

Public Disclosure Authorized  
Public Disclosure Authorized  
Public Disclosure Authorized  
Public Disclosure Authorized  
Public Disclosure Authorized

CASE  
2

GREATER THAN PARTS

# Amman, Jordan

## Comprehensive Climate Plans

Myriam Ababsa and Ahmad Z. Abu Hussein



WORLD BANK GROUP

AMMAN

*Editors*

Shagun Mehrotra, Lincoln Lewis,  
Mariana Orloff, and Beth Olberding

© 2020 International Bank for Reconstruction and Development / The World Bank  
1818 H Street NW, Washington, DC 20433  
Telephone: 202-473-1000; internet: [www.worldbank.org](http://www.worldbank.org)

Some rights reserved.

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.

#### Rights and Permissions



This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) <http://creativecommons.org/licenses/by/3.0/igo>. Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the following conditions:

**Translations**—If you create a translation of this work, please add the following disclaimer along with the attribution: *This translation was not created by The World Bank and should not be considered an official World Bank translation. The World Bank shall not be liable for any content or error in this translation.*

**Adaptations**—If you create an adaptation of this work, please add the following disclaimer along with the attribution: *This is an adaptation of an original work by The World Bank. Views and opinions expressed in the adaptation are the sole responsibility of the author or authors of the adaptation and are not endorsed by The World Bank.*

**Third-party content**—The World Bank does not necessarily own each component of the content contained within the work. The World Bank therefore does not warrant that the use of any third-party-owned individual component or part contained in the work will not infringe on the rights of those third parties. The risk of claims resulting from such infringement rests solely with you. If you wish to reuse a component of the work, it is your responsibility to determine whether permission is needed for that reuse and to obtain permission from the copyright owner. Examples of components can include, but are not limited to, tables, figures, or images.

All queries on rights and licenses should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; email: [pubrights@worldbank.org](mailto:pubrights@worldbank.org).

Cover design: Oliver Uberti  
Typesetting: Puntoaparte

**Disclaimer**—The report contains preliminary research, analysis, findings, and recommendations. The information is circulated to stimulate timely discussion and critical feedback and to influence ongoing debate on emerging issues.

**Citation**—Ababsa, Myriam, and Ahmad Z. Abu Hussein. 2020. “Metropolitan Amman: Comprehensive Climate Plans.” In Volume II of *Greater Than Parts: A Metropolitan Opportunity*, edited by Shagun Mehrotra, Lincoln L. Lewis, Mariana Orloff, and Beth Olberding. Washington, DC: The World Bank.

CASE  
2

GREATER THAN PARTS

# Amman, Jordan

## Comprehensive Climate Plans

Myriam Ababsa and Ahmad Z. Abu Hussein



WORLD BANK GROUP

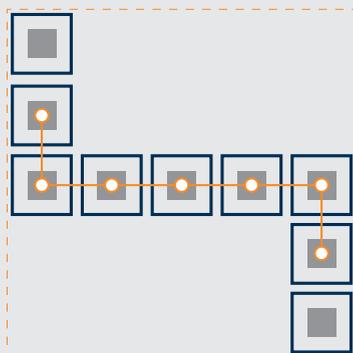
*Editors*

Shagun Mehrotra, Lincoln Lewis,  
Mariana Orloff, and Beth Olberding

## CASE STUDY 2: METROPOLITAN AMMAN

# Comprehensive Climate Plans

Myriam Ababsa and Ahmad Z. Abu Hussein



**Citation**—Ababsa, Myriam, and Ahmad Z. Abu Hussein. 2020. “Metropolitan Amman: Comprehensive Climate Plans.” In Volume II of *Greater Than Parts: A Metropolitan Opportunity*, edited by Shagun Mehrotra, Lincoln L. Lewis, Mariana Orloff, and Beth Olberding. Washington, DC: The World Bank.

The Synthesis Report offers a range of integrated solutions (Mehrotra 2020).

## CONTENTS

Acknowledgments iv

The Solution 1

Idea in Brief 2

**The Metropolitan Context 3**

**Integration 15**

**Implementation 24**

**Financing 37**

**Replication 42**

Density 48

References 49

Abbreviations 50

## TABLE

**Table 1** Urban innovations

**Table 2** Inventory of solutions—a portfolio of policies, programs, and projects

**Table 3** Finance sources, sectoral and thematic allocations, and amounts

## FIGURES

**Figure 1** Integrated planning model

**Figure 2** Sectors addressed by the case

**Figure 3** 3D population density distribution

**Figure 4** Amman community development rights

**Figure 5** Replication example, Greater Amman

**Figure 6** Population density, 2000

**Figure 7** Population density, 2017

**Figure 8** Overlay of density levels, 2000–2017

## MAPS

**Map 1** Urban expansion, 1985–2015

**Map 2** Population density, 2017

**Map 3** Road hierarchy, 2019

**Map 4** Urban footprint, 2015

**Map 5** Mass transit, 2019

## ACKNOWLEDGMENTS

THIS WORLD BANK REPORT was produced by a team led by Shagun Mehrotra and comprised of Anna-Maria Eftimiadis, Lincoln Lewis, Bruno Bonansea, María Pomes-Jimenez, and Miguel Ruiz at the World Bank, and Mariana Orloff, Robin King, and Beth Olberding at the World Resources Institute (WRI). Excellent research assistance was provided by Hamza Atumah, Maya James, Julian Lark, and Avnish Dayal Singh.

Overall strategic guidance was received from World Bank's Sameh Wahba (Global Director, Global Practice for Urban, Disaster Risk Management, Resilience, and Land), Ede Ijjasz-Vasquez (Regional Director Sub-Saharan Africa, Sustainable Development), Maitreyi Das (Practice Manager, Urban Global Programs), Peter Ellis (Global Lead, Sustainable City Infrastructure and Services), Xueman Wang (Senior Urban Specialist and Program Coordinator of the Global Platform for Sustainable Cities, GPSC), and WRI's Ani Dasgupta (Global Director, Ross Center for Sustainable Cities).

The team is deeply grateful to the reviewers for the insightful comments and deliberative discussions beyond the formal review process. Peer reviewers included Alope Barnwal (Global Environment Facility, GEF), Rafeef Abdelrazek, Chyi-Yun Huang, Annie Gapihan, Qingyun Shen, Yuan Xiao, Anjali Mahendra (WRI), and Jessica Seddon (WRI). The team also deeply appreciates the thoughtful advice of Professor Peter Newman at the report's framing stage.

In addition to the core report team, case study contributors were: Myriam Ababsa, Hazem Abdelfattah, Antar AbouKorin, Ahmad Z. Abu Hussein, Abudlrahman Alsayel, Laura Azeredo, Madhu Bharti, Amartya Deb, Jaya Dhindaw, Amy Faust, Natalia Garcia, Wiwandari Handayani, MaryGrace Lugakingira, Jorge Macias, Felipe Montoya, Luiza Oliveira, Bintang Septiarani, Rukuh Setiadi, Jiawen Yang, and Jiangping Zhou. Specific authorship acknowledgements are mentioned within each case and the authors thank those who were interviewed for the cases.

Valuable technical contributions and comments were provided by Karina Acevedo (Annex B), Brenan Gabriel Andre, Spandana Battula, Mary Donovan, Lina Duque, Peter Griffiths (Annex C), Robert Mansour Harrison, Dany Jones, Ryan Kemna, Jeffery Dean Lawrence, Christiana Nikola Reichsthaler, Apoorva Narayan Shenvi, Adeel Abbas Syed, Vickie Taylor, Oliver Uberti, and Matthew Woundy (Annex D).

The report benefited from discussions, thoughtful insights and suggestions from several colleagues who have specific expertise and locational experience,

including Lina Abdullah, Mohamed Bakarr (GEF), Venessa Alexandra Velasco Bernal, Ashok Das (University of Hawaii), Narae Choi, Eric Dickson, Somik Lall, Kevin Milroy, Vincent Roquet, Katia Herrera-Sosa, Steffen Soulejman Janus, Jad Raji Mazahreh, Alex Ortiz, Gayatri Singh, Horacio Christian Terraza, and Mariko Yamamoto.

Data contributions were graciously provided by: Thomas Esch, Daniela Palacios Lopez, and Mattia Marconcini (German Aerospace Center, DLR); Pir Mohammad and Ajanta Goswami (Indian Institute of Technology, Roorke); and Antar AbouKorin and Abdulrahman Alsayel.

Excellent administrative and production support was generously provided by Elizabeth Acul, Adelaide Barra, Lucie Albert-Drucker, and Cinthia Donantchat. The writing process greatly benefited from Marc DeFrancis' manuscript editing. Jacqui Lewis and Mary Paden copyedited the report. Typesetting was performed by Puntoaparte's Mateo Zúñiga, Andres Barragán, Sarah Peña, María Rojas, and Carmen Villegas.

The contributors graciously acknowledge GEF's Sustainable Cities Integrated Approach Pilot program which supported the production of the report. This program is a broader partnership between GEF, World Bank's GPSC, participating countries and cities, project-implementing agencies, and Resource Team organizations (comprising WRI, C40, and ICLEI Local Governments for Sustainability). WRI contributed to the report and case studies through the grant "Urban Networking to Complement and Extend the Reach of the Sustainable Cities Integrated Approach Pilot" which is managed by the World Bank's Anna-Maria Eftimiadis. The case study of Dammam was supported by the Kingdom of Saudi Arabia through the Reimbursable Advisory Services project managed by World Bank's Hazem Abdelfattah.

The editors and authors thank the wider World Bank and WRI teams, and others not specifically mentioned here, who contributed to the concerted efforts to publish the report and its extensive case studies. 🏘️



Supported by:



Led by:

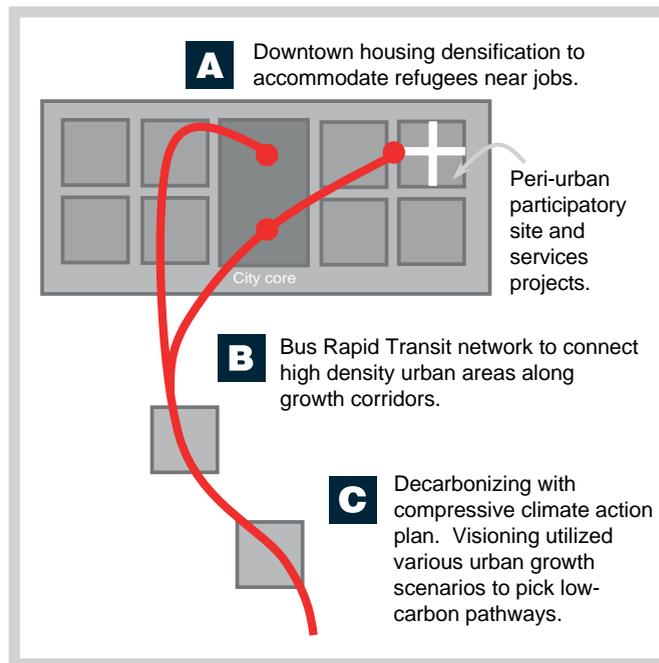


In partnership with:



THE SOLUTION

# Integrating climate action with transit and refugee housing



**Figure 1**  
Integrated planning model

Source: Mehrotra 2020.

KEY FINDINGS

**1** Amman is the first Arab city to adopt a Climate Plan to tackle inefficient land use and the cost of imported energy. A Bus Rapid Transit system nearing completion, which links cities beyond the metropolitan boundary, is being supported with intensification policies along the two trunk routes, allowing Amman to scale up earlier inclusive housing initiatives into more walkable, mixed-use neighborhoods with green building standards and carbon-free electricity.

**2** Promoting climate objectives is strategic to Amman’s financial resilience and environmental sustainability, reducing the associated costs of imported energy, new housing, and expanded infrastructure.

**3** Amman has utilized urban growth scenarios proving that densification and improved public transport would allow the city to absorb its population increase by 2030 within the current built-up areas, reducing building and transport greenhouse gas emissions.

## IDEA IN BRIEF

Comprehensive climate action builds on urban densification, recent transit corridors, and historic housing of forced migrants by utilizing participatory integrated planning and informal settlement upgrading near job centers.

Amman offers a metropolitan integration model that integrates downtown revitalization, peri-urban sites and services, transit, and deliberate decarbonization in a three-step solution. First, the city integrated a million refugees through participatory site and services projects and by incentivizing downtown home owners to build additional rooms in existing homes for rental accommodation. This allowed for increasing density in the core city while socially accommodating marginal groups near job centers.

Second, with new Bus Rapid Transit lanes the city is stitching together a mosaic of higher-density downtown areas with its urban periphery, building cross-boundary transit, and curtailing sprawl along metropolitan growth corridors.

Third, to maximize its efforts to decarbonize, Amman has prepared a comprehensive climate action plan that addresses issues of energy efficiency across a wide range of urban systems—energy, water, transport, buildings—while expanding public open space.



**Figure 2**  
Sectors addressed  
by the case

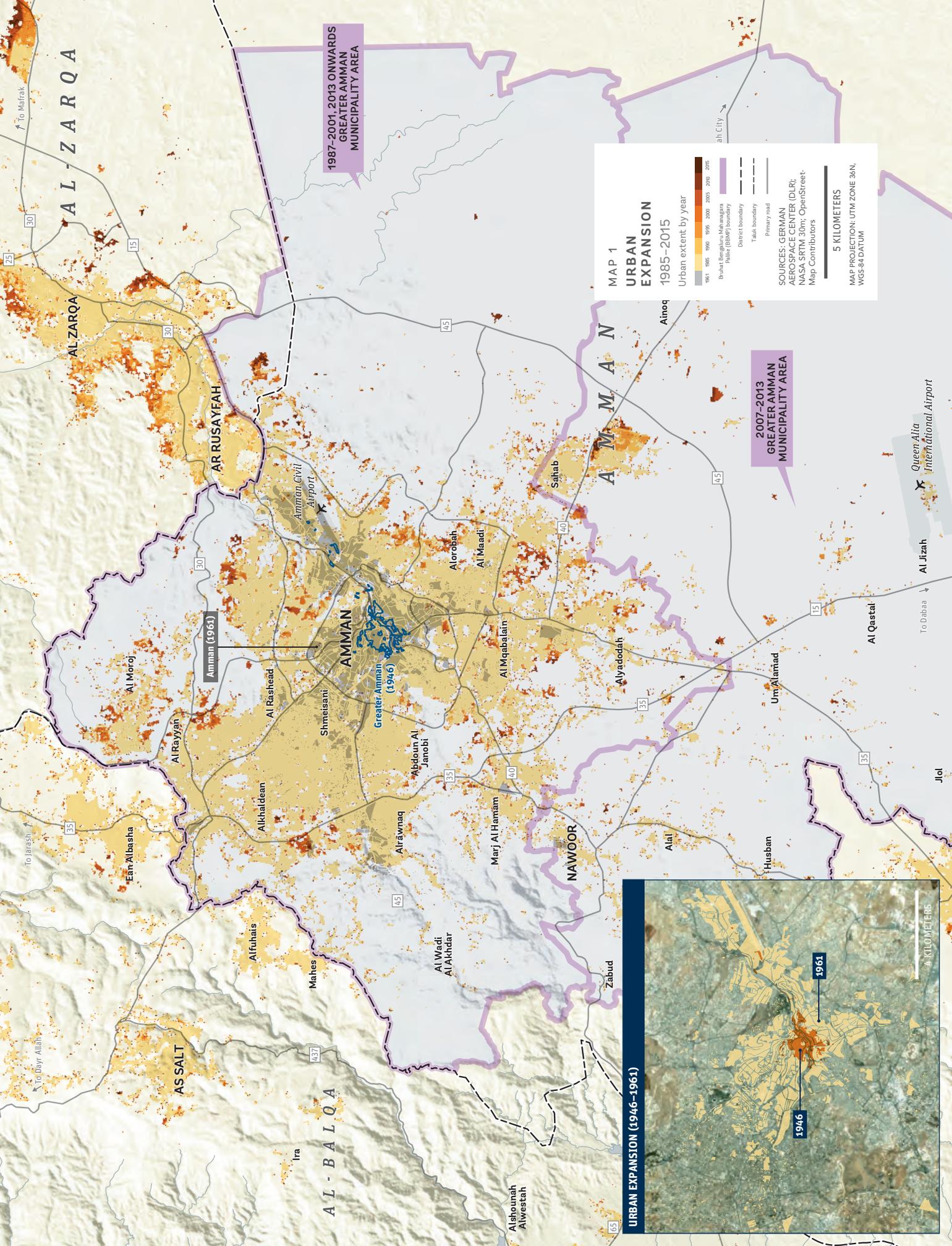
## The Metropolitan Context

A CITY OF 4 MILLION INHABITANTS, Greater Amman Municipality (hereafter, Greater Amman) is the vibrant heart of the Hashemite Kingdom of Jordan, accounting for 40 percent of its population. The capital city is the economic engine of the country, representing 80 percent of its enterprise capitalization (DoS 2012, Table 20). It is also the political center where power is concentrated, including the presence of the royal court, the parliament, foreign embassies, UN agencies, and international nongovernmental organizations (NGOs). As of 2019, Amman’s GDP accounts for more than \$30 billion out of Jordan’s total GDP of \$42 billion.<sup>12</sup> The city is the locus of the kingdom’s banking, information technology, and pharmaceutical companies. Amman is also a “medical tourism” destination for the Middle East region, featuring 46 hospitals and no fewer than 1,200 pharmacies.

---

<sup>1</sup> World Bank 2019, p. 2. No data is available on Amman’s GDP, but it is more than 20 billion (or 4 million by \$4,248 of GDP per inhabitant).

<sup>2</sup> Here and throughout this chapter, all dollar amounts refer to US dollars.



**MAP 1**  
**URBAN EXPANSION**  
**1985-2015**

Urban extent by year

1985	1990	1995	2000	2005	2010	2015
------	------	------	------	------	------	------

- Bulsat (Bulgaria) Mapmakers  
 - Pallex (BBMP) boundary  
 - District boundary  
 - Taluk boundary  
 - Primary road

**SOURCES: GERMAN AEROSPACE CENTER (DLR); NASA, SRTM 30m; OpenStreetMap Contributors**

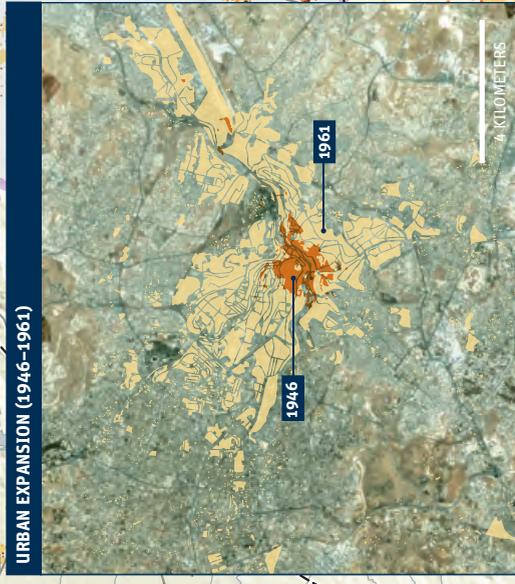
**5 KILOMETERS**  
 MAP PROJECTION: UTM ZONE 36N, WGS84 DATUM

**1987-2001, 2013 ONWARDS**  
**GREATER AMMAN MUNICIPALITY AREA**

**2007-2013**  
**GREATER AMMAN MUNICIPALITY AREA**

**Amman (1961)**

**Greater Amman (1946)**



Queen Alia International Airport

Al Jizah

To Dabaa

Jilol

4 KILOMETERS

To Mafraq

To Irbid

To Dayr Allah

To Zarqa

AL-ZARQA

AL-ZARQA

AL-ZARQA

AL-ZARQA

AL-ZARQA

AS SALT

AL-BALQA

NAWOOR

AMMAN

AMMAN

AMMAN

AMMAN

25

30

15

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

30

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

45

15

15

15

15

15

15

15

15

35

35

35

35

35

35

35

35

15

15

15

15

15

15

15

15

15

15

15

15

15

15

15

15

Nearly half (40 percent) of Amman’s population is under the age of 20 (DoS 2015, Table 3.4). The informal sector accounts for 26 percent of the national economy (UNDP 2013). Unemployment is a major concern for a third of the youth and for women generally, a problem that is reinforced by the absence of reliable public transportation, especially for women.

### A REFUGEE-HEAVY POPULATION

For more than half a century, Amman has been a haven for tens of thousands of Arab refugees, ever since the first Israeli–Arab war in 1948, when the main wave of refugees—70,000—came from Palestine. Those who arrived in that wave were given Jordanian citizenship between 1949 and 1954. A fifth of the people in that first wave were settled in refugee camps established by the United Nations Relief and Work Agency (UNRWA) in Jordan’s major cities.

Amman still hosts three refugee camps: Wahdat, Jabal Hussein, and Marka (Schneller), hosting 147,980 persons (UNRWA 2018). The city has managed to integrate its several refugee waves, as people have become established not only in camps and informal areas but also in dynamic neighborhoods (such as Jabal Amman, Jabal Lweibdeh, and Shmeissani). In 1967, Amman’s population doubled in just a few weeks with the arrival of 300,000 Jordanians from the West Bank. In January 1991, Amman received another 350,000 Jordanians expelled from Gulf countries in one month. This last wave helped develop west Amman (Gardens Street, Sweifieh, Khalda, Deir Ghbar). Then, in 2003–2005, around 200,000 Iraqi refugees settled in Amman, stimulating the real estate market.

Today, fully a fourth of Amman’s population has refugee status: 1,080,716 Palestinian refugees are registered by UNRWA within the boundaries of Greater Amman (UNRWA 2019)<sup>3</sup>, the vast majority of them being Jordanian citizens. While another 193,361 Syrian refugees are registered by the UNHCR (UNHCR 2019), according to the population and housing census of 2015, a total of 435,000 Syrian refugees have progressively settled in Amman since 2011 (DoS 2015), joining the 121,000 Iraqi refugees who arrived after 2003 (DoS 2015, Table 2.3). The most recent wave is composed of 27,000 Yemeni refugees, who arrived since 2014.



Greater Amman's  
population that has  
refugee status

<sup>3</sup> This figure is calculated by adding together the registered refugees in UNRWA following the administrative categories: Amman Town North (317,024), Amman Town South (381,402), Prince Hassan unofficial camp (112,406), the Marka suburbs (76,160), Sweileh (42,722), Wadi Seer (3,022), and the three camps of New Amman (Wahdat, 59,205; Jabal Al Hussein, 32,775; and Marka, 56,000).

Most of this population with refugee status lives in overcrowded conditions: a seventh of them live within camps, and most of the rest live in informal areas developed around the camps in the central and eastern parts of the city. The majority of Palestinian refugees are Jordanian citizens, so they have access to civil service jobs and their children have access to both UNRWA and governmental schools and UNRWA medical services. By contrast, Syrian refugees face difficulty accessing school for their children (only 50 percent of Syrian children are attending school) and finding decent jobs. Moreover, the Syrian refugees are competing for jobs with 390,000 Egyptian workers and 140,000 Asian domestic workers (DoS 2015).

### DENSITY CHALLENGES

Greater Amman's population density reached 13,600 inhabitants per square kilometer in 2019 (equal to 136 inhabitants per hectare, 4 million on 293 km<sup>2</sup> of built-up area), but goes down to 4,987 inhabitants per square kilometer for the entire municipality (802 km). However, this density is very uneven, with some districts reaching more than 20,000 inhabitants per square kilometer, among the highest urban densities in the world. This overcrowding increases the incidence of respiratory disease, forces children and young adults onto the street, and leaves children with a poor study environment within refugee camps and poor neighborhoods (Al Hussein 2011). The great variation in density is illustrated in Map 2.

Greater Amman's footprint has reached 293 square kilometers, twice as large as that of Barcelona, which has a similar population (165 square kilometers for 5.4 million people) (ESA 2015). The city is suffering from growing spatial and social inequalities between its western areas, developed on large plots of more than 1,000 square meters each, its ancient neighborhoods near its central commercial areas, and its eastern informal settlements, which developed around the three refugee camps of Jabal Hussein, Wahdat, and Marka.

The sharp rise in the city's population has placed a strain on resources and infrastructure, including water, education, jobs, transportation, housing, and medical services. The Syrian refugee crisis, in particular, has contributed to an 83 percent increase in public debt, a 30 percent increase in youth unemployment, a 40 percent increase in the demand for water, and a 17 percent increase in the cost of rental housing since 2011 (GAM 2017).



**13,600**  
people per square km  
in Greater Amman



## INFRASTRUCTURE NEEDS

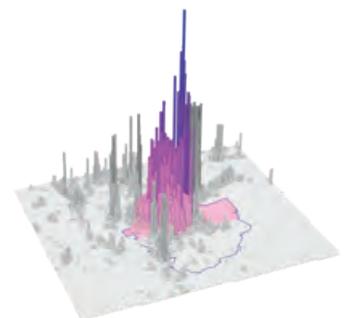
Amman has a semi-arid climate and suffers from aridity, lack of renewable water sources, and energy dependency. Jordan imports 96 percent of its energy, and since 2010 it has turned to an energy mix that includes solar energy. Since the 1960s Amman has derived water from the Azraq aquifer, and since 2013 from the fossil Disi aquifer, 350 kilometers south of the city, on the Saudi border. Water distribution in Amman is restricted to 24 hours per week on average, which represents less than 150 liters per person per day. As such, storing water in tanks by each household is the norm. Water networks and sewage systems need to be upgraded; in fact, water losses in bad networks and non-revenue water account for 50 percent of water distributed.

Amman has received institutional, technical, and financial support from the World Bank since the 1960s to solve its main urban issues: its housing crisis (the upgrading of informal settlements and sites and services policies), its insufficient water and sewage networks, and its incomplete highway network (construction of the Amman Ring Road from the industrial zone of Sahab to Zarqa, southeast).

However, despite international technical assistance, Amman's infrastructure has not kept up with the pace of its demographic and urban growth rate. Because its population has doubled in just a decade and a half, from 1.7 million in 2004 to 3.5 million in 2015 and 3.9 million in 2019, the city is no longer functional in terms of transportation, housing, and access to public spaces (DoS 2004; DoS 2015; DoS 2020).

## HOUSING

Amman today is suffering from a major housing crisis. Twenty-three percent of its housing units are vacant, and 10 percent of them are overcrowded (DoS 2015, Table 2.7). Informal housing sprawl is also an issue. The lack of public transportation (14 percent of the modal share) now translates into traffic congestion, particularly since 2011 and the arrival of Syrian refugees (GAM 2015). Spatial disparities have been growing between the informal areas in the center and eastern parts of the city, on the one hand, and the western part, on the other. The city lacks enough public parks and green areas, and air pollution is a major issue too.<sup>4</sup> Amman is still lacking proper public participation incentives in its policies, and its governing authorities' communication with residents needs to be scaled up.



**Figure 3**  
3D population density distribution

<sup>4</sup> Greater Amman has signed an Air Quality Agreement Form with the Air Quality Index and shares its data. <http://aqicn.org/city/jordan/amman/railway-station/>

Between 1980 and 1997, the municipality of Amman implemented an innovative policy of upgrading informal areas, creating access to home-ownership, employment for residents, and genuine public participation. This approach benefitted thousands of residents and helped their social and spatial integration within the city and its economy. Urban policies afterwards focused more on transportation and commercial areas along development corridors rather than on upgrading residential areas.

## PLANNING

Amman has followed a comprehensive masterplan since 2008, with a horizon of 2025. This plan includes transit-oriented development and development corridors with high-rise buildings, following a high-density mixed-use model. Foreign direct investments have been directed to the city's new central business district Abdali, administrated by Mawared, a semi-public, semi-private institution, to develop military land. Three major infrastructure projects have also been developed: a Bus Rapid Transit (BRT) system, the Amman Ring Road, and the Al Ghabawi landfill, the latter featuring waste-to-energy solutions. Note that no BRT or light railway is yet scheduled to connect Queen Alia International Airport to the city center (9 million passengers).

In 2017, the city adopted the Amman Resilience Strategy to cope with its main urban problems compounded by the refugee influx and the effects of climate change. It proposed an action plan based on five pillars, namely, to become:

1. "Integrated and smart"
2. "Environmentally proactive"
3. "Innovative and prosperous"
4. "Young and equal, and
5. "United and proud."

The Amman Resilience Strategy aims to connect refugee response efforts with the city's long-term actions and to focus on job opportunities and enhanced access to municipal social centers for refugees. The Amman Climate Plan was launched in June 2019 as a development of the resilience strategy.

The major change in Greater Amman's planning policies has been the adoption of the Amman Climate Plan, with its focus on shifting transportation modalities, energy efficiency (e.g. LED lights, photovoltaic panels, insulation, and green building codes), waste sorting, and energy conversion.

Greater Amman was supported in the 1980s by the World Bank to upgrade its informal settlements, which are inhabited by Palestinian refugees, with on-site renovations and with sites and services projects (in East Wahdat, Jabal Jofeh, Nuzha, Hay Amir Hassan, and Wadi Rimam). Those successful projects included cost recovery for replicability and the regularization of land tenure. They were conducted along with the preparation and adoption of Jordan's National Housing Policy in 1987.

However, all of these upgrading projects were interrupted in 2008, when the Housing and Urban Development Corporation (HUDC) was tasked to direct the Royal Initiative of Decent Housing for Decent Living project (2008–13). To date, though, only 8,445 housing units have been built out of the planned 100,000 units in this project's five years in Public-Private Partnerships (see Section III).

In 2008, Greater Amman launched the Greater Amman Master Plan 2025 (hereafter referred to as the masterplan), announcing the details in *Amman Plan: Metropolitan Growth Report* (GAM 2008). This is still the main guiding document for its transportation projects (including the BRT system), its ring roads (the Amman Development Corridor), and its innovative intensification policy along development corridors, which allows developers to build on up to 50 percent of a plot and increase the floor area ratio by adding additional floors. (See Table 1 for a more detailed listing of innovative projects). The masterplan serves as the unified planning guideline for the 22 districts. Its three main components are:

- A radial road network and ring roads
- An emphasis on public transport, and
- The use of development corridors and centers to direct urban expansion.

The Greater Amman Master Plan 2025 was innovative in several ways. The first was its focus on public participation and strong stakeholder involvement through the mayor's roundtable sessions and citizen awareness campaigns. Such public consultation went into the preparation of the masterplan itself, signifying a move away from authoritarian technical planning. The second was the way the BRT system was implemented in 2007–2008, that is, during the preparation of the masterplan, in order to push the project as the cornerstone of all transportation plans. However, when the masterplan was presented in 2008, the master transportation plan was not yet ready. It was only approved in 2010 and is currently being updated. Map 3 illustrates the existing and planned road hierarchy.

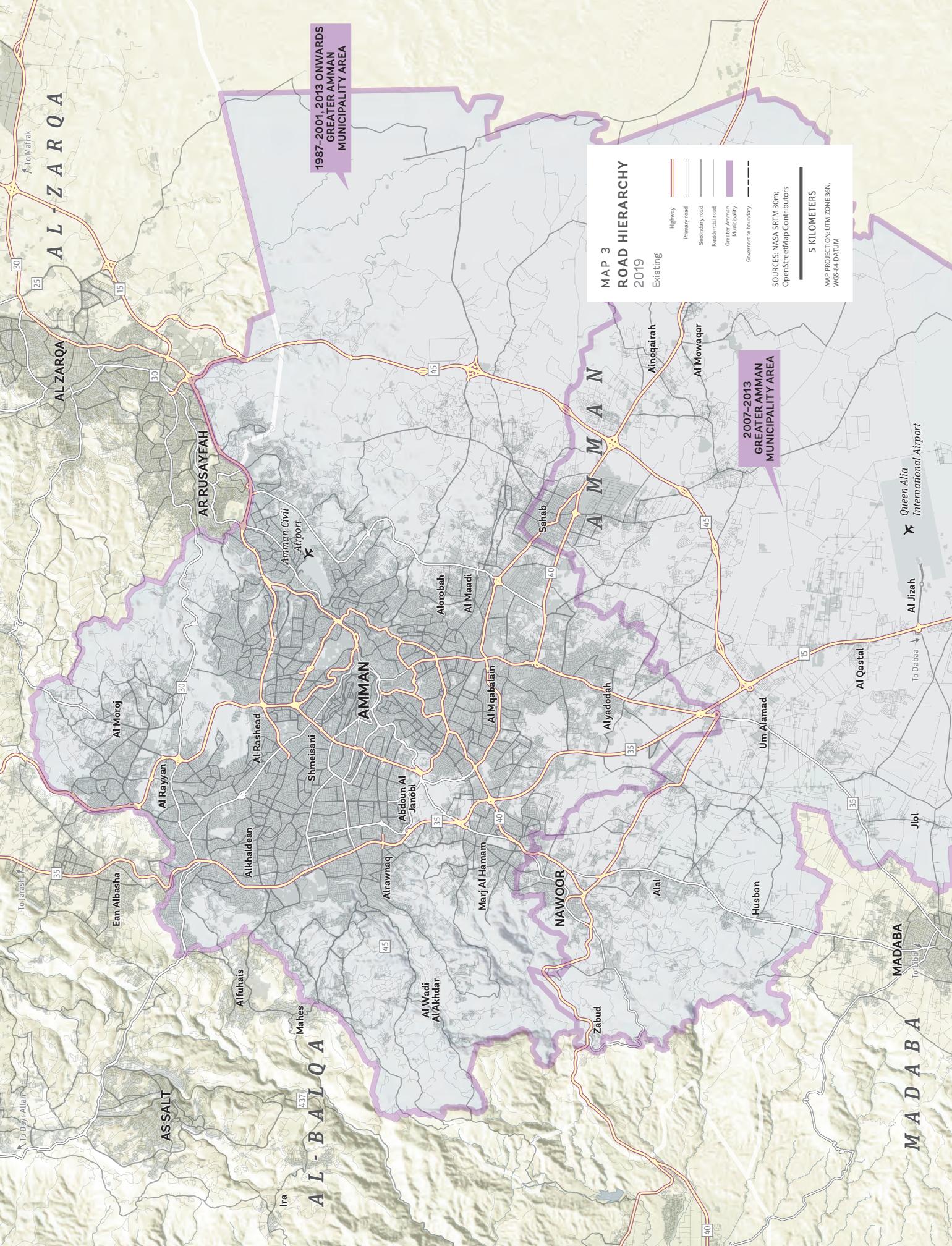
**TABLE 1. URBAN INNOVATIONS**

TIMELINE	INNOVATION	DESCRIPTION
<b>1878</b>	Circassian settlement built within the Roman ruins of “Philadelphia” as a new foundation to Amman	The Ottoman Empire brought Circassian soldiers with their families from the Caucasus to control the pilgrimage road from Damascus to Mecca. With improved security, they brought in Syrian and Palestinian merchants, and Amman came back to life. Its site had been abandoned due to Bedouin attacks and seismicity (with earthquakes in the years 749, 1202, and 1759).
<b>1909</b>	Amman Municipality created	The first mayor elected is Ismael Babouk, a Circassian.
<b>1921</b>	Amman becomes the capital of the Emirate of Transjordan	In order to counterbalance the political power of Salt, Irbid, Kerak, and Maan urban elites, Amman is chosen as the capital of the Hashemite Emirate of Transjordan under the British Mandate (1921–1946).
<b>1927</b>	Rebuilding after July 11 earthquake	Dozens of houses destroyed when earthquake strikes Amman; 242 persons killed. Decision is taken to build on top of hills, with solid foundations.
<b>1938</b>	First land-use regulations	Adopted by the British administration
<b>1948</b>	Palestinian refugees resettled in camps (Nakba)	70,000 Palestinian refugees, expelled from their land, settle in Transjordan, the majority in Amman. Red Cross camps are set up for them, transformed into UNRWA camps in 1949 and 1951.
<b>1955</b>	First Comprehensive Plan for the city’s development	Plan is prepared by United Nation consultants, along with the First Municipality Law.
<b>1967</b>	Second large wave of Palestinian refugees arrives in Amman	Around 300,000 Palestinian refugees are expelled from the West Bank. They settle in central and east Amman.
<b>1977</b>	Comprehensive Plan, Amman-Balqa region	The Amman Urban Region Planning Group is established within the Ministry of Municipal Affairs and prepares a comprehensive plan for Amman and the Salt (Balqa) metropolitan area.
<b>1980–2008</b>	Informal settlement upgrading with public participation and sites and services low-income housing projects	The Urban Development Department is created within Greater Amman with World Bank financial support. It becomes HUDC in 1992.
<b>1987</b>	Greater Amman Municipality created; Greater Amman Comprehensive Development Plan released	The Comprehensive Development Plan for Greater Amman 1985–2005 is initiated by USAID in 1983 with World Bank funding; the plan is ready by 1987.

**TABLE 1. URBAN INNOVATIONS**

TIMELINE	INNOVATION	DESCRIPTION
<b>2003–2014</b>	Amman Development Corridor	This project was a success in limiting the urban envelope, but land acquisition costs were too high. The development project also lacked coordination between the main stakeholders and donors (WB and EIB <sup>a</sup> ).
<b>2007–2013</b>	Expansion of Amman south	Over a six-year period, Amman incorporates six municipalities to the south, doubling its size to 1,300 km <sup>2</sup> .
<b>2008</b>	Second Comprehensive Master Plan, including Corridor Intensification Strategy	The Greater Amman Master Plan for 2025 includes transport-oriented development and development corridors to attract investors and promotes a Bus Rapid Transit System. There is genuine public participation.
<b>2008</b>	Amman Institute for Urban Development established; Transport Mobility Master Plan	Amman Institute for Urban Development established as an urban planning institute with highly qualified Jordanians and international experts to implement the Greater Amman Master Plan. Trains Iraqi Arab urban planners in 2009, and prepares Irbid Master Plan.
<b>2008–2019</b>	Industrial rezoning and classification	Greater Amman Municipality and the Ministry of Environment carry out these reclassifications to relocate small and medium industries in three locations.
<b>2013</b>	Green Building Density Bonus for Densification	Density bonus is offered to support the cost of green building. With TOD.
<b>2015</b>	Construction resumes on Bus Rapid Transit system	The BRT work started in 2008, was suspended in 2011, and resumed in 2015. It will be operational in 2020, with 150 buses running on 32 km of bus lines.
<b>2017</b>	Amman Resilience Plan	To adapt to climate change and cope with the refugee crisis, this plan was prepared by 100 Resilient Cities (Rockefeller Foundation).
<b>2017</b>	Electrification of public taxi fleet	Plan is to add 150 electric cars to the public taxi fleet. To date, 10 electric car charging stations built, 5 with solar energy, to save 40 kilotons CO <sub>2</sub> per year; 20 additional charging stations are planned.
<b>2017–2018</b>	Urban Growth Scenarios	Developed by the World Bank and CAPSUS <sup>b</sup> , this study shows that compact growth within current zoned areas would reduce greenhouse gas emissions and infrastructure costs
<b>2017–2018</b>	LED street lighting and solar farm within the Amman Climate Plan	To date, 130,000 LED lights have been installed, and an additional 130,000 will be installed with EBRD <sup>c</sup> support. Greater Amman will install a solar farm (wheeling) on 1,200 acres.
<b>2019</b>	Green City Action Plan; Amman Climate Plan	Green City Action Plan is launched in Feb 2019, supported by EBRD. Amman Climate Plan is launched by the World Bank in June 2019. Plan includes green belt to limit urban expansion in east Amman (Ohoud) before Al Ghabawi solid-waste treatment plant.

<sup>a</sup> European Investment Bank<sup>b</sup> Capital Sustainable (Urban planning consulting firm, Mexico)<sup>c</sup> European Bank for Reconstruction and Development



**MAP 3  
ROAD HIERARCHY  
2019**  
Existing

- Highway
- Primary road
- Secondary road
- Residential road
- Greater Amman Municipality
- Government boundary

SOURCES: NASA SRTM 30m;  
OpenStreetMap Contributors

5 KILOMETERS  
MAP PROJECTION: UTM ZONE 36N,  
WGS-84 DATUM

1987-2001, 2013 ONWARDS  
GREATER AMMAN  
MUNICIPALITY AREA

2007-2013  
GREATER AMMAN  
MUNICIPALITY AREA

AL-ZARQA

AL ZARQA

AR RUSAYFAH

AMMAN

AMMAN

NAWOOR

AL-BALQA

ASSALT

MADABA

MADABA

Queen Alia  
International Airport

Al Jizah

Al Qastal

Um Alamad

Alyadolah

Ainoqairah

Al Mowaqar

Sahab

Al Maadi

Albrobah

Al Mqabalain

Abdoun Al Janobi

Shmeisani

Al Rashead

Al Rayyan

Al Moroij

Ean Albasha

Alfuhais

Mahes

Ira

Zabud

Marj Al Hamam

Alrawnaq

Al Wadi Al Akhdar

Alal

Husban

Jbl

To Mafraq

To Jarash

To Druze Alah

To Daba

To Irbid

To Tabbal

## RESILIENCE STRATEGY AND CLIMATE PLAN

Amman's resilience strategy was published in 2017. It identifies a range of actions that will help city residents adapt to climate shocks and become more resilient. Jordan's nationally determined contribution to the Paris Agreement commits to greenhouse gas emissions level 14 percent below a business-as-usual scenario by 2030.

Another development that emerged from the 2017 resilience strategy, and which the city is now working on, is implementing the Amman Climate Plan. Greater Amman is the first Arab city to implement such a climate action plan. Amman's plan is both cross-sectoral and horizontally integrated. It relies on eight pillars:

1. Carbon-free-sourced electricity;
2. Green building guidelines for newly constructed buildings along with renovations to improve energy efficiency;
3. Citizen engagement with awareness programs and information campaign;
4. Renewable energy for Greater Amman buildings and photovoltaics solutions for residential and commercial buildings;
5. Sustainable mobility with clean public transport, electric-powered private vehicles, and walking promoted by the improved walkability of the city center and main avenues;
6. Waste that is reduced, sorted, composted, and recycled, with the remainder to be processed to produce energy;
7. Harvesting of rainwater, efficient use of water, and treatment of wastewater; and
8. Concerning urban planning and land use: New development focused on public-transit-oriented corridors and an increase in green open spaces.

## GREEN CITY ACTION PLAN

Greater Amman is currently developing a Green City Action Plan, in partnership with the European Bank for Reconstruction and Development (EBRD). It emerged from the June 2019 Prioritization Workshop, where Greater Amman identified a forward-looking vision and prioritized the challenges currently facing the city. In response to these priority challenges, the project team developed a list of over 300 actions that *could* be implemented to address these challenges. With its Green City Action Plan, Greater Amman is taking part in Jordan's National Action Plan for Green Growth 2019–2030, which calls on it to (i) Rethink solutions to economic, environmental and social challenges and (ii) Rethink the role of environment in increasing economic opportunities for sustainable development.

## GREEN INFRASTRUCTURE

In 2017, Greater Amman launched a green infrastructure project in the city's poor and dense neighborhoods. This project promotes walkability and increases pedestrian safety by linking upgraded informal areas to the BRT lines through staircase renovation. The 5-million-euro project (July 2017–July 2021) is being implemented by the German development agency Gesellschaft für Internationale Zusammenarbeit (GIZ), in partnership with Jordan's Ministry of Environment and Greater Amman, with funding from the German development ministry Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (BMZ) and GIZ expertise. It aims at improving living conditions in poverty-stricken areas in Amman by rehabilitating stair networks that connect poor neighborhoods with BRT bus stations in Ras al Ayn (in Badr and Basman) and through the creation of two small community parks.<sup>5</sup> These small projects focus on both greening and walkability. “On the neighborhood level, the aim is to counteract the degradation of urban spaces, improve social cohesion and foster interaction between different population groups. On a higher level, the infrastructure networks contribute to filtering air and water pollutants, preserving local biodiversity, decreasing the impact of urban heat waves and stabilizing soil to reduce erosion.”<sup>6</sup>

## URBAN GROWTH SCENARIOS

Amman's most recent innovation has been the preparation of urban growth scenarios in 2017–2018, which were also developed for the cities of Russeifa and Zarqa within the Amman metropolitan area to accommodate the 1,231,325 new residents expected by 2030.<sup>7</sup> The study, which was commissioned by the World Bank and was developed through consensus to make informed decisions for sustainable development, discussed the cross-sectoral effects of public policies. It compared the environmental, social, and economic impacts of different urban growth paths to guide sustainable urban investment projects (World Bank 2018b). ■■■

# ■■■ Integration

GREATER AMMAN has a history of integrated urban planning projects focused on housing solutions through sites and services and upgrading operations aimed at enhancing the living conditions of refugees and poor residents. Those solutions

<sup>5</sup> One park is on left-over land in Palestine Street, Jabal Nasr, occupying 380 m<sup>2</sup>; the other is in Mahmoud Al Qda Park, in Jabal Nasr, occupying 1000 m<sup>2</sup>.

<sup>6</sup> GIZ, Green Infrastructure Project leaflet, p. 2.

<sup>7</sup> Following DoS high-growth model, 944,513 additional inhabitants are planned for Amman in 2030, 124,517 in Russeifa, and 162,294 in Zarqa (World Bank 2018b).

have crossed district boundaries within Greater Amman, reducing the segregation between poor and dense east Amman and wealthy west Amman. They have involved multiple sectors, including housing, transportation, and social services. In addition, as mentioned earlier, Greater Amman is the first Arab city to implement a climate plan, which is part of its resilience strategy.

Paradoxically, the adoption of the Metropolitan Growth Master Plan in 2008 has halted integrated urban planning outside Greater Amman's boundaries.

## HOW INTEGRATED PLANNING IS DEFINED AND ADOPTED

Amman's first development plan was produced in 1955, the year its municipal law was also adopted. Following the arrival of Palestinian refugees in 1967 and the expansion of informal areas in the city's center and to its east, a Civic Center Development Plan was prepared in 1968. In 1976, the Amman Urban Region Planning Group (AURPG) was founded with assistance from the US Agency for International Development (USAID) and prepared an overall development plan for Amman and its surrounding areas, including Salt, Madaba, and Zarqa. Although this area plan provided guidelines on urban growth and transportation plans for several municipalities, each municipality then developed its own land use plan.

### Early projects, 1980–1987

An Urban Development Department (UDD) was created within the Amman Municipality in 1980 to direct growth through development centers and corridors and to limit urban sprawl. The UDD prioritized capital improvement projects and defined an integrated transit and transportation strategy. Its mandate was twofold: to develop infrastructure services and community facilities in informal areas and to provide low-income housing. The UDD aimed to solve the informal settlement issue and adopted the then-new World Bank concept of upgrading by involving the population. The World Bank supported the preparation of the first Building Regulation Law in 1985 and of the Greater Amman Comprehensive Development Plan (GACDP) in 1987 in order to solve the housing crisis.

The first Urban Development Project (1980–1987) for Amman, which was financed by the World Bank and implemented by the UDD, developed low-cost replicable solutions for the production of shelter and infrastructure services in East Wahdat, Jabal Jofeh, Rimam, and Nozha. Small serviced plots of land (150 to 300 square meters) were made available at affordable prices with legal property registration so that low-income residents and migrants could build homes incrementally on a self-help basis. The success of the project relied on subsidized loans for home renovation and access to property to ensure replicability. The small service plots were attractive to the lower end of the

housing market, due to the unavailability of affordable plots for low-cost housing. Importantly, fully 85 percent of the beneficiaries paid back their loans. The project also included loans to small-scale enterprises and vocational and commercial training to achieve improvements in productivity (totaling \$5.3 million). Shops and workshop plots were provided. This policy, which relied on both the purchase of land by the government and repayment by the buyers, proved to be a public investment of good quality.

### **Planning since 1987**

Greater Amman has managed to develop integrated urban planning within its boundaries since 1987 for 56 urban and 10 rural communities, and local plans were developed based on this. But some of the urban land developed during the 1980s race for land was in areas presenting geological risks, specifically landslides.

The 2008 Greater Amman Master Plan included a Metropolitan Growth Master Plan, which outlined the overall direction for the metropolitan area and established priority policy areas for growth, including (i) growth boundaries; (ii) generalized land use; (iii) transportation network, including public transit and hierarchy of roadways; and (iv) natural and cultural heritage, including major metropolitan parks.

The 2008 Greater Amman Master Plan delineates eight planning areas and 228 communities within those areas that would require a plan of their own. Specific area plans detail policies for land use, natural and cultural heritage, transportation, and urban infrastructure for the eight planning areas. Community plans are also prepared for strategic neighborhoods that require special attention, such as heritage districts, redevelopment or urban regeneration areas, natural heritage areas, and parks. Detailed community plans were developed for these areas, providing specific directions for development. Site plans and associated development agreements or large-scale projects are then drafted, and a site planning approval process is implemented, just as it is for high-density, mixed-use (HDMU) areas. These site plans are accompanied by development agreements that outline the obligations of Greater Amman and the investor/developer. They include imposition of a tax on additional floors to support a Community Development Fund.

The 2008 Metropolitan Growth Master Plan is based on densification and intensification along development corridors. It fosters transit-oriented development to reduce traffic congestion and the sprawl of informal settlements. However, this integrated urban planning concerns only Greater Amman and

*The 2008 Greater Amman Master Plan delineates eight planning areas and 228 communities within those areas that would require a plan of their own.*

does not include adjacent cities. As a consequence, the city of Zarqa is not represented in the technical committee for the implementation of the BRT system linking both cities. Only Greater Amman, the Ministry of Transport, the Land Transport Commission, and the French Development Agency are members of the technical committee, which points to a lack of integrated planning at the metropolitan level.<sup>8</sup>

### **PROCESSES, FINANCING, AND IMPLEMENTATION MECHANISMS WITH TOOLS AND SECTORS INVOLVED**

In 1984, 7 percent of Amman's population lived in low-income squatter settlements (World Bank 1996). The most challenging conditions were in East Wahdat, developed near the UNRWA-run Palestinian camp of Wahdat. It was built out of sheet metal and wood as the owners of the land refused to allow more permanent construction.

From 1980 to 1997, Jordan became the first Arab country to implement the World Bank's innovative policy of upgrading informal areas with public participation. Initiated in the 1960s in Peru by the urban planner John F. C. Turner, this policy aimed to involve the inhabitants of informal areas during every stage of the renovation of their homes and to allow them access to home-ownership through long-term loans guaranteed by the state. The Urban Development Project 1 (UDP1) was piloted from 1981 to 1987 in four informal sites in Amman (East Wahdat, Jabal Jofeh, Rimam, and Nozha).

The basic idea behind this new development approach was to renovate informal areas while involving their occupants in all stages of the process from design to construction, including funding (Turner 1968). Occupants had to pay a nominal fee to access home-ownership through long-term loans, while they trained in construction trades to help them leave unemployment. The use of long-term and therefore more affordable loans was a condition for the replicability of urban upgrading programs, because the reimbursement of the loans could be used to fund other, similar projects.

The aim of the project was to improve the living conditions of residents in informal settlements by enabling them to secure land tenure and providing them with basic infrastructure, shelter, and community facilities. The land was bought from the original owners and mortgaged to the householders with monthly installments based on a formula of 33 percent of the income of each beneficiary. Beneficiaries had to pay the full cost of on-site infrastructure services, as well as the cost of the land, through a long-term mortgage loan from the Jordan Housing Bank. Further, Palestinian refugees with Jordanian citizen-

---

<sup>8</sup> Interview with the head of BRT project at the French Development Agency, July 18, 2019.

ship gained access to legal property titles. The HUDC engineers were awarded the Aga Khan Award for Architecture for this project in 1992.<sup>9</sup>

UDP1, which was supported by the World Bank, was the first shelter-related project in Amman designed to solve the housing crisis among poor citizens and refugees. It consisted of the upgrading of four sites: East Wahdat, Jabal Jofeh, Rimam, and Nozha; and the creation of three sites with services: in Marka, Quweisma, and Russeifa. These sites and services projects aimed to prepare land for purchase at affordable prices, based on the division of property into small plots (150 m<sup>2</sup>), thus creating a new “E” zoning type, with core units and all services provided. Most of the upgrading in these informal areas has taken place in downtown Amman since 1980.

Sites and services were provided at the North Russeifa site (covering 30.2 hectares, with a target population of 14,000 persons); at the Marka site north-east of Amman (covering 22.1 hectares with a target population of 10,000); and at the Quweisma site in east Amman (covering 35.4 hectares with a target population of 17,000). The three sites were selected for low-income beneficiaries on the basis of affordable land prices, proximity to employment opportunities, and reasonable costs for site preparation and off-site infrastructure. Each development site required two new schools for the nine grades of compulsory education, because there was no available spare capacity in existing schools nearby.

UDP1 was successful in its affordability and its cost recovery as well as in terms of enhanced beneficiary participation. It aimed to make serviced land available at affordable prices, and it facilitated housing construction through loans and assistance with building designs and permits. The beneficiaries were involved in the several phases of conception and implementation. The project has succeeded beyond its stated objectives by making significant improvements in the quality of life for low-income families, including through the provision of a wide range of community facilities and activities such as childcare and improved hygienic practices (e.g. soaps for hand-washing near the toilets).

As of 1986, UDP1 was the first shelter-related project in Amman aimed to solve the housing crisis of poor citizens and refugees. The UDD mandate was broadened to upgrade informal settlements and develop low-income plots on a nationwide basis. The new project included the training of municipal staff in urban management practices. In April 1992, the UDD was merged with the Housing Corporation to form HUDC. It became an independent government agency responsible for the housing and urban sectors, and it is still the main provider of housing that is addressing the needs of different groups, in particular low-income ones.

---

<sup>9</sup> “Client’s Record of East Wahdat Upgrading Program, Aga Khan Award for Architecture, 1992.” [http://www.archnet.org/library/files/one-file.jsp?file\\_id=925](http://www.archnet.org/library/files/one-file.jsp?file_id=925)

### 1980s–1990s

In Amman in the 1980s, several innovative planning tools were developed during the UDP1 project. The main components of the upgrading policy were these:

- Land tenure consolidation—in which the UDD bought the land and sold it to the squatters;
- Cost recovery—to ensure the principle of project replicability;
- Self-help—to enable squatters to acquire building skills;
- Job opportunities—created by requiring at least half the workers to come from the local population;
- Community involvement—to facilitate the process and cope with the population’s needs; and
- Incremental housing—by starting each building with a core unit equipped with a sanitary section.

The upgrading program was based on full cost recovery. Beneficiaries had to pay the full cost of on-site infrastructure services as well as the cost of the land, through a long-term mortgage loan from the Jordan Housing Bank. Meanwhile, the government was responsible for the cost of the community facilities and off-site infrastructure. The Jordan Housing Bank usually asked the beneficiaries to provide a guarantor; in many cases, beneficiaries failed to satisfy the bank’s requirements, while others rejected the idea of taking out a bank loan for religious reasons. Therefore, the government took the initiative to allow this category to pay directly to the UDD with reasonable arrangements, which did not require any guarantee, although the beneficiaries were still charged an interest rate equivalent to that charged by the bank (Al Daly 1999).

The UDD built a community center on each of the project sites. The objectives of the community centers were to mobilize and organize local community initiatives, promote income-generating activities and literacy campaigns, raise public awareness, and encourage women’s involvement in the community development process. Furthermore, women’s vocational training centers were built to provide vocational training for women and promote their economic activities through an access-to-credit program (Al Daly 1999).

The project also permitted an upgrading of environmental sanitation over the project period on the upgraded sites. In 1981, very few households on these sites were connected to sewers, but by 1985 nearly all were connected to the mains. The number of households directly connected to municipal water mains more than doubled over the project period, until 95 percent

of all households were connected to the water mains (World Bank 1989). These changes were reflected in health outcomes, as households changed their own healthcare practices with the addition of new sanitary facilities. Infant mortality in the upgraded neighborhoods fell from an average of 68 per thousand to 55 per thousand, and child mortality fell by 20 percentage points in a decade (1981–1991).

Public participation through local committees in each neighborhood and the construction of several HUDC offices on site has been key to the success of the former upgrading projects carried out in the 1980s and 1990s.

### **Since 1997**

In 1997, the government of Jordan launched a national strategic plan to reduce poverty and unemployment through a huge urban infrastructure program in both refugee camps and informal areas: the Community Infrastructure Program (CIP). For the first time ever, an urban planning project included the 10 UNRWA Palestinian refugee camps and the three Palestinian Affairs Department camps. The objective of the first part of this infrastructure (CIP-A) was to renovate infrastructure in informal settlements and camps, while the objective of CIP-B was to improve infrastructure in rural areas and small towns, in coordination with the Ministry of Municipal Affairs. CIP-C concerned the internal development of HUDC through training and technical and computer equipment.

CIP-A was implemented between March 1998 and February 2002, mainly in Amman, but also in Zarqa for informal areas and throughout the country for camps. The essential services included water supply and sanitation (environmentally sound wastewater and solid-waste disposal); drainage systems to minimize property damage and reduce the risk to human life due to floods; safety measures through accessible roads and lighting; and the provision of schools, health facilities, and community centers. Major roads were widened and lit within informal settlements. The widening of streets was done around the UNRWA camps, but not within them, in order to protect their physical integrity. Finally, in informal areas, eight schools, five clinics, and eight community centers (where literacy activities and association meetings are held) were built.

CIP-A benefited 450,000 people living in informal areas and another 220,000 living in camps. Just under half the cost of these projects (JD 46 million in total) was covered by the Jordanian government (JD 20 million); around a quarter of the cost was funded by the World Bank (JD 10 million); and the remainder was

paid for by the German development bank Kreditanstalt für Wiederaufbau (KfW) (JD 8.5 million), Islamic banks (JD 6 million), and the Arab fund (JD 1.5 million).

The CIP programs provided a set of services while demanding nothing in return, and did not aim for cost recovery at all. They gave very good indemnities and compensations to all families affected by house demolition or displacement. Yet the fundamental aspect of land tenure was abandoned, the official reason for this being that land had become so expensive that even the government could not afford to buy and sell it. Moreover, the families concerned had become too poor to be able to take out 20-year loans with the Housing Bank, the Islamic Bank, or the government (Ababsa 2012). Low- to medium-income citizens did have the option of registering for rotating accounts at saving and credit associations to borrow a few thousand dinars on two- or three-year loans at no interest to build additional floors (Tobin 2016).

Since 1997, HUDC has changed its policy for two reasons: first, the considerable rise in the cost of land; and second, the difficulty of targeting populations able to get sufficient loans from banks. With the prevailing loan terms for housing finance (25-year loans at 8.5 percent interest), households below the fifth decile cannot afford to obtain a loan of more than JD 25,000. The rising cost of land—it has more than tripled since 1997—is such that the government can no longer advance the funds needed to purchase the property.

In May 2010, the HUDC camp and informal areas department was closed, and all its employees were engaged in the production of the Royal Initiative of Decent Housing for Decent Living. Since 2015, HUDC has focused its action on the provision of sites and services, using affordable plots of land. In September 2019 it launched its new housing program to build 916 housing units in Amman, Zarqa, and Kerak, with Public-Private Partnerships. But due to lack of funds, it did not resume its upgrading work in the poor neighborhoods of Amman, where additional housing units have been built informally for a growing population over the last decade.

Map 4 illustrates the rapid expansion of the urban footprint as all of these projects and population influxes occurred, between 1987 and 2015.

### **Transportation**

Greater Amman is fostering intensification along the two BRT lines by allowing developers to build on up to 50 percent of the plot and to add additional floors. The Amman and Amman-Zarqa BRT lines are the backbones of the Amman–Ru-



seifa–Zarqa integrated public transport network. This project started in 2008, was suspended in 2011, and then resumed in September 2015 with financial support from the French development agency AFD. Its main target is to increase the share of commuters using public transport from 13 percent to 25 percent by the year 2025. Once completed, the Amman BRT will become the city’s first Bus Rapid Transit system, in which high-capacity buses will run exclusively on 25 kilometers of segregated lanes. (See Map 5.)

Putting the system into effect will require development and design of stops, stations, interchanges, and passenger information, as well as vehicle specifications. The aim is for buses to run on a frequency as rapid as one bus every three minutes along Amman’s busiest corridors. An extensive network of feeder services is being designed along with the BRT, consisting of buses and smaller vehicles to reach densely inhabited areas of east Amman with narrow streets.

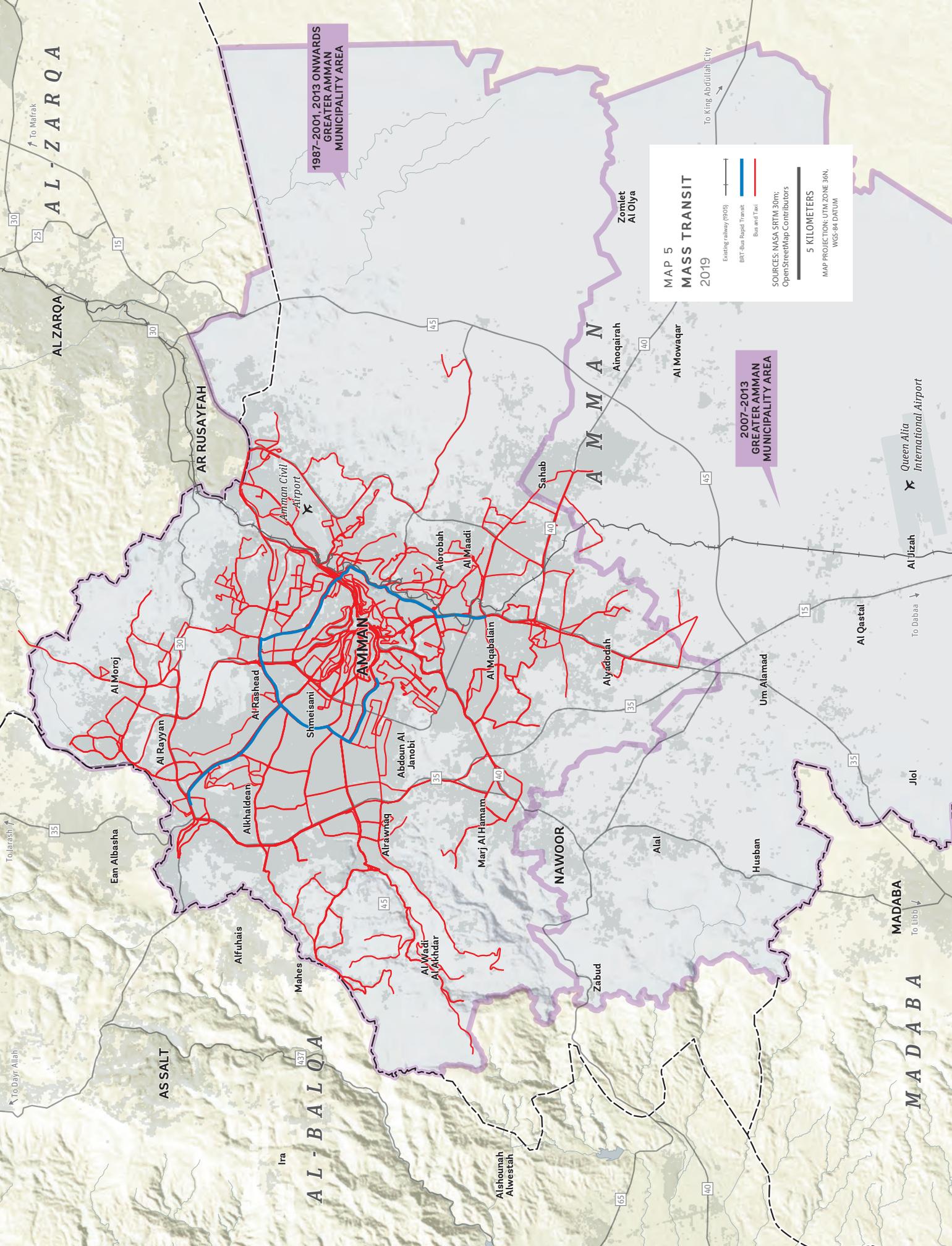
The Amman BRT is expected to reduce the distance traveled using private vehicles by 85 million kilometers per year and the distance traveled using taxis by 12 million kilometers per year. By 2021, the 150 rapid buses in Amman will be carrying 315,000 passengers a day. Additionally, 4,000 native trees (requiring less water and care than other trees) will be planted on median islands separating BRT lanes from traffic lanes along corridor 1 (Sweileh–Mahatta). International donors are pushing for electric buses along the BRT lines, but contractors prefer to import Euro 5 diesel-fueled buses. ■■■

## ■■■ Implementation

IN RECENT YEARS, Greater Amman has been focusing on the implementation of its metropolitan growth plan and Bus Rapid Transit system. Those policies have been embedded within the Amman Resilience Plans since 2017 and are also part of the Amman Climate Plan. All the current urban planning policies have been modeled within the urban growth scenarios prepared by the World Bank in 2017–2018 for the large metropolitan area of Amman, Russeifa, and Zarqa.

### ACTORS

An autonomous entity, Greater Amman has developed its several urban planning policies in close collaboration with specialized entities such as HUDC, the Department of Land and Survey, the Jordan Electric Company, and Amman’s water company Miyahuna.



**MAP 5  
MASS TRANSIT  
2019**

Existing railway (1995)  
BRT (Blue Rapid Transit)  
Bus and Taxi

SOURCES: NASA SRTM 30m;  
OpenStreetMap Contributors

5 KILOMETERS

MAP PROJECTION: UTM ZONE 36N,  
WGS-84 DATUM

1987-2001, 2013 ONWARDS  
GREATER AMMAN  
MUNICIPALITY AREA

2007-2013  
GREATER AMMAN  
MUNICIPALITY AREA

AL ZARQA

AL ZARQA

AR RUSAYFAH

AMMAN

AMMAN

NAWOOR

AS SALT

AL BALQA

MADABA

MADABA

Zonlet  
Al Olya

Ainoqairah

Al Mowaqar

Queen Alia  
International Airport

Al Jizah

Al Qasstal

Um Alamad

Jlol

Husban

Alal

Zabud

Alshounah  
Alwestah

Ira

To Jarashi

To Dayr Allah

To Mafrak

To King Abdullah City

To Dabaa

To Ibbid

30

25

15

30

30

35

35

25

40

40

45

40

35

45

15

35

437

65

40

International donors are playing a major role in funding and technical assistance: the World Bank for infrastructure and climate change adaptation, AFD for the BRT project, the EBRD for the al Ghabawi landfill and waste-to-energy solutions, GIZ for green infrastructure projects, and USAID for CITIES (Cities Implementing Transparent, Innovative and Effective Solutions) program 2016–2021, among others. However, there is room for these initiatives to be more coordinated and to minimize duplication. For instance, the UNDP is supporting Greater Amman in building thermal insulation and retrofitting (known as Project SURE: Systemic Approach to Sustainable Urbanization and Resource Efficiency in Greater Amman Municipality), which complements the Amman Climate Plan, while EBRD is promoting green growth. Greater Amman does not restrict donors from contributing to similar sectors, as it gives additional funds to the city and training opportunities to its staff.

The Amman Climate Plan provides a framework for engagement between government agencies, citizens, and the private sector. The objective is to involve stakeholders in the development, design, and implementation of actions, providing an opportunity for obtaining a better understanding of the social and environmental impacts of proposed projects. Stakeholder input will improve the design and increase local ownership and involvement. As a result, outcomes will improve and residents will experience a better quality of life.

Individual participation and behavior change are key to many of the actions of the Amman Climate Plan. As such, the residents of Amman will have to be engaged in the implementation and invested in the outcomes. Therefore, a general public awareness-raising campaign will be implemented by the municipality to address the role of important stakeholders in the climate actions proposed in the plan.

Since 2008, Greater Amman has also been working in close collaboration with the Ministry of Environment to produce its Interim Industrial Land Policy. The aim of this is to relocate small and medium industries scattered in the central and southern areas to three main areas: the Sahab–Al Muwaqar corridor for medium and large industries (it is now outside the Greater Amman boundaries); the al Qastal industrial area for light to medium industry, along with offices and research centers; and the Al Jeezah industrial area for light and medium industrial uses, along with residential units.

The decentralization law, adopted in 2015, gave much power to the members of the elected municipal councils (outside Greater Amman). Those councils are now pushing to zone additional land, as they are themselves under direct pressure from land owners wishing to benefit from the land gains. In turn, the head of the planning department is under pressure from elected local councils. These councils often only think of providing services to their own areas, without taking wider comprehensive planning into consideration. The executive director

*Individual participation and behavior change are key to many of the actions of the Amman Climate Plan.*



Amman's dense neighborhoods have rapidly absorbed refugees over several decades. Upgrades and transport infrastructure, such as along Al-Urdun Street shown here, have helped integrate these areas into the city's fabric.

Source: Manuel ROMARIS/  
Moment via Getty Images.



can make suggestions to extend zoned areas in order to please some city dwellers. As a result, informal urban sprawl is still occurring.

### INSTITUTIONAL ARCHITECTURE

In order to implement its main urban development projects, Greater Amman signs memoranda of understanding with national institutions and contracts with international donors. It has the power to formulate its own legislation and enact it. For instance, Greater Amman has been working with the Jordan Green Buildings Council (JGBC) since its establishment in 2009 to promote and advocate for green building.

Greater Amman has created its own green building unit within the planning department, which manages the program in close coordination with relevant entities, including the Construction and Sustainable Building Center (CSBC), the Civil Defense Department, Jordan Engineers Association, and others during the process of reviewing drawings, issuing building permits, and issuing certificates of compliance. It has published a green building incentives manual online.

A resilience unit was also created within Greater Amman, which serves to coordinate several departments, including transport, solid waste, and urban planning.

### SUSTAINABILITY

Integrated urban planning in Amman has room for improvement. First of all, it is concentrating on projects within Greater Amman boundaries, with no interrelations with the large metropolitan cities, due to regulatory barriers between the Ministry of Local Administration and the independent municipality of Amman. Second, there is a lack of trained planners in the secondary cities. Third, integrated urban planning is scattered among different projects, including the BRT, solid-waste management, and energy transition, and these are insufficiently coordinated. Greater Amman's comprehensive urban planning department, for instance, faces difficulties obtaining GIS and statistical data from the GIS Department and from the Land Use department.

Greater Amman has not developed institutional relations with the large cities of Russeifa and Zarqa, which comprise the larger metropolitan area. Those cities are struggling to limit their urban sprawl and implement zoning regulations. Municipalities are not empowered with the ability to prepare their own masterplans, and lack the staff, equipment, and training to do so. They may only update their land use plans. For instance, Zarqa Municipality's urban control department (*rakaba*) has no car to visit sites.<sup>10</sup>

---

<sup>10</sup> Interview with head of urban planning, Zarqa, January 28, 2019.

The preparation of the urban growth scenarios in 2017 was the first urban planning activity to bring together urban planners from these three main cities of the Amman metropolitan area. The scenarios were prepared in close collaboration with Greater Amman, the Ministry of Municipal Affairs (now the Ministry of Local Administration), and HUCD, under the Ministry of Planning and International Cooperation supervision. The planning engineers of those three cities received technical assistance and capacity-building to assess the socioeconomic and environmental costs and benefits, as well as the drawbacks, of different paths of urban development. However, no coordination framework had been established by the end of the project between the three cities, and decision makers in Zarqa and Ruseifa did not take up the recommendations for lack of power and funding.

The main policy goal applied in the urban growth scenario, to reduce the current land vacancy rate from 23 percent to 8 percent, is addressed through the policy lever of guarantees made to landlords to rent out their apartments and subdivide them if they are too large. About 742,910 future inhabitants could be housed in 141,238 existing but empty homes in Amman, instead of building new dwellings on the outskirts of the city. This measure will house three-quarters of the expected population growth of the city by 2030. It would require financial and legal guarantees, but at this stage they are considered too difficult to implement, even within the housing strategy. The taxation of vacant land has been suggested several times by the World Bank and USAID, but political deciders and parliament members have not yet been convinced, as many of them have made short-term personal profits in the current land speculation.

The second policy measure is a transport-oriented development policy, which aims to increase densities along the new BRT lines twofold. This lever yields benefits in reducing commuting distances and increasing proximity to urban services. Only inducing the new population to settle near employment areas and public transportation could prevent the city from expanding horizontally. The number of housing units that can be built according to the land uses defined in the current masterplan and following the building norms and limitations is large enough to house the population growth expected for 2030 without any further urban expansion (densification).

According to the Basic Business as Usual scenario<sup>11</sup>, if no urban policy is conducted, Amman's consumption of city land will increase by 14 percent between 2015 and 2030, in the amount of 41.44 square kilometers. Almost half of this growth (17 km<sup>2</sup>) is expected to happen outside zoned areas. Green or arable lands in the east and south of Amman are likely to be converted to urban use. This business-as-usual scenario consumes most land, costs the most in

---

<sup>11</sup> The Business as Usual scenario considers the city growth without any urban intervention.

terms of service delivery, and produces much more pollution. It may be the most likely scenario in Russeifa and Zarqa, where urban planning is weak and where political pressure is exerted on the mayors and the elected municipal council members to expand the zoned areas.

The masterplan scenario shows that enforcing Greater Amman's current masterplan could reduce the new land consumption to 24.19 square kilometers, saving valuable lands from becoming urban. But the total land consumption in the scenario could reach up to 99 square kilometers if all residential land uses are urbanized by 2030. Greater Amman manages to resist the political pressure to zone additional land and extend the zoned areas by phasing out its activities by geographic zones.

The 2008 masterplan is applied through five-year phases, by area. This full masterplan scenario is actually worse than the business-as-usual scenario, because it would lead to a leapfrogging development of the city and to higher costs for infrastructure and municipal services.

To sum up: The vision and compact growth scenarios suggested by the World Bank entail urban intensification with no additional built-up areas in the coming years. They are the least expensive in term of service delivery and greenhouse gas emissions. They both prove that all the population growth expected for 2030 can be accommodated within the existing city boundaries with proper planning, policy, and investment interventions. The two main policies are transport-oriented development and reduction of the vacancy rate to 8 percent with guarantees to the owners (World Bank 2018b).

In term of service delivery, the worst scenario is the business-as-usual scenario, as it requires high investment for infrastructure. About JD 231 million would be required to provide 41.44 square kilometers of new urban area with streets, walkways, water, drainage, and electricity networks. This is twice the cost of the masterplan scenario and 13 times more expensive than the vision scenario, which entails only maintenance of current networks. Concentrating infill along the BRT lines allows the Vision scenario to reduce the investment needed to upgrade the networks to JD 16.5 million.

## **PRIVATE PARTICIPATION**

Public-Private Partnerships (PPPs) have been used to alleviate Jordan's housing shortage. In 1996, the World Bank supported the creation of the Jordan Mortgage Refinance Company and pushed for the implementation of a housing PPP. HUDC, in partnership with the private sector, has created 52 such projects so far. In most Jordanian PPPs, the government designs a publicly owned asset and prepares the marketing. Developers obtain guarantees by the state in the form of prior payments at high market prices, and they are given building code exemptions, allowing for higher-storied buildings and greater density.

The biggest housing PPP so far has been the Decent Housing for a Decent Living Initiative—known in Arabic as *Sakan kareem la 'eish kareem*—a project launched by King Abdullah in 2008. The initiative included a plan for private contractors to build some 100,000 subsidized housing units over five years on state land. The projects were to be carried out in five governorates. Initially, however, the state did not financially support the project, and as a result the banks refused to offer loans to most people who applied. Only civil servants and army veterans managed to obtain loans. In March 2010, the government decided to reduce the apartment prices by 15 percent and pay 3.5 percent of the 8.5 percent interest rate. By November 2011, with several banks having withdrawn from the project, only 8,448 housing units had been built—as compared to the 100,000 that were planned—and only a third of those had been sold. In August 2014, the Ministry of Education purchased all the apartments for its employees, with payment deducted from their salaries.

The Decent Housing for a Decent Living project was unsuccessful due to its inability to target public subsidies toward the needy segments of the population, as well as to its high cost to the government as a subsidy-driven program. Developers were paid JD 265 dinars (\$373) per square foot, and the apartments were sold to the applicants for JD 220 (\$310) per square foot. This was very costly to the government. In a functioning PPP, the rate of return for the private sector must be large enough to attract private investments yet small enough to protect public interest. Such PPPs must include clear provisions for monitoring, marketing, and credit facilitation. In the case of this project, building maintenance costs were not taken into consideration.

Several PPPs are ongoing for the construction of the BRT. For the construction of several bridges and a line section, several PPPs of more than \$20 million each have been signed. The total cost of the project is \$250 million, of which two-thirds is financed by AFD.<sup>12</sup> The operations of the BRT will be handled by a private operator selected through competitive bidding. It will be responsible for developing the depot, hiring and training drivers, and handling customer service functions.

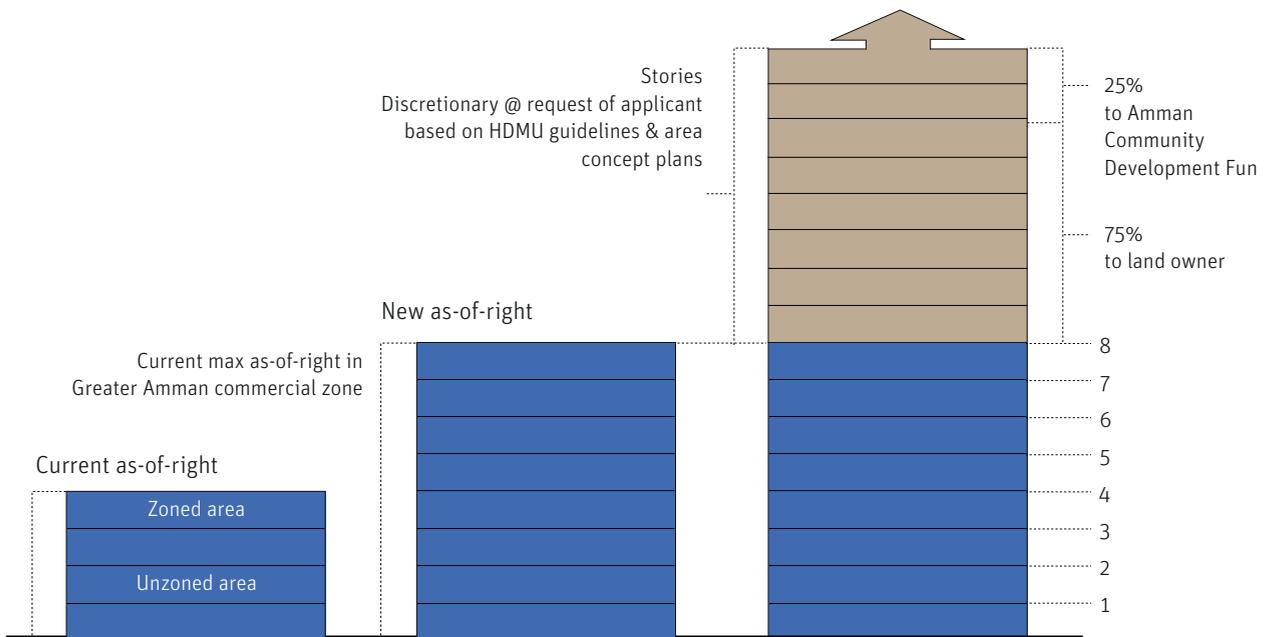
### **Types of solutions and phasing**

The Greater Amman Master Plan includes a Corridor Intensification Strategy for 10 separate but interconnected urban transportation corridors located in the west-central part of Amman and measuring over 40 kilometers in total length (e.g. Mecca, King Abdullah II, Queen Rania II, Zahran, and Arar streets). Investors are given incentives with the permission to build up to 50 percent of the plot (instead of 39 percent in Residential A and 45 percent in Residential B).

<sup>12</sup> [www.c40.org/case\\_studies/bus-rapid-transit-to-tackle-air-pollution-co2-emissions-and-improve-mass-public-transportation](http://www.c40.org/case_studies/bus-rapid-transit-to-tackle-air-pollution-co2-emissions-and-improve-mass-public-transportation)

### COMMUNITY DEVELOPMENT RIGHTS

In 2007, the Greater Amman interim growth plan included a mechanism to allow for the purchase of “community development rights” by developers who would like to build higher than the allowed eight floors. This was presented in 2007 as the “Made in Amman Solution.”<sup>13</sup> The developer would have been allowed to build up to 100 meters in height, on the condition that a quarter of the additional levels would be taxed to fund an Amman Community Development Fund. This fund was conceived to develop green areas and public infrastructure in eastern neighborhoods. This was designated as a land-value capture mechanism, or “Robin Hood” tax to achieve a fairer redistribution of public resources. (Figure 1).



**Figure 4**  
Amman community development rights

Source: World Bank analysis, adapted from GAM Master Plan 2007.

The high-rise mixed-use plans offered land in the valleys to allow for 100-meter towers, along transportation corridors. Active transportation in the form of walking and cycling was also promoted. Specific design considerations were given, including a reduced number of parking lots. Four locations for the development of tall buildings were offered: the Al Abdali Business District in Shmeissani; the Central Parkway between the Abdoun Bridge and Prince Ali Bin Al Hussain intersections; the Al-Jubayhah Business Gateway along the Jordan Road, north of Al-Shaheed Ring Road and east of the Queen Rania Road; and the Amman Southern Gateway (Zeadat 2018).

<sup>13</sup> [www.slideshare.net/AmmanInstitute/high-rise-towers-detailed-plans-amman-institute](http://www.slideshare.net/AmmanInstitute/high-rise-towers-detailed-plans-amman-institute)

The community fund was created, but very few projects have contributed to it due to the global financial crisis in 2008. But more structurally, the high-density mixed-use plan for tall buildings was contested. Its purpose in using land within the valleys was to limit the apparent height of the buildings seen across the skyline. But when excavations started on the “Limitless” project, water appeared in the lowest part of Wadi Abdoun, blocking any further development. As this coincided with the financial crisis, several projects were suspended, which has left behind a landscape of excavations and unfinished towers (Amman Gate project, 6th circle).

## DENSITY BONUS

Since 2013, Greater Amman has offered developers wishing to build green a “density bonus” in the form of additional percentage to the original floor area ratio (FAR). This is expected to compensate the owner for the expected extra capital cost incurred from implementing green building. The main concept of the bonus is to allow a larger land coverage ratio within identical setbacks.<sup>14</sup> As an incentive, green building applications are free of charge, on the condition that owners or developers have paid their property taxes (*musaqafat*). Certified green buildings are exempt from fees according to Amman’s 2019 building and zoning law.

Green building has been slow to build market share in Amman. It is considered to be too expensive by owner-builders and developers. So far, only 10 buildings have received the Leadership in Energy and Environmental Design (LEED) certification in Jordan. Building policies are set at the national level. Greater Amman plans to extend to owner-builders with more incentives and a better marketing campaign to build awareness.

Greater Amman currently faces difficulties acquiring land to create public parks, because since the mid-2000s land has become too expensive. Gardens and open space constituted less than 1.1 percent of the total area in 2015, with 9.1 square kilometers, which equaled just 2.2 square meters per inhabitant. In 2019 this figure increased to 11.7 square kilometers, including 8.6 square kilometers of parks.<sup>15</sup> This is a major issue for the residents’ well-being. The World Health Organization recommends a minimum of 9 square meters per resident, and if possible 50 square meters (Russo and Cirella 2018). For Amman, this means that open spaces should reach 36 square kilometers and ideally 200 square kilometers. Nevertheless, the city is currently engaged in the design of 73 small parks with private participation by banks (in Jabal Amman 1st circle) and insurance companies (Jabal Amman 3rd circle). GIZ is also working closely with Greater Amman to transform vacant land into community parks.

<sup>14</sup> Specifically: 25 percent additional for Residential A; 20 percent additional for Residential B; 15 percent additional for Residential C; and 10 percent additional for Residential D.

<sup>15</sup> <http://jordantimes.com/news/local/gam-cites-challenges-expanding-parks-who-standards-reveal-%E2%80%99great-short-age%E2%80%99-green-areas>

Greater Amman is facing difficulties freezing the expansion of zoned land in its western part, under political pressure exerted by land owners. One of its planning policies is to foster the development of “Residential Green” zones in the western parts of the city on 2,000-m<sup>2</sup> plots of land (Green A and B) and 1,200-m<sup>2</sup> plots (Green C). In Residential Green A and B, only 39 percent to 45 percent of the plot can be built on, with a maximum of two floors and a total height maximum of 8 meters. This is presented as a solution to preserve green areas within the city for climate change purposes, but it does not allow for the expansion of public spaces.

### **Risk management**

The cost of land acquisition is the main challenge in any upgrading or infrastructure project, because land value increases as soon as a development project is adopted. The Amman Ring Road Project included the objective to provide access to affordable land for productive investment and urban development. It was ambitious for the short time period and for the inputs provided through the project. The masterplans and promotional activities envisaged under the project would only provide seeds for further action plans and activities that would begin to address the objective proposed. A Land Acquisition and Resettlement Plan was completed before the ring road project could go ahead. As to resettlement, the initial survey indicated that the road project would impact about 500 plots, with about 1,900 identified owners (costing \$40 million), the very large majority being private parties. Special attention was given to vulnerable groups, including women. Follow-up during implementation included independent monitor reviews. The final estimate was that 3,028 people were affected and the final cost of land acquisition amounted to \$158 million—a 2.48-fold increase in the per-person cost.

Another risk to include is the lack of institutional support, as is the case between Greater Amman and the electric company in the waste-to-energy project. Al Ghabawi landfill for instance is only half a success. Jordan’s largest, and only lined, sanitary landfill serves five municipalities: Amman, Russeifa, Zarqa, Sahab, and Muwaqar. Located 32 kilometers from Amman, it has only one transfer station. Created in 2003, Al Ghabawi is the first municipal carbon finance partnership in the Middle East. The site receives 4,300 tons of solid waste daily (1.5 million tons in 2018). Since 2014, three cells have been producing methane gas; they could produce 4.8 million watts per hour for the grid. But due to governance issues with the public electricity company, this methane gas is flared off, further contributing to air pollution.

### **GEB outcomes and scale-up**

In 2013, the Government of Jordan endorsed the National Energy Efficiency Action Plan (NEEAP), which sets a national energy efficiency target of 20 percent by 2020 and proposes concrete measures in a number of key sectors to guide Jordan towards a reduction in greenhouse gas emission. These tackle both the demand and the supply side. On the demand side, they address energy labels, lighting, reduction of energy consumption in public buildings (by 10 percent), building codes, and the development of minimum standards/specifications for appliances. On the supply side, they address solar water heaters, PV, capacity-building in wind energy and concentrating solar power, and the solar energy code. Further, the NEEAP outlines several horizontal and cross-sectoral measures, including tax exemptions for energy efficient and renewable energy equipment, development of energy service companies, a green lending program, and university curricula.

Amman's C40 emission inventory measured the city's emissions in 2014 at 7.4 million tons of CO<sub>2</sub>e. This is similar to the emission of cities such as Paris, Philadelphia, and Washington, D.C. However, on a per-capita basis, Amman's emissions are much lower than these cities', at roughly 2.1 tons of CO<sub>2</sub>e per person. Without action, emissions are projected to double by 2030 and would reach almost 40 million tons by 2050. Since the population growth rate is projected to be 1.8 percent per year until 2030, Amman's population will reach 4.4 million in 2030, according to DoS (from 3.5 in 2015). Stationary energy and transportation are the two sectors that contribute the most to emissions (64 percent and 31 percent, respectively). More specifically, the largest subsectors of emissions were electricity in buildings and on-road transport.

During 2004–2014, residential energy consumption in Jordan grew at a rate of 8.5 percent, faster than the overall growth rate of 6.4 percent. Energy demand nationally grew 2.4 percent between 2005 and 2015, but this was significantly less than GDP growth, which increased at a rate of 4.4 percent per year. The country is already achieving a decoupling of economic development and energy consumption, a trend that needs to continue in order to achieve the 2050 Vision (Greater Amman 2019).

Amman's resilience strategy, published in 2017, identifies a range of actions that will help city residents survive climate shocks and adapt and grow stronger. Jordan's nationally determined contribution to the Paris Agreement commits to a reduction of greenhouse gas emissions by 14 percent compared to a business-as-usual scenario, by 2030. Jordan's planned emission reduction actions are largely focused on

the energy sector. According to national level projections, national greenhouse gas emissions in 2020 will be roughly 38 million tons of CO<sub>2</sub>e. According to CURB<sup>16</sup> projections, the emissions scenario shows Amman at roughly 11 million tons of CO<sub>2</sub>e in 2020, slightly less than a third of national emissions.

Several solutions have been adopted by Greater Amman to reduce its energy consumption. By 2020 solar panels will be installed on the rooftops of municipal buildings and LED lights will be installed along the main arteries (120,000 were installed in 2018) and in all Greater Amman buildings. The municipality has bought 100 electric cars, and in 2018 a Germany-based company, E-Charge, signed an agreement to install 10,000 electric charging stations across the country, many of which will be located in Amman.<sup>17</sup> Greater Amman can further expand on their efforts by creating an awareness program for electric car incentives (World Bank 2019). But debates are ongoing concerning the 150 buses of the BRT project, as the EU and the AFD are pushing for electric buses, while Greater Amman is worried that the operator would not invest in such facilities. ■■

## ■■ Financing

### ACCESS TO FINANCIAL RESOURCES

IN MOST PROJECTS, land acquisition for sites and services and upgrading is the key prerequisite. This has historically been a Greater Amman task, and in the 1980s, Greater Amman bought the land for UDP1 for sites and services projects. The Central Bank gave guaranties to the Jordan Housing Bank. The Urban Development Department (UDD) was the primary executing agency, with overall project responsibilities, and supervised the implementation. Construction loans were provided by the Housing Bank. An overview of several financing sources, sectorial and thematic allocations, and amounts is shown in Table 2.

The National Housing Corporation (NHC) was set up in 1965 under the Provisional Law No. 47 of the same year. Its functions were consolidated under Housing Corporation Law No. 27 of 1968. The main objectives of the NHC were to acquire land and design and construct housing for civil servants and limited-income groups, make recommendations to the government on housing policy, and grant loans for housing construction to cooperatives and to nominal and individual bodies.

Projects undertaken by the NHC have been substantially subsidized due to the fact that the NHC obtains most of its funds from the Central Bank on convenient financial terms.<sup>18</sup> Also, government-owned land is provided free of charge, the

<sup>16</sup> CURB is a World Bank interactive tool that is designed specifically to help cities take action on climate by allowing them to map out different action plans and evaluate their cost, feasibility, and impact. <https://www.worldbank.org/en/topic/urbandevelopment/brief/the-curb-tool-climate-action-for-urban-sustainability>

<sup>17</sup> [www.jordantimes.com/news/local/10000-electric-car-charging-stations-be-built-jordan%E2%80%99](http://www.jordantimes.com/news/local/10000-electric-car-charging-stations-be-built-jordan%E2%80%99)

<sup>18</sup> at a 4.5% interest rate; it then on-lends to its clients at an effective rate of 4.5% over 20 years.

costs of land being recovered only if land has to be purchased. No property taxes are charged against beneficiaries until they have completed their repayments. Finally, annual house insurance premiums and the NHC's operating expenses, mainly salaries, are met by government grants.

The service providers Amman Water and Sewerage Authority (AWSA) and WSC have waived their normal connection fees since the cost of on-site water and sewerage infrastructure (including connections) has been recovered from beneficiaries through plot charges. The fees to be waived are the charge of 25 percent of the value of the property in the year of installation and the charge of 4 percent per year for 20 years of the value of the property. However, the beneficiary has been required to pay the meter installation charge.

### **UDP1 outcomes**

UDP1 reduced subsidies. The project even produced a small surplus of JD 1 million. Apart from the government's contribution to costs associated with community facilities and off-site infrastructure, there has been no government subsidy for housing. The beneficiaries paid the cost of land acquisition, site preparation, on-site infrastructure, on-plot development, design, and supervision. The Urban Development Department (UDD) used cross-subsidies from the sale of commercial plots and some sales of Residential A. Beneficiaries were asked to make a down payment of 20 percent of the total cost of the plot or of the unit. Most of them took bank loans from the Housing Bank at 8.5 percent on 15-year loans. This is still the average for loans offered by commercial banks in 2019, although some banks also allow 20- and 25-year loans.

By making serviced land available at affordable prices, the project has shown that, when given legal access to land, households are motivated to invest time, effort, and financial resources in solving their own housing problems. This was amply demonstrated by the speed with which houses of good quality were constructed in slum areas, once land tenure had been granted to the residents. The overwhelming response to advertisements for the small serviced plots offered by the project also demonstrated high excess demand at the lower end of the housing market, due to the unavailability of affordable plots for low-cost housing.

### **UDP1 cost sharing**

The Housing Bank participated in the low-income housing project by financing 43 percent of project costs, administering all project finances, and providing beneficiary mortgage loans for more than 70 percent of the total households in the project. Special conditions were granted to project beneficiaries, including the financing of up to 95 percent of the cost of land and buildings, whereas normally the Housing Bank would finance just 75 percent of the cost of the building only (World Bank 1989).

The UDP1 project cost a total of JD 21.3 million, of which JD 5.7 million was financed by the government of Jordan, JD 7.1 million by the World Bank/International Bank for Reconstruction and Development (IBRD), JD 7.4 million by the Housing Bank, and JD 1.1 million by internally generated funds. Civil work cost JD 14.5 million for residential units, JD 0.5 million for commercial units, JD 4.5 million for community facilities, and JD 0.4 million for technical assistance (UDD salaries and experts) (World Bank 1989). Note that the JD 7.1 million from the World Bank was equivalent to \$24 million in 1987.

In the first year, the Housing Bank lost JD 58,903 each year on UDP1 operations, but these losses were covered by the surplus the bank made on other business operations. The Housing Bank provided 2,925 loans of, on average, JD 1,948 each. Residential plots were sold below their cost by subsidizing them from the surplus of the other plots sold at market prices. In addition, loans of JD 2,000 for building materials were granted to each beneficiary. The Central Bank of Jordan agreed to discount 30 percent of the Housing Bank's total investment from its own resources lent to UDD at an annual reduced rate of 4 percent. Such a discount rate reduced the effective cost of the Housing Bank's own money made available for the projects from 7.17 percent to 6.22 percent.

The World Bank has financed only 36 percent of the total UDP project costs. In 1980, the World Bank planned that the sites and services and upgrading components would together yield an estimated economic rate of return of 20 percent (World Bank 1983). The low-income housing project's long-term replicability depended on the management of beneficiary repayments. Altogether, 70 percent of the plots were financed by Housing Bank loans, 20 percent of total beneficiaries, including a quarter of the upgrading beneficiaries, paid cash for their plots, and the remainder made monthly payments to UDD as they refused to take a bank loan on religious grounds.

The sites and services and upgrading projects came along with small business assistance and a manpower training program. The project included (i) serviced sites for shops and workshops, some with preconstructed core units, (ii) loans to small businesses for workshop construction, equipment, and working capital, (iii) vocational training for both men and women, and (iv) extension services for small businesses. The shelter program came along with employment projects in the form of shops, workshops, and core shop plots. They provided a range of retail and repair services on project sites.

### **Viability and feasibility**

The financial viability of the UDP1 project depended on realizing adequate surpluses from the sale of commercial plots and some residential (type A) plots at market prices to cross-subsidize the low-income beneficiaries' plots. The project

has been feasible thanks to the low cost of the plots. Whereas the cost for 1,000-m<sup>2</sup> plots in Amman was more than JD 4,000, these plots cost about half that rate, around JD 300 per 150-m<sup>2</sup> plot, or just JD 2 per square meter of served land. In 1967, squatters had informally bought land at a cost of JD 1 per square meter using a *hujja* contract (a written informal contract between an owner and a buyer, not registered by the Department of Land and Survey, but recognized by courts) (Razzaz 1996). The most significant investment at the time was made by the informal-area dwellers themselves: at around JD 13,000 each to build an 83-m<sup>2</sup> house. Note that the World Bank first suggested creating 100-m<sup>2</sup> plots, but this was rejected by the government, which increased the size to 150 square meters. The size of rooms was also increased, from 3 x 3 meters to 3.6 x 3.6 meters. Some plots had a core unit, others were empty.

The World Bank also supported the construction of the Amman Ring Road between 2004 and 2014. It aimed, in part, to increase the efficiency of transport between the international airport in Amman and Jordan's main industrial city of Zarqa, and to relieve congestion in Amman by rerouting traffic away from the city center. The development of an inland port with appropriate logistics was designed to build the necessary infrastructure to facilitate transport of trade and to remove existing bottlenecks. Transport sector studies and masterplans were to provide further guidance to take appropriate reform actions. By 2014 the ring road had been successfully built, and the airport highway to Amman had been widened to accommodate public buses, taxis, and cars.

### **Composite combination of revenue resources**

For the Amman Ring Road project, the Government of Jordan contributed \$194.6 million, and requested a loan from the European Investment Bank (\$82.8 million), the Arab Fund for Economic and Social Development (\$78.1 million), and IBRD (\$71 million). Based on the input data outlined in the preceding section (the actual investment cost and the traffic volumes output from the original traffic model), the economic internal rate of return (EIRR) and the economic net present value (ENPV) have been calculated. The results of the economic analysis indicate that the viability of the ADC project is still positive, with an EIRR of 12.71 percent, despite the increase in investment costs since the original evaluation and the delay in completion.

A socioeconomic survey and census of project-affected persons (PAP) had already been carried out, also in 1999, as part of the Environmental Impact Assessment. An update of the ownership status of lands required for the ADC part of the ring road was carried out in August 2002, and an updated land acquisition analysis was issued in November 2003. A draft Land Acquisition and Resettlement Plan (LARP) for the project was submitted to the World Bank and disclosed for public inspection in February 2004. It indicated that the road

*In the planning and management of the land acquisition, special attention was given to groups considered more vulnerable, and especially to women, who accounted for about one-third of the owners identified.*

project would impact about 500 plots, with about 1,900 identified owners, the very large majority being private parties.

An important adjustment to standard Jordanian practice up until that time was provision for post-compensation monitoring of PAPs, as required under World Bank guidelines. And a crucial element in the smooth implementation of the large-scale expropriation required for accomplishment of the project was the close cooperation that had already begun in 2003 between the two bodies mainly responsible: MoPWH (project management team and the community liaison officers) and the Department of Lands and Survey (DLS).

In the planning and management of the land acquisition, special attention was given to groups considered more vulnerable, and especially to women, who accounted for about one-third of the owners identified. Particular efforts were needed to ensure that these groups were properly informed, enabled to make their own decisions, and would actually receive the compensation and any other assistance offered. A particularly important measure was recruitment into a community liaison office, the unit responsible for direct contacts with PAPs throughout project implementation, of high-quality female staff. Another, much smaller group of PAPs that was also considered potentially vulnerable and in need of special attention was the users of customary rights, whose livelihoods almost totally depend on the rangelands through which most of the project runs.

#### **Evolution over time of these resources**

During the neoliberal economic shift, Greater Amman sold several of its plots of land to developers. In 2006, this led to the construction of two towers (Jordan Gate) at the sixth circle, on a plot planned to be turned into a public garden. This led to such a large protest that the mayor was replaced by His Majesty in 2006, and the new mayor was tasked with preparing a masterplan for the city.

Since 2006, Greater Amman has sold part of its land to investors. 18.6 hectares of municipal land has been sold to Sanaya Real Estate for \$5.5 million. In July 2019, Greater Amman announced additional sales of its lands to investors. That is the worst way to capitalize on its land reserves; instead, Greater Amman should start renting vacant land to develop parks and additional open spaces for its population, along with community centers. ❏

**TABLE 2. FINANCE SOURCES, SECTORAL AND THEMATIC ALLOCATIONS, AND AMOUNTS**

	FINANCE SOURCE DESCRIPTION	AMOUNT
<b>Informal areas upgrading with public participation</b>		
<b>Land</b>	Land was purchased by the government and sold at affordable prices to the informal settlement dwellers. The purchase of plots by beneficiaries allows projects to be replicated. Cross-subsidization by marketing the most desirable plots allows to finance affordable plots on footpaths and cul-de-sacs.	
<b>Infrastructure</b>	The World Bank financed only 36 percent of the UDP total project costs. The Housing Bank and the government of Jordan paid the rest.	\$21 million for the Urban Development Project 1 (UDP1)
<b>Amman Bus Rapid Transit</b>		
<b>Land</b>	The law permits the expropriation for public use of 25% of a plot of land for free, only once; typically this is done to widen streets.	
<b>Roads and infrastructure</b>	AFD loan to the government of Jordan	150 million euros in 2011 (information not public later)
<b>Amman Ring Road</b>		
<b>Land</b>	The indemnities for land acquisition were underestimated by a factor of 2.5 during the initial design. Vulnerable groups have received compensation.	\$158 million for land acquisition

Source: World Bank analysis, based on World Bank 1989, World Bank 1996, GAM 2015.

## Replication

### EXTERNAL VALIDITY

POLICIES PROMOTING PUBLIC PARTICIPATION in the upgrading of informal areas are no longer a priority in Jordan, as it has become too expensive for the government to purchase the land. In the 1980s, Jordan was very successful in improving the living conditions of poor dwellers and in allowing them access to home-ownership through long-term loans guaranteed by the government. However, since Amman is now working on the implementation of its climate plan, a citywide retrofitting project of formal and informal buildings with roof insulation and double-glazed windows could be added.

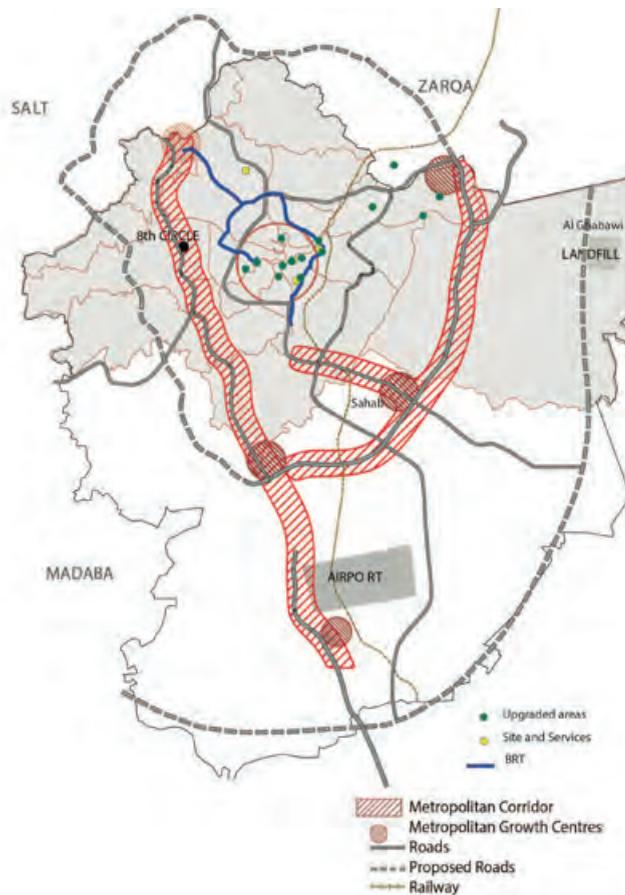
The city is concentrating its current efforts on intensification along the transportation corridors. But the impoverished central and eastern areas should also be included in detailed district urban planning. Linking the upgrading of informal areas to the Amman Resilience Strategy would benefit the large majority of residents. This policy is conducted by GIZ as part of the Green Infrastructure Project, repairing staircases and creating parks in the dense informal neighborhoods.

The 2019 Amman Climate Plan recommends some short-term objectives as well:

- **Improving** energy efficiency in Greater Amman municipal buildings and public lighting to show leadership and demonstrate cost-effectiveness;
- **Improve** the enforcement of existing building codes;
- **Incentivize** commercial and residential green building best practices for new construction;
- **Partner** with the national government and international organizations to implement energy efficiency programs for existing residential buildings.

**Figure 5**  
Replication example,  
Greater Amman

Source: World Bank analysis based on GAM 2008, GAM 2015, HUDC 2002, Ababsa 2012.



## POTENTIAL POLICY CONSIDERATIONS FOR FUTURE DEVELOPMENT PROJECTS

**Energy efficiency.** The energy efficiency programs that are currently receiving major attention should be associated with upgrading policies in informal neighborhoods inhabited by vulnerable citizens and refugees. This would be a way to revisit well-known upgrading policies and to link them to climate change mitigation policies.

The green building incentives are not sufficient for low- and medium-income households. The standardization of building materials (with limited sizes for windows, doors, and blocks) would allow a larger range of citizens to access affordable building materials and insulation solutions that would actually foster the development of more energy-efficient dwellings and neighborhoods.

**Water management.** Rainwater harvesting solutions such as collection wells should be subsidized by the government with donor support. In Jordan only 3.4 percent of households harvest water in cisterns, and in Amman only 0.4 percent do so.<sup>19</sup> Most Jordanian buildings' rainwater gutters are connected to the sewage networks, rather than to plastic tank or concrete cisterns. The new building code makes it mandatory to have concrete cisterns built during the excavation of the foundations for new buildings. The system is well developed by Palestinians as an inexpensive source of water and reduces flooding.

**River restoration.** Zarqa River restoration should be supported by the donor and international communities, as suggested by the urban growth scenarios. This has been requested by Zarqa Municipality for 30 years, because the riverbanks were informally built by polluting industries. Restoration, at least in the city center, would increase access to public parks in Amman's metropolitan areas, improve air quality through reforestation, and contribute to the upgrading of poor neighborhoods along the river.

---

<sup>19</sup> DoS Census 2015, Table 2.5.

## INVENTORY OF SOLUTIONS

An overview of the Amman case's inventory of solutions is shown in Table 3. In an economic context characterized by liberal policies and privatization, policies to upgrade informal areas allow municipalities to protect the public realm and coordinate large investments for the benefit of all. They can be linked to transportation development projects.

A citywide retrofit program could be adopted for existing buildings. This could include incentives to the adoption of a thermal building code and retrofit guidelines. This would require the standardization of construction materials in order to reduce their costs and allow citizens to install double-glazed windows and wall insulation at reduced costs.

**TABLE 3. INVENTORY OF SOLUTIONS—  
A PORTFOLIO OF POLICIES, PROGRAMS, AND PROJECTS**

SOLUTIONS	MECHANISM	DESCRIPTION
<b>Upgrading of informal areas with public participation</b>	Low-cost upgrading	Small serviced plots of land made available at affordable prices with legal property registration so that low-income residents and migrants could build homes incrementally on a self-help basis
	Cross-subsidization	Marketing the most desirable plots allows to finance affordable plots
<b>Intensification along development corridors</b>	Community Development Fund “Robin Hood” tax	To increase density, the Amman 2007 interim growth plan included a mechanism to allow for additional floors
	Green Density Bonus	To allow larger land cover ratio and additional floor area with green construction
<b>Urban Growth Scenarios</b>	Improving energy efficiency in Greater Amman municipal buildings and public lighting	LED lights and solar panels in public buildings and streets
	Green building	Incentivizing commercial and residential green building best practices for new construction
	Building retrofitting	Partnership with national government and international organizations to implement energy efficiency programs for existing residential buildings.
<b>Green Infrastructure Project</b>	Increase walkability	Outdoor staircase renovation to link informal neighborhoods to the Bus Rapid Transit lines
	Community parks	Parks created on slopes and brownfields

Source: World Bank analysis, based on World Bank 1989, Malkawi 1996, HUDC 2002, Ababsa 2012, James 2017, World Bank 2018b, GAM 2017, GAM 2019.

Distributed renewable energy systems present a great opportunity for the Amman metropolitan area, because it is very sunny. Greater Amman has created and shared design guidelines for rooftop solar PV systems. Combined with the 2012 Renewable Energy Law, which allows individuals to sell excess output back to the grid, a substantial uptake in rooftop solar PV has occurred. By 2017 around 25MW of rooftop solar capacity was installed. However, the exchange price per kilowatt between producers and the grid should be revisited.

Creating energy using clean sources at the city level will reduce city government spending on energy, freeing up resources for other initiatives. It could also lead to an increase in jobs and a reduction in air pollution, while reducing reliance on imported fuel and oil. For individuals installing building-integrated solar systems, household spending on utilities will be reduced. In addition, jobs in the renewable energy engineering, construction, operations, and maintenance sectors would increase.

Greater Amman needs to increase its green open spaces by modifying existing regulations through zoning and the creation of more public open spaces. Greater Amman also needs to properly enforce existing regulations and zoning policies to implement its 2025 masterplan and stop urban sprawl.

The second urban development plan, initiated by the World Bank in 1996, managed to develop new neighborhoods where commercial property and the more desirable housing sites on main streets were sold at market prices to cross-subsidize lower-costs plots on walkways for low-income beneficiaries. This created mixed-income communities with the full range of infrastructure, public buildings, and urban and social services they required. Following this model, the Royal Court is currently developing three housing and urban revitalization initiatives in partnership with the private sector, in Amman, Zarqa, and Irbid.

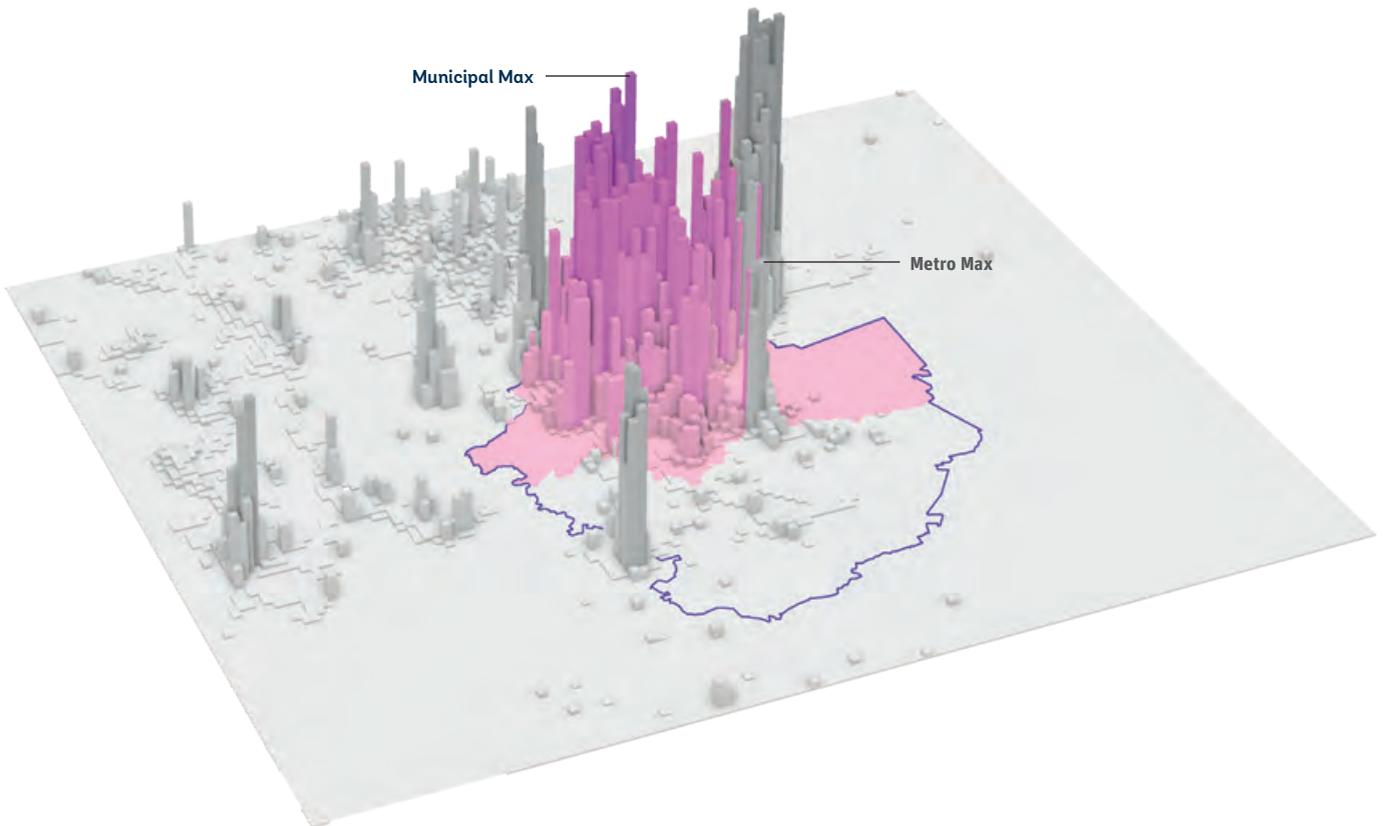
It is now time to develop mechanisms for land-value capture solutions: purchase of community rights (e.g. with a tax on additional floors above the eighth to fund social housing, as suggested during the 2007 masterplan consultative sessions); increases in vacant land taxation; or the renting of vacant land plots located in the heart of the city to develop open spaces. ■■■

# Density

Amman's city core has been densifying. Municipal area population density nearly doubled between 2000 and 2017 from 1,500 to 2,800 people per square kilometer.

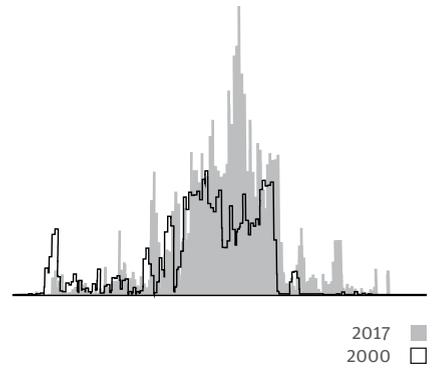
**Figure 6**  
**POPULATION DENSITY, 2000**

Municipal  
Maximum: 20,014 people/km<sup>2</sup>  
Minimum: 2 people/km<sup>2</sup>  
Average: 1,543 people/km<sup>2</sup>  
Metro (using 2007–2013 boundary)  
Maximum: 10,483 people/km<sup>2</sup>  
Minimum: 3 people/km<sup>2</sup>  
Average: 107 people/km<sup>2</sup>



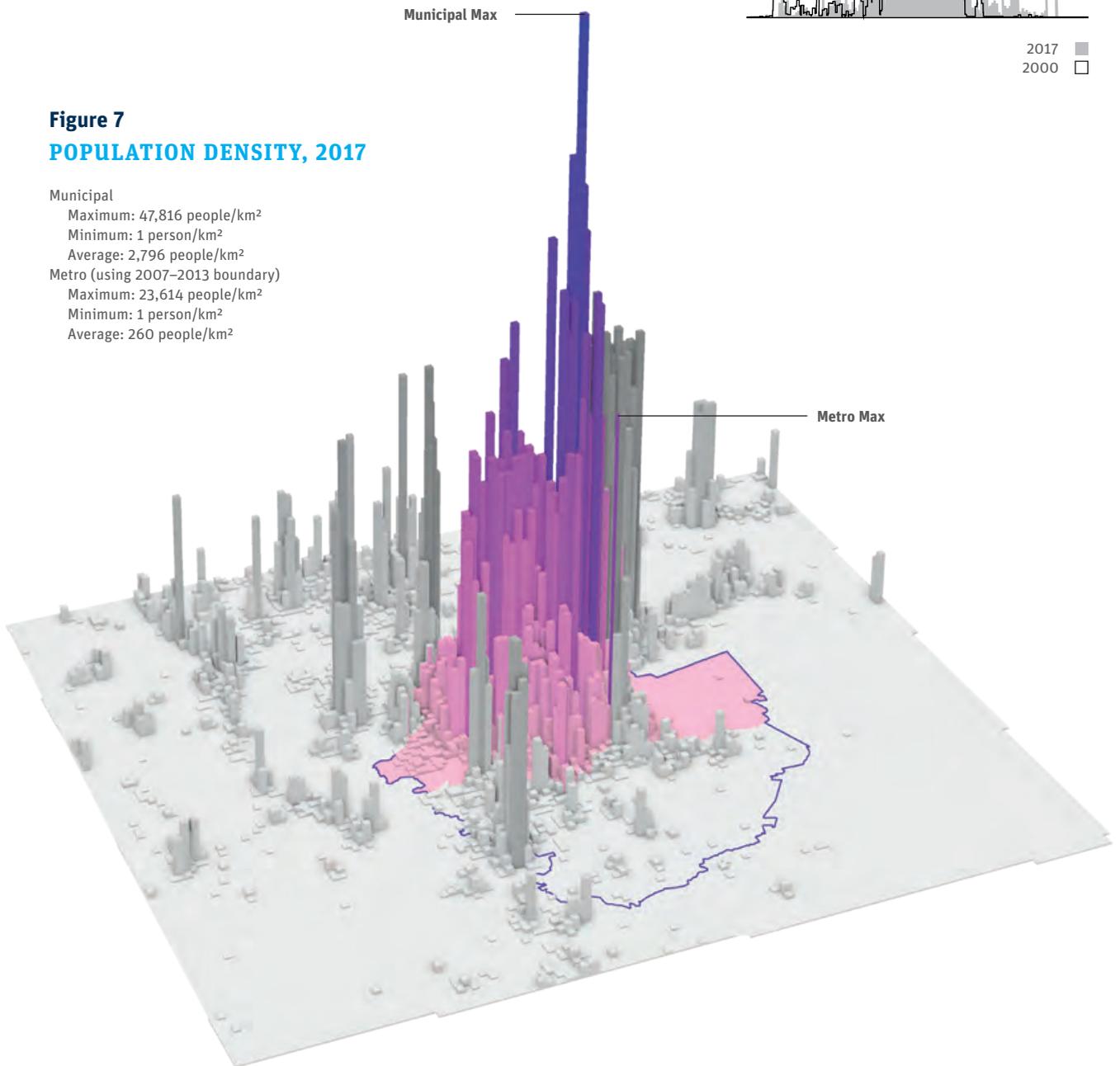
**Figure 8**

Overlay of density levels, 2000–2017



**Figure 7**  
**POPULATION DENSITY, 2017**

Municipal  
Maximum: 47,816 people/km<sup>2</sup>  
Minimum: 1 person/km<sup>2</sup>  
Average: 2,796 people/km<sup>2</sup>  
Metro (using 2007–2013 boundary)  
Maximum: 23,614 people/km<sup>2</sup>  
Minimum: 1 person/km<sup>2</sup>  
Average: 260 people/km<sup>2</sup>



## REFERENCES

- Ababsa, Myriam. 2013. *Atlas of Jordan. History, Territories and Society. Atlas al Urdunn. Al-tarikh, al-ardh, al-mujtama`*. Beirut: Cahiers de l'Ifpo. doi:10.4000/books.ifpo.4560.
- \_\_\_\_\_. 2012. "Public Policies toward Informal Settlements in Jordan (1965–2009)." In *Popular Housing and Urban Land Tenure in the Middle East. Case Studies from Egypt, Syria, Jordan, Lebanon, and Turkey*, edited by M. Ababsa, É. Denis, and B. Dupret, 259–282. Cairo: University in Cairo Press.
- Ababsa, M., and Daher, R. eds. 2011. *Villes, pratiques urbaines et construction nationale en Jordanie/Cities, Urban Practices and Nation Building in Jordan*. Beirut: Cahiers de l'Ifpo (Institut français du Proche-Orient) no. 6. doi:10.4000/books.ifpo.1675.
- Abu-Dayyeh, Nabil. 2004. "Persisting Vision: Plans for a Modern Arab Capital, Amman, 1955–2002." *Planning Perspectives* 19(1): 79–110.
- Abu Ghazalah, Samer. 2010. "Global Economic Forces' Effect upon Urban Planning: Greater Amman Case Study." *Journal of Urban Planning & Development* 136(2): 125–134.
- Abu-Hamdi, Eliana. 2015. "Unplanning the City: Patrimonial Governance, Unregulated Development, and Neoliberal Urban Transformation in Amman, Jordan." PhD thesis, University of California–Berkeley.
- \_\_\_\_\_. 2019. "The Urban Enclaves: On Neoliberal Urbanism in Amman." *7iber*. www.7iber.com/environment-urban/the-urban-enclaves-on-neoliberal-urbanism-in-amman/.
- Al-Bilbisi, H. 2019. "Spatial Monitoring of Urban Expansion Using Satellite Remote Sensing Images: A Case Study of Amman City, Jordan." *Sustainability* 11: 2260.
- Al Daly, Jamal. 1999. "Informal Settlements in Jordan: Upgrading Approaches Adopted and Lessons Learned." www.hdm.lth.se/fileadmin/hdm/alumni/papers/ad1999/ad1999-09.pdf.
- Al Hussein, Jalal. 2011. "The Palestinian Refugee Camps and Jordan's Nation Building Process." In *Villes, pratiques urbaines et construction nationale en Jordanie/Cities, Urban Practices and Nation Building in Jordan*, edited by Myriam Ababsa and Rami Daher. Beirut: Cahiers de l'Ifpo (Institut français du Proche-Orient) no. 6.
- Al-Majaly, Khater. 2017. *Jordan Municipality and Decentralization Elections 2017: A Political and Statistical Study*. www.mesc.com.jo/Publication/brief-Focus-05E.pdf.
- AlSayyad, N., and A. Roy, eds. 2004. *Urban Informality: Transnational Perspectives from the Middle East, Latin America, and South Asia*. Lanham, MD (USA): Lexington Books.
- Beauregard, R. A., and A. Marpillero-Colomina. 2011. "More than a Master Plan: Amman 2025." *Cities*, 28(1): 62–69.
- Chatterjee, Partha. 2004. *The Politics of the Governed: Reflections on Popular Politics in Most of the World*. New York: Columbia University Press.
- Daher, Rami. 2011. "Neoliberal Openness and the Greater Amman Municipality Master Plan." In *Villes, pratiques urbaines et construction nationale en Jordanie/Cities, Urban Practices and Nation Building in Jordan*, edited by M. Ababsa and R. Daher, Beirut: Cahier sde l'Ifpo.
- \_\_\_\_\_. 2013. "Neoliberal Urban Transformations in the Arab City: Meta-narratives, Urban Disparities and the Emergence of Consumerist Utopias and Geographies of Inequalities in Amman." *Environnement Urbain/Urban Environment*, 7: 99–115.
- Darling, J. 2016. *Forced Migration and the City: Irregularity, Informality, and the Politics of Progress in Human Geography*. Sage Publications Ltd.
- DoS (Department of Statistics, Kingdom of Jordan). 2004. *Population and Housing Census*. Amman. www.dos.gov.jo/dos\_home\_e/main/population/census2004/group3/table\_31.pdf.
- \_\_\_\_\_. 2012. *Establishment Census 2011*. Amman. http://dosweb.dos.gov.jo/wp-content/uploads/2017/08/Estab2011-1.pdf.
- \_\_\_\_\_. 2015. *Population and Housing Census*. Amman. www.dos.gov.jo/dos\_home\_a/main/population/census2015/Persons/Persons\_3.1.pdf.
- \_\_\_\_\_. 2018. *The Hashemite Kingdom of Jordan: The Environment Statistics (2014–2015)*. Amman.
- \_\_\_\_\_. 2020. *Jordan Statistical Yearbook 2019*. Amman. http://dosweb.dos.gov.jo/wp-content/uploads/2020/06/Population2019.pdf.
- ESA (European Space Agency). 2015. *World Settlement Footprint*. https://urban-tep.eu/#!.
- Fawaz, M. 2017. "Planning and the Refugee Crisis: Informality as a Framework of Analysis and Reflection." *Planning Theory*, 16(1): 99–115.
- GAM (Greater Amman Municipality). 2008. *The Amman Plan: Metropolitan Growth Report*. Amman.
- \_\_\_\_\_. 2015. *An Action Plan for Transportation in Amman*. www.ammanbrt.jo/en/docs/Greater Amman\_English\_brochure.pdf (accessed April 2017).
- \_\_\_\_\_. 2017. *Amman Resilience Strategy*. 100 Resilient Cities (Rockefeller Foundation). Amman.
- \_\_\_\_\_. 2019. *Amman Climate Plan*. Amman.
- GAM and ICMPD. 2017. *City Migration Profile. Mediterranean City-to-City Migration. Dialogue, Knowledge and Action*. Amman.
- GAM and World Bank. 2019. *Greater Amman Municipality Debt Management Strategy*. 28 p.
- Hamashaa, K. M., M. S. Almomani, M. Abu-Allaban, and W. P. Arnott. 2010. "Study of Black Carbon Levels in City Centers and Industrial Centers." *Jordan Journal of Physics* 3(1): 1–8.
- Hannoyer, J., and Sh. Seteney, eds. 1996. *Amman, ville et société/Amman, The City and Its Society*. Beirut: CERMO (Centre d'Etudes et de Recherches sur le Moyen-Orient Contemporain).
- Harvey, D. 2003. "The Right to the City." *International Journal of Urban and Regional Research* 27(4): 939–994.
- HUDD (Housing and Urban Development Corporation, Kingdom of Jordan). 2002. "Taqrir al-ittisal al-sakani al-awwal li-maqar hayy al-Nahariya." Unpublished report. Amman: HUDD, Social Studies Directorate.
- \_\_\_\_\_. 2019. *Population Indicators*. Amman: HUDD, Housing Policy Department, Directorate of Policies, Data.
- James, I. 2017. *Amman's 1987 and 2008 Master Plans*. Amman: Center for the Built Environment. www.csbe.org/amman-1987-and-2008-master-plans.
- Malkawi, F. K. 1996. "Hidden Structures: An Ethnographic Account of the Planning of Greater Amman." PhD thesis, University of Pennsylvania.
- Mehrotra, Shagun. 2020. "Synthesis Report." In *Greater Than Parts: A Metropolitan Opportunity*, edited by Shagun Mehrotra, Lincoln L. Lewis, Mariana Orloff, and Beth Olberding. Washington, DC: World Bank.
- Parker, C. 2009. "Tunnel-bypasses and Minarets of Capitalism: Amman as Neoliberal Assemblage." *Political Geography*, 28(2): 110–120.
- Payne, G. 2002. *Land, Rights and Innovation: Improving Tenure Security for the Urban Poor*. London: ITDG Publishing.
- Potter, R. B., K. Darmame, N. Barham, and S. Nortcliff. 2009. "Ever-growing Amman, Jordan: Urban Expansion, Social Polarisation and Contemporary Urban Planning Issues." *Habitat International*, 33(1): 81–92.

- Razzaz, O. 1994. "Contestation and Mutual Adjustment: The Process of Controlling Land in Yajouz, Jordan." *Law and Society Review* 28(1): 7–39.
- \_\_\_\_\_. 1996. "Land Conflicts, Property Rights and Urbanization East of Amman." In *Amman, ville et société/Amman, The City and Its Society*, edited by Hannover and Shami, 499–526. CERMOCC (Centre d'Etudes et de Recherches sur le Moyen-Orient Contemporain).
- Russo, A., and G. Cirella. 2018. "Modern Compact Cities: How Much Greenery Do We Need?" *International Journal of Environmental Research and Public Health*, 15. doi:10.3390/ijerph15102180.
- Tobin, S. 2016. *Everyday Piety: Islam and Economy in Jordan*. Cornell University Press.
- Turner, J. F. C. 1968. "Housing Priorities, Settlement Patterns, and Urban Development in Modernizing Countries." *Journal of the American Institute of Planners* 34(6): 354–363.
- \_\_\_\_\_. 1976. *Housing by People: Towards Autonomy in Building Environments*. New York: Pantheon Books.
- UNDP (United Nations Development Programme). 2013. *The Informal Sector in the Jordanian Economy*. New York.
- UNHCR (United Nations High Commissioner for Refugees). 2019. *Jordan, Total Persons of Concern*. Geneva. <https://data2.unhcr.org/en/situations/syria/location>.
- UNHCR, UNICEF and WFP. 2014. *Joint Assessment Review of the Syrian Refugee Response in Jordan*.
- UNRWA (United Nations Relief and Works Agency). 2018. *Registration Statistical Bulletin: The Fourth Quarter 2018*. Amman.
- \_\_\_\_\_. 2019. *Registration Statistics End 2018*. Amman.
- Verdeil, Éric. 2014. "The Contested Energy Future of Amman, Jordan: Between Promises of Alternative Energies and a Nuclear Venture." *Urban Studies*, 51(7): 1520–1536.
- World Bank. 1983. *Jordan Urban Sector Review*. Washington, D.C.
- \_\_\_\_\_. 1989. *Jordan First Urban Development Project (Loan 1893-JO)*. Washington, DC.
- \_\_\_\_\_. 1996. *Performance Audit Report. Jordan Second Urban Development Project (Loan 2587-JO)*. Washington, D.C.
- \_\_\_\_\_. 2014. *Review of the Transport Sector of the Hashemite Kingdom of Jordan*. Washington, D.C.
- \_\_\_\_\_. 2017. *Greater Amman Municipality, Jordan – Public Expenditure and Financial Accountability (PEFA) Assessment (English)*. Washington, D.C.
- \_\_\_\_\_. 2018a. *Jordan Housing Sector Assessment*. Washington, D.C.
- \_\_\_\_\_. 2018b. *Urban Growth Model and Sustainable Urban Expansion for the Hashemite Kingdom of Jordan (English)*. Washington, D.C. <http://documents.worldbank.org/curated/en/983981555961147523/Urban-Growth-Model-and-Sustainable-Urban-Expansion-for-the-Hashemite-Kingdom-of-Jordan>.
- \_\_\_\_\_. 2019. *Jordan's Economic Update*. Washington, D.C.
- World Vision International. 2015. *Social Cohesion between Syrian Refugees and Urban Host Communities in Lebanon and Jordan*. [www.wvi.org/disaster-management/publication/social-cohesion-between-syrian-refugees-and-urban-host-communities](http://www.wvi.org/disaster-management/publication/social-cohesion-between-syrian-refugees-and-urban-host-communities).
- Zeadat, Zayed F. 2018. "A Critical Institutionalist Analysis of Youth Participation in Jordan's Spatial Planning: The Case of Amman 2025." PhD thesis, Heriot-Watt University, Edinburgh.

## ABBREVIATIONS

<b>AURPG</b>	Amman Urban Region Planning Group
<b>AWSA</b>	Amman Water and Sewerage Authority
<b>BRT</b>	Bus Rapid Transit
<b>CIP</b>	Community Infrastructure Program
<b>CITIES</b>	Cities Implementing Transparent, Innovative and Effective Solutions
<b>CSBC</b>	Construction and Sustainable Building Center
<b>DLS</b>	Department of Lands and Survey
<b>DoS</b>	Department of Statistics
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>EIRR</b>	Economic Internal Rate of Return
<b>ENPV</b>	Economic Net Present Value
<b>FAR</b>	Floor Area Ratio
<b>GACDP</b>	Greater Amman Comprehensive Development Plan
<b>GAM</b>	Greater Amman Municipality
<b>HUDC</b>	Housing and Urban Development Corporation
<b>JGBC</b>	Jordan Green Buildings Council
<b>LARP</b>	Land Acquisition and Resettlement Plan
<b>LEED</b>	Leadership in Energy and Environmental Design
<b>MoPWH</b>	Project Management Team and the Community Liaison Officers
<b>NEEAP</b>	National Energy Efficiency Action Plan
<b>NHC</b>	National Housing Corporation
<b>PAP</b>	Project-Affected Person
<b>SURE</b>	Project SURE: Systemic Approach to Sustainable Urbanization and Resource Efficiency in Greater Amman Municipality
<b>UDD</b>	Urban Development Department
<b>UDP1</b>	Urban Development Project 1
<b>UNRWA</b>	United Nations Relief and Work Agency
<b>USAID</b>	US Agency for International Development

Currency exchange rate: 1 USD = 0.71 JD (June 2020).



# A Metropolitan Opportunity

How rapidly growing cities utilize integrated planning to decarbonize urbanization

Cities are the source of over 70 percent of the world's greenhouse gas emissions. Cities are also the engines of the global economy, concentrating more than half the world's population. By the year 2050, two-thirds of the world will be urban, with cities accommodating an additional 2.5 billion people over today's total. Nearly all of this urban growth will occur in developing countries. This concentration of people and assets also means that the impacts of natural disasters, exacerbated by the changing climate, may be even more devastating, both in terms of human lives lost and economic livelihoods destroyed. Earth is on a trajectory of warming more than 1.5°C unless important decarbonizing steps are taken.

Often urban policymakers prescribe integration as the solution to steering urbanization towards decarbonization to achieve greater global and local environmental benefits. However, little is known about the struggles—and successes—that cities in developing countries have in planning, financing, and implementing integrated urban solutions.

*Greater Than Parts: A Metropolitan Opportunity* presents nine diverse metropolitan areas as individual case studies each with a selection of urban innovations. From the analysis, the report derives models, poses guiding questions, and presents key principles to provoke and inspire action by cities around the world.

The main objective of this report is to understand how developing and emerging economies are successfully utilizing *horizontal integration*—across multiple infrastructure sectors and systems—at the metropolitan scale to deliver greater sustainability. Integrated planning processes extending well beyond city boundaries are examined to determine how they have been financed and implemented. The report's primary audience is therefore city decision makers, their financiers, technical advisers, and practitioners most interested in applying integrated approaches to sustainable urban planning in capacity-constrained environments.

