-based taxation establishes reliable own-source revenue for municipal governments. Moreover, the benefits of public development projects (e.g., public transportation), are often multiplied by the positive externalities and value created by investing in sustainable and accessible urban spaces.[36] UN-Habitat suggests that Riyadh makes use of land-based tax mechanisms (i.e., betterment levies) in public projects, including the new metro line that is under consideration.[37]

Public infrastructures, such as transportation systems can spur adjacent residential and commercial development, enhance mixed land use and create jobs, (see figure 54). Local development driven by public projects can also result in increased land value and indirectly engender a number of other community benefits, (see figure 56).[38]

Source: United Nations Human Settlements Programme (2018)

Fig. 54. Components of mixed land use

While betterment levies are well suited for infrastructure projects, fiscal instruments such as parking fees and congestion fees are useful tools in the process of reducing vehicle dependency and increasing pedestrian traffic, particularly in commercial and leisure areas.[39]

This is strategic for Riyadh and its plan to implement sustainable urban mobility system. During this progression, a set of fees, (see figure 56) can support Government to lessen the massive vehicle dependency, increase use of public transportation and consequently, the improve profitability for the financial contribution from the private sector in delivering public services, as recommended by the NTP. [40]

In Riyadh, the private sector can meet a variety of needs through (1) investment in public infrastructures and services, (2) enhanced local revenue, (3) reduction in municipal dependence on intergovernmental transfers, and (4) economic stimulus for mixed land use.

Public open space in Al Hamra Neighbourhood

THE IMPACT OF INFRASTRUCTURE DEVELOPMENT ON LAND VALUE

Case Examples	Key Findings
London ,England	The crossrail PropertyImpact study (2012) estimated that capital values in the areas around central london crossrail stations would rise by 35% for residential properties and 27.5% for office properties, outperfoming the baseline projections
Dubai, United Arab Emirates	The impact of public transportation on property values for dwellings and commercial properties is about 13% and 76%, respectively, within a 1.5 kilometres area
Cairo, Egypt	• Urban development that included retail facilities resulted in a price premium of 15 – 20%. • Schools increased residential land prices by approximately 13% • Walkability within a residential community increases home values by up to 9%
Bogotá, Colombia	Research suggests that for every additional 5 minutes of walking time to a public transportation station, rental prices fell by 6.8 - 9.3%

Source: GVA (2018); Mohammad et al. (2017); Colliers International (2017); Rodríguez and Targa (2004).

Fig. 55. The impact of infrastructure development on land value

Several finance tools are available to local governments interested in expanding own-source revenue. Municipal governments can maximise the benefits of these instruments by:

- Coordinating and collaborating with different levels of government to connect national strategies to local priorities, for example, establishing a local liaison office, or a local PPP unit linked to the National Centre for Privatization in charge of proposing, implementing, and monitoring PPP projects.
- Investing in capacity building and improving tax administration. The success of PPP projects is strongly related to the ability of officers at different levels to manage three strategic phases (1) feasibility, (2) procurement, (3) delivery and monitoring.
- Using a holistic approach. PPPs should be focused on linking infrastructure investment and land development, thus maximizing benefits that correspond to mixed land use (see figure 56).
- Generating a diverse income stream portfolio tailored to local needs. For example, urban mobility behaviour needs to be faced by the government to reduce the massive vehicle dependency of Saudi citizens and commuting costs. In this respect, new parking fees and congestion fees are highly recommended to increase the use of public transportation and, consequently, the profitability of investment for the private sector in the areas impacted by the new urban transport system.

Lastly, coordination among planning, legal/regulatory frameworks, and local finance is crucial to create the necessary local conditions for sustainable and equitable development, as outlined in the New Urban Agenda.[41]

CASE STUDIES AND BEST PRACTICES

WASTE MANAGEMENT

In the Tamil Nadu State of India, a waste management project proposed the central government (35 %) and the state government (15%) to share 50% of the total project costs. A private entity (via a PPP) would provide the remaining 50% of project funding. The private concessionaire would be responsible for planning, designing, building, financing, operating, and maintaining the municipal solid waste management facilities for the concession period. Land would be provided by the municipality through an annual lease, as specified by the Government of Tamil Nadu.

PARKING FEES

Chicago leased 34,500 curbside parking metres to the bank Morgan Stanley for 75 years, trading metre revenues for an upfront payment of nearly USD $1.16 billion. This type of PPP contract includes a fixed schedule of metre rate increases, which raised rates 2 to 4-fold by 2013. As a result, Chicago had the highest curbside metre rates in the United States. Metres were netting USD $20 million annually, while Morgan Stanley managed pricing and maintenance of the metres.

CONGESTION FEES

In 2007, Stockholm introduced a cordon pricing-based scheme to reduce congestion, local pollution, and generate local revenue. Following the introduction of the cordon, traffic decreased by 19% in the first year, in addition to generating € 59 million annually. In Singapore, the implementation of an Area Licensing System (ALS) reduced traffic from 12,400 vehicles in May 1995 to 7,300 vehicles in August 1995 during restricted hours. Moreover, revenue from the sale of area licenses amounted to US$ 47 million, while capital costs were US $ 6.6 million in 1975, with an additional US $17 million from ALS revisions in 1989.

Source: Ernst and Young Pvt Ltd., Ministry of Urban Development of the Government of India, & the Confederation of Indian Industry. Compendium on public private partnerships in urban Infrastructure: case studies. (2017). World Bank. Washington, DC.; Weinberger, R., Kaehny, J., & Rugo, M. (2010). U.S. parking policies: an overview of management strategies. Institute for Transportation and Development Policy. New York, NY.; Croci, E. (2016). The Canadian Council for Public-Private Partnerships, & PPP Canada. (2011). Public private partnerships: a guide for municipalities. The Canadian Council for Public-Private Partnerships. Canada.

Fig. 56. Case studies best practices

Al Masmak Fortress

8

ANNEX

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1 Encyclopaedia Britanica.

2 Riyadh CPI Report.

3 Riyadh CPI Report.

4 Represent the instructions issued by a Minister, his representative or any official of the Ministry to announce new regulations and updates regarding any intent or action to be undertaken.

5 The National Urban Observatory is situated in the Department of Urban Studies, MoMRA.

6 https://www.burohappold.com/wp-content/uploads/2016/07/Riyadh-Transit-Oriented-Development-TOD.pdf

7 FSCP Workshop in Riyadh, 2018.

8 It is composed of: a) Prince of the region; b) Deputy Emir of the region; c) Chairman of the Committee; d) chief executive officer; e) Secretary of the region; f) Representative from the Ministry of Economy and Planning; g) Representative from the Ministry of Finance; h) Representative from the Ministry of Municipal and Rural Affairs; i) Representative from the Ministry of Foreign Affairs; j) Representative from the Ministry of Communications and Information Technology; k) District Police Director; l) Representative of the Saudi Electricity Company; m) Representative of the National Water Company; n) Undersecretary of the Secretary of the region for reconstruction and projects; o) Chairman of the Board of Directors of Chambers of Commerce and Industry in the region; and p) 4 from the people of the region or from others nominated by the President of the Council and issued by appointment of an order from the Prime Minister and the duration of membership of three years, renewable for one time.

9 See this link for the map functions: "http://rbrs.arriyadhmap.com/Amana/BuildingLaws/viewer.html" http://rbrs.arriyadhmap.com/Amana/BuildingLaws/viewer.html#

10 This is an entertainment, sports and cultural resort. https://www.reuters.com/article/us-saudi-qiddiya-ceo/saudi-arabia-launches-multi-billion-dollar-entertainment-resort-idUSKBN1HZ0WF.

11 Royal Decree No M/4 dated 24 November 2015 (the "Law") and Council of Ministers Decision No. 377 dated 13 June 2016 (the "Regulations")

12 FSCP workshop in Riyadh, 2018.

13 Royal Decree of 1975

14 The other big four regional capitals (Riyadh, Jeddah, Madinah and Makkah) are also 1st Class Amanahs.

15 A line-item budget lists, in vertical columns, each of the city's revenue sources and each of the types of items such as capital outlays, contractual services, personal services etc. the city will purchase during the fiscal year.

16 Chapter 5 of the State of Saudi Cities Report, "Managing Urban Transformation in Saudi Arabia - The Role of Urban Governance (2018)" pg. 16.

17 See Article 5 of the Law of Regions to Royal Order No. A/92 (1993).

18 It consists of a) the Prince/Governor of the Region as president; b) Deputy Governor of the region as the vice president; c) Deputy Mayor of the Emirate/AMARAH; d) Heads of government authorities in the Region who are determined pursuant to a decision issued by the Prime Minister according to the directives of the Minister of Interior; and e) Ten citizens who are scholars, experts and specialists and are appointed by order of the Prime Minister based on the nomination of the Prince of the Region and the approval of the Minister of the Interior, for a renewable four year term.

19 See Article 23 of the Law of Regions to Royal Order No. A/92 (1993).

20 The National Urban Observatory is situated in the Department of Urban Studies, MOMRA.

21 Shearman and Sterling LLP, 'Understanding the Key Government Institutions and Ministries in the Kingdom of Saudi Arabia' (2016) <https://www.shearman.com/~/media/Files/NewsInsights/Publications/2016/09/Saudi-Arabia-Publications/Understanding-the-Key-Government-Institutions-and-Ministries-in-the-Kingdom-of-Saudi-Arabia.pdf> accessed 02 June 2018

22 In 2015 the total number of productive industries in the region is 12,845 factories. In the same year, the number of productive industries at national level is 7,036. Saudi Industrial Development Fund, (2016). The Kingdom of Saudi Arabia.

23 Saudi Arabia General Investment Authority. (2014). The Kingdom of Saudi Arabia.

24 General Organization for Social Insurance (GOSI). (2016). The Kingdom of Saudi Arabia.

25 In 2016, Saudi Industrial Development Fund loans to industrial projects in Riyadh Region totaled SR 26,464 million. It represented 37% of the total loans approved in 2016. Saudi Industrial Development Fund, Annual Report for the Fiscal Year 1437/1438H.

26 Central Department of Statistics and Information. The Kingdom of Saudi Arabia.

27 Education is a priority input for local economic development and was an important discussion topic during the FSCP Rapid Planning Studio workshop held in Riyadh (June 2018).

28 Each of the 13 regions is divided into governorates and the region capital. The capital of the region is governed by an Amanah (municipality), which is headed by a mayor.

29 Approved 2016 Budget for Riyadh (Amanah), Ministry of Finance, The Kingdom of Saudi Arabia.

30 NTP goal is to increase own-source revenue to 40% of municipal budgets by 2020. In 2016, intergovernmental transfers comprised 85% of the total budget for the Capital. Approved 2016 Budget for Riyadh (Amanah), Ministry of Finance, The Kingdom of Saudi Arabia.

31 David R. Godschalk, 2003, "Urban Hazard Mitigation: Creating Resilient Cities", Natural Hazards Review,Vol. 4, Issue 3 .

32 The term refers to the embodied benefits to environmental quality provided by ecosystemic features, from fresh water to clean air, food production, etc.

33 The tourism grew at 2.9% (Compounded Average Growth Rate) from 2010 to 2015. The share of business travel and leisure accounted for 29% and 24%, respectively. KPMG. (2016). Riyadh Real Estate Market Overview.

34 Potential revenue contribution through immovable property taxation is 2.1% of GDP in high-income countries, while in middle-income countries it contributes an additional 0.6% to GDP. Norregaard, J. (2013). Taxing immovable property revenue and implementation challenges. (No. 13-129). International Monetary Fund. Washington, DC.; Walters, L. (2016). Leveraging land: land-based finance for local governments. United Nations Human Settlements Programme. Nairobi, Kenya.

35 Under the new law approved in 2015, owners of empty plots of urban land designated for residential or commercial use in towns and cities will have to pay an annual tax of 2.5% of land value. The land tax applies to a plot size equal to or greater than 10,000 square metres. It has been adopted in the cities of Riyadh, Jeddah and Dammam; United Nations Human Settlements Programme. (2016). Finance for City Leaders Handbook, Nairobi, Kenya: United Nations Human Settlements Programme.

36 Leveraging land: land-based finance for local governments. (2016). United Nations Human Settlements Programme. Nairobi, Kenya.

37 This approach is based on the idea that individuals, businesses and landowners in the area benefits from government or private investments in high valued infrastructure, such as roads, railway, industrial infrastructures, or public services, like schools and hospitals. Landowners and beneficiaries of a specific area intervened by an infrastructure investment, can see an overall long-term land value gain of their properties, even after having paid the levy. United Nations Human Settlements Programme. (2016). Finance for City Leaders Handbook, Nairobi, Kenya: United Nations Human Settlements Programme.

38 Colliers International. (2017). The Impact of Social Infrastructure on Mixed-use Developments; Rodriguez, D.A., & Targa, F. (2004). Value of Accessibility to Bogotá's Bus Rapid Transit System. Transport Reviews 24(5), 587-610.

39 The estimated number of cars in the Capital is around six million. Central Authority for Statistics. (2016). Demography Survey.

40 Public and Private Partnership (PPP) is effective financing tools that support urban productivity. In PPPs, the private sector can provide the public sector with much-needed expertise in the provision of high-quality public goods and services (i.e. waste management system).

41 United Nations. (2017). New Urban Agenda. United Nations Human Settlements Programme, Nairobi, Kenya. Retrieved from http://habitat3.org/the-new-urban-agenda/

ISBN: 978-603-8279-25-0