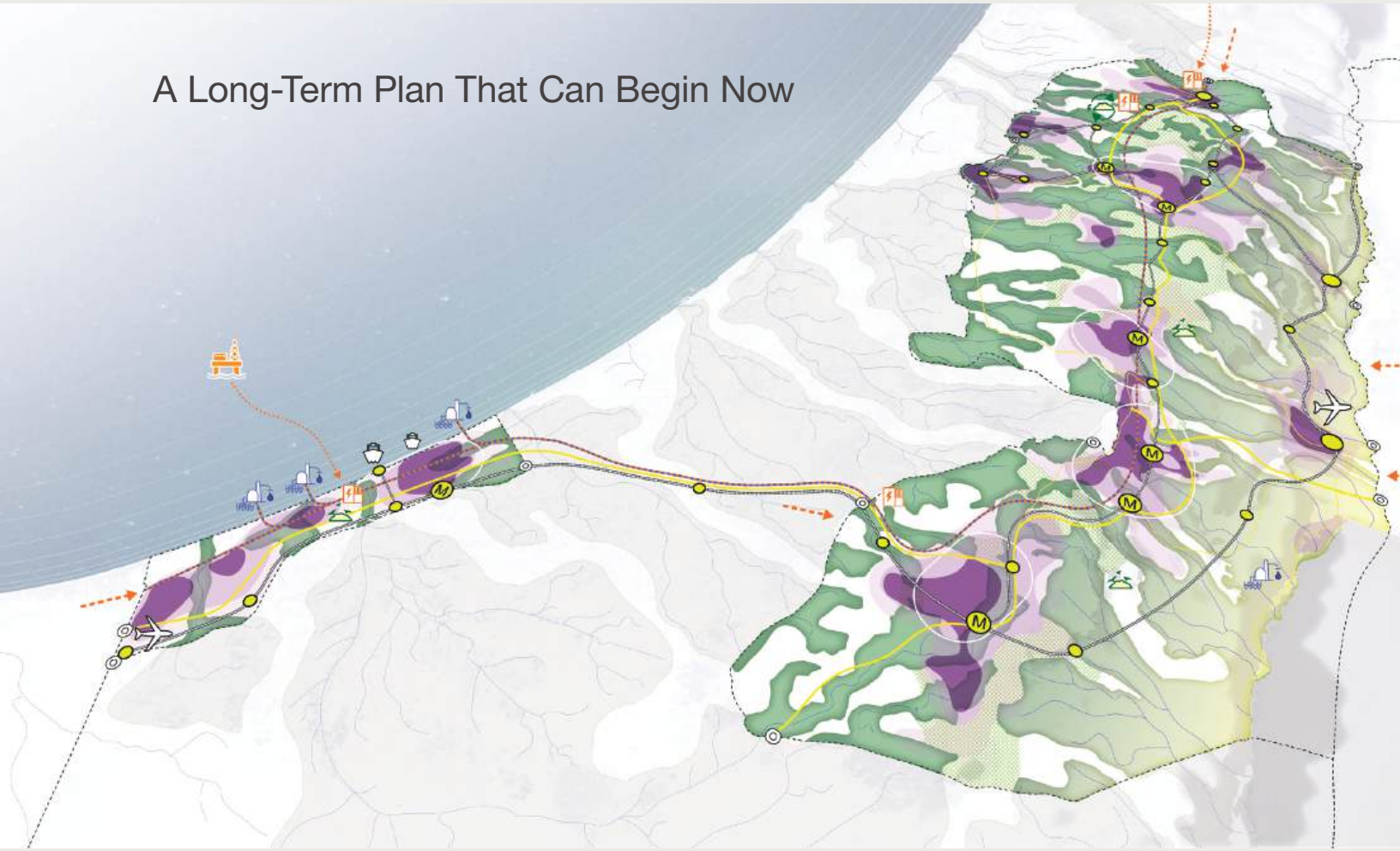


A SPATIAL VISION FOR PALESTINE

A Long-Term Plan That Can Begin Now



SHELLY CULBERTSON ■ C. ROSS ANTHONY ■ KOBI RUTHENBERG ■ ROBERT LANE ■ SHIREEN SHELLEH

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About This Report

In this report, we offer a vision for how spatial planning, infrastructure development, and resource management could better the daily lives of Palestinians now while creating a foundation on which a future independent Palestinian state could be built. We profile strategic projects that could begin immediately at the local level, even without a political solution; over time, these projects add up to the essential foundations of a future state.

We offer a spatial vision with six sectors: governance, environment, cities, transportation, energy, and water. For each, we offer a new vision, describe the current situation, suggest transformative projects and initiatives, and provide illustrative maps. Illustrative plans are shown for six existing or future cities: the North Jordan Valley, Jericho, Nablus, East Jerusalem, Hebron, and Gaza City. The analysis categorizes information from diverse sources, including extensive interviews with Palestinian, Israeli, and other stakeholders, and from multiple datasets.

The world urgently needs a solution to the Israeli-Palestinian conflict. The devastation of the Israel-Hamas war may provide a turning point that enables longer-term negotiations and solutions. It is our intent for this report to contribute to these discussions by offering a vision for how technical and infrastructural development might contribute to a more peaceful and prosperous future for all.

This study builds on previous spatial planning for Palestine, in particular a 2005 spatial design RAND report, *The Arc: A Formal Structure for a Palestinian State* (Suisman et al., 2005), and a companion report, *Building a Successful Palestinian State* (Palestinian State Study Team, 2005).

The analysis was conducted by a team of Middle East experts and urban planners. The team was assembled by the nonprofit, nonpartisan RAND Corporation (United States) and led by RAND experts familiar with the Israeli-Palestinian conflict. RAND subcontracted with ORG Permanent Modernity (United States and Belgium), Plan+Process (United States), and the Center for Engineering and Planning (Palestine).

This work should be of interest to policymakers in Israel, the West Bank, and Gaza; interested parties in the Middle East region more broadly; and the international community. It is oriented to foreign policy and regional experts and to organizations and individuals committed to finding a durable and peaceful resolutions to decades of conflict and untold suffering.

Community Health and Environmental Policy Program

RAND Social and Economic Well-Being is a division of RAND that seeks to actively improve the health and social and economic well-being of populations and communities throughout the world. This research was conducted in the Community Health and Environmental Policy Program within RAND Social and Economic Well-Being. The program focuses on such topics as infrastructure, science and technology, industrial policy, community design, community health promotion, migration and population dynamics, transportation, energy, and climate and the environment, as well as other policy concerns that are influenced by the natural and built environment, technology, and community organizations and institutions that affect well-being. For more information, email chep@rand.org.

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We are grateful to the many dedicated officials and experts in government agencies, multilateral institutions, nongovernmental organizations, and academic and research organizations in Ramallah, Jerusalem, Tel Aviv, and Washington for their generosity with their time during our interviews and for sharing their valuable knowledge about spatial, urban, infrastructure, and resource management.

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We carefully chose a set of peer reviewers to reflect diverse sectors (including Middle East and urban planning expertise) and geographic perspectives in order to best advise us on the quality of the analysis in the report. We are grateful to the peer reviewers for this report for their thoughtful reviews that helped us to significantly improve it: Daniel Egel (senior economist, RAND), David Harden (founder and managing director, Georgetown Strategy Group), Michael Koplow (chief policy officer, Israel Policy Forum), Doug Suis-man (principal, Suisman Urban Design), and Fadi Masoud (associate professor of landscape architecture and urbanism, University of Toronto). We thank Ambassador Charles Ries (adjunct senior fellow, RAND) for his informal review as well.

Summary

The world urgently needs a solution to the Israeli-Palestinian conflict. Its unresolved and ever-changing status is increasingly costly for both parties and risky for the stability of the wider Middle East. Most countries and policy analysts have long viewed the two-state solution—Israel and Palestine as successful, peaceful neighbors—as the most promising solution.¹ Creating a successful, independent Palestinian state will be a multistep, multiyear process with many hurdles along the way. The most commonly considered step is a long-term political settlement. However, other indispensable steps have received less attention. One of these is a long-term spatial vision for an independent Palestinian state.

In this report, we offer a vision for how spatial planning, infrastructure, and resource management could better the daily lives of Palestinians now while creating a foundation on which a future independent Palestinian state could be built. We propose strategic projects that could begin immediately at the local level, even without a political solution; incrementally, over time, these projects can comprise the essential foundations of a future state. Our goal is to contribute a tool for dialogue and rational planning, offering an integrated, technical approach to aid diplomacy.

Why Now?

The current realities of this volatile region were significantly shaped by the 1993 and 1995 Oslo Accords, which were intended to be temporary, five-year agreements while a more permanent solution was negotiated. However, in the decades since they were signed, there has been no movement toward a political resolution. Both sides have lost faith in the process.

The Israeli-Palestinian conflict has reemerged on the world agenda, however, stimulated by the grim reality of the brutal and tragic October 7, 2023, attack on Israel by Hamas and Israel's devastating military response in Gaza. There is an urgent search for real change. Emerging negotiations offer a rare opportunity to craft a future that stabilizes the region and addresses both Palestinian and Israeli needs for security, mobility, dignity, and economic development.

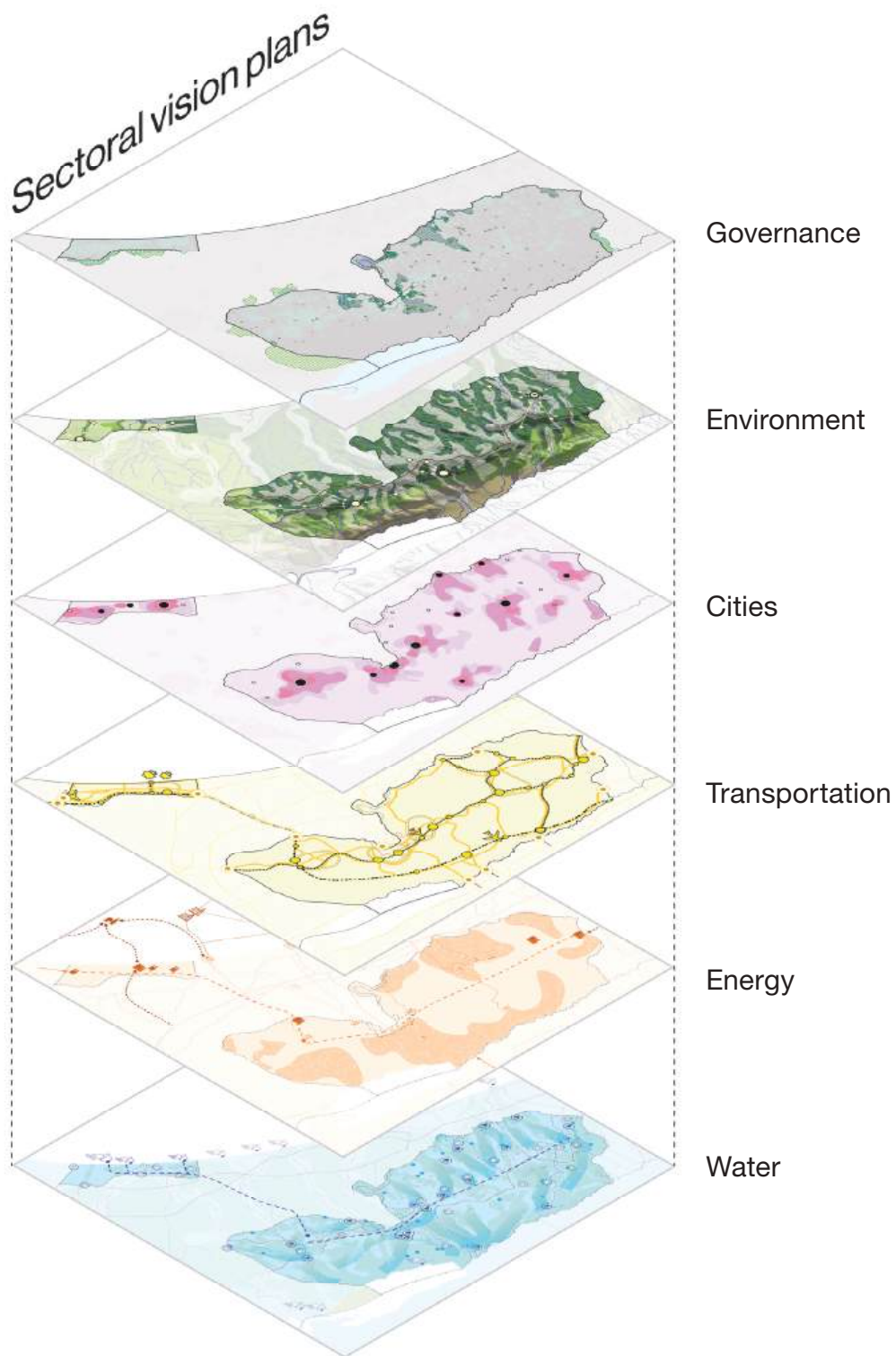
Integrated Design

To develop a new spatial vision for Palestine, we conducted extensive interviews with Palestinian, Israeli, and other stakeholders; reviewed relevant literature and secondary data; and examined available statistical and geospatial data. We categorized the information into six sectors: governance, environment, cities, transportation, energy, and water, as shown in Figure S.1. This *integrated design* process considers factors individually and then collectively to understand how they affect one another. It is an iterative process in which the layers inform each other and are modified to account for interactions with other layers.

For each sector, we offer a future vision compatible with a revitalized Palestine, describe the current situation and explain its implications, and suggest a set of transformative projects and initiatives that would address the limitations we have described. We highlight projects in each sector that could be implemented in the short term (three to five years) without a political resolution of the conflict. We provide maps that illus-

¹ Although U.S. policy is to promote a Palestinian state, the U.S. government does not recognize such a state, referring to the West Bank and Gaza as the *Palestinian Territories*. We also adopt this position; for convenience, we refer to the Palestinian Territories as *Palestine*.

FIGURE S.1
Sectors of Analysis



trate the vision for that sector and current conditions. We illustrate how all six sectors coalesce in six existing or future cities: the North Jordan Valley, Jericho, Nablus, East Jerusalem, Hebron, and Gaza City.

Figure S.2 illustrates our six sectors, layered on top of each other, on a map of the West Bank and Gaza.

The Vision, Current Situation, and Projects in Each Sector

Figures S.3 through S.8 provide descriptions of the vision, current situation, and projects for each of our six sectors, along with examples.

Looking Ahead

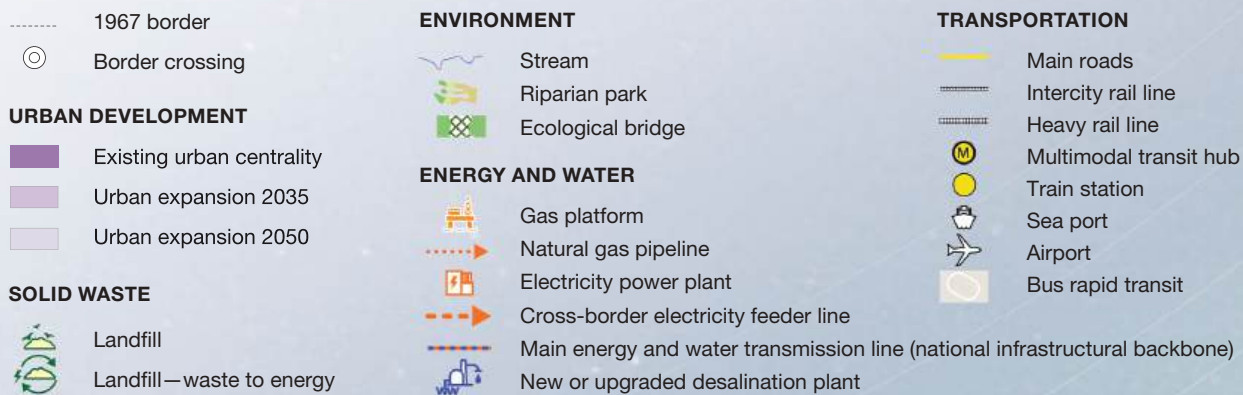
Our analysis demonstrates that there can be a realistic vision for spatial planning, infrastructure development, and resource management for Palestine. It is possible to create new infrastructure and redevelop existing infrastructure to create a sustainable future that meets the needs of a growing population. The plan we describe focuses on incremental progress, ultimately achieving a reality that is greater than the sum of its parts. We identify a broad variety of projects, both ambitious and conservative, that can improve the lives of Palestinians in the short term even as the long-term geopolitical challenges are worked out.

The vision is flexible. It need not be implemented sequentially. Because all projects are concurrent with the larger vision, sequencing can be adaptable and opportunistic. Projects with demonstrated need, political agreement, and financing could begin now. The approach can facilitate a dialogue between the two sides about which projects are more viable immediately and which are harder to achieve.

We did not prioritize which projects may be of most interest to either Israelis or Palestinians; however, according to our interviews, we are confident that there is a subset of projects of interest to multiple parties that could move forward in the short term. This document can be used as a basis for stakeholder engagement with Palestinian, Israeli, and global stakeholders to establish priorities.

Achieving a resolution to the Israeli-Palestinian conflict will require overcoming daunting challenges in security, governance, logistics, and financing, but all of this is achievable with political will, good-faith negotiations, strategic planning, and international support. The spatial vision we offer is part of the roadmap for achieving a modern, successful, independent Palestinian state living in peace and security with its neighbors. The vision also offers a realistic pathway for improving the daily lives of Palestinians.

FIGURE S.2
Layered Sectors in the West Bank and Gaza



SOURCES: OCHA, NTMP, MoT, MoLG, Shaul Arieli, HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoA, CEP, CESVI, PCBS, Office of the Quartet, Israel MoE, Israel WaSA, PWA, CEP, ORG. See Appendix B for more information.

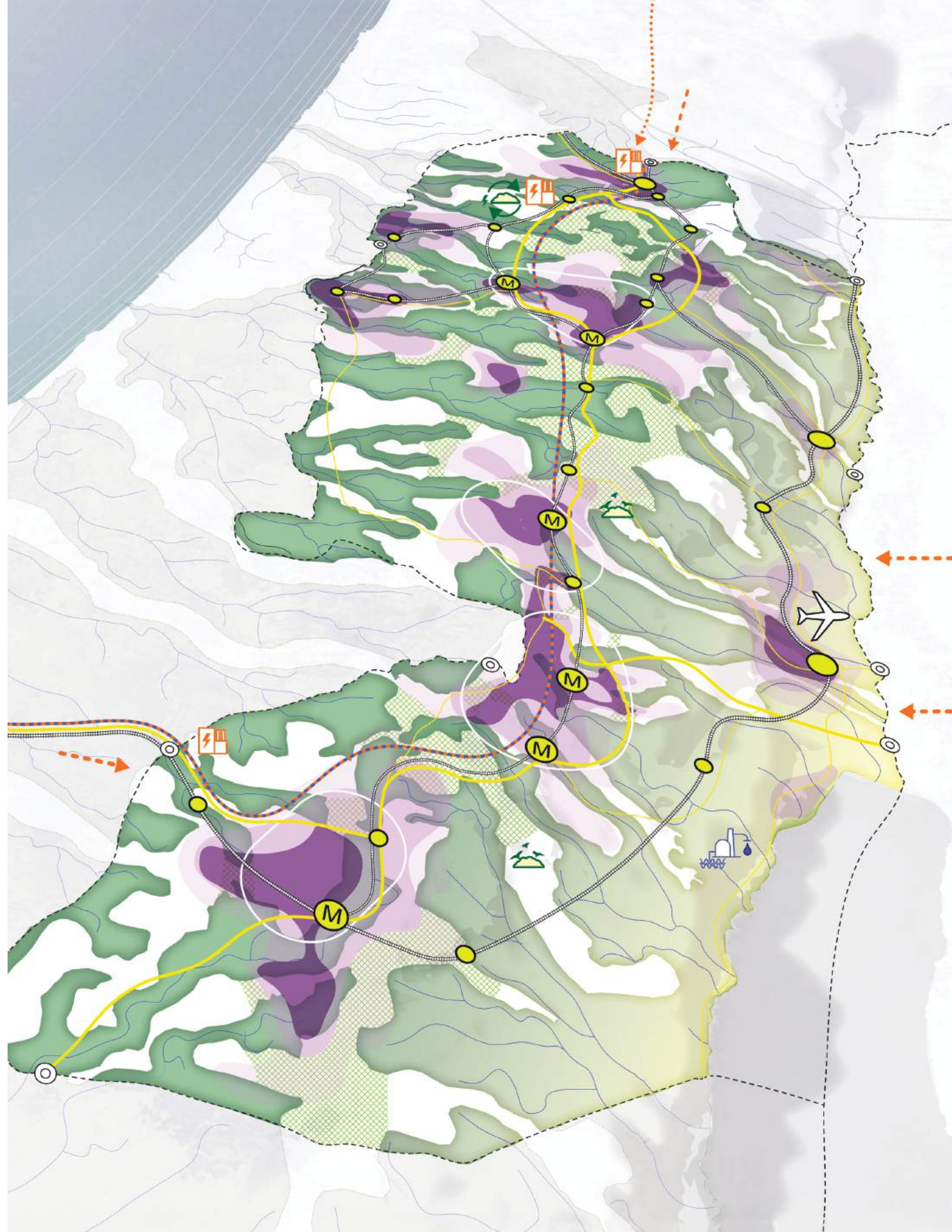


FIGURE S.3

Governance: Vision, Current Situation, and Projects

Vision	Current situation
<p>Palestine will have the jurisdiction, good governance, security, and rule of law required for carrying out the infrastructure projects and initiatives described in this report. We envision governance based on popular legitimacy and technical capability that makes public decisions about land use and about the development and preservation of natural resources. Palestine is both territorially <i>contiguous</i> and <i>permeable</i>—i.e., one unified whole in which the movement of goods and people within and across borders is easy and predictable. In the long term, Palestine will transition from its current challenges to a stable and economically viable state, with interim measures to get there.</p>	<p>There is <i>no consensus about appropriate borders</i> for Palestine. <i>The West Bank is fragmented</i> into Areas A, B, and C, and there is no land connection between the West Bank and Gaza for most Palestinians. <i>Israeli control over Area C</i> (about 60 percent of the West Bank) constrains Palestinian building efforts and the allocation and protection of natural resources. <i>Israeli settlements</i> and land use for other purposes consume an increasing percentage of Area C. <i>Ambiguity of land ownership</i> hampers the building of large-scale public works. <i>Ongoing security and governance challenges</i> among the Palestinians inhibit development of the large-scale infrastructure projects envisioned here.</p>
Transformative projects and initiatives	Examples
<p>Projects that could address the challenges with respect to governance fall into three broad areas: borders and jurisdiction, border crossing, and administration.</p>	<p>Agreement on borders and border control, new or improved border crossing with Palestinian management, phased civil and administrative control of Area C, improved border crossings, improved customs services, trade agreements, improved planning institutional capacity, upgraded communications, land ownership mapping.</p>

FIGURE S.4

Environment: Vision, Current Situation, and Projects

Vision	Current situation
<p>Palestine will have a clean environment that supports the needs of the population and the economy. Watersheds and environmentally sensitive lands will be protected to conserve access to water, with best practices in transboundary watershed management for the region. Solid waste will be managed according to global standards. Resources for agriculture will be managed responsibly, and traditional knowledge and practices will be resurrected. Areas for parks and open space for people will be preserved. Resources will be sustained for future generations. A sustainable Palestine is achievable if the underlying natural systems are acknowledged and reinforced in planning, with environmental systems that account for climate change shaping future development patterns.</p>	<p>Climate change threatens fragile natural systems, including watersheds and major water bodies (such as the Sea of Galilee, the Jordan River, and the Dead Sea). Watersheds are poorly managed. Solid waste management does not meet global standards, and solid waste infrastructure lacks capacity to accommodate future needs. Nearly half of all solid waste is deposited in unsanitary dumpsites. Extensive rubble will need to be cleared from Gaza; parts of the West Bank are contaminated with explosive hazards.</p>
Transformative projects and initiatives	Examples
<p>Transformative projects and initiatives fall into five broad categories: environmental zones, agricultural development zones, solid waste management, rubble removal and explosive hazard mitigation, and administration.</p>	<p>Riparian parks that protect water bodies, their surrounding and enclosed ecosystem, and other landscape features; improved collection processing, recycling, and disposal of solid waste (including increased landfill capacity, rubble removal, and mitigation of explosive hazards); development of a regulatory agency to coordinate decisions about natural resources.</p>

FIGURE S.5

Cities: Vision, Current Situation, and Projects

Vision	Current situation
<p>Urban expansion, planning, and development will accommodate population growth in ways that reflect best practices in urban and infrastructure planning, respect environmental resources, and calibrate access to and impact on natural resources. Growth will be unconstrained by fragmentation into the artificial divisions of Areas A, B, and C. Communities and spaces will be planned to optimize quality of life, expand prosperity, ease mobility, and promote safety and security while minimizing urban sprawl and environmental degradation. Spaces that enable economic growth, enhance recreation, encourage tourism, and create national pride will be built.</p>	<p>Cities must provide livable communities for the rapidly expanding population. Population <i>density in the West Bank and Gaza is very high</i> by world standards. Urban growth has been disjointed and poorly managed. Permit restrictions in Area C have prevented appropriate infrastructure development. <i>Uncontrolled and unplanned development threatens environmental resources</i>. Special planning is needed to meet the needs of <i>displaced people in Gaza</i> and compensate for the <i>significant destruction</i> of its civilian infrastructure.</p>
Transformative projects and initiatives	Examples
<p>Transformative projects and initiatives fall into six broad categories: infrastructure-driven urban growth, urban renewal and redevelopment, new cities, civic institution development, economic centers, and administration.</p>	<p>Upgrades to existing urban infrastructure to enhance mixed-use development in the downtowns; expansion of infrastructure of existing cities, with transit-oriented development hubs; urban renewal and redevelopment in the centers of main cities; construction of three new cities in the Jordan Valley; development of civic institutions and the symbols of state; investment in economic centers, such as industrial zones, central business districts, and tourism hubs.</p>

FIGURE S.6

Transportation: Vision, Current Situation, and Projects

Vision	Current situation
<p>Reliable transportation and mobility systems will enable reliable, convenient, and secure movement of people and goods within Palestine, between Palestine and its neighbors, and between Palestine and the international community. A high-quality, multimodal transportation network will evolve, including transport by bus, train, air, and sea. Public transportation will be convenient and accessible while promoting sustainable and livable urban spaces. A transportation network will link the West Bank and Gaza. Citizens will have direct access to an international airport, and Palestine will have direct access to international markets for its exports and imports.</p>	<p>The transportation network is <i>fragmented, poorly planned, and in poor repair</i>, impeding free movement of people and goods within the West Bank, between the West Bank and Gaza, and between Palestine and the rest of the region. <i>Restrictions on movement</i> imposed by Israeli checkpoints and settler-only roads create an atmosphere of perpetual uncertainty, hindering routine tasks and undermining establishment of a stable and flourishing economy. The West Bank and Gaza have <i>constrained access</i> to the international economy.</p>
Transformative projects and initiatives	Examples
<p>Transformative projects and initiatives fall into four broad categories: new public transportation infrastructure, roads and internal connectivity, ports of entry, and administration.</p>	<p>Improved transportation institutional capacity and administration; a road network connecting major urban centers; multimodal transit hubs, including rail, bus, roads, and more; new ports of entry, including international airports and ports; a transportation administration integrating independent, private, and public systems.</p>

FIGURE S.7

Energy: Vision, Current Situation, and Projects

Vision	Current situation
<p>Palestine will be supported by a robust and resilient energy sector that ensures adequate energy for a better quality of life and promotes self-sufficient and independent economic development. This 21st-century energy network will be capable of transmitting, storing, transforming, and distributing both domestic and imported energy from diverse sources. The potential for renewable energy sources will be fully exploited. Use of gas resources in the Mediterranean will reduce energy costs and increase prosperity. Energy efficiency will guide Gaza's reconstruction.</p>	<p>The West Bank and Gaza suffer from <i>inadequate energy supply and infrastructure</i>, almost complete <i>dependence on outside energy sources</i>, <i>insufficient transmission infrastructure</i>, and fragmented and <i>inadequate utility governance</i>. There are opportunities and constraints with <i>alternative energy sources</i>.</p>
Transformative projects and initiatives	Examples
<p>Transformative projects and initiatives fall into three broad categories: energy sources, energy networks and transmission, and energy administration.</p>	<p>Additional energy sources, including solar photovoltaic systems, gas exploration and extraction, upgraded power plants, and waste-to-energy plants; upgraded networks and transmission, including substations, pipelines, and a continuous high-voltage transmission line; improved institutional capacity, administration, and financing.</p>

FIGURE S.8

Water: Vision, Current Situation, and Projects

Vision	Current situation
<p>Palestinians will enjoy abundant access to water at global standards, and water management will be efficient, sustainable, and cost effective. The Palestinians' role as the traditional stewards of their own resources will ensure that water resources are managed efficiently and fairly. All Palestinians will have access to sewage linkages, and sewage will be appropriately managed. Benefits from recycling gray water (such as in agriculture) will accrue to the Palestinian economy. Citizens will pay fairly for their use of water, with financing improved. Water will be managed jointly and equitably among countries of the region, using internationally acknowledged best practices for transborder watershed management.</p>	<p>Palestine lacks sufficient access to fresh water. Palestinians do not have access to World Health Organization <i>minimum per capita recommendations</i> for domestic consumption. Irrigation infrastructure and gray water reuse are underdeveloped. There is substantial leakage in its <i>poorly maintained distribution systems</i>. Water provision is not financially sustainable. <i>Gaza's water infrastructure</i> has been severely damaged. Increasingly, <i>pollution</i> from industry, agriculture, and sewage has contaminated water from springs and aquifers. Many do not have access to sewage linkages. Israel's good practice in water management can be a model.</p>
Transformative projects and initiatives	Examples
<p>Transformative projects and initiatives fall into four broad categories: water sources, distribution, sanitation and reuse for agriculture and environmental purposes, and water administration.</p>	<p>Additional water sources, such as wells and dams; repair or replacement of leaking pipes; improved distribution, including municipal infrastructure, water main pipe, desalination plants, and new connection points to the Israeli water system; repair and expansion of wastewater processing; reuse for irrigation purposes; and improved institutional capacity and financing.</p>

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Introduction

Most Palestinians aspire for normalcy: to live in freedom with dignity, raise their families, enjoy the rewards of hard work, and abide in peace and security alongside their neighbors, including Israel. The events of October 7, 2023, and the subsequent Israel-Hamas war have dramatically complicated these aspirations, deepening the urgency for meaningful steps toward peace, stability, and improved daily lives for Palestinians and Israelis alike.

The decades-long Israeli-Palestinian conflict can no longer remain a simmering issue. It demands meaningful resolution and bold, transformative action to secure a future of peace and stability for Palestinians, Israelis, the broader Middle East, and allies such as the United States. However, political and practical realities present immense challenges that require courage, commitment, and creative practical plans to overcome. Negotiations about the next steps for wider regional political and security problems are underway.

This report supports the technical aspects of developing a better future. We offer a vision for how spatial planning, infrastructure development, and resource management in the West Bank, Gaza, and East Jerusalem can improve the quality of life for Palestinians in the short term through impactful, practical projects, while preserving and supporting the long-term potential for an independent Palestinian state. We propose infrastructure projects that could begin in the short term at the local level even without a political solution, as well as larger strategic infrastructure projects that would require changes in governance authorities. Incrementally, over time, these projects can meet the needs of communities today and later comprise the essential physical infrastructure of a future state.

By both improving lives now and preparing for the future, the proposed spatial and infrastructure projects can serve as a catalyst for peace, stability, and sustainable development in the West Bank and Gaza. We aim to contribute a tool for dialogue and rational planning, offering an integrated, technical approach to aid diplomacy.

Why Now?

Why develop a spatial vision for Palestine now?¹ The terrible events of the October 7, 2023, attack on Israel by Hamas, which left more than 1,200 Israelis dead and 240 kidnapped, triggered a devastating Israeli military response that has displaced more than 1.9 million of Gaza's 2.2 million residents, killed more than 46,000 Gazans (with one credible estimate placing the death toll at 64,000 as of June 2024), and reduced much of the Gaza Strip to rubble (United Nations [UN] Population Fund, undated; "Explainer: Gaza Death Toll: How

¹ Although U.S. policy is to promote a Palestinian state, the U.S. government does not recognize such a state, referring to the West Bank and Gaza as the *Palestinian Territories*. We also adopt this position; for convenience, we refer to the Palestinian Territories as *Palestine*.

Many Palestinians Has Israel’s Campaign Killed?” 2024; Jamaluddine et al., 2025).² Trust on both sides is at an all-time low. The fighting has metastasized, engaging Lebanon, Iran, Yemen, and Syria, as well as the United States. The fighting between Israel and Hezbollah in Lebanon displaced some 100,000 Israelis and 1.3 million people in Lebanon (UN High Commissioner for Refugees, 2024). A ceasefire in Gaza in January 2025 provided hope for an end to the fighting, although there is the expectation that instability could continue for years.

In the decades since the signing of the 1993 and 1995 Oslo Accords, which were intended to be temporary, five-year agreements that led to a longer-term Israeli-Palestinian peace agreement, both Israelis and Palestinians have lost faith in the process (Makovsky, 2001). There has been a series of peace conferences, summits, and U.S. presidential initiatives, all of which have failed to make any substantial progress, for reasons well documented elsewhere (Shlaim, 2000; Ross, 2004; Kurtzer et al., 2013).³ Lack of movement on a political process has been considered as both a cause and an effect of repeated rounds of violence. Efforts to improve infrastructure in the West Bank and Gaza by donors and aid agencies have also encountered failure.

Despite this grim reality, the Palestinian issue is again on the world agenda for the first time in decades. The immense shock and appalling horrors of this war have heightened awareness that new initiatives are needed to better circumstances for both Palestinians and Israelis and to promote future Middle East stability. A “grand bargain” has been envisioned in which many difficult and complicated dimensions (such as security, governance, and reconstruction) come together at the same time. There is an urgent need for new ideas, fresh approaches, and a renewed commitment to economic development and political reform instead of a continuation of paused progress. Emerging strategies, plans, political realignments, and negotiations offer a rare opportunity to move beyond the past. This moment offers hope for crafting a future that stabilizes the region and addresses Palestinian, Israeli, and regional needs.

In the long run, we are assuming the eventual evolution of a Palestinian state (based on extensive prior studies about what would be necessary for a state to succeed⁴) that includes both the West Bank and Gaza; is administered by one politic, with a corridor between the West Bank and Gaza; and upholds peace and security among the neighbors of the region. Promoting an independent Palestinian state has been the formal policy of almost all U.S. administrations. At the same time, this is hard to envision evolving quickly and is not necessary to begin some of the immediate steps of our spatial plan, although many of the bigger and more strategic efforts may require different governance and decisionmaking circumstances. Successful states have good governance based on popular legitimacy, sound internal security, and economic viability. Earlier RAND studies found that a successful Palestinian state needs to be both territorially *contiguous* and *permeable* (Palestinian State Study Team, 2007)—i.e., one unified whole in which the movement of goods and people across borders is easy and predictable. States have defined borders and governance authority within those borders. Our sector maps reflect these ideas, offering strategic projects within a contiguous West Bank and between the West Bank and Gaza.

We recognize the daunting security, governance, and diplomatic considerations that must be addressed for the long term. In this report, we do not make recommendations about these needed steps. Others have taken on those questions (Ries et al., 2025). Instead, we offer a technical infrastructure planning tool that can be used by Palestinians, Israelis, the United States, neighboring countries (including Egypt and Jordan), the

² In an article in *The Lancet*, researchers using capture-recapture statistical methods placed the number of dead at more than 64,000 in June 2024, 41 percent higher than the official count because of uncounted bodies buried in the rubble. Furthermore, their estimate and others found that approximately 60 percent of those killed were women, children, and people over 65 (Jamaluddine et al., 2025).

³ See also Aronoff, 2009; Pundak, 2001; and Podeh, 2014.

⁴ Suisman et al. (2005) and Palestinian State Study Team (2007) found that, for a Palestinian state to succeed, it must be both contiguous and permeable in the sense of trade and travel. Other key studies include Prime Minister’s Office, Palestinian Authority, 2021; White House, 2020; Lang and deLeon, 2016; and Office of the Quartet, 2023a.

European Union and its member states, the Gulf Cooperation Council countries, and multilateral donors as they negotiate the future.

We hope that, from these darkest days of war, a lasting peace can emerge, enabling the people of this land to live in freedom, normalcy, dignity, and prosperity.

A Focus on Sectors

Six sectors—governance, environment, cities, transportation, energy, and water—provide a framework for our analysis. For each sector, we offer a vision statement that proposes an ideal, summarize the current situation and challenges, describe a set of transformative projects and initiatives that may help to achieve the vision and address the challenges, and provide illustrative maps. Projects focus on infrastructure, and related initiatives enhance the institutional capacity for the infrastructure projects. We provide an extensive list of some 200 projects, organized by sector (see Appendix A).

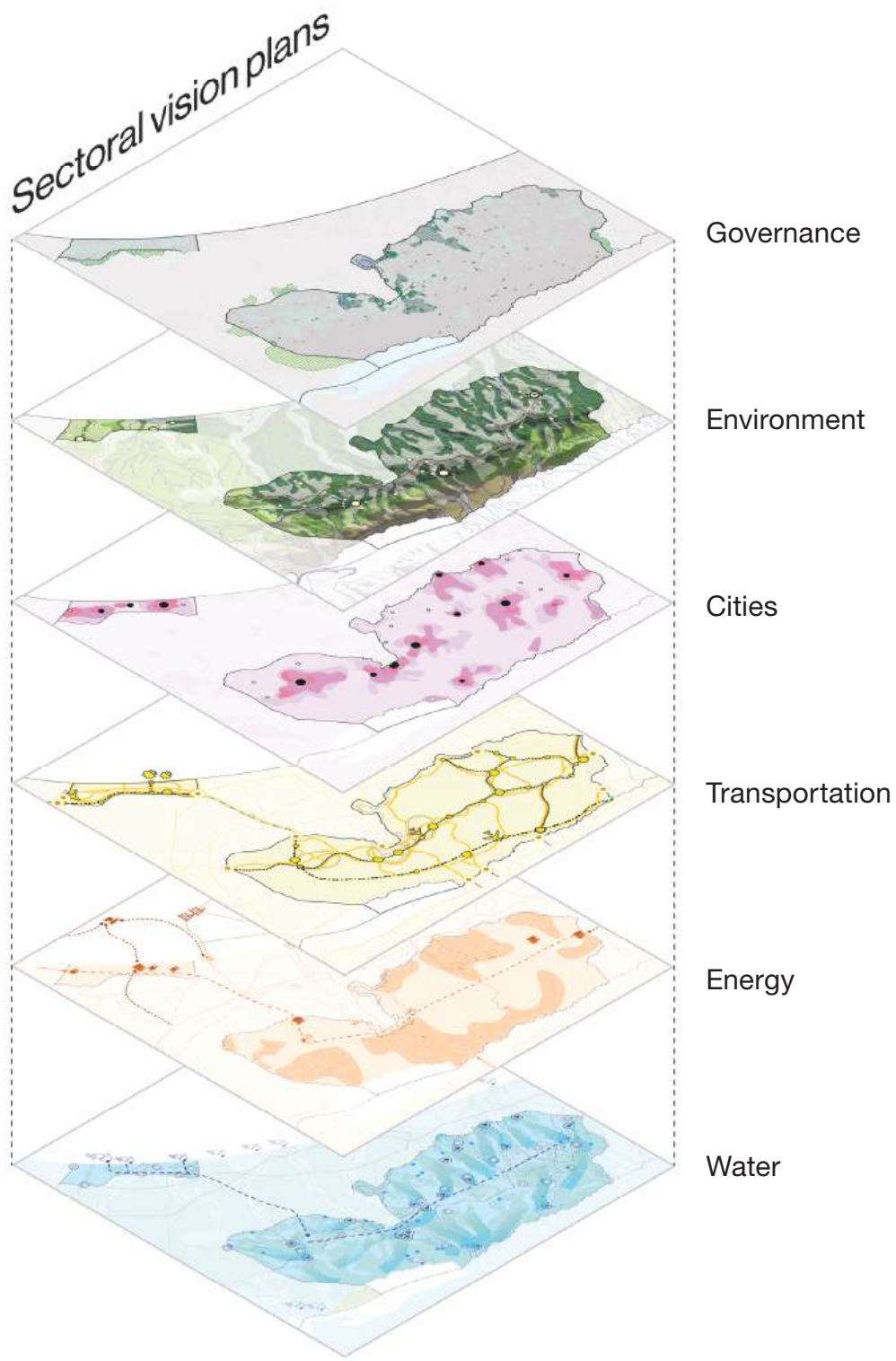
This report is not a final plan. It is meant to start the conversation, not to end it. It is also meant to be a tool for later prioritization and phasing among potential projects, with extensive engagement among Palestinians, Israelis, and global stakeholders. We plan to continue this effort, providing more-detailed analysis of some of the projects and a plan for implementation.

We define our six sectors as follows:

- **Governance** encompasses decisionmaking authority over infrastructure planning in the West Bank and Gaza. It includes considerations for jurisdiction, administrative oversight, security, borders, and land ownership.
- **Environment** focuses on clean water and land. It includes watershed management and waste management, as well as rubble and unexploded ordnance.
- **Cities** includes the capacity for cities to absorb expected population growth, as well as the health of economic infrastructure and civic institutions.
- **Transportation** includes heavy and light rail, roads, air, and maritime considerations. It involves ease of connection within Palestine and ease of connection for travel and trade with other countries.
- **Water** includes sustainable water sources, wastewater infrastructure, and delivery methods.
- **Energy** includes energy sources, distribution, and financial sustainability.

As shown in Figure 1.1, we conceptualize these sectors as layers of a deeply interconnected system. Our process of integrated design used those layers toward planning purposes (McHarg, 1969; Berger, 2009). *Integrated design* is a comprehensive and holistic mode of urban planning practice in which factors that are normally examined in isolation are reconsidered collectively and simultaneously to understand how they affect and are affected by one another. In our spatial vision, integrated design underpins an approach in which, for example, transportation and environmental considerations interact with urban development simultaneously. It is an iterative process in which the layers, as they inform each other, are modified to account for the interactions. We identified locations where the design elements from each sector are most synergistic, and we illustrate how various sectoral considerations come together in six example cities.

FIGURE 1.1
Six Layers of Sector Maps



Our Project-Based Approach

In terms of the projects and initiatives, we offer both those projects that we believe could begin in the short term (three to five years) and longer-term, more ambitious projects that would require more time or diplomatic agreements. Through this approach, we aim to illustrate that, despite the current challenging environment, (1) there are steps that can be taken now to improve Palestinian lives, and (2) longer-term strategic investments may be used as a key component for generating future prosperity and security. Indeed, we hope that some of the projects and initiatives we describe may serve as win-win opportunities for many stakeholders.

A project-based approach to national development allows us to disaggregate a broad, overarching vision into a series of smaller, manageable projects that contribute to long-term goals. This approach is particularly useful in environments in which political instability and a weak regulatory enforcement limit the effectiveness of large-scale, policy-driven change, such as land-use or zoning laws. By focusing on concrete, achievable projects, stakeholders can make incremental yet tangible progress, building trust, momentum, and a foundation for future development.

By creating a succession of interlinked projects, this approach turns an ambitious vision into a series of practical steps. The success of each project could generate support and momentum, potentially leading to more-involved undertakings that collectively and incrementally drive the region toward its aspirational vision.

The projects vary widely in scale and scope—from improving public infrastructure, such as roads, transit systems, and utilities, to developing new green spaces or affordable housing. Each project, by virtue of being finite and focused, is easier to fund, manage, and complete, making it possible to demonstrate progress even if the political landscape shifts or resources are limited.

In our approach, projects are structured to align with the spatial vision: Each project serves as a building block that contributes to a stable foundation and incrementally advances national goals. While a comprehensive vision may not be achievable in the short term, smaller, actionable projects can begin within the next three to five years, delivering tangible benefits to Palestinians, Israelis, and the broader region. These projects aim to foster economic development, improve environmental conditions, enhance mobility, and strengthen security. By being practical, mutually beneficial, and technically feasible, these initiatives can obtain the approvals and resources needed for implementation. A combination of small-scale, community-oriented projects (such as urban redevelopment efforts) and larger infrastructure undertakings (such as waste-to-energy and sanitation reuse facilities) works to balance immediate needs with long-term impact. Moreover, targeted programs promoting policies for sustainable development, job creation, or environmental protection can reinforce these projects, gradually transforming the physical and socioeconomic landscape.

We note that some projects are from our analysis, while others are drawn from the extensive planning previously conducted by Palestinian planning authorities, multilaterals, or other initiatives. We include the full list under one strategic spatial vision.

To demonstrate that we are truly proposing a long-term plan that can begin now, per this report's title, we identify projects in each chapter that could be feasible in the short term, along with the rationale for why. Projects could be feasible now for multiple reasons: because they are projects in Areas A and B in the West Bank, over which the Palestinian Authority (PA) has civil and administrative authority; projects in parts of Area C of the West Bank (the parts over which Israel has administrative control) that are not viewed as sensitive to Israel (e.g., not near military facilities); recovery projects in Gaza; projects that are in the mutual interest of both the Palestinians and Israelis; projects that are already underway or permitted; and projects that are not fully dependent on the land (such as institutional capacity-building).

For example, projects that could be feasible now include continuing mapping of property ownership and registration in the West Bank, improving border screening, removing rubble and unexploded ordnance in

Gaza, developing a bus rapid transit (BRT) system in some cities in the West Bank, improving landfills and solid waste management, reforming the financing of water and energy, and developing Mediterranean gas.

Other projects, such as a West Bank–Gaza connector road, solar farms in the West Bank, a Gaza port and airport, and a railway with international connections, may require longer-term negotiations and authorities. Some projects may face barriers in the short term because they require additional Palestinian technical capacity or legal reform, require Israeli permits, are located in sensitive areas of Area C, face archaeological considerations, require currently unavailable financing, or require transit through areas with checkpoints.

Methods and Limitations

To conduct our analyses, we drew on our multinational team’s expertise and experience in the West Bank, Gaza, and Israel; postconflict recovery elsewhere; urban and infrastructure planning; refugee management; and Middle East security, development, and economics. We conducted a literature review and secondary data analysis related to Israeli-Palestinian negotiations, critical infrastructure, environmental development, economic development, and security. We incorporated consultations with Palestinian government officials, private sector leaders, and planners in Ramallah, Jerusalem, and Washington; Israeli government officials and scholars in Tel Aviv, Jerusalem, and Washington; U.S. government officials; and regional and international stakeholders. We conducted site visits to multiple locations in the West Bank, East Jerusalem, and Israel.

Our study builds on previous spatial planning for Palestine while incorporating new analysis and current spatial, economic, political, and security circumstances. In particular, this work builds on two RAND reports: *The Arc: A Formal Structure for a Palestinian State* (Suisman et al., 2005), which provided an earlier spatial vision on which many subsequent plans have been based, and *Building a Successful Palestinian State* (Palestinian State Study Team, 2007). Our analysis also builds on a rich literature of other planning documentation, including *Global Palestine, Connected Gaza: A Spatial Vision for the Gaza Governorates*, a collaboration between the Palestinian private sector and the Portland Trust (AECOM, 2016); *Palestine’s Road and Transportation Master Plan* (Palestine Ministry of Transport and Communications, 2016); and a body of work by Salem Thawaba and colleagues, including *Regional Plan: West Bank & Gaza Strip* (Thawaba et al., undated). For Gaza, we draw on plans and analysis that were conducted before the war, as well as the limited data available about the current status of infrastructure.

To develop our spatial planning maps and analysis, we collected available statistical and geospatial data and reports from governmental, multilateral, and academic sources and categorized and integrated the information for each sector. Integrating previous analyses, we developed maps on which we aggregated our new analyses according to the sectors and considerations that we heard about most frequently in our interviews and that were highlighted in the literature.

The sources for each of the sections in our chapter structures are as follows:

- The *visions we present for each sector* reflect insights from the interviews, team workshops, the literature, and analysis of needs and solutions to address the main issues identified in the current situation and future trends analysis.
- The descriptions of the *current situation* are based on insights from the interviews, our literature reviews related to each sector, and analysis of current spatial and map data.
- The *transformative projects and initiatives* include categories of projects that would address the needs identified in the vision and current situation analysis of the sector, along with specific projects and locations when feasible. To develop the list, we reviewed the main government and international reports and asked about influential or significant projects in interviews. A full list of projects appears in Appendix A. We did not fully prioritize or sequence the projects. Prioritization should happen as a next step,

using this report as a basis and in consultation with Palestinian, Israeli, and global stakeholders. At the same time, we offer examples of projects that we view as feasible in the short term.

- The *maps* are based on multiple Geographic Information System (GIS) data sources, as well as team design techniques and the visions and transformative project lists. The data sources for the maps are listed in Appendix B.

Our methods have several limitations. Given the ongoing war in Gaza at the time of our study, we could not conduct as many site visits and in-person stakeholder consultations with Palestinians and Israelis as initially planned, and we could not visit Gaza. The war also affected data availability and accuracy related to infrastructure: We did not have access to government data for several key sectors, such as energy, relying on other data sources when necessary.

Roadmap for the Report

This report is organized as follows. In Chapters 2 through 7, we provide analysis of the sectors in our spatial vision: governance, environment, cities, transportation, energy, and water. In each sector chapter, we describe a long-term vision, detail challenges of today's reality, present projects and initiatives, include maps, and offer examples of projects that can be implemented in the next three to five years, despite current realities. In Chapter 8, we develop views of how these projects could be implemented in six cities in the North Jordan Valley, Jericho, Nablus, East Jerusalem, Hebron, and Gaza City. Concluding remarks in Chapter 9 offer next steps.

Governance

A Vision for Governance

Palestine will have the jurisdiction over the land, good governance, security, and rule of law required for carrying out the infrastructure projects and initiatives described in this report. We envision governance based on popular legitimacy and technical capability in order to enable a flourishing civilian life, a thriving economy, and internal security. Inside its agreed-upon borders, the Palestinian government will maintain full civil, administrative, and security control. It will make public decisions about land use and about the development and preservation of natural resources. Palestine will be both territorially contiguous and permeable (Palestinian State Study Team, 2007)—i.e., one unified whole in which the movement of goods and people within and across borders is easy and predictable. In the long term, Palestine will transition from its current challenges to a stable and economically viable state, with interim measures to get there.

The Current Situation

This spatial vision starts with a determination of the land to be included, its boundaries, and authority over decisions about how the land is used. Palestine confronts major challenges with these dimensions. There is *no consensus about appropriate borders*. Negotiations have been inconclusive, and proposed borders have differed under various proposals. There is a *lack of contiguity*. The West Bank is fragmented into Areas A, B, and C, isolating Palestinian cities from each other, and there is no land connection between the West Bank and Gaza. *Israel's control over land use in Area C* constrains Palestinian building efforts and the allocation and protection of natural resources. Israeli settlements and land use for other purposes consume an increasing percentage of land in Area C. *A lack of clear land ownership and registration* hampers the building of large-scale public works. *Ongoing security and governance challenges* among Palestinians inhibit the development of the large-scale infrastructure projects envisioned here.

No Consensus About Borders

Historical negotiations over borders and governance have been inconclusive. The borders of Israel and Palestine have evolved through conflict and negotiations since the UN partition plan of 1947 and the creation of Israel in 1948 following the first Arab-Israeli war. Two wars and two main governing agreements were particularly instrumental in shaping the present environment in the West Bank and Gaza: the 1967 Arab-Israeli War, the 1993 and 1995 Oslo Accords, the 1994 Paris Agreements, and the ongoing (as of this writing) Israel-Hamas war in Gaza.

In 1967, amid deteriorating relations with its neighbors—Egypt in particular, which had troops gathering on the border—Israel launched a series of preemptive attacks on neighboring states. Over the six days of the war, Israel took control of the West Bank and East Jerusalem (from Jordan), Gaza and Sinai (from Egypt), and the Golan Heights (from Syria). Eventually, Sinai was returned to Egypt, the Golan Heights and East Jerusa-

lem were annexed by Israel, and the West Bank and Gaza became occupied territories. Peace agreements with Jordan (1994) and Egypt (1979) were later signed. Israel unilaterally withdrew from Gaza in 2005.

The Oslo Accords, agreements between Israel and the Palestinians signed in 1993 and 1995 (Government of Israel and Palestine Liberation Organization, 1993; Hassan, 2011; Smith, 2016), were meant to be temporary: An interim five-year phase before a final political agreement, including borders, would be negotiated (Barak, 2005). The accords stipulated shared Palestinian-Israeli security and oversight of parts of Palestine, as described in the following section, and that the West Bank and Gaza constituted one territorial unit, with the exclusion of Jerusalem. However, absent a political agreement, the terms of the Oslo Accords have endured for more than 30 years.

Lack of Contiguity

The Oslo Accords divided the West Bank into Areas A, B, and C (as shown in Figure 2.1) (Government of Israel and Palestine Liberation Organization, 1995; Niksic, Nasser Eddin, and Cali, 2014; Frisch, 2016). This allowed Israel to maintain administrative and security control over the majority of the land of the West Bank, as follows:

- Area A (approximately 22 percent of the West Bank) falls under full Palestinian governance and security control.¹
- Area B (approximately 18 percent of the West Bank) is under Palestinian civil authority and shared Israeli-Palestinian security responsibility, with Israel having ultimate control.
- Area C (approximately 60 percent of the West Bank, including Israeli-declared East Jerusalem) is under full Israeli security and administrative control, although the PA provides educational and health services to Palestinians in Area C. Area C includes all Israeli settlements (except two, in Hebron and East Jerusalem) and two-thirds of the West Bank's fertile agricultural land (UN Conference on Trade and Development, 2015).²

Area C separates Palestinian population centers. Area C is a continuous territory, whereas Areas A and B are fragmented into 166 separate enclaves (Kadman, 2013). This isolates Palestinian cities from each other in a way that facilitates Israeli security management (Dekel, Cohen, and Shalev, 2023). It has left Palestinians living in noncontiguous enclaves, an archipelago of isolated population centers surrounded by occupied land that is sometimes characterized as “confetti” or “Swiss cheese” (terms we heard in our interviews). This affects Palestinian freedom of movement, inhibits many plans that would improve the economy of the West Bank, degrades the Palestinian physical environment, and has led to urban development that is constrained by these divisions of land.

There is no land connection for most Palestinians between the West Bank and Gaza. Palestinians are not able to drive between the two territories, with the exception of some individuals who have special permits. This constrains economic activity, family engagement, and cultural life.

¹ Although Area A is supposed to be under full PA control, the Israel Defense Forces often conduct incursions into Area A.

² The term *outpost* is commonly used to refer to usually small areas of land taken over by Israeli settlers who seek to expand the number settlements in the West Bank. They are illegal under Jewish law but historically have often been made legal settlements over time by Israel.

Israel's Control over Land Use in Area C

Israel has designated significant parts of the West Bank for its own purposes, including settlements. Israel has designated about 60 percent of Area C as various types of state land that is not available for Palestinian use or development (B'Tselem, 2019). These designations include formal annexation, settlements, national parks, nature reserves, declaration of land as state land, large areas declared as military zones, seizure of absentee property, and designation of land for public needs (UN Economic and Social Commission for Western Asia, 2022). Of this land, Israel has designated 18 percent of the West Bank in the Jordan Valley (home to 6,200 Palestinians) as closed military “firing zones,” where construction is not permitted and Palestinian property is often confiscated (UN High Commissioner for Human Rights, 2024).

Israel built walls and buffer zones inside the 1967 border line to separate Israel, the West Bank, and Gaza, which reduces land areas usable to Palestinians. From 2002 to 2007, Israel built walls to prevent attacks following the second intifada. Eighty-five percent of the West Bank wall is within the West Bank, east of the 1949 Armistice Line, creating a “seam zone” of roughly 9 percent of the West Bank in which special permissions for Palestinian movement are required (UN Office for the Coordination of Humanitarian Affairs, 2022). In Gaza, during the Israel-Hamas war, Israel built an additional fence about one kilometer inside the border, which accounts for 16 percent of the Gaza strip (Specia and Gladstone, 2018; Kingsley, Bergman, and Harouda, 2024; Saeed et al., 2024).

With control over Area C, Israel maintains decisionmaking authority over permitting, land use, and most of the West Bank's natural resources. The Israeli government institution for Coordination of Government Activities in the Territories (COGAT) holds decisionmaking authority over permitting for buildings, including those related to infrastructure, public works, and housing (Government of Israel, undated). Between 2009 and 2018, COGAT approved only 2 percent of Palestinian permit applications. As a result, Palestinians often build without permits (UN Office for the Coordination of Humanitarian Affairs, 2021). From 2011 to 2018, Palestinian communities in Area C drafted development plans with European Union and multilateral support. By 2018, only five of 102 plans had been approved by COGAT (B'Tselem, 2019).

Lack of Clear Land Ownership and Registration

Land ownership in many parts of the West Bank and Gaza is unclear, with full registration lacking. Many property records are missing, and ownership is often subdivided among multiple generations (UN, 1980). In addition, after the 1967 war, Israel halted land registration in the West Bank; as a result, many Palestinians have been unable to register land or prove ownership (Brown, 2024). This legal limbo impedes active management of land and water for economic, agricultural, public services, and environmental purposes. The UN Human Settlements Programme (UNHabitat) has piloted a project to map land ownership, tracing ownership back to Ottoman and British property laws (Durzi, 2021). In Gaza, land and property ownership may be even more unclear due to the war's destruction and its implications for establishing shares in buildings and property records.

Ongoing Palestinian Governance and Security Challenges

The war in Gaza has led to renewed calls for Palestinian governance and security reform. Palestinian government authorities struggle with legitimacy, rule of law, resource management, and maintaining security. The PA was established in 1994 as an interim governance authority for five years, after which the Oslo terms envisioned that talks would decide permanent governance. Yet permanent governance structures have not emerged. As time has passed and as elections have not happened since 2005, the PA has lost much of its legitimacy (al-Omari, 2023; Ries et al., 2025). President Joe Biden also called for a “revitalized” PA (Weissert, 2023). Surveys indicate that Fatah and the PA are considered corrupt and ineffective by the public (“What Is

the Palestinian Authority and What Is Its Relationship with Israel?” 2023). In addition, the West Bank and Gaza have been separately governed since 2007 and lack a single leadership voice, with Fatah in control in the West Bank and Hamas in Gaza. Furthermore, parts of the West Bank have remained outside PA security control, instead controlled by militant groups, particularly in the refugee camps (Lahlouh, 2023).

There are multiple proposals for governance and security reform in the West Bank and Gaza after the war. Although we do not address larger questions of governance and security in Palestine in this report, we acknowledge the need for such work and focus on the narrow part of governance that enables infrastructure planning. Good governance, rule of law, security, and technical capacity are prerequisites to implementing the expansive vision that we propose here. There are multiple other proposals regarding security and governance in the West Bank and Gaza, as well as the security and governance steps that would be needed for the transition to a longer-term consideration of a state.

A Map of the Current Situation

Figure 2.1 provides a snapshot of the governance situation in Palestine. The map highlights the fragmentation imposed by the establishment of Areas A, B, and C and the isolation of Gaza from the West Bank. Area A is shown in green, Area B in beige, and Area C in white, with Israeli settlements shown in dark blue. Area C can be seen separating all the Palestinian population centers in Areas A and B from each other. The red line illustrates the border wall. Red circles illustrate border crossings to Israel, Jordan, and Egypt. There are three border crossing points in Gaza, with two to Egypt. There are two crossing points between the West Bank and Jordan. The King Hussein/Allenby Bridge crossing is located centrally in the West Bank, while the southern Wadi Araba/Yitzhak Rabin crossing is located near Aqaba.

Transformative Projects and Initiatives

Below, we profile projects that address some of the governance-related challenges facing Palestine. Details of these projects appear in Appendix A. The projects fall into three broad categories, as listed in Table 2.1.

TABLE 2.1
Governance Projects and the Challenges They Address

Project or Initiative Category	Challenges Addressed
Borders and jurisdiction	<ul style="list-style-type: none"> No consensus about appropriate borders Lack of contiguity Israeli control over land use in Area C
Border crossings	<ul style="list-style-type: none"> Ongoing security and governance challenges Israeli control over land use in Area C
Administration	<ul style="list-style-type: none"> Israeli control over land use in Area C Lack of clear land ownership and registration Ongoing security and governance challenges

FIGURE 2.1
Governance: The Current Situation



SOURCES: OCHA, NTMP, MoT, MoLG, CEP, ORG. See Appendix B for more information.

Borders and Jurisdiction

We undertook this study with a set of assumptions, based on extensive prior studies,³ regarding what would be necessary in a spatial vision for an independent Palestinian state living in peace and mutual security with its neighbors *to succeed*. In the long run, we assume the eventual evolution of a Palestinian state that includes both the West Bank and Gaza and is administered by one entity with good governance based on popular legitimacy, sound internal security, and economic viability. All of this is hard to envision evolving quickly; at the same time, it is not all necessary now to begin our spatial plan.

States have defined borders and governance authority within those borders. According to earlier RAND studies, a successful Palestine also needs to be both territorially “contiguous” and “permeable” (Palestinian State Study Team, 2007)—i.e., one unified whole where movement of goods and people across borders is easy and predictable. We assume that, eventually,

- agreement between Israelis and Palestinians, with backing of key stakeholders such as the United States and neighboring Middle East countries, will be reached on borders
- a plan will be developed for phased full Palestinian civil and administrative control of what are today Areas A, B, and C.

Border Crossings

Border crossings will be designed to facilitate easy movement of goods and services. Plans will be developed for management of ports of entry, including air and seaports, as well as border crossing points. Such projects and initiatives include the following:

- Improved *border crossings* will be strategically placed, connecting Israel, the West Bank, and Gaza and providing easy and secure passage for people and goods to neighboring countries in all directions.
- *Border control mechanisms* will include joint border coordination centers, joint border security forces responsibilities, customs services, and customs police. The Palestinian government will coordinate with its neighbors Israel, Jordan, and Egypt on maintaining cross-border security.
- *Technology and surveillance* for border monitoring, passport, and customs control, as well as other necessary border and crossings controls, will be implemented.

Administration

Administration projects and initiatives include the following:

- Initiatives will be supported by *trade agreements*, laws for crossing, taxes, and technology to facilitate rapid crossings for goods and people.
- The Palestinian government will upgrade its *capacity to make public decisions* about land use, infrastructure projects, and the development and preservation of natural resources within its borders.
- International organizations will provide support for *capacity-building* for a new Palestinian spatial planning institution.
- Upgrades will be made to West Bank and Gaza security force communications, cellular networks, information technology systems, and cybersecurity systems to support security force and emergency services command, control, and communications.

³ Suisman et al. (2005) and Palestinian State Study Team (2007) found that, for a Palestinian state to succeed, it must be both contiguous and permeable in the sense of trade and travel. Other key studies include Prime Minister’s Office, Palestinian Authority, 2021; White House, 2020; Lang and deLeon, 2016; and Office of the Quartet, 2023a.

- Extending UNHabitat’s pilot, a land ownership reorganization effort, will establish a property ownership inventory for all of the West Bank and Gaza in order to enable decisions about land use and development.

Map of the Vision

There have been multiple proposals for borders for a two-state solution. In this report, we do not take a position on what the borders should be, just that they should be negotiated and agreed upon. Proposed borders for the West Bank have differed under various proposals. Since the 1967 war, the pre-1967 war boundaries (called the Green Line), plus or minus land swaps, have formed the basis of almost all negotiations on the borders of an independent Palestinian state. However, even among Palestinians and Israelis who support a two-state solution, opinions differ about where borders should be, which lands should be swapped, what percentage of land will be swapped, and the quality of that land. Most major proposals envision Israeli settlements contiguous with the Green Line and particularly large settlements around Jerusalem as prime areas to be swapped. The major exception to this framing is the 2020 Trump administration proposal that Palestinian population centers in the West Bank be connected with roads and tunnels, with the enclaves surrounded by an enlarged Israel, instead of the West Bank being a fully contiguous area (White House, 2020).

As an example, Figure 2.2 overlays the Israeli and Palestinian proposals from the 2008 Annapolis summit, a meeting at which both sides made offers that were the closest in terms of border locations and amount of land swaps (4 percent by the Palestinians and 6.5 percent by the Israelis). The Israeli proposal is in blue, and the Palestinian proposal is in green. We show the 2008 proposals to illustrate that, at various points in time, both parties have had positions on borders that have been close to reconcilable.





What Is Feasible Now?

Palestine cannot thrive without the necessary robust institutional and governmental capacity. This is a matter of managing both internal resources and external support from the international community. Many of the listed projects and initiatives will be difficult to achieve in the short term. Having said that, there are several capacity-building and legislative initiatives that are already under discussion. There are no immediate obstacles, for example, to *building up the newly established Ministry of International Cooperation and Planning*, which will play a key role in coordinating and managing the resources needed for rebuilding Gaza. Upgrades to border crossings, such as at Allenby, have been ongoing for several years, and such investments may continue. Finally, we know that resolving issues of land tenure is essential for meaningful investment at both the local and national levels. In this case, our suggested project would only have to *expand the pilot initiative by UNHabitat*.

FIGURE 2.2
Governance: A Vision





BORDER PROPOSALS—2008 NEGOTIATIONS



-  1967 border
-  2008 Israeli border proposal
-  2008 Palestinian border proposal
-  Palestine

LAND SWAPS—2008 NEGOTIATIONS


Land added to Israel

-  Overlapping proposal
-  Non-overlapping proposal

Land added to Palestine

-  Overlapping proposal
-  Non-overlapping proposal

EXISTING BUILT AREA

-  Built area

SOURCES: OCHA, NTMP, MoT, MoLG, CEP, Shaul Arieli, ORG. See Appendix B for more information.

Environment

A Vision for the Environment

Palestine will have a clean environment that supports the needs of the population and the economy. Watersheds and environmentally sensitive lands will be protected to conserve access to water, with best practices in transboundary watershed management for the region. Solid waste will be managed according to global standards. Resources for agriculture will be managed responsibly, and traditional knowledge and practices will be resurrected. Areas for parks and open space for people will be preserved. Resources will be sustained for future generations. A sustainable Palestine is achievable if the underlying natural systems are acknowledged and reinforced in planning, with environmental systems that account for climate change shaping future development patterns.

The Current Situation

A spatial vision includes the underlying foundation of environmental systems—watersheds, streams and rivers, topography, and climate. Natural systems are fragile and at risk of being absorbed by urbanization and resource extraction. Palestine’s fragile watersheds are *poorly managed*—an even more urgent concern given the effects of climate change. Increasingly, *pollution* from industry, agriculture, and sewage is contaminating water from springs, reducing access to clean water. The war has reduced most of Gaza to rubble. To make the land safe for agriculture and parks and provide open space for people, the *rubble will need to be cleared*, as will the large numbers of *explosive hazards*.

Fragile Watershed Management

The West Bank’s ridgeline defines its topography and watersheds. The West Bank is dominated by its heavily populated mountain range, running from Nablus in the north to Hebron and Yatta in the south. The ridgeline divides the West Bank: The western slopes drain into the Mediterranean Sea through Israel, and the eastern slopes drain into the Jordan Valley and the Dead Sea. Rainfall on the western slopes is greater than on the dryer eastern slopes.

Climate change is projected to make the region hotter and dryer, making sustainability of watersheds and water bodies even more critical. Temperatures in Palestine are rising, and rainfall is decreasing (World Bank, 2018a). The UN estimates declining precipitation for most parts of the Middle East, by up to 30 percent by 2050 (Palestinian Team, 2014). As a result of drier weather and overuse, the discharge of springs in the West Bank shrank by 60 percent between 2005 and 2011 (53.64 million cubic meters [MCM] to 21.03 MCM) (Palestinian Team, 2014). Seawater incursion is worsening the salinity of Gaza’s Coastal Aquifer (Hall, Kirschenbaum, and Michel, 2024). Water levels in the Sea of Galilee, Jordan River, and Dead Sea have been dropping, with water quality declining.

Fragile natural systems face risks related to climate change. The region's semi-arid to arid climate zones and limited freshwater resources make its ecosystems particularly vulnerable to degradation. Excessive extraction of groundwater, deforestation, and soil erosion significantly threaten the well-being of local ecosystems. In addition, climate change affects agricultural productivity by influencing crop yields and livestock health, posing a threat to food security and local economies reliant on agriculture.

Natural springs and aquifers are increasingly polluted and have reduced reserves (Palestinian Central Bureau of Statistics, 2023a). About 90 percent of Gaza's water supply comes from the Coastal Aquifer Basin, and 10 percent comes from desalination plants or is purchased from Israel's national water company, Mekorot (Wilson, Oliver, and Newman, 2023). The Coastal Aquifer faces severe risks caused by over-extraction, saltwater intrusion, and sewage infiltration. This water is brackish and salty: 96 percent of it is not potable (Baba and Neuman, 2023; World Bank, European Union, and United Nations, 2024). Groundwater in the West Bank is contaminated by high levels of chlorides and nitrates due to unregulated vehicle dismantling and e-waste industries from both Palestinian industry and Israeli settlements and, in places, is polluted by electronic waste coming from Israel and processed in Palestine (UN Environment Programme, 2020a).

Palestine, Israel, and Jordan share watersheds, making their management of natural resources by definition a joint undertaking. Israel and Palestine are interdependent on many shared watersheds and natural resources. For example, Wadi Gaza, the most important waterway in Gaza, is part of the larger Ash-Shalala Basin that is also shared with Israel and the West Bank. This means that water management in Hebron and Yatta in the West Bank and in Be'er Sheva in Israel has a profound impact on the water quality of Gaza's largest stream, and runoff pollution in Qalqiliya is shared by Tel Aviv (Fuks et al., 2017). Stormwater from Be'er Sheva or agricultural lands of the Negev flow into Wadi Gaza. The northern aquifer is under both the West Bank and Israel. This interdependence presents challenges, but it may also present opportunities for regional cooperation that is in everyone's interest.

Pollution from Inadequate Solid Waste Management

Solid waste management in the West Bank and Gaza is not up to global standards, leading to pollution in populated areas, health risks, and environmental degradation. Leaching from solid waste and unregulated industries is degrading surface and groundwater sources, as well as marine ecosystems, placing severe pressure on ecosystems (UN Environment Programme, 2020a). Sanitation issues in the West Bank and Gaza affect Israel. For instance, pollution that runs into the Mediterranean Sea has, on occasion, polluted the beaches in Tel Aviv.

Solid waste infrastructure and management are insufficient today and lack surplus capacity to accommodate future needs. There are seven operational landfills in Palestine: five in the West Bank (including one Israeli-managed landfill in the Jericho Governorate) and two in the Gaza Strip. Many are receiving more waste than originally planned and are likely to reach full capacity before anticipated (Thöni and Matar, 2019; UN Environment Programme, 2020a). Furthermore, waste is delivered to 12 solid waste transfer stations in the West Bank, where it is further routed to the landfills, but there is insufficient coordination between the transfer stations and their destination landfills. In some cases, the building of new landfills in Area C has been held up due to legal disputes in Israeli courts or the lack of Israeli permits (Abdel-Baqi, 2023).

Nearly half of all solid waste is deposited in unsanitary dumpsites, not managed landfills (UN Environment Programme, 2020b). The Palestinian Ministry of Local Government estimated that there were 83 dumpsites in the West Bank in 2018 (Thöni and Matar, 2019, p. 46); however, reliable data on waste and an up-to-date list of uncontrolled dumpsites are not fully available (UN Environment Programme, 2020a). In both the West Bank and Gaza, about 65 percent of municipal waste is disposed of in landfills; about one-third of that waste is illegally deposited in dumping sites. Only 3 percent is reused or recycled. Israeli settlements dispose of 80 percent of their solid waste in unsanitary dumpsites in the West Bank (Atallah, 2020). Israeli

industrial zones in the West Bank (19 in 2015) produce large amounts of hazardous waste that is often discharged in Palestinian lands near residential areas, causing environmental and health problems (Isaac and Rishmawi, 2015).

Investments have improved disposal of solid waste in recent years. There have been multiple investments in solid waste in recent years. These investments include the Gaza Solid Waste Management Project, collecting and disposing of waste generated by roughly 1 million people in Southern and Middle Gaza at a sanitary landfill and rehabilitating over 12 hectares of previously contaminated land (World Bank, 2023). Another example is the Zahret Al Fenjan Waste to Energy Project in Jenin.

Explosive Hazards and Rubble

Extensive rubble will need to be cleared from Gaza, with appropriate waste handling. As of April 2024, the war in Gaza had resulted in approximately 37 million tons of debris. The UN estimated that rubble removal would take 14 years (assuming the use of 100 trucks and 750,000 person workdays during those 14 years) (UN, 2024).

Large areas of Palestine are contaminated with explosive hazards. Large areas of Palestine are polluted with explosive remnants of war. In Gaza, the risk is from unexploded aerial bombs; the West Bank is contaminated with mines and riot control agents. Gaza has an estimated 7,500 metric tons of unexploded ordnance (Frayer and Baba, 2024). There are 16 confirmed minefields in Areas A and B and 86 minefields on the border with Jordan (UN Mine Action Service, undated).

A Map of the Current Situation

Figure 3.1 provides a snapshot of the environment. The natural systems of Palestine are shaped by the ridge-line that runs like a spine down the center of the West Bank. Moving east toward the lower elevations of the Jordan Valley, the climate becomes progressively more arid and hotter. However, because the clouds shed their rains as they move east over the ridgeline and into the valley, some of the highest value agricultural land is located in a wide zone that follows the Jordan Valley (shown in Figure 3.1 with a pattern of green dots). It is important to note that the boundaries of the watersheds—the areas that collect rainfall and water from both seasonal and year-round streams—do not coincide with the jurisdictional boundaries between Palestine and Israel, making water quantity and quality a responsibility shared between Palestinians and Israelis. The locations of waste treatment plants and landfills reflect the disjointed pattern of Israeli and Palestinian jurisdictions, resulting in inefficiency, redundancy, and the compromise of adjacent natural resources.

Transformative Projects and Initiatives

The profiles below suggest how the transformative projects and initiatives address the needs identified in the current situation and the vision. More details about the location and characteristics of the projects appear in Appendix A. The projects fall into five broad categories. Table 3.1 depicts the project categories and the challenges that they address.

FIGURE 3.1
Environment: The Current Situation




TOPOGRAPHY

 Ridgeline

WATER SYSTEM

 Watershed

 Stream


SOIL

 High value soil

CLIMATE CLASSIFICATION

 BWh (arid, desert, hot)


 BSh (arid, steppe, hot)


 Csa (temperate, dry summer, hot summer)


SOLID WASTE MANAGEMENT

 Landfill

 Israeli landfill

 Solid waste transfer station

 Israeli solid waste transfer station

 Illegal dumping site

SOURCES: HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoA, CEP, CESVI, ORG. See Appendix B for more information.

TABLE 3.1

Environment Projects and the Challenges They Address

Project or Initiative	Challenge(s) Addressed
Environmental zones	<ul style="list-style-type: none"> • Fragile watershed management
Agricultural development zones	<ul style="list-style-type: none"> • Fragile watershed management • See also the discussion of underdeveloped infrastructure and policies for agriculture in Chapter 7
Solid waste management	<ul style="list-style-type: none"> • Inadequate solid waste management
Rubble removal and explosive hazard mitigation	<ul style="list-style-type: none"> • Explosive hazards and rubble
Administration	<ul style="list-style-type: none"> • Fragile watershed management • Inadequate solid waste management • Explosive hazards and rubble

Environmental Zoning

Planning and land use management of riparian parks will encompass water bodies, their riparian surrounding and enclosed ecosystems, and other landscape features (including agriculture, nature reserves, parks, and other unbuilt spaces) to ensure that clean water and land are available for the population. These zones will benefit from an integrated approach to environmental protection and development, in coordination with urban planning that takes into account the local knowledge and culture. Development of these lands would not be prohibited, but a more integrative approach to environmental protection that is compatible with urban and agricultural planning is encouraged. The spaces between the riparian zones will be the main focus of urban and industrial development. This establishes a distinction between areas where urban and industrial development could be promoted and those where more environmentally sensitive land use management is needed. Environmental zoning projects and initiatives include the following:

- *Seventeen watershed riparian parks* will be designated across the West Bank (14) and Gaza (three). A North to South Riparian Park will connect the four watersheds that flow from the ridgeline toward the east. Ecological bridges will link Nablus and Jenin, Ramallah and Nablus, and Hebron and Bethlehem.
- Connections between these areas, which we are terming *ecological bridges*, will protect the ecosystem as the urban footprint expands. An ecological bridge is a zone in which landscape elements are linked to ensure the continuity of natural systems that would otherwise be cut off from one another by development or infrastructure. These bridges support various land uses, including agriculture, urban parks, environmental protection, and recreational amenities, offering pathways for people to enjoy nature while enhancing environmental health in urban settings. We propose eight ecological bridges.

Solid Waste Management

Appropriate management of solid waste will protect the land and public health. Collection, transport, processing, recycling, and disposal of solid waste will be carefully administered. Good waste management means that health risks will be minimized and comparable with global averages. Solid waste management projects and initiatives include the following:

- *Landfills*. Multiple sites for safe and controlled disposal of waste materials that cannot be recycled or processed will be developed in both the West Bank and Gaza.
- *Postwar waste* in Gaza will be well managed and will contribute to Gaza's rebuilding.

- *Solid waste transfer stations.* Locations will be identified for intermediary facilities where waste is temporarily held, sorted, and consolidated before being transported to landfills, recycling centers, or other disposal sites.
- *Solid waste treatment and reuse.* Nonrecyclable waste materials will be converted into usable energy, such as electricity or heat, through such processes as incineration and anaerobic digestion, thereby reducing landfill use and contributing to renewable energy production. A waste-to-energy facility will be located in Jenin.

Rubble Removal and Explosive Hazard Mitigation

For civilians to return to their homes and to carry out recovery, reconstruction, and new building, there will need to be a multiyear investment in rubble removal and mitigation of the explosive hazards buried in the rubble. This effort will require a specialized workforce, equipment, and staging areas.

Agricultural Development Zones

Seven agricultural development zones will be located in the North and South Jordan Valley, Jenin, the Western slopes, the Hebron slopes, the Gaza Strip, and the Tulkarem and Qalqilya area. These designated areas are aimed at fostering agricultural growth and sustainability through strategic investments, policies, and services. These zones will enhance food security, promote rural development, and boost local economies and environmental sustainability. Agricultural development zones will provide farmers and agribusinesses with access to improved infrastructure (such as irrigation from reused sewage, energy, roads, warehousing, and more), advanced technologies, financial incentives, and market linkages, facilitating increased productivity and profitability. By concentrating resources and expertise in specific regions, agricultural development zones encourage innovation, efficient land use, and environmentally sustainable practices. They also serve as hubs for research, training, and collaboration, supporting the broader agricultural value chain and empowering communities.

Administration

The Palestinian government will make public decisions in coordination with its governorates about land use and the development and preservation of natural resources within its borders, using spatial planning principles as they relate to land use, water, and the environment. Planning will need to account for the sustainable management of agricultural lands, watersheds, and the lands and activities that affect rivers, other water bodies, and prime agricultural land to ensure that citizens have access to clean water and land into the future. Resilience is enhanced by making investments at every scale, including highly local investments at the village and farm scale. The government will coordinate with neighboring states (Israel, Jordan, Egypt, and others with which they are interdependent) to best manage environmental interests, watersheds, and other shared resources. Upgraded government capacities and capabilities will be needed. Administration projects and initiatives include the following:

- An *environmental protection agency* will oversee watershed basin land use planning. It will enforce and coordinate activities internal to Palestine and with neighboring countries (Israel, Jordan, Egypt).
- *Local capacity* will be reinvigorated through outreach, education, and other forms of support.

Maps of the Vision

Figure 3.2 illustrates our vision for the Palestinian environment and the transformative projects and initiatives that enable it. New policies protect the streams, forests, high-value agricultural lands, and other elements of the natural environment. While this vision entails some selective open space preservation, it is more about deploying best practices related to stormwater management, forestry, and sustainable agriculture, as well as directing future development to places where infrastructure is in place. The focus areas for these policies are shown in Figure 3.2 as the “green fingers,” which we are calling *riparian parks*: *riparian* because they follow primarily the orientation of the wadis, and *parks* because of their quality-of-life benefits. These ecological “bridges” between and through historic cities and villages create the continuity that natural systems depend on. The network of waste treatment facilities and landfill locations is rationalized for efficiency and is designed to protect natural systems. The landfills will be redesigned to incorporate best-practice recycling and waste-to-energy technologies.

Figure 3.3 demonstrates our riparian park and ecological bridge concept. Riparian parks delineated around ecologically sensitive areas located primarily in river valleys and low-lying areas will protect natural resources, such as water. These features will not necessarily be considered nature reserves in the strictest sense of the term, although the different activities that might take place within them—such as urban expansion, agriculture, energy production, and more—will be designed with consideration for their effects on the functionality of natural ecosystems in support of Palestinian communities.

What Is Feasible Now?











Because the geographies of natural systems, such as watersheds, do not correspond to jurisdictional boundaries, there are some issues that need to be managed jointly by Israelis and Palestinians and that are in mutual self-interest. These projects will take advantage of growing international experience related to *transborder watershed management*. The projects presented here comport with the efforts of active nongovernmental organizations, such as the Friends of the Earth of the Middle East, the UN Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere Program, and Ecopeace. There are some ambitious and expensive projects, such as the *Jenin Zaharat Al Finjan landfill waste-to-energy plant*, that can move forward in the short term because they are already underway and there are already investors who are raising funds. But we also include here incremental projects that derive from our geographically ambitious long-term initiatives, such as the proposed *riparian parks*, *ecological bridges*, and *agricultural development zones*, which cross Areas A, B, and C. We include these projects because environmental regeneration does not need to happen through mega projects but can also occur incrementally through scalable pilots—for example, local solid waste cleanup projects that transition into parks, an idea that may interest Israelis even in Area C.

Related to solid waste management, solid waste transfer stations in Areas A and B or in less sensitive parts of Area C could be built. Improved landfills may be feasible only a little further out in time because of Palestinian reluctance for these projects. Steps can also be taken in the short term to develop the regulatory requirements for improved solid waste management.

In Gaza, we anticipate that one of the first postwar stabilization and recovery steps will be to begin to address the extensive rubble laced with unexploded ordnance.

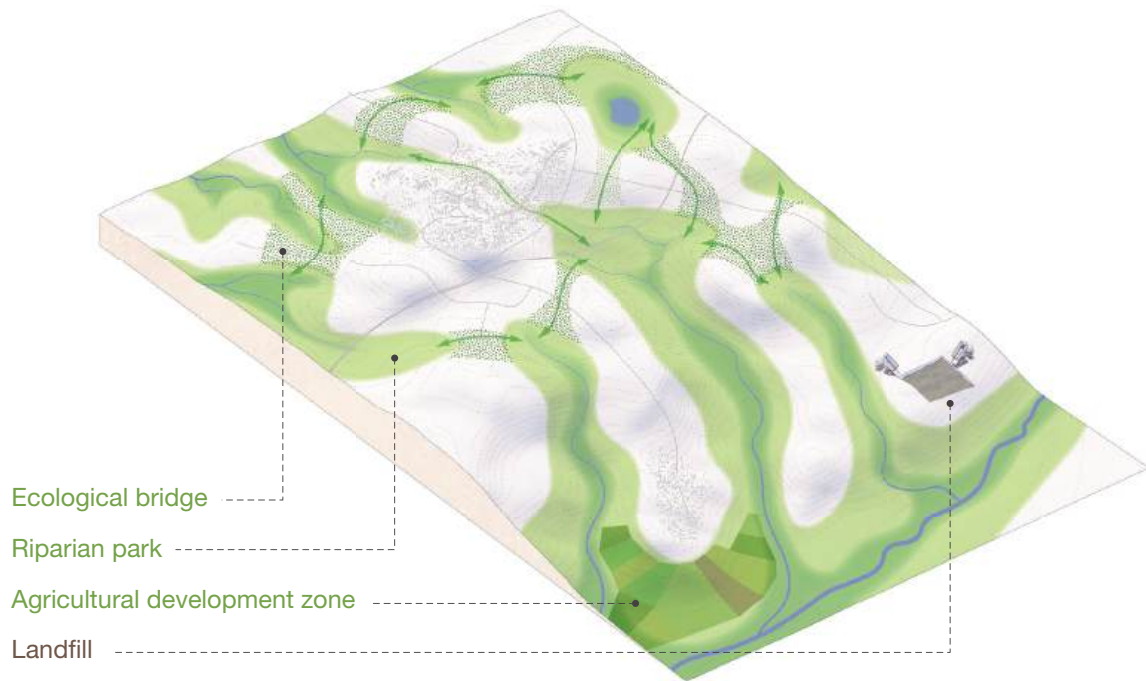
FIGURE 3.2
Environment: A Vision



TOPOGRAPHY	LAND USE	SOLID WASTE MANAGEMENT
 Ridgeline	 Riparian park	 Landfill: waste to energy
WATER SYSTEM	 Ecological bridge	 Landfill proposal
 Watershed	 Agricultural development zone	 Existing landfill and station
 Stream		 Existing solid waste transfer station

SOURCES: HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoG, CEP, CESVI, ORG. See Appendix B for more information.

FIGURE 3.3
Riparian Parks and Ecological Bridges



Cities

A Vision for Cities

Urban expansion, planning, and development will accommodate population growth in ways that reflect best practices in urban and infrastructure planning, respect environmental resources, and calibrate access to and impact on natural resources. Growth will be unconstrained by fragmentation into the artificial divisions of Areas A, B, and C. Communities and spaces will be planned to optimize quality of life, expand prosperity, ease mobility, and promote safety and security while minimizing urban sprawl and environmental degradation. Spaces that enable economic growth, enhance recreation, encourage tourism, and create national pride will be built.

The Current Situation

The most basic challenge for Palestine is to provide a livable environment for its rapidly expanding population. Between 1990 and 2024, the Palestinian population of the West Bank and Gaza has more than doubled, growing from 2 million people in 1990 (World Bank, undated-b) to roughly 5.6 million in 2024 (Palestinian Central Bureau of Statistics, 2021). Although the rate of growth has declined slightly in recent years, robust growth is likely to continue into the future. The number of people who will need to be accommodated will further swell if some of the Palestinian refugees return to Palestine.

Providing livable communities will face several challenges. *Population density in the West Bank and Gaza is very high* by world standards, although comparable in density to other large cities in the Middle East and Asia. To date, *urban growth has been disjointed* and poorly managed. Permit restrictions in Area C have prevented appropriate infrastructure development. *Uncontrolled and unplanned development threatens environmental resources*. Special planning may be needed to meet the needs of the *displaced people in Gaza* and compensate for the *significant destruction* of its infrastructure.

High Population Growth and Density

Future population growth will require an expanded urban footprint. While total population figures vary slightly depending on the source, we have chosen to use numbers from the Palestinian Bureau of Statistics. In 2024, 3.3 million Palestinians lived in the West Bank (including East Jerusalem), and 2.2 million lived in the Gaza Strip.¹ The Palestinians are a young population: In 2023, children under the age of 15 comprised 37 percent of the population (Palestinian Central Bureau of Statistics, 2023b). The population has increased, on average, by 2.4 percent since 2000 (Palestinian Central Bureau of Statistics, 2021), higher than the world

¹ The Palestinian Bureau of Statistics reports numbers for all of Jerusalem and does not split East Jerusalem from the total. According to both Israeli and UN reports, approximately 360,000 Palestinians reside in East Jerusalem.

average (1.2 percent) and the Middle East and North Africa average (1.9 percent) and similar to the Sub-Saharan Africa average (2.7 percent) (World Bank, undated-a). Because of limitations on building in Area C, population density in Areas A and B has significantly increased. Globally, on average, city footprints triple as population counts double (Angel et al., 2012); therefore, larger urban footprints to accommodate population growth should be expected in Palestine.

High population growth in a limited area calls for smart urban planning approaches, sustainable land use management, and investment in infrastructure. Population densities in the West Bank (557 people per square kilometer) and Gaza (5,853 people per square kilometer) vary depending on the type of city, village, or geographic location (Palestinian Central Bureau of Statistics, 2022). Thriving cities elsewhere have similar densities. Main cities, such as Hebron and Gaza City, are comparable in density to other large cities in the Middle East and Asia.² Marrakesh has an average density of 5,400 people per square kilometer, Tel Aviv has 5,100 people per square kilometer, and Cairo has 11,500 people per square kilometer, while London has 4,500 people per square kilometer, and Chicago has 1,300 people per square kilometer (Atlas of Urban Expansion, undated). Some cities have drawn on best practices in urban planning and infrastructure development to offer high quality of life and support robust economies while densifying (Atlas of Urban Expansion, undated).

Planning must also accommodate some number of returning refugees. There are 5.9 million registered Palestinian refugees (UN High Commissioner for Refugees, undated) living in Jordan (2.3 million), Lebanon (0.5 million), Syria (0.6 million), the West Bank and Gaza (2.3 million), and elsewhere (UN Relief and Works Agency for Palestine Refugees in the Near East [UNRWA], undated-b). If the government of Palestine invites refugees to return at a future point, cities will need to accommodate them. The government would decide how many could return, where, and at what pace. In recent decades, in other settings, about one-third of refugees, on average, returned to their homeland within a decade after a conflict ends (Constant et al., 2021). If one-third of the 3.4 million Palestinians in Jordan, Lebanon, and Syria return, then planning should accommodate roughly 1 million. In our interviews, Palestinian government officials said that their planning numbers also assume 1 million.

In 2023, Israeli settlements and demolition of Palestinian structures in Area C of the West Bank expanded quickly. Israeli settlers have also been a growing population. During the past decade, the settlements have grown quickly, facilitated by financial incentives and infrastructure (Hoyle, 2019). When the Oslo Accords were signed in 1993, there were 116,000 settlers; in 2022, there were 478,600 settlers in the West Bank, excluding East Jerusalem, making them roughly 15 percent of the total West Bank population, on some 337 settlements, outposts, and farms (Peace Now, undated; Egel et al., 2021). A 2024 UN report indicated that approximately 700,000 Israeli settlers live in the West Bank and East Jerusalem, including in 14 settlements in East Jerusalem (UN Information Service, 2023; UN High Commissioner for Human Rights, 2024).

In 2023, Israeli settlement expansion was the fastest on record: 12,855 housing units in Israeli settlements were built, and 22 outposts in the West Bank were legalized (Goldstein, 2023). COGAT approved 24,300 housing units in the West Bank. During that time, Israel demolished 917 Palestinian-owned structures in the West Bank (UN High Commissioner for Human Rights, 2024). After the 1967 war, Israel began establishing settlements in the newly occupied West Bank, Gaza Strip, and East Jerusalem. The settlements are a particularly contentious issue; we see this being resolved through negotiation between Israelis and Palestinians. During previous two-state solution negotiations, both Israelis and Palestinians have held positions that allowed varying proportions of settlers to remain in place under land swaps. One proposed solution has been to allow settlers to be citizens of Israel while living under the authority of a future Palestinian state (Husseini and Beilin, 2022).

² Density calculations were made by ORG Permanent Modernity based on population data collected from the Palestinian Central Bureau of Statistics and GIS data collected through Geomolg (Portal for Spatial Information in Palestine) for the governorate boundaries.

In other chapters, we discuss the far-reaching effects of the settlements on waste management, transportation, energy, and water.

Disjointed Urban Growth

Urban growth to accommodate rapid population growth has been disjointed. High population growth has been accompanied by rapid urbanization—around 77 percent of the population resides in urban areas—creating growing pressure on land, infrastructure, and resources (Palestinian Central Bureau of Statistics, 2021). Permit restrictions in Area C have led to unbalanced and disjointed urban development, with growth channeled mainly in Areas A and B, meaning that infrastructure cannot be developed in locations that would be optimal for wise urbanization and environmental preservation (Shalev and Cohen-Lifshitz, 2008). Uncontrolled urban expansion has led to suboptimal development of infrastructure and transportation and an unbalanced distribution of services among urban and rural centers (Thawaba and Hassoun, 2022). Uncontrolled development also threatens important environmental resources, such as agricultural land and watersheds.

Gaza’s Displaced Population and Destroyed Urban Infrastructure

Addressing the challenges of Gaza’s population will require special planning. The war in Gaza has displaced 1.9 million of its inhabitants. The majority of them are concentrated in the Rafah governorate in the southern Gaza Strip (UN Office for the Coordination of Humanitarian Affairs, 2024a). In addition, the conflict has damaged or destroyed more than 60 percent of residential buildings and 80 percent of commercial facilities, making the process of returning civilians to their homes a multiyear challenge (World Bank, European Union, and United Nations, 2024). Moreover, an estimated 42 million tons of debris (as of August 2024; UN Institute for Training and Research, 2024), including unexploded ordnance, may take at least 14 years to remove, according to the UN (“In Pictures: In the Rubble of Gaza,” 2024). Gaza’s urban areas were already facing slow reconstruction from previous conflicts due to restricted access into and out of the territory, Israeli blockage of construction materials deemed *dual use* (meaning they have both civilian and military applications), political rifts between Hamas and the PA, ongoing violence that led to donor reluctance for further funding, other funding issues, and a cumbersome bureaucracy created by the Gaza Reconstruction Mechanism. These challenges, which delayed and complicated past recovery efforts (Barakat and Masri, 2017) will certainly be amplified in Gaza by the level of destruction there.

A Map of the Current Situation

Figure 4.1 shows the current situation, with most of the population concentrated in urban areas in Areas A and B in the West Bank and particularly high population density in Gaza. Historic development patterns reflect the topography, with most of the large cities following the ridgeline that runs down the center of the West Bank. Most of the Palestinian villages are in the more temperate areas west of the ridgeline, with fewer scattered villages in the agricultural areas to the east. With the exception of the arc of historic cities along the ridgeline, there is no discernible pattern to the many scattered smaller villages; they are “islands” separated by the “ocean” of Area C. Similarly, the Israeli settlements, with the exception of a few larger concentrations (mostly near Jerusalem), are scattered in the West Bank. The red shading in Figure 4.1 represents population density. As a result of limited opportunities to expand urban centers outside Areas A and B, the densities in some of the historic centers and refugee camps, especially in Gaza, are extraordinarily high.

FIGURE 4.1
Cities: The Current Situation



SOURCES: OCHA, MoLG, CEP, PCBS, ORG. See Appendix B for more information.

Transformative Projects and Initiatives

Accommodating a growing population will require smart, sustained investment in communities. The projects profiled below illustrate the kinds of projects that can improve the urban core, support economic growth, engender community pride, and enhance the everyday life of Palestinians. Details of location and characteristics of representative projects appear in Appendix A. The projects fall into six broad categories. Table 4.1 depicts how the projects address the challenges identified.

Infrastructure-Driven Urban Growth

Growth and expansion of existing cities to accommodate anticipated population growth will consider the proposed transportation network, as well as the analysis of suitable land for urban development. Growth will be calibrated to access to natural resources, such as water and agricultural land. Such projects and initiatives include the following:

- *Development zones* will be designed as mid- and high-density, mixed-use districts that maximize the benefit of proximity to *multimodal transit hubs*, including rail and bus stations, as well as connections to BRT systems.
- Priority transit-oriented development locations will be placed strategically at *gateways* to the main cities, including Hebron, Jerusalem, Nablus, Ramallah, and Gaza City, as well as key secondary cities, such as Jenin, Qalqilya, and Jericho, among others.

Urban Renewal and Redevelopment

Urban renewal and redevelopment will take place in and around the centers of main cities, such as Jerusalem, Nablus, Hebron, Ramallah, and Gaza City. These more robust and mature urban environments require surgical infrastructure and landscape interventions to address the pressures of congestion, requirements for higher population densities, utility upgrades, and much more. In Gaza City, renewal and development will address postwar reconstruction efforts while accommodating future growth.

TABLE 4.1
City Projects and the Challenges They Address

Project or Initiative	Challenge(s) Addressed
Infrastructure-driven urban growth	<ul style="list-style-type: none"> • High population growth and density • Gaza's displaced population and destroyed urban infrastructure
Urban renewal and redevelopment	<ul style="list-style-type: none"> • High population growth and density • Gaza's displaced population and destroyed urban infrastructure
New cities	<ul style="list-style-type: none"> • High population growth and density
Civic institution development	<ul style="list-style-type: none"> • High population growth and density • Gaza's displaced population and destroyed urban infrastructure
Economic centers	<ul style="list-style-type: none"> • High population growth and density
Administration	<ul style="list-style-type: none"> • Disjointed urban growth • Gaza's displaced population and destroyed urban infrastructure

New Cities

Three new cities, created by expanding existing villages, will be built along the Jordan Valley, activating the eastern edge of the West Bank with agro-industrial, ecotourism, and recreational projects. These cities will benefit from high-value soil for agriculture, dry and stable climate for year-round tourism, and access to proposed transportation corridors for intercity and heavy rail linking to the border crossings and the proposed international airport.

Development of Civic Institutions

Public and private institutional facilities, both new construction and redevelopment of existing ones, will support socioeconomic prosperity of urban environments and the quality of life of those living in them. Such structures are also important symbols for pride and national spirit. In the case of Gaza, rebuilding such facilities will be central to recovery. These projects and initiatives include the following:

- Highly visible *symbols of state* will contribute to civic pride and national identity. Development, enhancement, or rebuilding of symbols of state include a government campus in Jerusalem containing the parliament, courthouses, central bank, and various government ministries; a national stadium; a national museum; and a national performing arts center.
- Universities and tech incubators will be strategic centers of innovation driving economic growth, attracting talent, fostering research and development, and enhancing the cultural and intellectual vibrancy of communities.
- Hospitals and a medical campus will provide health care services, offer medical education, conduct research, and improve public health.

Economic Centers

Critical infrastructure will support entrepreneurship and investment across various sectors, including agriculture, tourism, technology, and manufacturing. Such projects and initiatives include the following:

- *Industrial zones* can be transformative. Meant to attract manufacturing and business operations, they create jobs, foster innovation, and enhance a city's infrastructure and industrial capabilities. Examples include expansion and redevelopment of industrial zones in Jenin, Tulkarm, Jericho, Bethlehem, Hebron, and Gaza.
- *Developing a city's central business district* is essential for economic growth and is important to the quality of life in those areas. This concentration of commercial, financial, and business activities would include high-density office buildings and retail establishments and would promote vibrant economic activity. Targets for central business district development include Ramallah, Hebron, and Nablus.
- *Tourism hubs* will be created by expanding and redeveloping clusters of attractions, amenities, and services designed to draw and accommodate visitors, including landmarks, cultural sites, entertainment options, hospitality facilities, and transportation links. Examples include historical and cultural destinations in Jerusalem and Bethlehem, Jericho and the Dead Sea, Hebron, and Nablus.

Administration

Urban expansion, planning, and development will accommodate population growth in ways that reflect best practices in infrastructure planning, respect environmental resources (such as agricultural land and watersheds), and are unconstrained by fragmentation into artificial areas (such as Areas A, B, and C). In particu-

lar, urban expansion will take place primarily in areas between the riparian parks described in Chapter 3 in order to preserve watersheds and other resources for the population. Modern transportation infrastructure will promote higher population densities, including new mixed-use neighborhoods. A clear and carefully planned hierarchy among large cities, secondary cities, and rural hubs will promote efficiency in services and regulations. Cities will be planned to expand and connect with neighboring cities, towns, and their periphery in ways that reflect synergies among these places. Administration projects and initiatives include the following:

- *Regional planning councils* will be collaborative councils that align planning efforts across cities, towns, and villages to promote equitable growth, involving government and civil society initiatives.
- *Smart growth incentive programs* will offer incentives for adopting compact, mixed-use developments to reduce urban sprawl and improve land use aligned with environmental and infrastructural ambitions.
- *Public-private partnership initiatives* will engage private sector expertise in close collaboration with government agencies to promote sustainable and bankable urban infrastructure and land development projects.
- *Affordable housing development programs* can strategically ensure equitable land use by incorporating housing for all income levels in urban planning, especially in proximity to central urban areas and key mobility assets.
- *Special economic zone development programs* can establish designated areas with tax and regulatory benefits to stimulate economic activity and coordinated regional growth. This includes economic zone legislation, promoting bonded areas as tax-free zones for logistical and industrial activities in search of foreign direct investment.

Maps of the Vision

Figure 4.2 illustrates our vision for how urban footprints can grow as the population expands (according to models of population growth and urban expansion) and as urban growth is directed into the land most appropriate for growth. In this vision, the main cities become the centers of coherent and connected metropolitan areas, with many of the smaller, formerly isolated villages reconnected to the center and to each other. Population densities (represented by the range of red shading) are highest in the centers and progressively lower toward the urban edge. The existing scattered and sprawling conditions are replaced by a clear hierarchy of main, secondary, and tertiary cities.

Note that, in keeping with the in-process national plan, several new cities are suggested. While the exact configuration and extent of these continuous urbanized areas will evolve over time, the shapes shown in Figure 4.2 reflect likely access to transportation resources and environmental opportunities described in this report, especially the riparian parks.

To determine the 2035 urban footprint, we relied on an assumption of a continued 2.4-percent population growth per year, for an estimate of 7.3 million people, in combination with modeling how urban footprints grow with population growth, channeling the urban footprint growth between the proposed riparian parks, and assuming no restrictions in development of Area C. This urban footprint modeling faces limitations of incomplete confidence in future population growth levels and uncertainty about growth potential into Area C related to permitting in the next decade. We note that this 2.4-percent growth rate will likely decline, given similar trends elsewhere in the world. This urban footprint may therefore be best considered the urban footprint when the population reaches 7.3 million rather than being tied to the 2035 date.

We used the same approach for the 2050 urban footprint lines, although we note that this calculation is even more notional and comes with a lower degree of confidence, given the 26-year time horizon; there

FIGURE 4.2
Cities: A Vision



URBAN DEVELOPMENT

- Existing urban centrality
- Urban expansion 2035
- Urban expansion 2050
- Existing built footprint

URBAN HIERARCHY

- Main cities
- Secondary cities
- Tertiary cities
- New city—agriculture or industry oriented
- New city—tourism oriented

SOURCES: MoLG, CEP, PCBS, ORG. See Appendix B for more information.

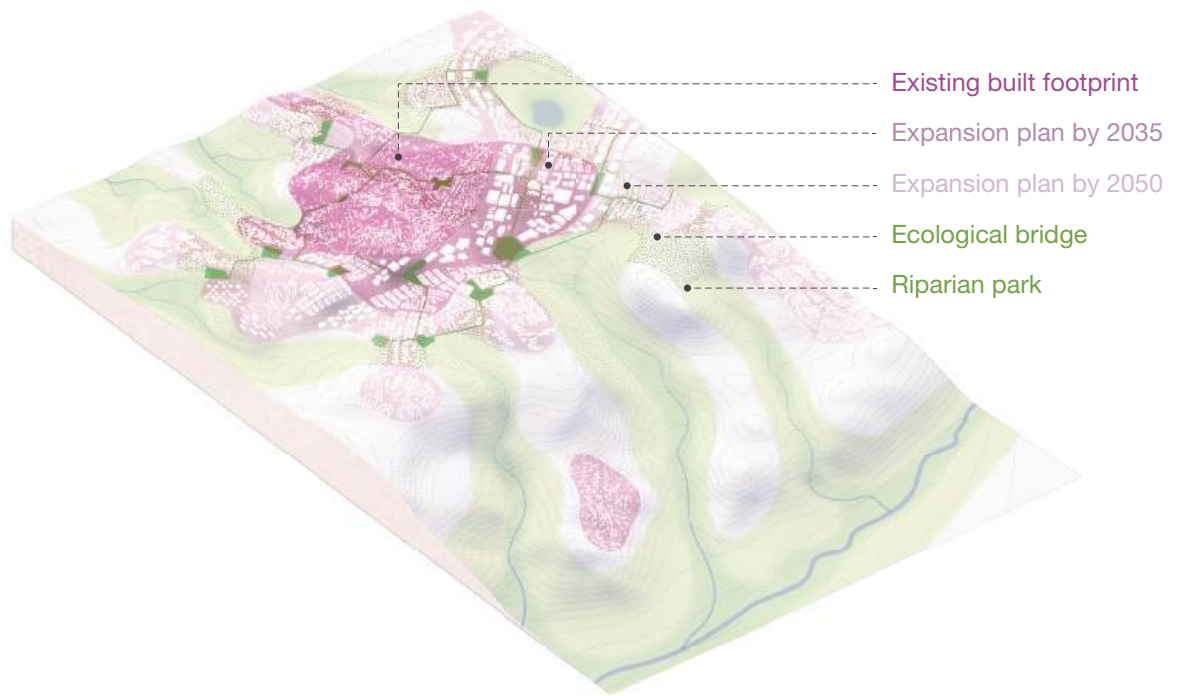
are multiple plausible scenarios for population figures in 2050. For 2050, we used a 10.5 million population, which is a continued 2.4-percent growth, through a combination of natural growth and refugee return. As with the 2035 estimate, this urban footprint can best be considered the urban footprint when the population reaches 10.5 million, whether that is in 2050 or in another year.

Figure 4.3 provides an example of how this growth might happen in a prototypical urban space. As the population grows, so will the footprint of cities. Urban expansion planning responds to riparian parks and ecological bridges intended to safeguard the natural environment. Green corridors connecting riparian parks will inevitably cross urban areas, necessitating careful planning of urban parks and boulevards.

What Is Feasible Now?

Although Gaza City, described elsewhere, is obviously a special case, all cities and villages in the West Bank can benefit from inexpensive, *small-scale, place-making interventions* that create amenity and improve the quality of life for Palestinians. Such interventions include reclaiming abandoned lots for new parks and greenways, some of which may ultimately be part of the larger ecological bridges proposed elsewhere. While *transit-oriented development* is most effective with the fixed-guideway systems that will be in place in the more distant future, the basic strategy of linking transit investments and land use can start at the existing bus terminals and other transit hubs. *Upgrades to existing urban infrastructure* will enable new forms of compact, mixed-use development in the downtowns. While larger-scale capital projects may seem out of reach, there are a variety of *symbols of state*—sources of national pride and identity—that can be built now, because many of these are individual buildings in Area A, such as a *performing arts center, a national museum, or hospitals*. Another opportunity for immediate-term capital investments are the various *industrial development zones* in Jenin, Tulkarem, Jericho, Hebron, and elsewhere because these zones all exist, to some degree, and represent a great case for public-private partnership collaborations with foreign support, encouraging local economic development with private sector partners around agricultural, manufacturing, or technological sectors. It is possible to *support the new Ministry of Industries*, which is expected to promote special economic zones dedicated to specific types of manufacturing, such as shoe manufacturing in Hebron. These zones do not require extensive land and can be established in Areas A and B, avoiding the challenges of obtaining Israeli approval. Finally, while it is more complicated from a political and security point of view, *tourism hub development* can be initiated because the economic benefits are significant for both Israelis and Palestinians. Because these are shared sites from a shared history, such development can also be a way to build shared understanding between the two peoples.

FIGURE 4.3
Integrating Urban Development Projects into a Prototypical City



Transportation

A Vision for Transportation

Transportation and mobility systems will enable reliable, convenient, and secure movement of people and goods within Palestine, between Palestine and its neighbors, and between Palestine and the international community. A high-quality, multimodal transportation network will evolve, including transport by bus, train, air, and sea. Public transportation will be convenient and accessible while promoting sustainable and livable urban spaces. A transportation network will link the West Bank and Gaza. Citizens will have direct access to an international airport, and Palestine will have direct access to international markets for its exports and imports.

The Current Situation

Transportation in the West Bank faces multiple challenges. The transportation network is *fragmented, poorly planned, and in poor repair*, impeding free movement of people and goods within the West Bank, between the West Bank and Gaza, and between Palestine and the rest of the region. These limitations make it difficult for people to reach employment, education, and health care. *Restrictions on movement* imposed by Israeli checkpoints create an atmosphere of perpetual uncertainty for Palestinians, hindering their ability to carry out routine tasks or make future plans. This restrictive environment also poses formidable challenges to businesses and to the establishment of a stable and flourishing economy. The West Bank and Gaza have *constrained access* to the international economy, limiting exports.

Fragmentation, Inconvenience, Poor Planning, and Disrepair

Transportation within and between Palestinian cities is congested. Many roads are older, narrow, and winding. High urban density and Israeli restrictions on permits and construction of transportation have limited the ability of cities to grow optimally, negatively affecting the economy. Because some main Israeli-built roads are prohibited to Palestinians, they must travel through urban centers or on unpaved rural roads, creating delays and congestion (Abraham, 2024). Numerous Israeli checkpoints exasperate mobility difficulties.

Public transit is poorly coordinated, unreliable, inefficient, and fragmented. The public transit system in the West Bank includes buses, shared taxis, and call taxis. In 2022, the West Bank had 1,136 public buses and 1,681 private buses; before the war, Gaza had 412 public buses and 113 private buses (Palestinian Central Bureau of Statistics, 2023c). Most public transit is provided by independent private entities that are not coordinated. They lack a central entity managing how services interact with each other or how passengers can integrate their travel from mode to mode. In 2022, over 100,000 Palestinian workers from the West Bank had permits to enter Israel and the settlements. They used Israeli public buses, with more than 260 buses connecting Israel to West Bank settlements (Who Profits Research Center, undated; Horovitz, 2022).

Bottlenecks constrict movement in key locations. *Bottlenecks* typically are points in a road network with reduced capacity and congestion where multiple routes converge, with few alternative routes. They lead to long lines, delays, reduced safety, and economic costs (Yue, Li, and Mao, 2018). Main bottlenecks include Salman roundabout up to Beita roundabout on Road 60, Beita up to Zaatara on Road 60, Bittin Junction, Kufar Aqab Road and Qalandia Road (which connects Ramallah with Jerusalem), Hizma Road, El-Ezariyeh Road, and Beit Ummar Entrance on Road 60.

Wadi Naar is a bottleneck of particular note. It is along the only connections between the north and south of the West Bank—i.e., between Bethlehem, Hebron, and Ramallah—and long delays are common (UN Office for the Coordination of Humanitarian Affairs, 2008). The road has an Israeli military checkpoint, sharp curves, and a steep grade; during winter, trucks sometimes slip on the slopes, creating further blockages. The topography and road configuration make travel especially uncertain and create significant delays for both people and goods. Uncontrolled dumpsites abutting the road are an eyesore and environmental hazard.

Up-to-date technology to better manage transportation is lacking. The West Bank and Gaza lack the technology infrastructure to generate real-time information for passengers, dispatchers, and providers; coordination among modes of transportation is inadequate. Both the West Bank and Gaza lack ride-share services, such as Careem, Uber, or Lyft. Careem operated briefly during part of 2017 but ceased operations at the request of the PA, which viewed its operation as illegal (Othman, 2017).

The PA and Israel both have transportation plans for the West Bank, but they are not coordinated. These plans are similar in some respects, but the two sides have not formally discussed them. The Palestinian National Transportation Master Plan was financed by the European Commission and includes planning related to roads, rail, maritime transport, air transport, public transport, border crossing points, and connectivity between the West Bank and Gaza (Palestine Ministry of Transport and Communications, 2016). One major difference is that the Israeli plan includes roads in the West Bank that are accessible only to settlers. In 2023, Israel allocated \$940 million for upgraded and new roads for settlers in the West Bank, bypassing Palestinian population centers (Sharon, 2023), which some experts project will increase congestion in Palestinian towns (Al-Bazz, 2022).

Restrictions on Movement

For most Palestinians, there is no usable connection between the West Bank and Gaza. There is no road linking the two parts of Palestine with access allowed for most Palestinians. Under the Oslo Accords and in almost all other conflict resolution discussions, the West Bank and Gaza were deemed a single “territorial unit” with a “safe passage” between them. A passage was opened in 1999, but it operated for less than a year, until the second intifada broke out (Norwegian Refugee Council, 2016). Since then and until the Israel-Hamas war started following October 7, 2023, Palestinians could cross between Gaza and the West Bank only with a special permit. The separation fragments familial, social, and economic ties (Human Rights Watch, 2022).

Palestinians lack free access to all roads in the West Bank. Some key routes are reserved for Israeli settlers and security. Figure 5.1 shows the West Bank road network, with roads prohibited to Palestinian vehicles in red. Since the start of the Israel-Hamas war, many major roads that are open to settlers have been closed to Palestinian vehicles, requiring them to use secondary roads that can be unpaved, narrow, and winding (Abraham, 2024). In 2020, Israel approved and started additional projects to build more segregated roads, including a north-south thoroughfare, with bypass roads that only Israelis and those with special military permits can use (Al-Bazz, 2022).

Israeli checkpoints and a permit system restrict efficient movement. In 2023, there were 565 “movement obstacles,” including 49 permanent checkpoints; 139 occasionally staffed checkpoints; 304 roadblocks, earth mounds, and road gates; and 73 earth walls, road barriers, and trenches within the West Bank and East Jerusalem, impeding movement of Palestinians and goods coming in and out of the West Bank (UN Office

for the Coordination of Humanitarian Affairs, 2023). The resulting transportation bottlenecks render business imports and exports uncertain and affect the Palestinian economy by delaying or inhibiting the transit of goods and services (Niksic, Nasser Eddin, and Cali, 2014).

Movement of people across borders, whether to visit family or conduct business, is also constrained by Israeli security restrictions. Palestinians seeking to travel internationally must exit through Jordan. A minority of Palestinians, mostly living in Jerusalem, have so-called green cards that allow access to Ben Gurion Airport in Tel Aviv. International travel, therefore, requires crossing the Palestinian terminal, then the Israeli border, then the Jordanian border. Borders are open for limited hours: from 8 a.m. to 5 p.m. Sunday through Thursday and Friday morning. Access is not reliable, as borders often close unpredictably.

Constrained International Access

Weak transportation links with other countries constrain economic connections to the global economy. The West Bank and Gaza lack direct connection to the international economy. There is no Palestinian airport, global train linkage, or port capable of handling cargo ships. Because Israel controls all border crossings and customs, as well as import and export tax collection, the West Bank and Gaza must depend on Israeli export channels; thus, nearly all exports and imports transit through Israel or Israeli-controlled checkpoints. Israeli customs clearance and security checks often cause delays that can be costly for perishable products, such as fresh fruits, flowers, and vegetables (U.S. International Trade Administration, 2023b). Collectively, restrictions on movement of goods and services have substantially constrained economic growth in the West Bank and Gaza.

A Map of the Current Situation

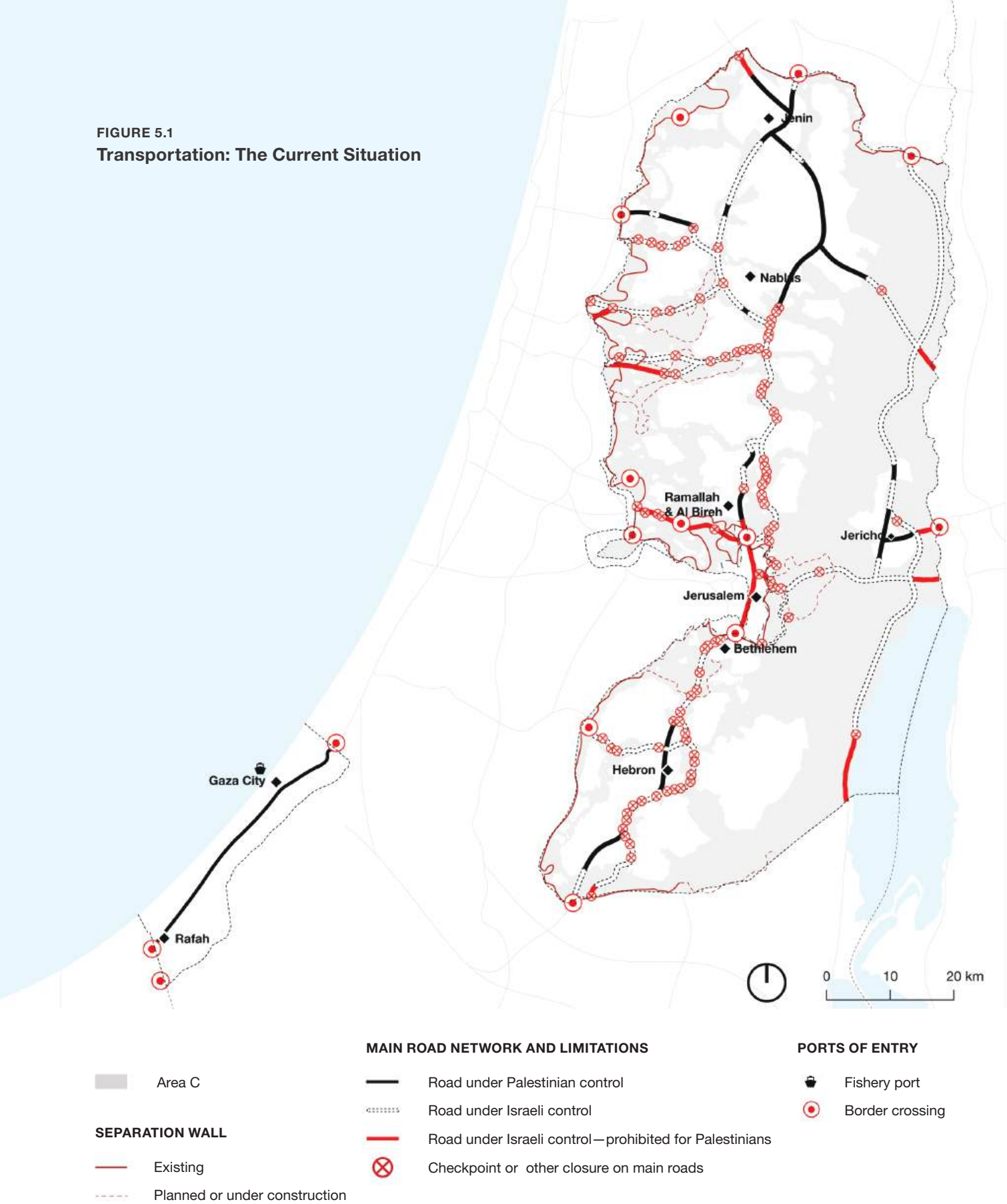
Figure 5.1 illustrates the current situation. This map shows the degree to which mobility in the West Bank is discontinuous and otherwise constrained. Almost all roads are either lined with Israeli checkpoints or are altogether prohibited to Palestinians. Access to the few segments of road that are controlled by Palestinians is also controlled by Israeli checkpoints. There is no connection between the West Bank and Gaza, and there are only a few highly constrained border crossings to the adjacent countries.

This fragmentation not only imposes constraints on the Palestinian economy but also imposes burdens on the social fabric of the Palestinian people. Although public transit is not represented on this map, it would show a similarly disjointed and inefficient ad hoc network of private bus companies, unlicensed taxis, and car services operating in uncoordinated fashion.

Transformative Projects and Initiatives

The transformative projects and initiatives we describe address the challenges and opportunities identified in our discussion of the current situation and promote aspects of the overall vision. Details of location and characteristics of the projects appear in Appendix A. The projects fall into four broad areas, profiled below. Table 5.1 shows how the projects address the challenges we identified.

FIGURE 5.1
Transportation: The Current Situation



SOURCES: OCHA, MoT, NTMP, CEP, ORG. See Appendix B for more information.

TABLE 5.1

Transportation Projects and the Challenges They Address

Project or Initiative	Challenge(s) Addressed
New public transportation infrastructure	<ul style="list-style-type: none"> • Fragmentation, inconvenience, poor planning, and disrepair • Restrictions on movement
Roads and internal connectivity	<ul style="list-style-type: none"> • Fragmentation, inconvenience, poor planning, and disrepair • Restrictions on movement
Ports of entry	<ul style="list-style-type: none"> • Constrained international access
Transportation administration	<ul style="list-style-type: none"> • Fragmentation, inconvenience, poor planning, and disrepair • Restrictions on movement

New Public Transportation Infrastructure

An extensive public transit network will ensure connectivity and mobility between communities in the West Bank and Gaza. BRT lines will connect cities and villages. The backbone of this public transit is an inter-urban rail line, with stops near the eight major population centers in the West Bank and three stops in Gaza, allowing rapid movement of goods and people throughout. Transit-oriented development (such as industrial parks, hospitals, and education centers) will be compact, centered around stations, and close to cities. Such projects and initiatives include the following:

- *Multimodal transit hubs* will provide well-planned intersections between multiple modes of transport, including bus, rail, BRT, taxis, and private vehicles. Transfer stations will be close to the city centers, per transportation master plans, to reduce transit times and improve reliance and mobility.
- *A rail network* of interconnected railway tracks, stations, signaling systems, and supporting infrastructure will facilitate efficient and reliable transportation of both passengers and freight. The network would include a heavy rail line for both freight and passengers and a passenger intercity rail network connecting all ridgeline cities. A connector railroad through Jenin will offer access to a planned international rail system from Saudi Arabia to the Mediterranean.
- *BRT lines* will offer an efficient public transportation system that uses dedicated bus lanes, priority signaling, and specialized vehicles to provide fast, reliable, and cost-effective urban mobility.
- *Central stations and local stations* will provide well-planned intersections between multiple modes of transport, connecting regional and local destinations, including bus, rail, taxis, and private vehicles, as well as bikes and scooters for last-mile solutions.

Roads and Internal Connectivity

A road network connecting major urban centers will facilitate regional mobility and provide essential links between local roads and highways, ensuring the smooth flow of people and goods. Both primary and secondary roads will be upgraded, with a few key highlights, as follows:

- *A West Bank–Gaza connector road* would link the two parts of Palestine and enable improved economic and social relations, both internally and regionally.
- *Bridges over Wadi Naar* would enable seamless mobility between the north and south of the West Bank by overcoming the hilly terrain of East Jerusalem while improving access to and from Jerusalem and connectivity between the main cities along the ridgeline.
- *Other key routes* include upgrades to Road 60, the main north-south highway in the West Bank, and the Salah ad-Din Road in Gaza that also cuts across the strip from north to south.

Ports of Entry

People and goods will move across Palestinian borders, with access to both regional and international markets. Palestinians will have direct access to international markets for exports and imports.¹ This will include development of trade corridors, logistics hubs, and customs procedures conducive to efficient commerce. Permeability with Israel for trade and labor market access will benefit both the Palestinian and Israeli economies (Palestinian State Study Team, 2007). Such projects and initiatives include the following:

- Palestinians will have direct access to *an international airport* that could be located in the Jordan Valley or Gaza. Palestinians will be able to travel the world, as do citizens of most other countries, and citizens of other nations can access Palestine directly via airports or through Jordan and Egypt.
- Seaports will include redevelopment and expansion of the *fisheries port* in Gaza City supporting the fishing sector with a suite of support functions, as well as a marketplace for trading. A Gaza *commercial port* for container, bulk, and other modes of freight movement will be developed, perhaps on a new jetty or on an island built on rubble from the war. In our interviews, Israeli officials expressed particular interest in the Gaza commercial port as a win-win solution.
- *Multiple new border crossings*, strategically placed, can connect Gaza and the West Bank and create gateways to the north, east, and south for goods and people. Crossings can be expanded to serve as hubs for logistics and industrial facilities. After a transition period, there will be transportation permeability between the borders of Israel and Palestine, with Palestinians being able to access labor markets in Israel conveniently.

Administration

Administration projects and initiatives include the following:

- A *coordinating institution* will support seamless combined mobility, integrating independent, private, and public systems. Modern technology will enable *combined mobility*, by which people can move easily across all modes—rental cars, bus, rail, ride shares—whether publicly or privately owned. Palestinian transportation institutions will develop the capacity to manage this comprehensive and coordinated system.
- *Expanded mandates* will promote collaboration among the Ministry of Transportation, Ministry of Public Works, and Ministry of Local Government. Skilled management, policy development, and resource allocation will ensure effective governance, coordination, and implementation of projects.
- *Best-practice technology* will enable better infrastructure planning and management.
- *Coordination with Israel* will increase in the interim, in terms of infrastructure improvements and management of flows of both passengers and logistics.
- A *Jordanian-Palestinian free trade zone* will give Palestinians access to a Jordanian airport for trade; Palestinian exporters will have unlimited access to a port on the Mediterranean Sea. A negotiated trade agreement with Israel will replace the customs union.
- *Reductions in checkpoints* will require security coordination among multiple parties; this will provide significant improvements to quality of life and the economy.

¹ This vision of connectivity for goods is based on the *Peace to Prosperity* plan from the Trump administration (White House, 2020).

Maps of the Vision

Figure 5.2 illustrates our transportation vision and the transformative projects that enable it. This map illustrates a comprehensive mobility strategy for Palestine, one that would enable the free movement of people, goods, and services within Palestine and beyond. Existing roads can be improved to accommodate bus and BRT lines; elsewhere, new roads can relieve chokepoints, such as Wadi Naar. Beyond the new and improved roads, there must be an efficient public transit network. The first component of this would be BRT lines circulating within metropolitan areas. The next level of investment would be an intercity light rail line connecting the major cities along the ridgeline, with branch lines to secondary cities. Finally, a new heavy rail network is shown through the Jordan Valley to Gaza and beyond. New ports, an airport, and modernized border crossings will enable international trade and travel. *Transit hubs* are a key concept here: These are places where the intersection of different transit nodes supports compact, mixed-use centers of activity.

Figure 5.3 shows how these transportation improvements may happen in a close-up view of an illustrative urban area. New heavy and light rail lines, as well as improved road connections, will enhance connectivity and accessibility across Palestine. Urban expansion will be planned in accordance with this new infrastructure, and larger agglomerations will be networked with BRT systems and multimodal hubs, which will further increase connectivity, reduce commuting times, and encourage sustainable urban development.

What Is Feasible Now?

Creating a comprehensive, multimodal transportation network for Palestine is both essential and challenging because of the scale, cost, and political and security implications of the most impactful projects, such as new light and heavy rail lines, the Gaza connector road, and the proposed bypass routes around Jerusalem. However, as with the other larger-scale initiatives described here, there are incremental opportunities in the short term even as long-term projects are planned. Such initiatives can start with building institutional capacity to enable coordination among the many formal and informal services that already exist, such as taxi and van services, as well as support for “micromobility,” including e-scooters and e-bikes. A reimagined transportation ministry would also lead in the introduction of best-practice technology for efficiency and sustainability. This effort can build on the newly established Ministry of International Cooperation and Planning and is both low cost and uncontroversial. There are also places where new services, such as BRT lines, could improve inner-city mobility, while intercity buses can be put in place to connect to new multimodal hubs at the edges of selected, adjacent city pairs (where accommodating Israeli security concerns is possible). In a similar category is the upgrading of selected segments of important road corridors. While the comprehensive rebuilding of Road 60 is a long-term project, incrementally identifying and implementing less controversial segments is possible.

FIGURE 5.2
Transportation: A Vision



ROAD NETWORK

- Main road network
- Secondary road network

BUS TRANSIT

- BRT

TRAIN NETWORK

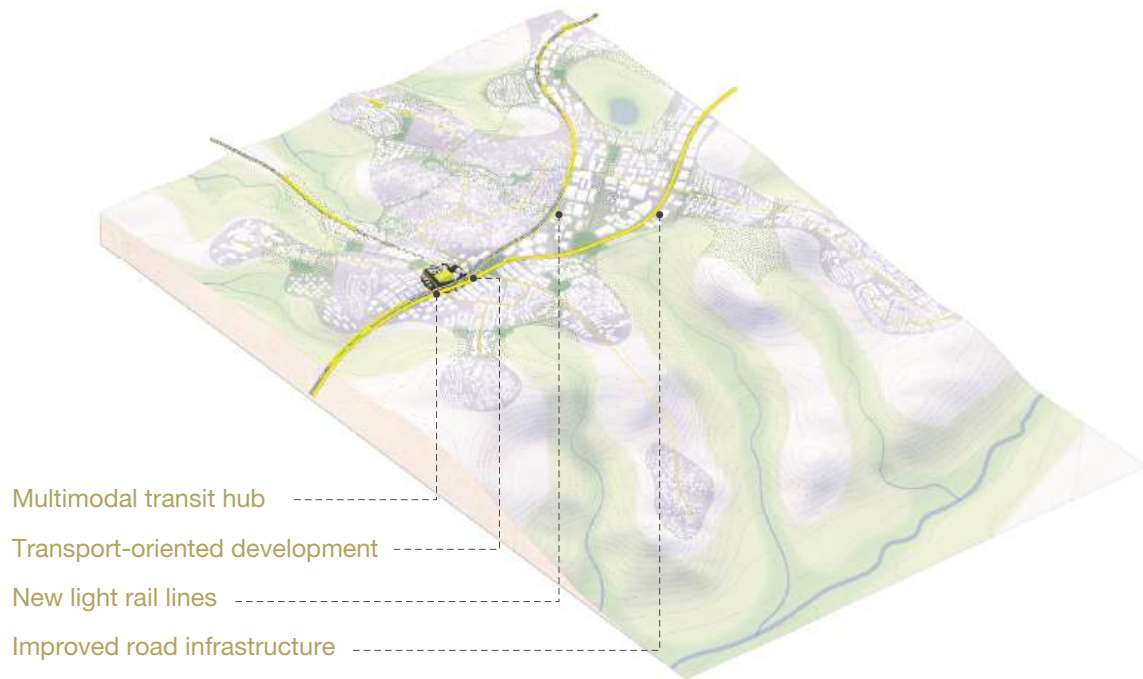
- - - - - Intercity line (light rail)
- - - - - Heavy rail
- M Multimodal hub
- Central station
- Local station

PORTS OF ENTRY

- ⚓ Commercial port
- ⚓ Fishery port
- ✈ International airport
- Border crossing

SOURCES: MoT, NTMP, CEP, ORG. See Appendix B for more information.

FIGURE 5.3
Transportation: Urban Integration



Energy

A Vision for Energy

Palestine will be supported by a robust and resilient energy sector that ensures adequate energy for a better quality of life and promotes self-sufficient and independent economic development. This 21st-century energy network will be capable of transmitting, storing, transforming, and distributing both domestic and imported energy from diverse sources. The potential for renewable energy sources will be fully exploited. Use of gas resources in the Mediterranean will reduce energy costs and increase prosperity. Energy efficiency will guide Gaza's reconstruction.

The Current Situation

The West Bank and Gaza suffer from *inadequate energy supply and infrastructure*, almost complete *dependence on outside energy sources*, *insufficient transmission infrastructure*, and fragmented and *inadequate utility governance*. There are opportunities and constraints with regard to alternative energy sources.

Inadequate Energy Supply and Infrastructure

Available energy supply does not meet demand. In the West Bank, energy supply at its maximum barely covers demand; in Gaza before the war, supply dramatically lagged demand. As a result, rolling blackouts plagued the Gaza Strip during the hottest and coldest times of the year. Before this conflict, most Gazans received six to eight hours of electricity per day (Todman, Bermudez, and Jun, 2023). At times, such as in 2017, the supply has dropped to as low as two hours per day in some areas (Oxfam, 2017). Demand is expected to increase. West Bank electricity demand is expected to increase from around 1,360 megawatts (MW) in 2023 to over 2,000 MW by 2040 (Office of the Quartet, 2023b).

Electricity is expensive and financially unsustainable. Uncertainty and unreliability impose a crippling burden on Palestinian residents and business, with electricity and fuel prices that are 30–40 percent higher than in Israel (Rapaport, 2022). Electricity would become cheaper if transmitted through high-voltage lines from Israel, but the network has been adapted only to medium-voltage transmission from Israel substations; as a result, the Israeli Electricity Company sells wholesale energy at consumer rates (World Bank, 2017). The energy crisis is likely to worsen because a growing economy will require greater energy consumption.

Energy distribution is vulnerable. The existing urban electric infrastructure urgently needs upgrading. Old transmission lines and transformers, degraded by poor maintenance, trigger substantial losses in the system (up to 22 percent, according to some sources); pirate connections not only further degrade the network but also reduce the collection rate of utility bills (Ersoy, Terrapon-Pfaff, and Brik, 2022). Without widespread upgrades to the electric grid in the West Bank and Gaza, it will not be possible to distribute whatever new energy is produced through large-scale solar energy integration or other renewable sources (such as wind), especially for remote, open areas.

Dependence on Outside Energy Sources

Lack of energy autonomy means reliance on Israel for energy. In 2015, about 90 percent of energy for Palestine was imported from Israel, with smaller amounts from Jordan and Egypt (Badiei, Foster, and Coma-Cunill, 2017). This gives Israeli authorities almost complete control of the Palestinian energy supply. At moments of tension, or when unpaid electrical debt becomes high, Israel has cut off electricity flows (Herman and Fischhendler, 2021), as happened in Gaza after October 7, 2023. Although there are several plans for new plants and substations in the West Bank and Gaza, only four new Palestinian substations have come online in recent years.

Development of new gas infrastructure has significant potential but is stalled (Office of the Quartet, undated-b). Gas for Gaza is a new natural gas pipeline that was approved by Israel in July 2023 and is supported by key international partners and funders, including the United States, the European Union, Qatar, the Netherlands, and the United Kingdom. When completed, Gas for Gaza will provide Gaza with enough gas to generate up to 1,100 MW of electricity at one-third the cost of current retail rates and reduce carbon emissions by 6 percent. Once developed, the Gaza Marine gas field will significantly enhance Palestinian energy independence and improve the Palestinian fiscal position by generating revenues in excess of \$5 billion over the gas field's lifetime (Office of the Quartet, undated-b). It is not clear how the war in Gaza will affect this project.

Unsustainable Utility Governance

Utility governance is inadequate, leading to financial instability. The Electricity Law of 1995 and later amendments led to the creation of the Palestinian Electricity Regulatory Council (PERC) and the Palestinian Electricity Transmission Company. However, these reforms were not fully implemented (Badiei, Foster, and Coma-Cunill, 2017). There are high rates of illegal and unmonitored connections to the energy grid and low collection rates by energy distribution companies (DISCOs) and municipalities. Despite efforts by PERC, electricity is not priced at cost-recovery levels, leading to significant gaps between tariffs and costs, especially in Gaza. In 2015, revenue recovered only 64 percent of the electricity purchased in the West Bank and only 50 percent in Gaza (Badiei, Foster, Coma-Cunill, 2017).

The distribution infrastructure is fragmented. The Palestinian distribution network is split into multiple DISCOs (five in the West Bank and one in Gaza); 35 percent of municipalities still manage electricity distribution independently (meetMED, 2020). The electricity networks under their control are not interconnected, reducing the ability to balance loads, and electricity losses are high: up to 34 percent, according to some sources, caused by technical losses and theft (Ersoy, Terrapon-Pfaff, and Brik, 2022). There are plans, yet to be implemented, to consolidate the West Bank DISCOs into one distribution company.

DISCOs and municipalities are not able to fully collect unpaid bills, partly due to high prices and illegal connections. In August 2024, Palestinian debt to the Israel Electric Corporation reached \$530 million ("After Decades: Palestinian Authority to Finally Pay 2b NIS Electric Bill?" 2024). Many Palestinians, especially those living in refugee camps in the West Bank and Gaza, have historically not paid for electricity (Hadid, 2015; Deprez, 2019). Others tap into the power grid illegally, with the Palestinian government rarely prosecuting (Thurin, 2014). According to the director of the Jerusalem District Electricity Company, only about 30 percent of bills were paid on a regular basis as of 2014 (Thurin, 2014). Although this factor further reduces the incentive for DISCOs and municipalities to increase their collection rates, the PA indirectly subsidizes unpaid DISCO debt to the International Electrotechnical Commission through tax revenue withheld by Israel.

Opportunities and Constraints with Regard to Alternative Energy Sources

Renewable energy is slowly gaining momentum. The PA aims to generate 20–33 percent of electricity from *renewable energy* by 2040 and improve energy efficiency of all sectors by 20 percent in 2035 (Office of the Quartet, undated-b). But multiple constraints will make that goal extremely difficult to achieve. Several projects have been planned or begun, but few have been completed. The most ambitious project underway is the \$620 million Jenin Power Plant, developed through the Palestine Power Generation Company (Massader, undated). It will be a gas-fired combined cycle gas turbine with a generation capacity of 450 MW, enough to satisfy approximately 50 percent of Palestine’s current total electricity consumption. But because it depends on secure natural gas supply from the Gaza Marine gas field, it is not clear when it will come online (Massader, undated).

Alternative energy sources offer potential but face limitations. Solar energy offers the greatest potential for supply increases. There are several successful projects to point to: Massader Solar is installing solar panel arrays in up to 500 schools in the West Bank (UN Framework Convention on Climate Change, undated), and the Bureij Central Wastewater Plant, funded in large measure by Germany and put into operation in 2021 (Kreditanstalt für Wiederaufbau, 2021), is a self-sufficient plant that produces 4 MW from the solar and biogas plant (Todman, Bermudez, and Jun, 2023). In 2017, the World Bank estimated that peak production from solar energy from utility-scale solar farms could amount to 100 MW in Areas A and B and 3,374 MW in Area C. Rooftop solar could potentially provide 530 MW in Areas A and B and 160 MW in Gaza (Badiei, Foster, and Coma-Cunill, 2017). A 7.3-MW rooftop solar photovoltaic power plant in Gaza’s Industrial Estate could generate up to 80 percent of the estate’s electricity (UN Framework Convention on Climate Change, undated).

Israel has not granted permits for Palestinians to build solar energy facilities in Area C. In 2022, the PA identified over 200 MW of potential solar photovoltaic sites in coordination with the European Union and the Israeli government. In addition, the Israeli government had previously approved two solar photovoltaic sites in the West Bank: one in Bani Naim (Area A) and another in Aqbat Jabr (Area C) (Office of the Quartet, 2023b; U.S. International Trade Administration, 2023a). However, the Israeli authorities have not issued permits for the use of land in Area C for solar energy purposes (Baskin, 2021). If these solar projects were constructed, additional infrastructure would be needed to transmit electricity from Area C to Areas A and B (Baskin, 2021). Israeli projects in Area C (in lands annexed to settlements) include solar farms.

Wind energy offers limited promise. A less robust but potential source of renewable energy for Palestine is wind power. However, several factors limit the potential of this source. Average wind speeds are marginally high enough to support this technology. Challenges related to costs and financing, professional capabilities, and jurisdiction over promising sites in Area C make many wind energy projects impractical (Salem, 2019). Israel’s development of a 42-MW wind turbine project in Yatir Forest, which is located in the Naqab Desert and parts of the West Bank, suggests that wind energy could be an alternative source of electricity for the Palestinians in the West Bank in some locations (Shqair, 2023). However, most of these locations are in Area C and therefore would require Israeli authorization.

A Map of the Current Situation

Figure 6.1 profiles the current energy status in Palestine and Gaza. This map reveals the almost complete dependence of the West Bank and Gaza on the Israeli energy network, a reality that Israel can exploit in times of tension. While the network in Israel is well developed, there are only a handful of medium-voltage transmission lines from Israel into the West Bank, and the distribution network inside the West Bank is inadequate and fragmented. Most of the substations are controlled by Israel as well. In terms of supply, except for one power plant and two substations in Gaza, there are no power plants in Palestine, and the offshore oil is

FIGURE 6.1
Energy: The Current Situation



SOURCES: OCHA, Office of the Quartet, Israel MoE, CEP, ORG. See Appendix B for more information.

from Israeli platforms. Despite the desert environment, there are no solar energy fields in Palestine because they would need to be located primarily in Area C; to date, this has been unacceptable to Israel.

Transformative Projects and Initiatives

The transformative projects and initiatives profiled here, in different stages of planning or completion, will improve the energy sector in Palestine. They address both the opportunities and challenges described in our assessment of the current situation. They include gas pipelines, gas-fired power plants, substations and transmission lines, and renewable energy sources. Details of locations and characteristics of the projects appear in Appendix A. The projects fall into three broad categories, with projects mapped to the challenges they address in Table 6.1.

Energy Sources

Domestic generation will be sufficient to make Palestine energy independent and politically autonomous. Energy sources will be diversified, both domestically and in terms of imports from Jordan, Israel, and Egypt. Electricity power generation stations will be in both the West Bank and Gaza. The potential for renewable sources, such as solar, wind, and waste-to-energy, will be fully exploited. Use of gas resources in the Mediterranean will reduce energy costs and increase prosperity. Such projects and initiatives include the following:

- *Large-scale deployment of solar photovoltaic systems* will generate electricity for the grid, typically involving solar farms or arrays with capacities ranging from several megawatts to hundreds of megawatts, aiming to supply power to utility companies and large-scale consumers. Upgrades to the electrical grid will enable the integration of solar energy with other energy sources.
- *A new terminal* planned as part of the Gaza Seaport will store and distribute various types of fuels, such as gasoline, diesel, and aviation fuel.
- *Gas exploration and extraction* will occur offshore of Gaza.
- *Existing power plants* will be upgraded, and new ones will be developed.
- *The Jenin waste-to-energy power plant, Zaharat Al Finjan*, will convert nonrecyclable waste materials into electricity, heat, or fuel through processes of incineration or anaerobic digestion, thereby reducing landfill use, managing waste effectively, and generating renewable energy.

Energy Networks and Transmission

New infrastructure, such as transmission systems, distribution networks, substations, and pipelines, as well as transmission agreements with Israel, will comprise energy connections between the West Bank and Gaza.

TABLE 6.1
Energy Projects and the Challenges They Address

Project or Initiative	Challenge(s) Addressed
Energy sources	<ul style="list-style-type: none"> • Inadequate energy supply and infrastructure • Opportunities and constraints with regard to alternative energy sources • Dependence on outside energy sources
Energy networks and transmission	<ul style="list-style-type: none"> • Inadequate energy supply and infrastructure
Energy administration	<ul style="list-style-type: none"> • Unsustainable utility governance • Measures underway and models to emulate

The energy network will be *robust* (i.e., it functions consistently) and *resilient* (i.e., if a segment fails, other parts can compensate). Such projects and initiatives include the following:

- *Distribution companies will be upgraded*, and their activities will be coordinated and made compliant with legislation.
- *New substations* will be established in the north and west of Gaza.
- *New gas pipelines* on the West Bank will connect to the Israeli network; new pipelines in Gaza will connect to the Israeli or Egyptian network.
- *A continuous, high-voltage transmission line* along the ridgeline of the West Bank will connect all DISCOs and substations to each other, as well as to the Gaza Strip and its new facilities and infrastructure.
- International cross-border, medium-voltage feeder lines from Jordan, Israel, and Egypt will reinforce and supplement local production of energy.

Administration

Administration projects and initiatives include the following:

- *A power authority* that can manage the operations of DISCOs will replace the current fragmented system. It will develop the institutional capacity, as well as the legal and regulatory tools, to manage this diverse and complex system.
- *Regulations and policies* will be in place to recoup energy costs at a fair price that is not inflated by the current system. The goal will be to have stable and competitive energy prices and improved collection mechanisms, eliminating theft and delinquency.
- *Building codes will be updated* to promote energy efficient practices.
- *Adequate risk insurance* will be in place for the largest and most vulnerable projects and infrastructure components.
- *Frameworks will be established for planning, investment, and operations*, ensuring that safety, reliability, and efficiency standards are met; promoting competition, innovation, and sustainability; and fostering public and private sector collaboration to achieve long-term energy security and environmental goals.
- *Improved energy bill collection* will enable sustainable energy financing.
- Gaza will be reconstructed with energy efficiency as one of the guiding principles.

Maps of the Vision

Figure 6.2 illustrates our energy vision for Palestine and the transformative projects that will enable it. This map shows a comprehensive strategy for energy infrastructure that would enable energy independence and sustainable supply while ensuring efficient connections to the Israeli network and feeder lines from other countries. Not unlike the transportation vision, the map shows a major new *electric backbone*, or electric utility corridor linking the major cities along the alignment of the ridgeline. This corridor would link a set of new Palestinian substations and power plants. In addition to the new power plants, this map shows several other strategic opportunities for supply and independence: There are large geographies—mostly in Area C—for utility-scale solar power. In addition, there is the potential for a gas platform and pipeline off the Gaza coast, the Gas for Gaza initiative.

Figure 6.3 demonstrates the addition of new energy infrastructure to a hypothetical urban area in the region. The energy sector, currently fragmented and with unreliable and insufficient infrastructure, will benefit from new facilities and energy sources, improving energy independence and blackouts. New gas-







FIGURE 6.2
Energy: A Vision








GAS NETWORK

-  Israeli gas platform
-  Proposed Palestinian gas platform
-  Israeli natural gas pipeline
-  Proposed Palestinian natural gas pipeline

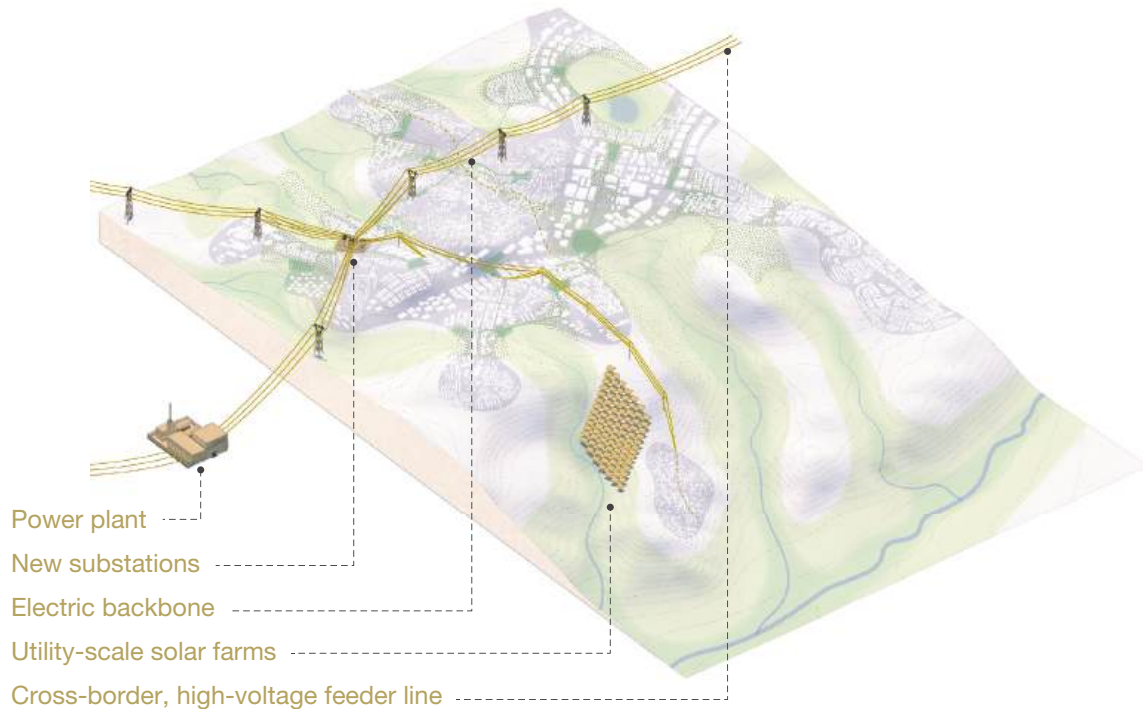
ELECTRICITY NETWORK

-  Israeli power plant
-  Israeli substation
-  Palestinian substation
-  Palestinian power plant
-  Proposed Palestinian substation
-  Proposed Palestinian power plant

-  Proposed electric backbone
-  Overhead lines
-  Proposed cross-border feeder line
-  High potential for utility-scale solar production
-  Ideal location for solar production

SOURCES: OCHA, Office of the Quartet, Israel MoE, CEP, ORG. See Appendix B for more information.

FIGURE 6.3
Energy: Urban Integration



turbine or waste-to-energy power plants will increase power produced locally, together with new utility-scale solar farms, and the electric backbone will ensure the connectivity and resilience of the electrical system across Palestine.

What Is Feasible Now?

As with transportation, a national-scale initiative to reorganize and rebuild the entire network faces many barriers in the short term, as does the Gas to Gaza initiative, which all regional partners agree makes sense but is stalled by the war in Gaza. But, as in other sectors, there are gains to be made related to institution-building and the introduction of best practices into the existing network. Such gains include the upgrading of local distribution companies' capacity to ensure effective rate collection and lessen transmission loss. There are also achievable capital projects, including new power plants—some of which already have permits and require only additional funding—and the waste-to-energy pilot project mentioned above. The biggest untapped source is solar; although a utility-scale national program is a longer-term objective, we have mapped places in Area A and less contested places in Areas B and C where solar production could be put in place. Solar production is also something that can be implemented at the most local scale of individual buildings and neighborhoods.

Water

A Vision for Water

Palestinians will enjoy abundant access to water at global standards, and water management will be efficient, sustainable, and cost effective. The Palestinians' role as the traditional stewards of their own resources will ensure that water resources are managed efficiently and fairly. All Palestinians will have access to sewage linkages, and sewage will be appropriately managed. Benefits from recycling gray water (such as in agriculture) will accrue to the Palestinian economy. Citizens will pay fairly for their use of water. Water will be managed jointly and equitably among countries of the region, using internationally acknowledged best practices for transborder watershed management.

The Current Situation

Water and its relationship with the landscape shape the spatial vision of Palestine, including managing the flow of stormwater, monitoring the supply from aquifers, and making adequate clean water available to everyone in the community. Indeed, water is an essential requirement—for the health of the Palestinian people and the robustness of Palestine's economy.

But Palestine faces daunting water-related challenges. It *does not have sufficient access* to fresh water. A disproportionate share of aquifer resources are used by Israel. Repairs to the water distribution system have been hobbled by Israel's dual-use restrictions. Gaza's water infrastructure, inadequate before the war, has been severely damaged by the war. *Inadequate sewage infrastructure* leads to pollution, and about half of Gazans do not have sewage connections. *Water distribution is poorly managed*, and very little wastewater is treated for other uses, such as agriculture. There is substantial leakage in Palestine's *poorly maintained distribution systems*, which also facilitate illegal connections and thus loss of government revenue to support the system.

Insufficient Access to Clean Water

For natural and technical reasons, as well as restrictions related to Area C, Palestine lacks sufficient access to fresh water. In 2016, Palestinians had 66 and 62 liters per capita per day in the West Bank and Gaza, respectively, well below the World Health Organization's minimum recommendations of 100 liters per capita per day for domestic consumption for health and hygiene (World Bank, 2018a). In comparison, Israelis in settlements in Area C had three times as much water per day per person (McKernan, 2023). Climate change will reduce the volume of natural water supply, making it more variable and requiring careful management (World Bank, 2018a). With these constraints, the Palestinians depend mostly on groundwater (accounting for 95 percent of their water supply), putting immense pressure on this resource (Palestinian Water Authority, 2017).

Joint Israeli-Palestinian water management hinders strategic water management in the West Bank.

The Joint Water Committee, composed of both Israelis and Palestinians, was established in 1995 as part of the Oslo Accords to manage water in the West Bank but not the Jordan River. Meant to last five years, it is still in place today; as a result, decisions involving water in the West Bank must be made by consensus (World Bank, 2018a). This governance structure has hampered strategic planning for water resources; each party has different objectives for water use (Fanack Water, 2023a). Israel uses approximately half of the available water from the Jordan River Basin and 80 percent of shared mountain water aquifers (Fanack Water, 2023a).

Most of Gaza's water infrastructure, inadequate before the war, has been damaged or destroyed by the conflict. As of January 2024, about 57 percent of water infrastructure in Gaza had been destroyed or partially damaged (World Bank, European Union, and United Nations, 2024). In February 2024, according to data provided to us by the UN, the UN found that 60 percent of desalination plants, 33 percent of stormwater basins, 75 percent of stormwater pumping plants, 50 percent of water treatment plants, and 50 percent of reservoirs had been damaged or destroyed (Ipsos, 2024). As of April 2024, water production capacity was estimated at 20 percent of prewar output (UN Office for the Coordination of Humanitarian Affairs, 2024b). Even before the war, Gaza's four desalination plants were not able to meet water needs (Palestinian Central Bureau of Statistics, 2023a). Israel classifies about 70 percent of the construction materials and equipment related to building and maintaining water and sanitation infrastructure as dual-use, which resulted in limited availability of materials required to maintain the water infrastructure in Gaza before the war (Martin and Klawitter, 2017).

Insufficient Sewage Access and Infrastructure

Sewage infrastructure is insufficient and under strain, leading to pollution in populated areas, posing health risks and degrading the environment. Several wastewater treatment plants are operating above their capacity and require expansion and upgrades (Office of the Quartet, 2022). Funding, dual-use restrictions, and the slowness of permits from Israel have hindered improvements to the sewage infrastructure. Sanitation issues also affect Israel: Pollution that runs into the Mediterranean Sea from Gaza has, on occasion, polluted the beaches in Tel Aviv.

Only slightly more than half of Palestinians in the West Bank and Gaza had sewer connections in 2015, and raw sewage pollutes aquifers and the Mediterranean (Palestinian Central Bureau of Statistics, 2015). In 2015, the most recent year with available data, the figure was 54 percent. Since then, the proportions may have increased, given additional infrastructure projects; however, the war in Gaza has destroyed 70 percent of the water and wastewater treatment plants, and vast numbers of displaced people live in camps without sewage treatment (Shurafa and Frankel, 2024). Some of the untreated sewage flows into Israel, which deducts funds from PA tax revenues for treatment (\$31 million in 2017) (World Bank, 2018a). The remainder of the untreated sewage is discharged into cesspools, septic tanks, open drains, and vaults. In Gaza, raw sewage flows into the Mediterranean Sea and/or seeps into the coastal aquifer (UN Environment Programme, 2020a).

Underdeveloped Infrastructure and Policies for Agriculture

Irrigation infrastructure and management practices are underdeveloped. After personal consumption, agriculture is the second major water user, accounting for about 20 percent of use in the West Bank and Gaza (Palestine Ministry of Agriculture, 2016). Rainfed cultivation is the primary approach in agriculture, covering about 80 percent of the agricultural land; only about 20 percent of agriculture relies on irrigation (Food and Agriculture Organization of the United Nations, undated). Irrigation infrastructure and gray water reuse are underdeveloped. Irrigation efficiency is low (60–75 percent), with substantial losses occurring in the water conveyance systems (Food and Agriculture Organization of the United Nations, French Agricultural

Research Centre for International Development, and European Union, 2023). There is overconsumption of water resources for unprofitable agricultural products (Tagar, 2007). Palestinians do not have full stewardship of their water resources, so some local responsibility, knowledge, and best practices have been lost.

Very little treated wastewater is reused for other purposes, such as agriculture. In the West Bank, only about 5 percent of wastewater is retreated for irrigation (Fanack Water, 2023a); in comparison, Israel retreats 90 percent of its wastewater for irrigation (2022 Delegation to Israel, 2023). The potential for reusing treated wastewater to irrigate agricultural lands is considerable. According to data provided to us by the Office of the Quartet, more than 41 square kilometers of agricultural land could be irrigated with about 42 MCM of treated wastewater, generating over \$78 million annually in additional agricultural revenue.

However, wastewater treatment plans require significant infrastructure, such as pumping stations and water tanks. Reuse of wastewater for agriculture has faced multiple challenges, including restrictions on entry of equipment into Gaza because of dual-use restrictions, social norms against reuse of wastewater, project governance, lack of a water reuse association, inaccurate data, low local capacity, poor operations and maintenance, and unorganized donor intervention (Buge, 2023).

Unsustainable Financing for Water

Leakage and illegal connections reduce water supply and make water provision financially unsustainable. There is substantial loss of water through leaks in the poorly maintained freshwater and irrigation distribution networks. Water loss in 2016 was estimated at 41 percent in Palestine (World Bank, 2018a). Many Palestinians are not paying for water use, denying the government the funds needed to provide water and maintain the system. For instance, in 2021, the PA reported outstanding debts on water service providers of more than \$320 million, a sum that is increasing annually by about \$30 million (Palestinian Water Authority, 2021). On average, West Bank service providers recoup only 76 percent of costs. Addressing water theft requires cooperation with Israel, especially in Area C, where most theft is thought to occur (World Bank, 2018b).

Measures Underway and Models to Emulate

Measures are underway to improve water access and sewage treatment, but challenges remain. A water sector strategy for Palestine has multiple components, including new wells to increase groundwater supply; assessments of climate change impacts on water resources; plans to meet demand by reducing water loss from degraded infrastructure, changing crop patterns, and reducing water use; harvesting stormwater through the construction of dams; and developing alternative resources through water purchase, desalination, and reuse of wastewater (Palestinian Team, 2014). The European Union, United States, Gulf Cooperation Council countries, and UN have all allocated funding for these plans. In the West Bank, the Kidon Valley project, a cooperative effort between Israelis and Palestinians, seeks to treat raw sewage daily for agricultural use, thereby reducing pollution and fostering regional cooperation (Vorsanger-Zavit, 2019).

Before the Israel-Hamas war, Gaza improved its sewage infrastructure through such initiatives as the 2021 Bureij Central Wastewater Treatment Plant and the 2018 North Gaza Emergency Sewage Treatment Project. Together, these projects provided wastewater treatment services to over 1.4 million Gaza residents. The projects cost \$175 million and were financed by international partners (World Bank, 2018c; Kreditanstalt für Wiederaufbau, 2021).

Israel has invested in desalination and water reuse, thereby improving its water security, beginning to replenish depleted water resources, and providing a potential model for the region. To address water shortages over the years, Israel has developed technology and approaches to address water needs (Fanack Water, 2023b). These efforts included desalination plants, wastewater reuse, infrastructure maintenance, and more-efficient agricultural practices. Israel's desalination plants provide half of all potable water in the coun-

try. Israel was an early leader in wastewater reuse, which meets about half of the total water demand for agriculture and about 25 percent of the total water demand in the country (Fanack Water, 2023b). Israel was also a pioneer in using water-conserving agriculture practices, such as drip irrigation.

Desalination has supported efforts to replenish groundwater levels in Israel. In 2023, Israel completed the National Carrier Flow Reversal Project, transporting water from the desalination plants to replenish the Sea of Galilee. This project is expected to stabilize water levels, making it possible to sell water to Jordan and improve water security for Israel. The innovative Israeli approaches could be a model for Palestine and a foundation for cooperation.

A Map of the Current Situation

Figure 7.1 provides a snapshot of the water situation in Palestine. As with energy, there are issues of supply, distribution, and independence. Although there are clusters of wells around Qalqilya, Tulkarem, Jenin, and Jericho, the distribution of wells does not conform to the chain of major cities along the ridgeline, which highlights the limitations in terms of the water supply. The map shows the complete dependence of Palestine on Israeli desalination plants. There are also several locations where Israeli wastewater treatment plants treat Palestinian water, for which Palestinians must pay.

Transformative Projects and Initiatives

The projects described here illustrate how selected transformative projects and initiatives could address the challenges and opportunities with respect to water in Palestine and realize important elements of the vision. Table 7.1 links the projects and initiatives to the categories of challenges discussed. Details of the location and characteristics of the projects appear in Appendix A. The projects fall into four broad areas, as profiled below.

Water Sources

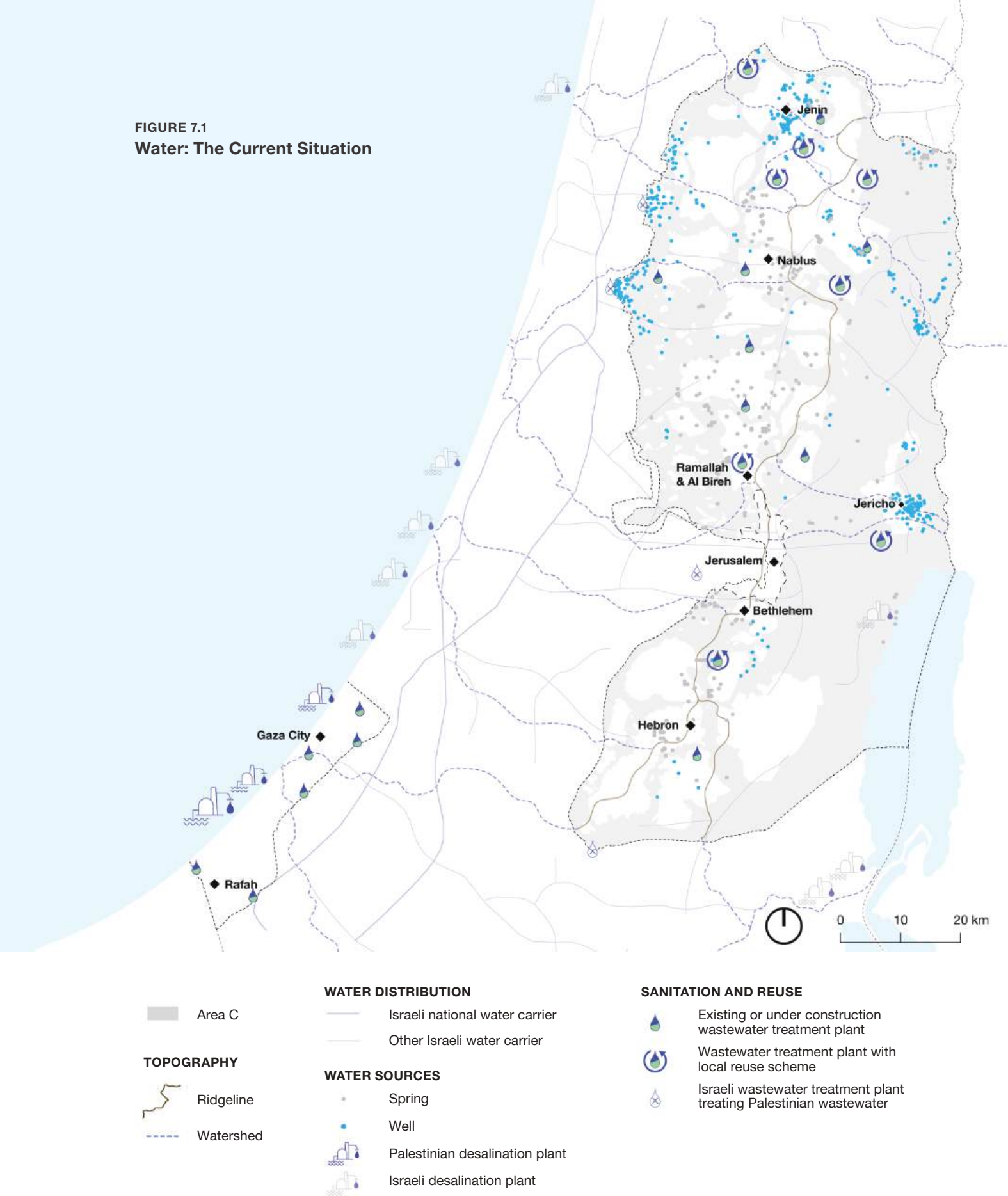
New water sources, strategically located, can increase the amount of water available to Palestinians, bringing domestic consumption to minimum requirements, as specified by the World Health Organization. Such projects and initiatives include the following:

- Twenty-two *new wells*, distributed in the West Bank and Gaza, will extract 30 MCM per year from shared groundwater aquifers.
- A suite of *new dams* will be located in Jenin, Tubas, Nablus, and Jericho governorates, as will several agricultural ponds in the Jenin governorate.

TABLE 7.1
Water Projects and the Challenges They Address

Project or Initiative Category	Challenge(s) Addressed
Water sources	<ul style="list-style-type: none"> • Insufficient access to clean water
Distribution	<ul style="list-style-type: none"> • Insufficient access to clean water
Sanitation and reuse for agriculture and environmental purposes	<ul style="list-style-type: none"> • Insufficient sewage access and infrastructure • Underdeveloped infrastructure and policies for agriculture
Water administration	<ul style="list-style-type: none"> • Unsustainable financing for water • Measures underway and models to emulate

FIGURE 7.1
Water: The Current Situation



SOURCES: OCHA, HydroBASINS, Israel WaSA, MoLG, CEP, PWA, Office of the Quartet, ORG. See Appendix B for more information.

- *Short-term, low-volume desalination plants* will increase the supply of domestic water in the Gaza Strip by 30 MCM per year, complementing the Associated Works of the Gaza Central Desalination Plant.
- *A new desalination plant in central Gaza* would treat 55 MCM in the short term and significantly expand as a key source of water distributed nationally in the long term. *A proposed new desalination plant* could treat large brackish springs on the slopes of the Dead Sea and in the Bethlehem and Hebron governorates.

Distribution

Repair of existing water infrastructure can make distribution systems more reliable and efficient. New water infrastructure will distribute water efficiently, making use of this precious resource more efficient. Desalination plants can serve as a much needed supplement to groundwater resources. Such projects and initiatives include the following:

- *Reduction in water leakage* through repair of existing municipal infrastructure will address water loss and resource sustainability, enhancing the reliability and efficiency of water distribution systems. Water resources will be used sustainably and efficiently, and investments will be made to prevent and detect leakage and other sources of unaccounted-for water.
- *A new national water carrier main pipe* along the ridgeline of the West Bank will efficiently distribute water to surrounding cities, towns, and sectors, including industrial and agricultural, enhancing connectivity and resource use across the country.
- *New connection points to the Israeli water system* will increase supply in both Gaza and the West Bank.

Sanitation and Reuse for Agriculture and Environmental Purposes

All Palestinians will have access to sewage linkages, and sewage will be managed so as not to pollute aquifers and coastal land and waters. Benefits from recycling gray water (such as in agriculture) will accrue to the Palestinian economy. Agriculture will thrive as a sector of the economy, supported by sufficient infrastructure for irrigation, including sewage reuse. Such projects and initiatives include the following:

- *Development, repair, and expansion* of more than two dozen wastewater processing facilities across the West Bank and Gaza will ensure that wastewater is safe for discharge, thereby protecting public health and the environment. These facilities will also serve irrigation and environmental purposes, targeting valuable agricultural zones in the West Bank and Gaza.

Administration

As a shared resource, water will be managed jointly and equitably among countries of the region. Sustainable management of river basins and watersheds flowing into the Mediterranean Sea will be a joint Palestinian-Israeli venture. The Palestinian government will make public decisions about water use and coordinate with its governorates, as well as with neighboring states (Israel, Jordan, Egypt, and others with which it is interdependent), on managing watersheds and shared water resources. Palestine will adopt good practices in water management from Israel, which will provide technical support. Administration projects and initiatives include the following:

- *Consolidating the water utility companies* will streamline and coordinate the more than 300 water service providers across the West Bank and Gaza, enhancing resource efficiency and reducing environmental and economic challenges.

- *Reforming the water payment system* will entail installing water meters to mitigate water loss and reduce informal connections, thereby enhancing accountability and efficiency. Water provision will be financially sustainable. Citizens will pay fairly for their use of water, and methods for collecting payment and financing the water system will be improved.
- *Legal reform* will develop and enforce wastewater treatment and reuse regulations, set clear guidelines for gray water reuse in agriculture, and ensure proper collection, treatment, and sustainable practices.

Maps of the Vision

Figure 7.2 illustrates our water vision for Palestine and the transformative projects that enable it. To increase the supply of water, both for living and industry, we envision at least 22 new wells, as well as new dams around Jenin, Tubas, Nablus, and Jericho. The water sector, currently with degraded infrastructure and over-exploited resources, will benefit from a new national carrier as an infrastructural backbone on the ridgeline, distributing clean drinking water.

New and upgraded desalination plants on the Mediterranean and Dead Sea coastlines will help alleviate water shortages, and new reuse schemes of treated wastewater will reduce agricultural dependency on rain or drinking water for irrigation.

Most significant are the green-blue shaded areas: the approximate geographies where best-practice water management, reuse, and conservation can be most effectively deployed. Not surprisingly, these correspond roughly to the locations of the riparian parks described earlier (see Figure 3.2). These areas also are where most of the wastewater treatment plants are located, both the new plants and the upgraded existing plants. As noted earlier, the watershed boundaries do not correspond to jurisdictional boundaries, highlighting the need for Israeli-Palestinian cooperation.

Figure 7.3 provides an example of how new water infrastructure could be integrated into a theoretical urban community. Water is provided from a local desalination plant and from the national water carrier, with wastewater treated for reuse for agricultural and environmental purposes.

What Is Feasible Now?

As with energy, despite the immediate challenge of creating a national water carrier, there are gains to be made with regard to institution-building and the upgrading and repair of distribution infrastructure to ensure effective use monitoring and, especially, reduce water loss through leakage. Experience elsewhere demonstrates the outsize return in investment that these upgrades can achieve. Another low-cost, management-related project is to study and change the way existing water resources are allocated. Some studies suggest that a significant amount of water is diverted to wasteful crops. There is an opportunity to empower local farmers to reengage with their traditional and more sustainable practices. In terms of new capital projects, there are local service dams and wells that can be built; even though permission from Israel has sometimes been difficult to get, there are selected locations that are uncontroversial and where Israel has a shared interest. New technologies are also enabling local-scale desalination, and these projects should be supported. In addition, Palestine can undertake the legislative and regulatory reform needed for agricultural and environmental reuse of wastewater; it can undertake repairs and upgrades to sewage networks.

FIGURE 7.2
Water: A Vision



WATER DISTRIBUTION

- Palestinian national water carrier
- Israeli national water carrier
- Other Israeli water carrier

TOPOGRAPHY

- Ridgeline
- Watershed

WATER SOURCES

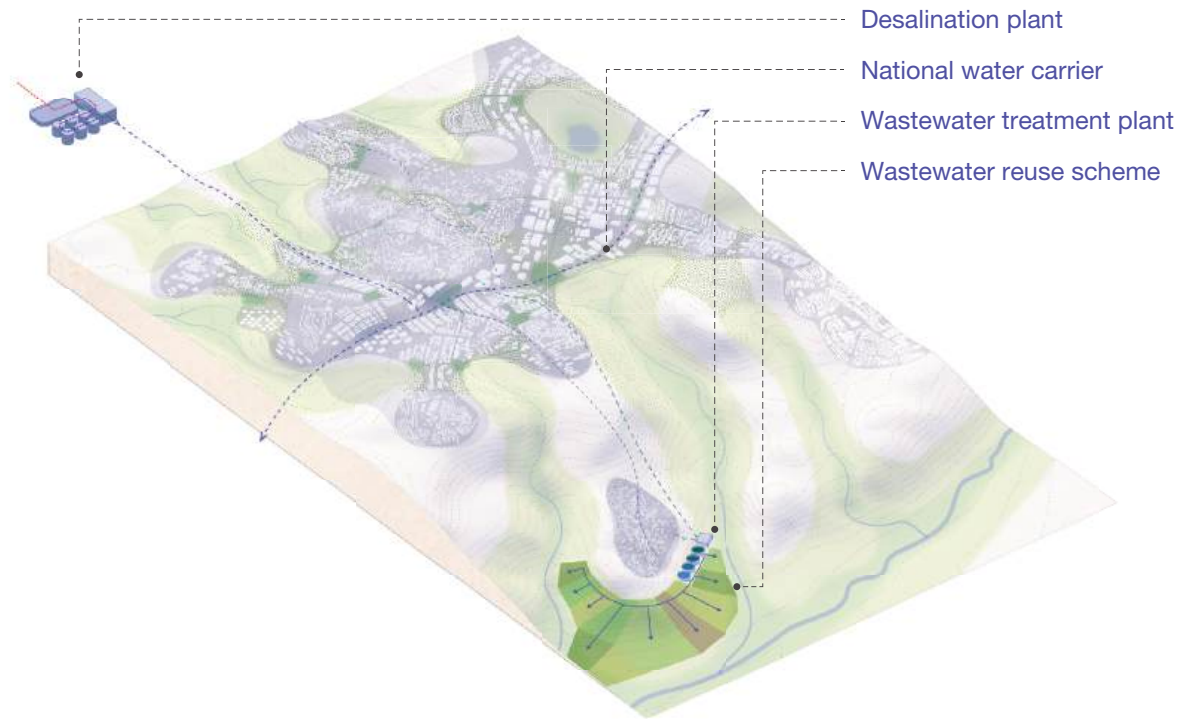
- Spring
- Well
- Proposed well
- Proposed dam
- Palestinian desalination plant upgrade
- New Palestinian desalination plant
- Israeli desalination plant

SANITATION AND REUSE

- New wastewater treatment and reuse plant
- Proposed reuse on existing wastewater treatment plant
- Wastewater treatment plant and reuse scheme
- Potential reuse scheme distribution area

SOURCES: HydroBASINS, Israel WaSA, MoLG, CEP, PWA, Office of the Quartet, ORG. See Appendix B for more information.

FIGURE 7.3
Water: Urban Integration



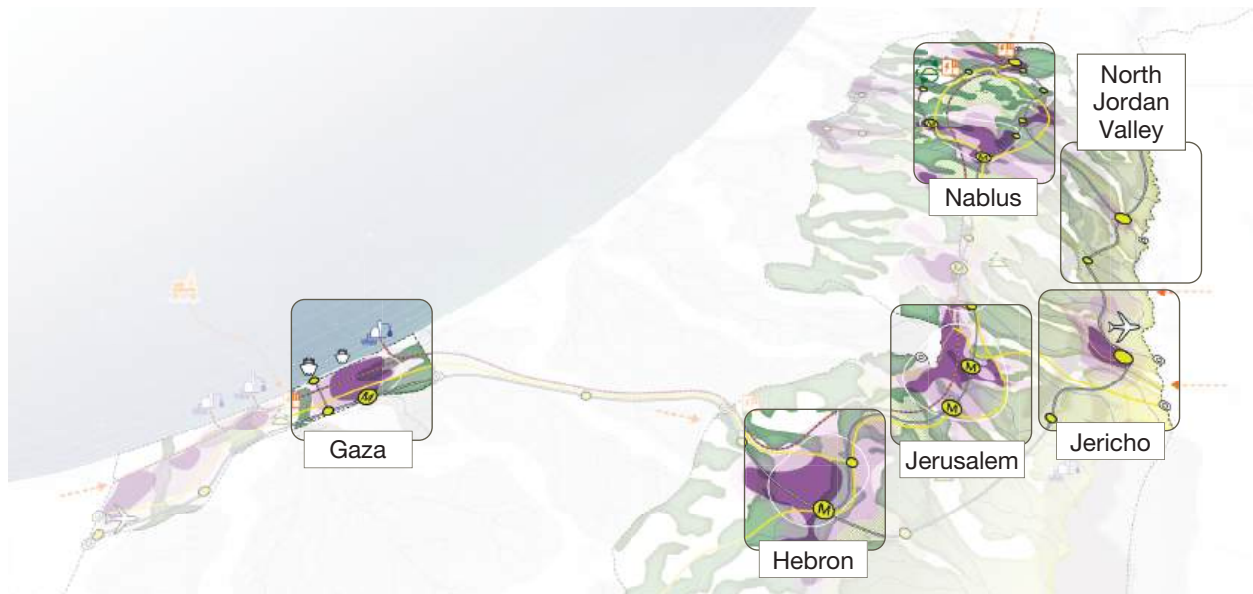
The Spatial Vision in Six Cities

We organized our spatial vision for Palestine around six sectors: governance, environment, cities, transportation, energy, and water. For each, we present three figures: a map of the current situation, a map of a vision of the future in which transformative projects are proposed, and a diagram with a three-dimensional representation of a prototypical place in Palestine.

For this vision to move from abstract and aspirational to concrete and implementable, and for it to be relatable and accessible for all stakeholders, it must be grounded in physical space and illustrate what the vision would mean in real places that residents will recognize as their own. To that end, we have selected six geographies that collectively are representative of Palestine: North Jordan Valley, Jericho, Nablus, East Jerusalem, Hebron, and Gaza City. Figure 8.1 illustrates the six locations we have chosen.

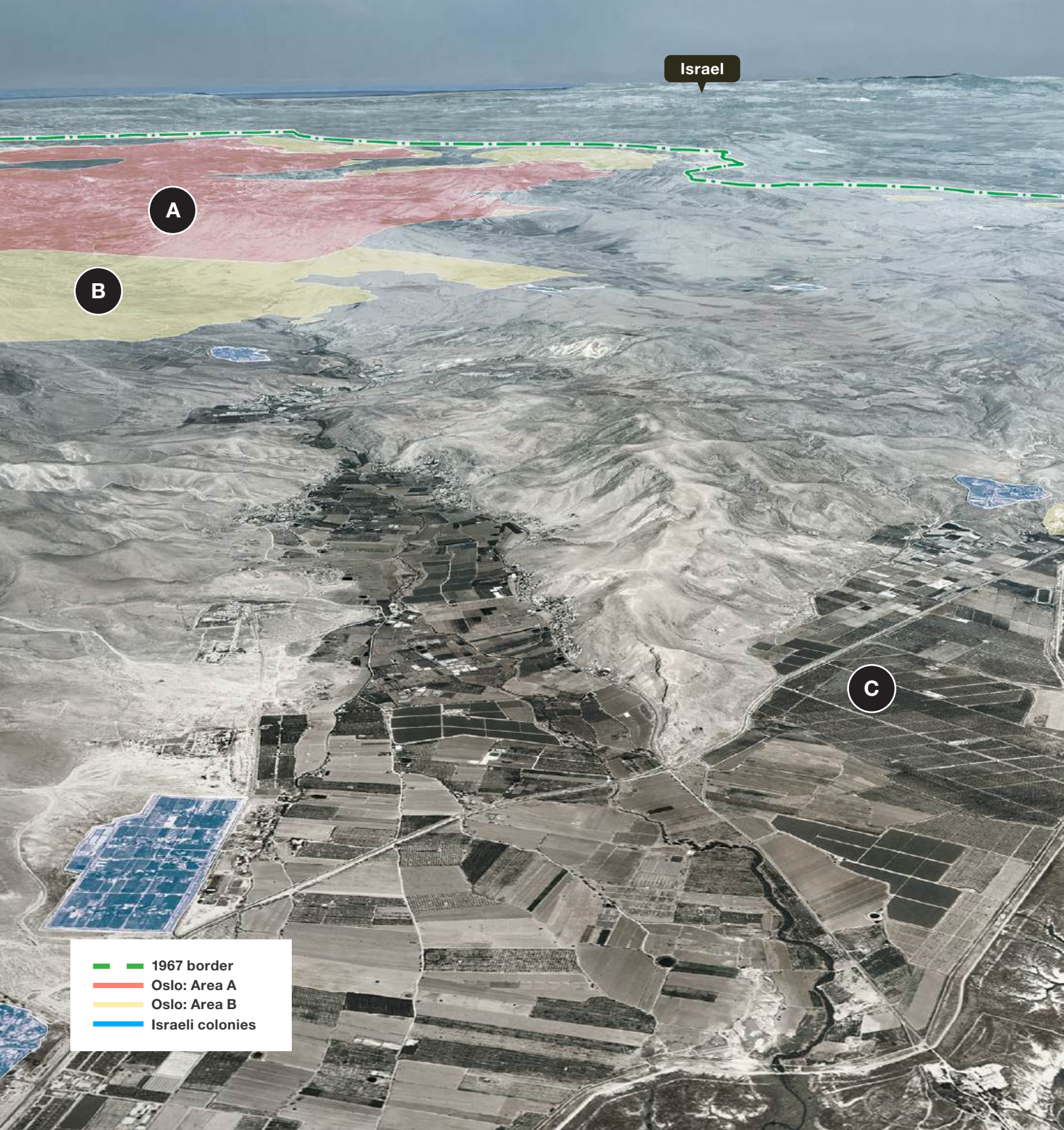
For each of these locations, we offer a bird's-eye view, followed by a plan view of how these areas would be transformed after the projects are implemented. For both the aerial and plan views, we provide some of the transformative projects with approximate locations. This is to reinforce the idea that this aspirational, long-term plan can be viewed concretely. Finally, we provide a ground-level photo simulation of how particular locations could be transformed through the implementation of the transformative projects, bringing an ambitious and comprehensive plan down to the eye level of a Palestinian. To further ground the plan in lived experience, we paired these views with a series of short narratives: first, an overview of the status quo and our plan and, second, an “envisioned typical day” or a fictional “day in the life” in this place that we have composed, as told from the perspective of different Palestinian citizens.

FIGURE 8.1
Local-Level Planning: Areas of Focus



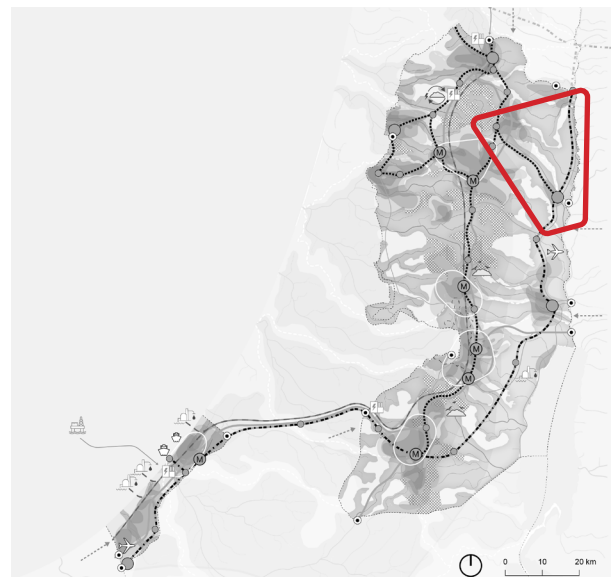
NORTH JORDAN VALLEY

FIGURE 8.2
North Jordan Valley Overview



Overview

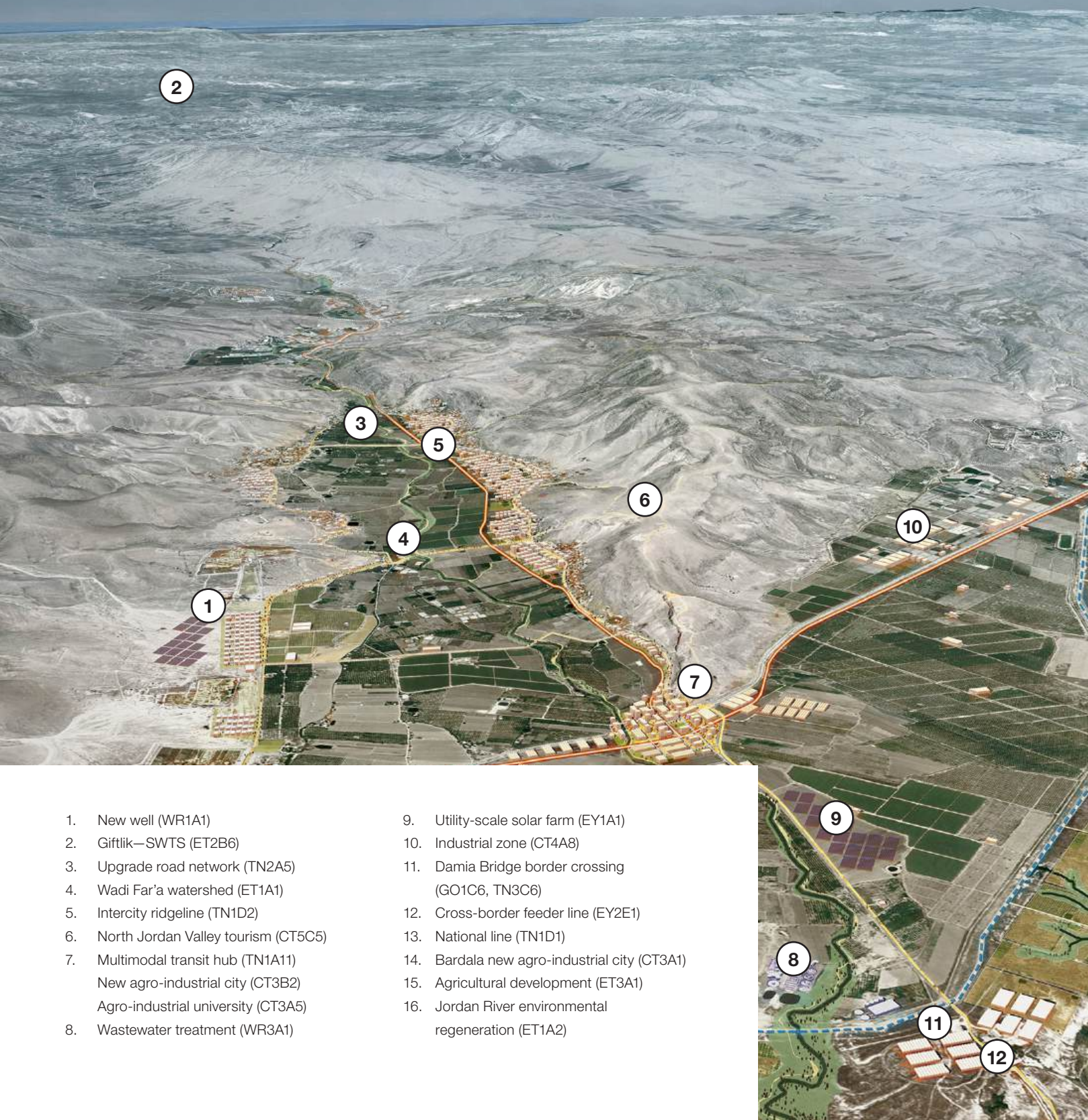
In the Northern Jordan Valley, we focus on the area around the village of Giftlik and the Damia bridge crossing to Jordan, where Wadi Far'a intersects with the Jordan River and agricultural and environmental assets are abundant. The plan for this area coordinates investments in infrastructure and urban development, supported by legal and policy revisions, in order to catalyze economic progress.



View location map

NORTH JORDAN VALLEY

FIGURE 8.3
North Jordan Valley Projects and Initiatives

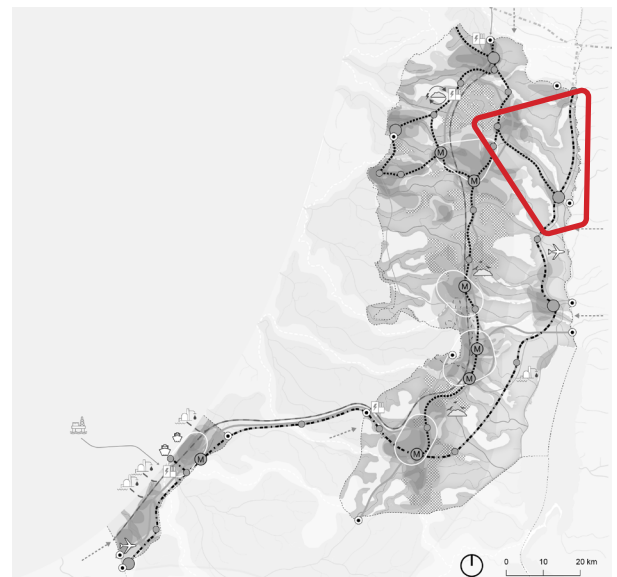




A city plan allows for the rapid and strategic expansion of Giftlik village, which has a population of about 4,000 residents.¹ Giftlik is among the most impoverished villages in the region, and we propose planned growth for Giftlik toward 50,000 residents over a period of ten years through investments in a wide variety of projects across sectors.² We chose Giftlik because of its unique location in regard to transportation infrastructure and natural resources and for its connection from the Damia Bridge to Jordan and beyond. Investment here would benefit the Northern Jordan Valley area and Palestine at large for economic development, with a focus on agricultural and industrial sectors. The plan presents a comprehensive approach for development of the valley, with a set of interventions that includes transportation, logistics, energy, water and sanitation, agricultural development, solid waste, and environmental restoration and protection.

¹ Population estimate by the study team based on a Palestinian Central Bureau of Statistics population census from 2017.

² Future population size for Giftlik corresponds to a Palestinian National Spatial Planning team statement in an interview, as well as design guidelines and case studies developed by the International New Town Institute.



View location map

NORTH JORDAN VALLEY

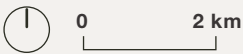


FIGURE 8.4
North Jordan Valley Synthesis Vision Plan

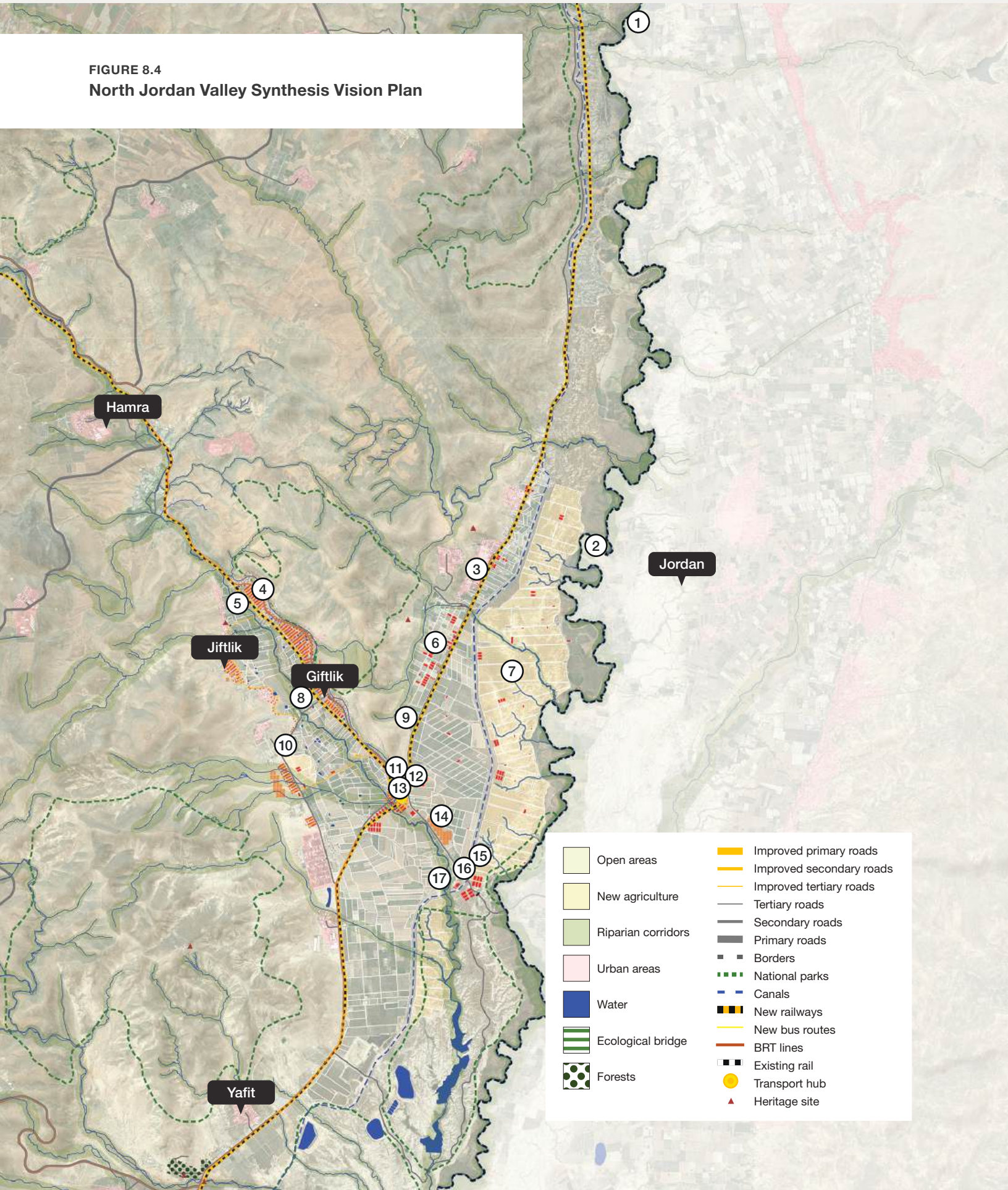


FIGURE 8.5
Wadi Far'a Watershed Management Plan (ET1A1)



Giftlik expands into a new “agro-industrial city,” where agricultural education, entrepreneurship, and agronomy best practices are showcased using new water and environmental investments.

FIGURE 8.6
Giftlik New Agro-Industrial City (CT3A2)



The new city center of Giftlik benefits from connections to both heavy rail and light rail lines intersecting with the redeveloped Road 90.

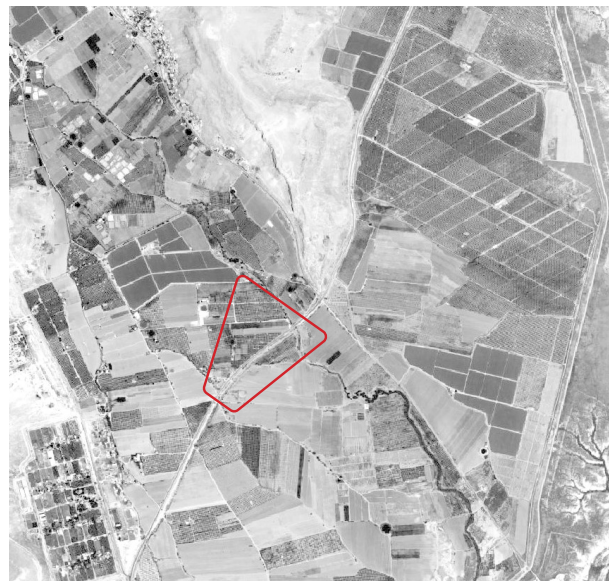
1. Bardala new agro-industrial city (CT3A1)
2. Jordan River environmental regeneration (ET1A2)
3. National line (TN1D1)
4. Intercity ridgeline (TN1D2)
5. Upgrade road network (TN2A5)
6. Giftlik industrial zone (CT5A8)
7. North Jordan Valley agricultural development zone (ET3A1)
8. Wadi Far'a watershed management plan (ET2D1)
9. North Jordan Valley tourism hub (CT5C5)
10. New wells (WR1A1)
11. Agro-industrial university (CT4A5)
12. Giftlik new agro-industrial city (CT3A2)
13. Giftlik multimodal transit hub (TN1A11)
14. Utility-scale solar farm (EY1A1)
15. Electricity feeder line from Jordan (EY2E1)
16. Damia Bridge border crossing (GO1C6, TN3C6)
17. Wastewater treatment with reuse (WR3A1)

An Envisioned Typical Day

The early morning call to prayer finds Giftlik already starting to buzz. In the old part of the village, established along the north side of the Wadi Al Far'a, the bakeries and coffee shops are coming to life as long-time residents greet new residents who have built homes among the historic buildings. Many of these residents are walking east through the neighborhoods that were established after Giftlik became an agro-city, where agricultural education, entrepreneurship, and agronomic best practices are showcased. Their destination is the mixed-use center that emerged at the intersection of the light rail, national rail system, and redesigned Road 90. It is a diverse group: A business executive is meeting a visitor from Tubas; a student at the Institute for Agriculture Studies has morning classes; and some technicians are heading for the solar farm and waste treatment plant that helped bring the rich ecology of the Jordan valley back to life.

The rebuilding of the Damia Bridge border crossing—with its bonded warehouse area—and, later, the completion of a national freight rail line along the Jordan Valley link Giftlik economically to the region as never before. This morning, a farmer at the multimodal station oversees the loading of his products onto a northbound train; a group of workers gets off the Route 90 express bus right on time so that, after a leisurely bike-share ride, they will get to the greenhouses in time for a coffee before work. (See Figure 8.7.) Once an isolated village, Giftlik has become a major agrarian and ecological community in the Jordan Valley.

FIGURE 8.7
Giftlik Future: From Road 90 Toward Agro-Industrial City

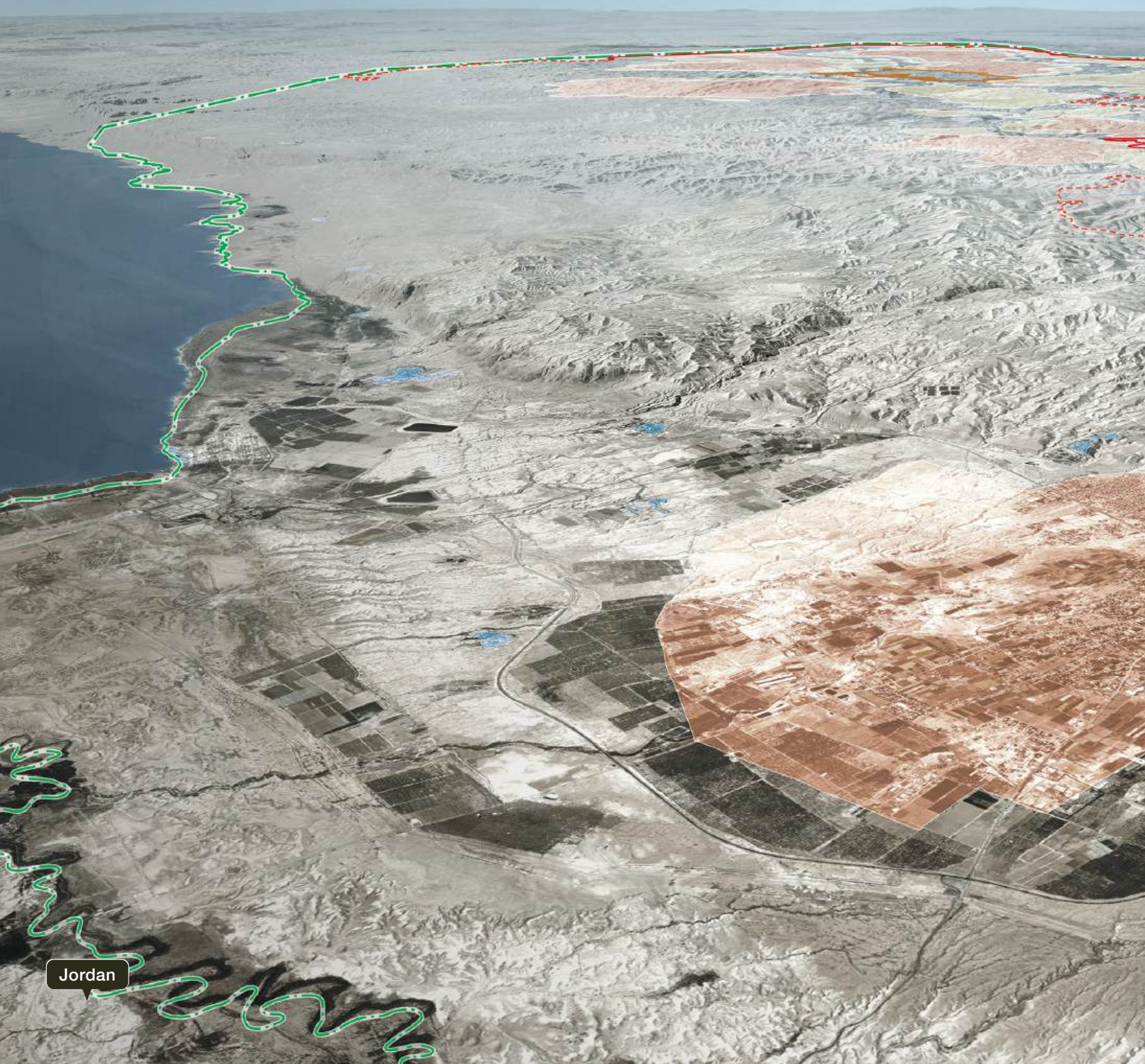


View location map

JERICHO

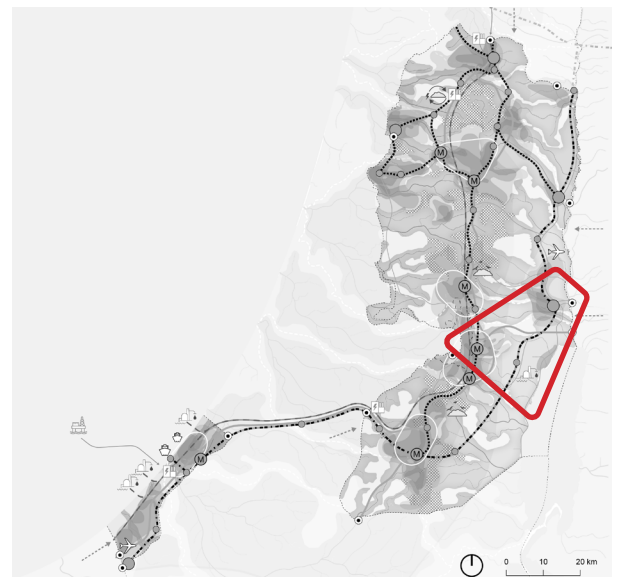
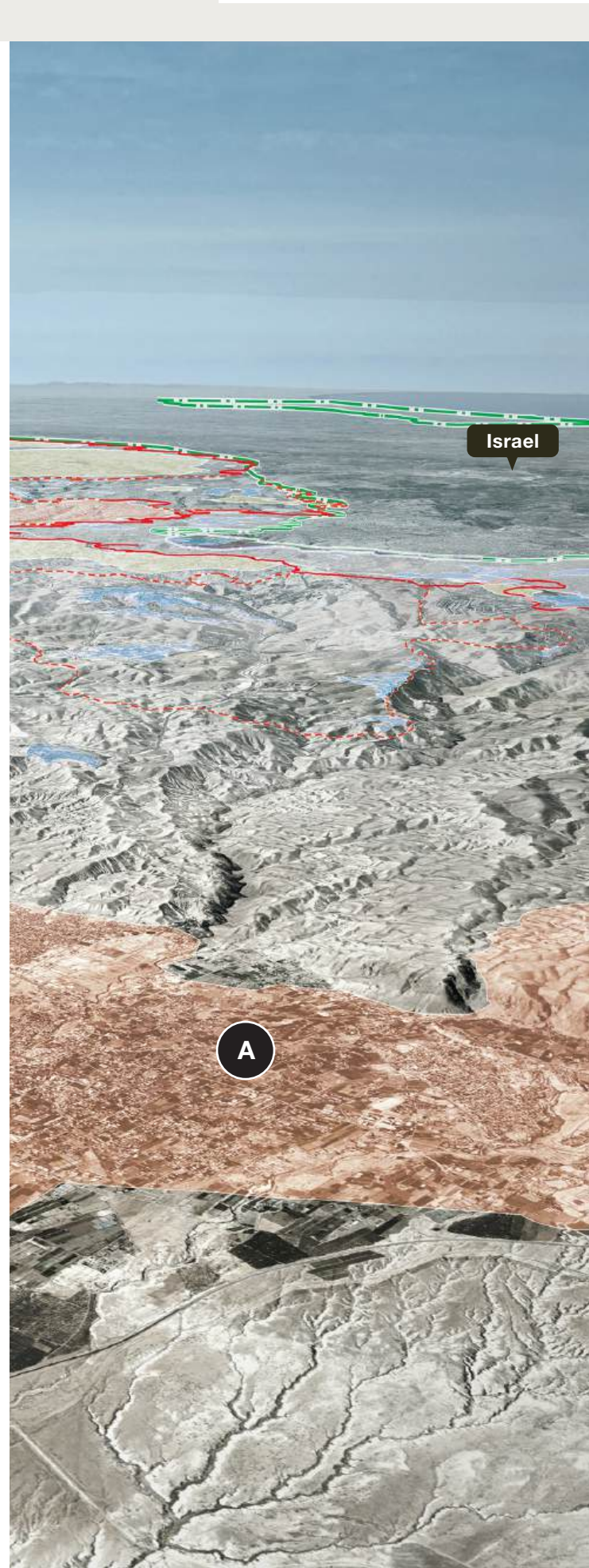
FIGURE 8.8
Jericho Overview

- 1967 border
- Oslo: Area A
- Oslo: Area B
- Oslo: "Israeli declared E. Jerusalem"
- Oslo: "No man's land"
- Israeli colonies
- Barrier (constructed)
- Barrier (planned)



Overview

Jericho is a city rich in historic and archeological resources that are important to Muslims, Jews, and Christians. It has always been a regional and local destination for tourism and, because of its historical sites and access to the Dead Sea, a popular recreational destination for local and international visitors alike. It is also home to the Jericho Agro-Industrial Park, an important processing and manufacturing center for several sectors that takes advantage of the adjacent King Hussein/Allenby Bridge crossing to Jordan.



View location map

JERICOHO

FIGURE 8.9
Jericho Projects and Initiatives

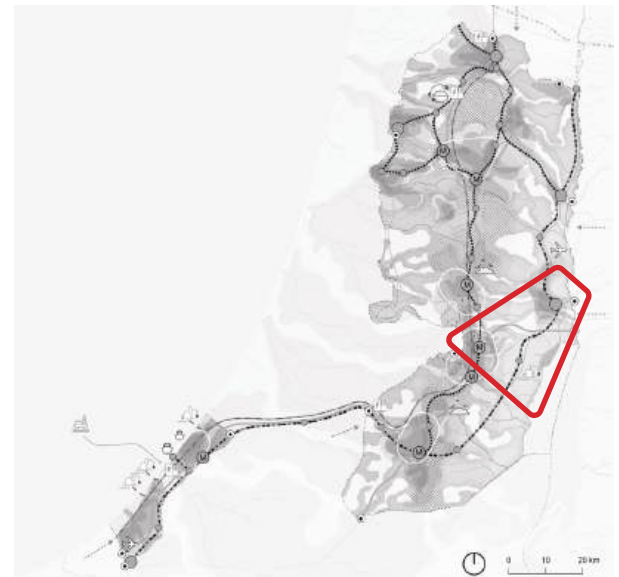


LOOKING SOUTHWEST

1. King Abdallah border crossing (GO1C8, TN3C8)
2. Dead Sea tourism hub (CT5C2)
3. Jericho new tourism city (CT3B1)
4. Utility-scale solar production (EY1A1)
5. Dead Sea desalination plant (WR1D2)
6. Wastewater treatment and reuse (WR3A1)
7. Jordan River regeneration (ET1A1)
8. Jordan Valley agricultural development (ET3A2)
9. Jericho industrial zone (CT5A3)
10. King Hussein/Allenby Bridge border crossing (GO1C7, TN3C7)
11. Upgrade road network (TN2A5)
12. National rail network (TN1D1)
13. Electricity feeder line from Jordan (EY2E1)
14. Jericho urban redevelopment (CT2A6)
15. Multimodal transit hub (TN1A10)
16. Jericho tourism hub (CT5C2)
17. Water riparian management (ET1A1)
18. New well (WR1A1)
19. New dam (WR1B1)

In this plan, through a series of strategic investments (primarily in transportation infrastructure), Jericho will become a tourism city, with restored historical destinations and modern mixed-use resort development along the shores of the Dead Sea. Investments in wastewater networks and desalination could enable Jericho to grow in a sustainable manner from its population of 40,000 toward 100,000 in the year 2050.¹ Urban growth will be structured through radial infrastructure that connects the city center with its peripheral agricultural lands. Robust and diverse economic development in the agricultural and industrial sectors will be enabled by connections to the new rail network and to the international airport, as well as by the redevelopment of the King Hussein/Allenby Bridge border crossing.

¹ Calculation assuming a stable population growth rate of 2.4 percent, corresponding to the ratio in 2023 and the national average for the past 15 years.



View location map

JERICHO

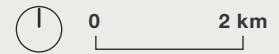
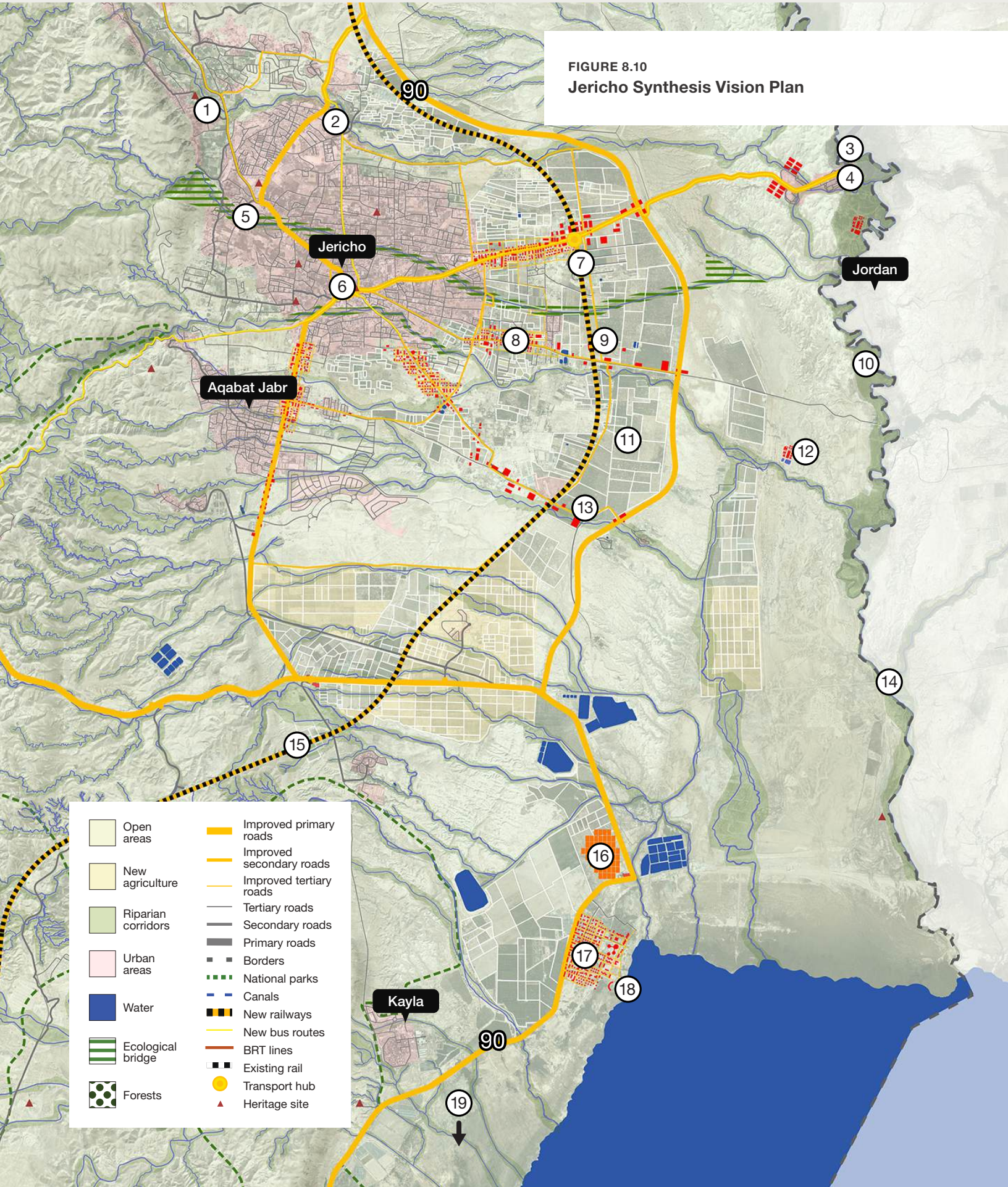


FIGURE 8.10
Jericho Synthesis Vision Plan



- | | | | |
|--|--------------------|--|--------------------------|
| | Open areas | | Improved primary roads |
| | New agriculture | | Improved secondary roads |
| | Riparian corridors | | Improved tertiary roads |
| | Urban areas | | Tertiary roads |
| | Water | | Secondary roads |
| | Ecological bridge | | Primary roads |
| | Forests | | Borders |
| | | | National parks |
| | | | Canals |
| | | | New railways |
| | | | New bus routes |
| | | | BRT lines |
| | | | Existing rail |
| | | | Transport hub |
| | | | Heritage site |

FIGURE 8.11

Jericho New Tourism City (CT3B1)



A new tourism city is proposed along the northern shores of the Dead Sea, benefiting from the redeveloped Road 90 and newly established energy and water infrastructure.

FIGURE 8.12

Jericho Urban Redevelopment (CT2A6)



The city center of Jericho benefits from new transportation connections to national rail and intercity bus networks, which enable urban expansion along improved transportation routes, both local and regional.

- | | |
|---|--|
| 1. New dam (WR1B1) | 10. Jordan River regeneration (ET1A1) |
| 2. New well (WR1A1) | 11. South Jordan Valley agricultural development (ET3A2) |
| 3. Electricity feeder line from Jordan (EY2E1) | 12. Wastewater treatment and reuse (WR3A1) |
| 4. King Hussein/Allenby Bridge border crossing (GO1C7, TN3C7) | 13. Jericho industrial zone (CT5A3) |
| 5. Water riparian management (ET1A1) | 14. King Abdallah border crossing (GO1C8, TN3C8) |
| 6. Jericho tourism hub (CT5C2) | 15. National rail network (TN1D1) |
| 7. Jericho multimodal transit hub (TN1A10) | 16. Utility-scale solar production (EY1A1) |
| 8. Jericho urban redevelopment (CT2A6) | 17. Jericho new tourism city (CT3B1) |
| 9. Upgrade road network (TN2A5) | 18. Dead Sea tourism hub (CT5C2) |
| | 19. Dead Sea desalination plant (WR1D2) |

An Envisioned Typical Day

Jericho is one of the most historic and storied places in the Middle East, home to some of the most significant religious sites: the Mount of Temptation Monastery, the Shalom al Israel Synagogue, Tel Es Sultan Hisham's Palace, the Russian Museum, and many others. It has been growing vigorously now that it is connected to Jerusalem by the intercity bus line and to Hebron by the regional rail, which follows the Jordan Valley before swinging westward toward Gaza. On this day, a mother drops her kids off at school on her way to work at the expanding agro-industrial park and bonded warehouse district, which was completed shortly after the King Hussein/Allenby Bridge and border crossing was modernized, enabling an expanded level of trade with Jordan and other points to the east.

Not surprisingly, the real driver for economic growth has been tourism. Along the northern shores of the Dead Sea, there is now a resort and entertainment complex with hotels and waterparks, all linked by a public boardwalk and pedestrian trail networks. (See Figure 8.13.) Today, a family of five from Jerusalem has decided to spend the weekend visiting historic sites and enjoying lazy beach activities at the Dead Sea. They prefer meeting relatives from other countries here now that international travel has been made easy and the airport has been completed just north of Jericho. In the evenings, they can take a short cab ride to the bustling downtown of Jericho city, where the urban boulevard and commercial centers are benefiting from enhanced transportation infrastructure. Jericho has become a year-round destination for tourism and recreation in the Middle East.

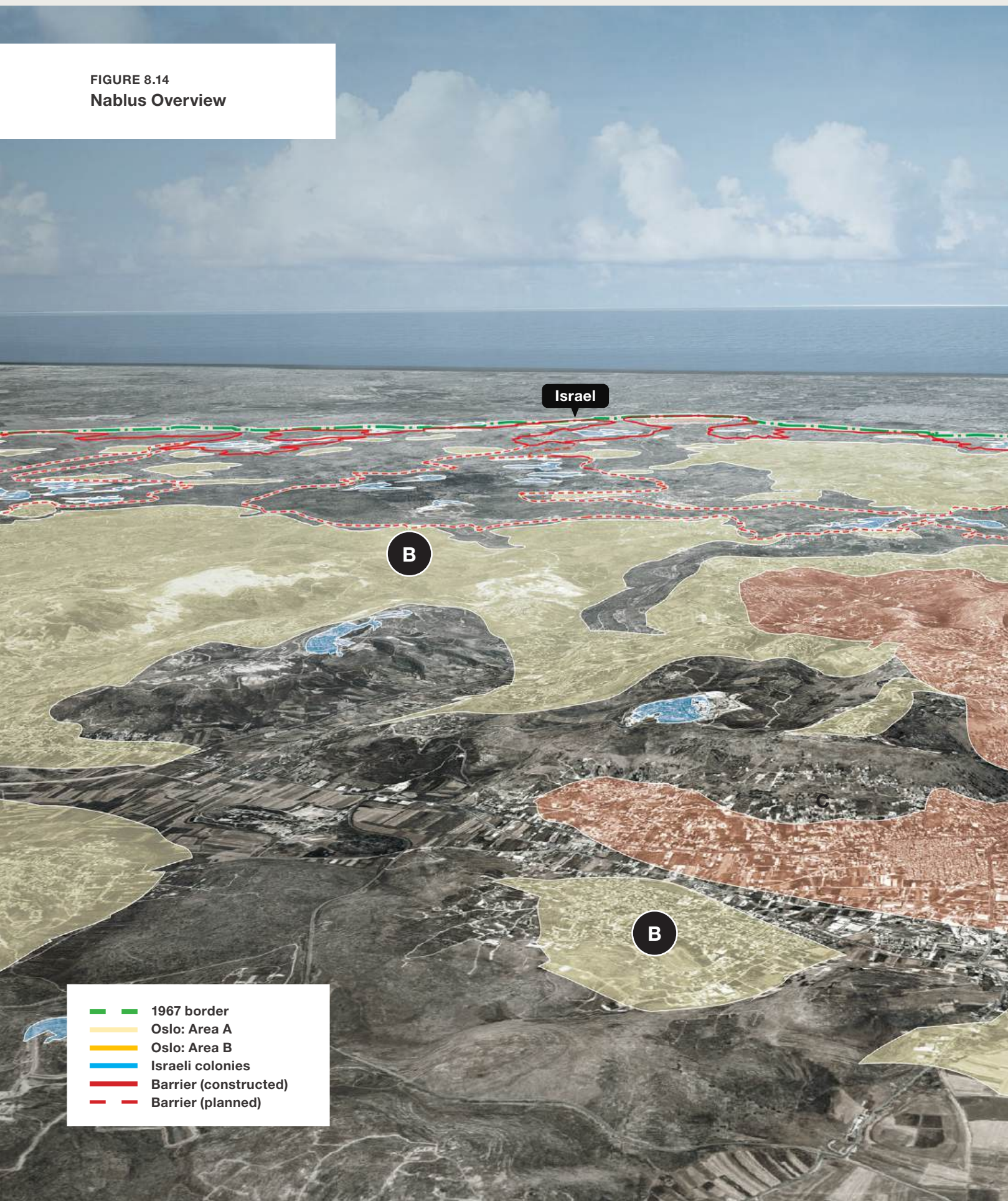
FIGURE 8.13
Jericho Future: New Tourism City



View location map

NABLUS

FIGURE 8.14
Nablus Overview

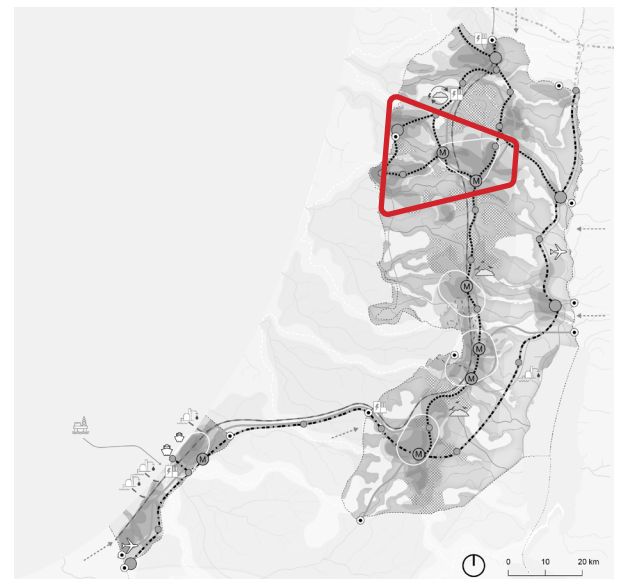


Overview

Nablus is the largest northern city in the West Bank, located along its historic urbanized ridgeline, where it serves as the focal point for a constellation of networked towns and villages, including Jenin, Tubas, Tulkarm, and Qalqilya, all nestled in a highly fertile agricultural zone that benefits from moderate climatic conditions and rich environmental systems.

The plan balances infrastructural and land-based proposals meant to support the projected population growth of Nablus from 230,000 toward one projected scenario of 715,000 in 2050.¹ In the plan, all northern region towns and cities will be linked by intercity rail and bus lines, benefiting from a modernized highway system in which multimodal transit hubs will allow for seamless mobility between the cities and in the greater region. This well-connected network of cities will further benefit from recreational and environmental improvements via the riparian parks;

¹ Calculation assuming a stable population growth rate of 2.4 percent, corresponding to the ratio in 2023 and the national average for the past 15 years.



View location map

NABLUS

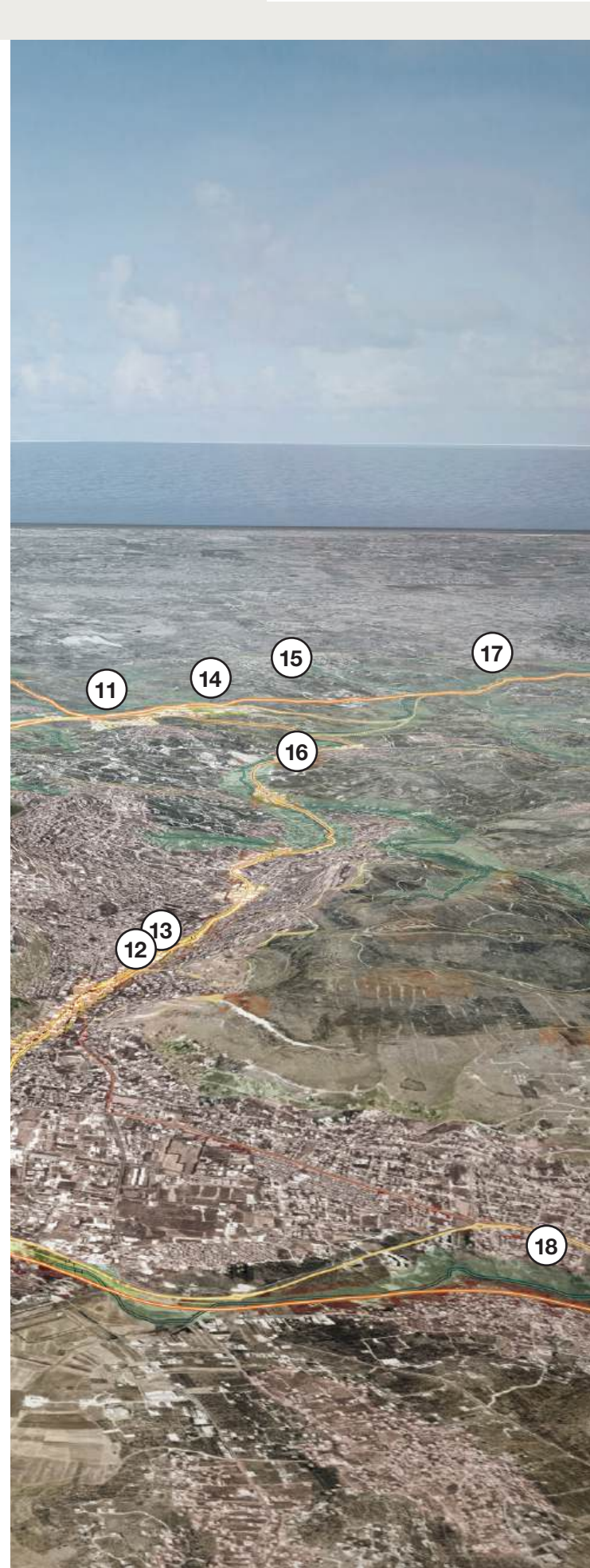
FIGURE 8.15

Nablus Projects and Initiatives

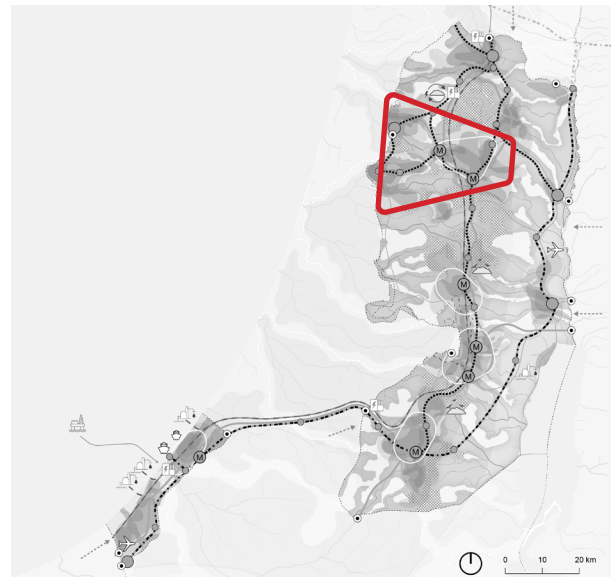


- | | |
|---|--|
| 1. Ecological bridge: Nablus-Salfit (ET1B2) | 10. Nablus tourism hub (CT5C4) |
| 2. South Nablus multimodal hub (TN1A2) | 11. West Nablus multimodal hub (TN1A1) |
| South Nablus gateway (CT1A3) | West Nablus gateway (CT1A4) |
| 3. Riparian management (ET1A1) | 12. Nablus central business district (CT5B3) |
| 4. Nablus urban redevelopment (CT2A2) | 13. BRT lines (TN1E6) |
| 5. National water carrier (WR2C2) | 14. New dam (WR1B1) |
| 6. Road 60 redevelopment (ET3A3) | 15. WB—North—S/S (EY2A1) |
| 7. New well (WR1A1) | 16. Hospital (CT3A6) |
| 8. Western slopes agricultural zone (ET3A4) | 17. Ecological bridge: Nablus-Jenin (ET1B1) |
| 9. Intercity rail (TN1D2) | 18. WB—North—SWTS (ET2B1) |





the parks are further reinforced and connected by ecological bridges between those cities located along the watershed line. Within Nablus city, the growing central business district will present opportunities for development of institutions and public amenities, benefiting from an urban BRT system, which will extend outward toward the intercity rail network. At the western and southern edges of Nablus, along the coincident alignment of the intercity rail line and Route 60 road, nodes of mixed-use transit-oriented development will anchor BRT development corridors from the Nablus central business district to the periphery.



View location map

NABLUS



FIGURE 8.16
Nablus Synthesis Vision Plan

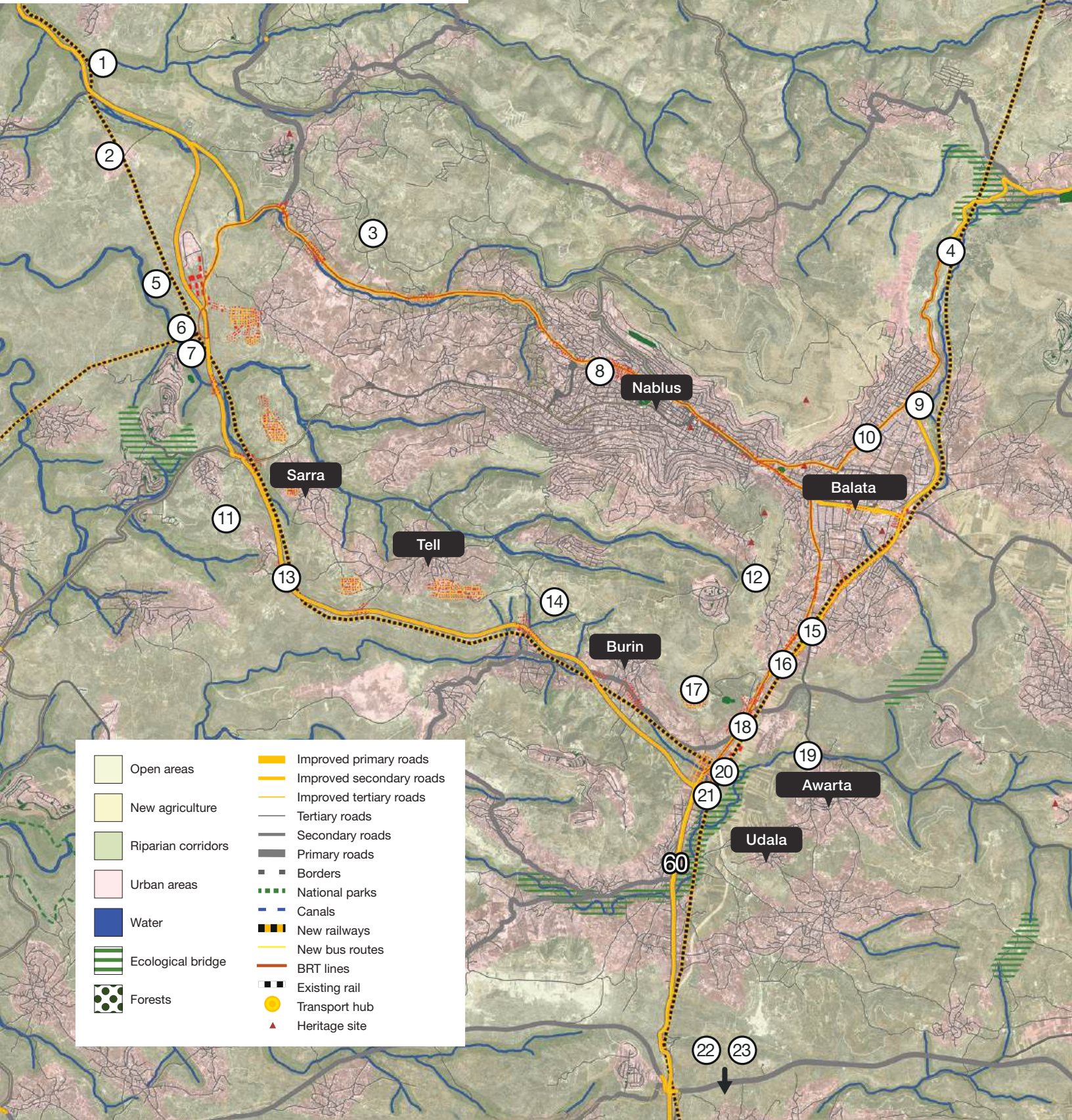


FIGURE 8.17
Nablus Central Business District (CT5B3)



The central business district of Nablus benefits from improved urban roads and investments in public institutions that catalyze both economic and social development in the city.

FIGURE 8.18
South Nablus Multimodal Hub (TN1A2)



A newly established multimodal hub in Hawara connects rail and road networks to public transit services, providing improved access to the southern neighborhoods of Hawara, Burin, and Udala.

- | | |
|---|--|
| 1. Ecological bridge: Nablus-Jenin (ET1B1) | 13. Intercity rail (TN1D2) |
| 2. WB—North—S/S (EY2A1) | 14. Western slopes agricultural zone (ET3A4) |
| 3. Hospital (CT4A6) | 15. Road 60 redevelopment (ET3A3) |
| 4. North Nablus local station (TN1C1) | 16. National water carrier (WR2A2) |
| 5. New dam (WR1B1) | 17. Nablus urban redevelopment (CT2A2) |
| 6. West Nablus multimodal hub (TN1A1) | 18. National water carrier (WR2A2) |
| 7. West Nablus gateway (CT1A4) | 19. Riparian management (ET1A1) |
| 8. Nablus Central Business District (CT5B3) | 20. South Nablus gateway (CT1A3) |
| 9. WB—North—SWTS (ET2B1) | 21. South Nablus multimodal hub (TN1A2) |
| 10. BRT lines (TN1E6) | 22. Ecological bridge: Nablus-Salfit (ET1B2) |
| 11. New well (WR1A1) | 23. Ecological bridge: Nablus-Ramallah (ET1B3) |
| 12. Nablus tourism hub (CT5C4) | |

An Envisioned Typical Day

On her way from work to her home in Izmut, a woman stops in a new shopping center along one of the new BRT routes to pick up some furnishings for her new house. She will meet her husband, who has taken the day off from his job at a company that makes medical devices, to bring their children to the family health center for their annual checkups. They plan to do a family dinner out at a restaurant before catching the bus home.

The revival of Nablus was jump-started by the redevelopment of Road 60 and the several development nodes along it. But it was the completion of the two branches of the intercity rail line, one on each side of the city, that really made Nablus—which was already a center for medical services—take off as a destination for medical tourism: a place where people from all over the world come to meet with the best trained and highly specialized doctors and staff, who are working with emerging technologies to provide cutting-edge health services.

Huwara, where the two light rail lines converge, has grown from a small village in an agrarian landscape into a major gateway for mixed-use development. Just beyond Huwara's core, recently built houses and communities demonstrate this growth. A young couple go out for a bike ride along one of the trails that follows the edge of a restored stream. (See Figure 8.19.) Tomorrow, they will be at the conference facilities where other researchers from around the globe are coming to network and share their most recent work. As Nablus and the surrounding villages have prospered, the city is fulfilling its potential as a center for health innovation in the Middle East.

FIGURE 8.19
Nablus Future: Urban and Riparian Park Development



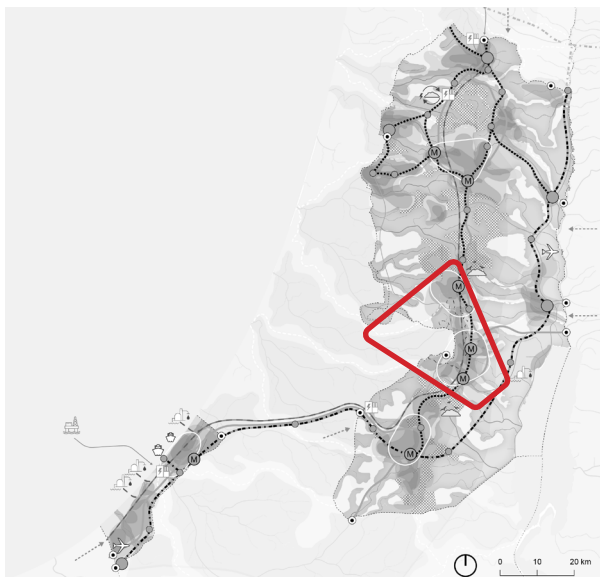
View location map

JERUSALEM

Overview

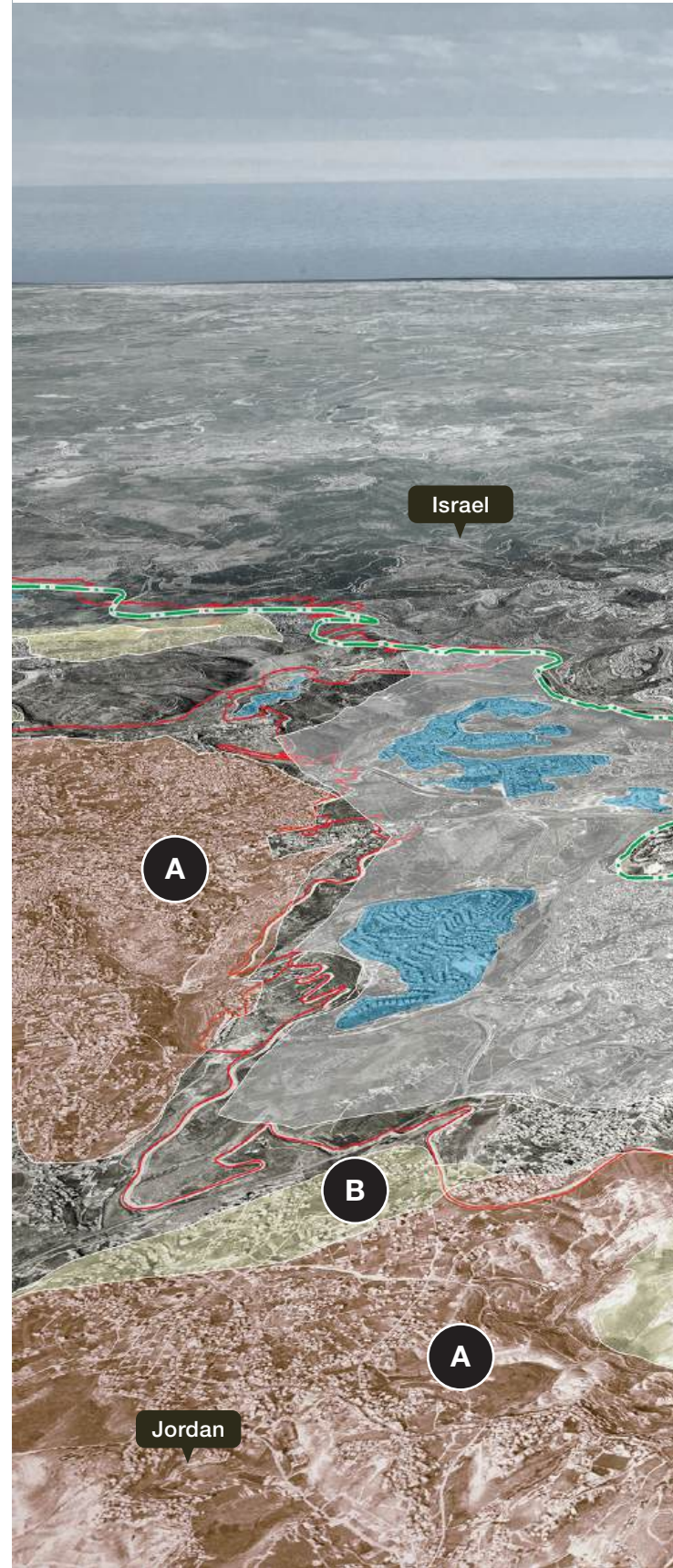
Jerusalem is uniquely divided between its Israeli western side and its Palestinian eastern side. This reality, exacerbated by the separation barrier and the declaration of its municipal boundaries by Israel, creates a condition in which north-south movement in the West Bank is significantly constrained, further exacerbated by the unpredictable nature of checkpoints along the way.

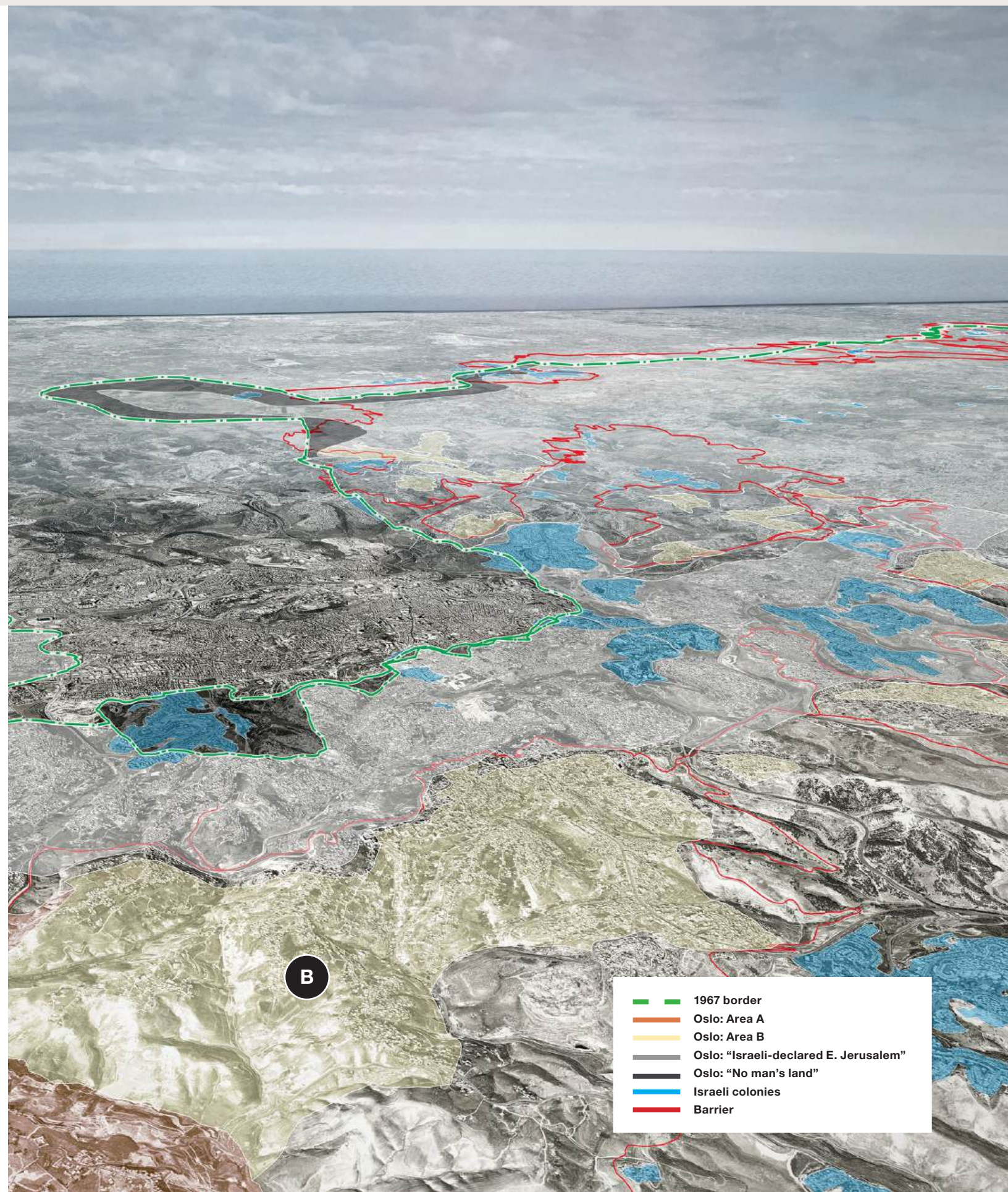
The proposed plan for Jerusalem addresses the mobility challenge that affects Palestinians across the West Bank through a series of investments in transportation infrastructure that will connect Jerusalem with its immediate surroundings, such as Bethlehem and Ramallah, and with cities farther along the ridgeline, such as Hebron, Nablus, and Gaza City.



View location map

FIGURE 8.20
Jerusalem Overview



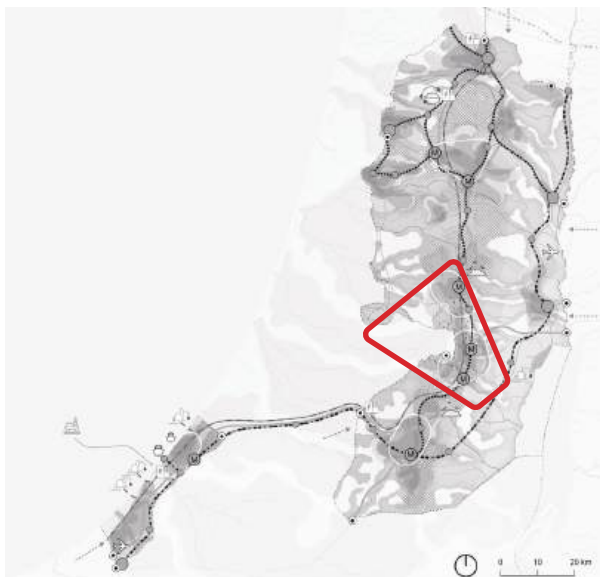


B

- 1967 border
- Oslo: Area A
- Oslo: Area B
- Oslo: "Israeli-declared E. Jerusalem"
- Oslo: "No man's land"
- Israeli colonies
- Barrier

JERUSALEM

Road infrastructure that benefits bus, truck, and car mobility will be enhanced by a series of bridges as part of a newly designed eastern ring road for the city. This ring road, in turn, will create a series of gateway developments connecting the city periphery with its redeveloped and modernized commercial centers in Abu Dis and Sheikh Jarrah, as well as in the Walled Old City and Bethlehem, where tourism hubs will be developed. A multimodal hub at the center of Abu Dis near the elegantly designed government campus connects BRT and rail networks that will extend farther along the ridgeline toward cities to the north and south. As East Jerusalem expands eastward, compact mixed-use development along BRT corridors will be balanced by investments in riparian parks that both provide amenities and preserve natural resources.



View location map

FIGURE 8.21

Jerusalem Projects and Initiatives



1. Gateway (CT1A5)
2. Multimodal hub (TN1A5)
3. Industrial zone (CT5A4)
4. Bethlehem BRT lines (TN1E3)
5. Jerusalem and Bethlehem tourism hub (CT5C1)
6. Urban redevelopment (CT2A4)
7. Watershed riparian management (ET1A1)
8. Wadi Naar bridges (TN2A1)
9. Wastewater treatment (WR3A1)
10. University (CT4A5)
11. Multimodal hub (TN1A4)
12. WB—Center—S/S (EY2A2)
13. Electricity feeder from Israel (EY2E2)
14. WB—Center—SWTS (ET2B2)
15. WB—Center—Landfill (ET2A2)
16. Road 60 redevelopment (TN2A3)
17. East Jerusalem central business district (CT5B4)
18. Government campus (CT4A1)
19. Jerusalem BRT lines (TN1E4)
20. East Jerusalem gateway (CT1A2)
21. Rail network—intercity (TN1D2)
22. New wells (WR1A1)
23. National energy distribution line (EY2D1)



JERUSALEM

0 2 km

FIGURE 8.22
Jerusalem Synthesis Vision Plan

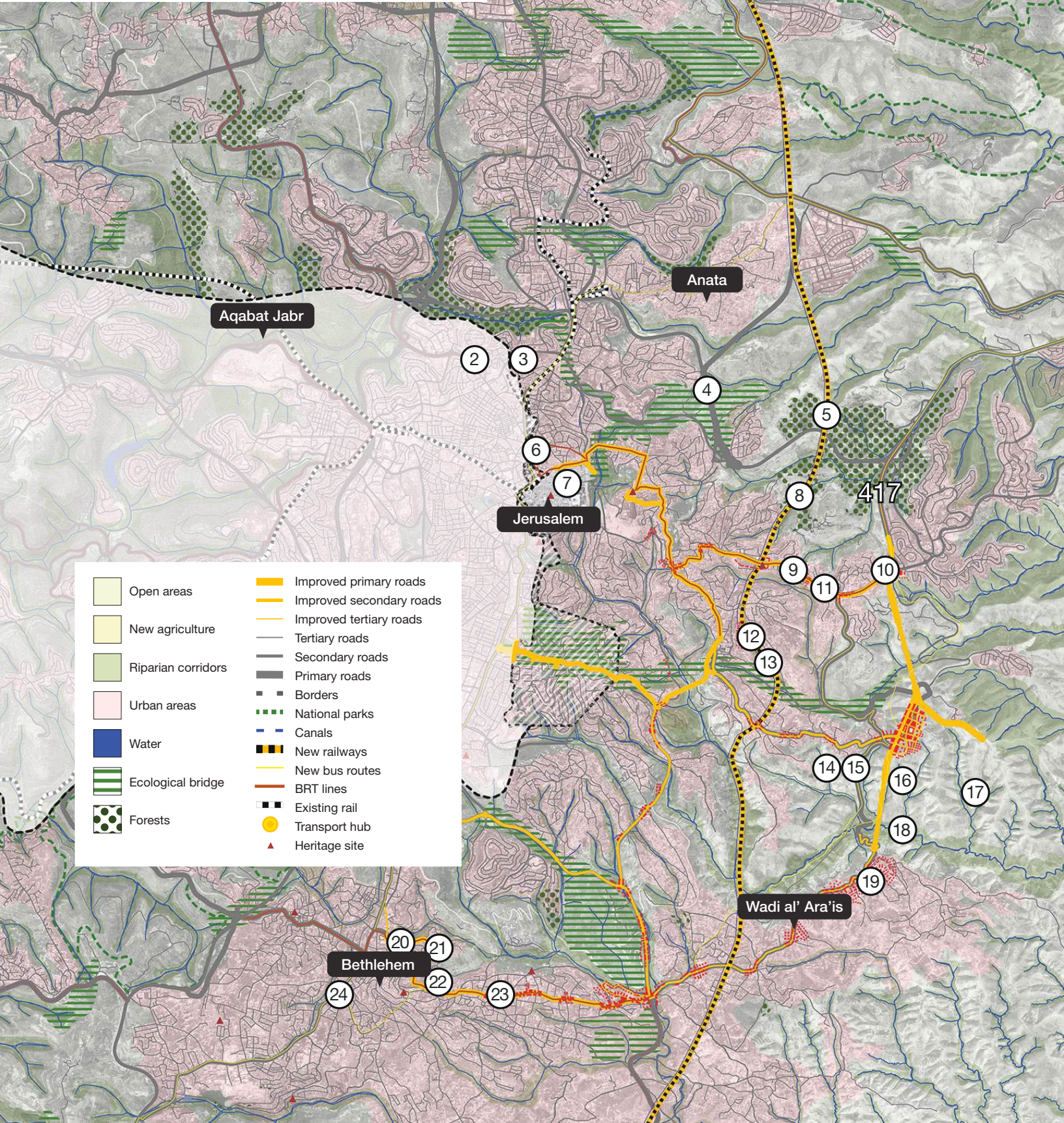


FIGURE 8.23
Wadi Naar Bridges (TN2A1)



Two new bridges along the eastern ring road resolve transportation bottlenecks while catalyzing urban and economic development opportunities for the easternmost communities of the city.

FIGURE 8.24
Jerusalem Multimodal Hub (TN1A4)



A new transit-oriented development district in Abu Dis around the proposed East Jerusalem multimodal hub, enabling seamless regional mobility to the Jerusalem central business district and the Old City.

1. New wells (WR1A1)
2. Electricity feeder line from Israel (EY2E2)
3. WB—Center—S/S (EY2A2)
4. Government campus (CT4A1)
5. National energy distribution line (EY2D1)
6. Road 60 redevelopment (TN2A3)
7. Jerusalem tourism hub (CT5C1)
8. Rail network—intercity (TN1D2)
9. Jerusalem BRT lines (TN1E4)
10. East Jerusalem gateway (CT1A2)
11. East Jerusalem central business district (CT5B4)
12. Jerusalem multimodal hub (TN1A4)
13. University (CT4A5)
14. WB—Center—SWTS (ET2B2)
15. WB—Center—Landfill (ET2A2)
16. Wadi Naar bridges (TN2A1)
17. Wastewater treatment (WR3A1)
18. Watershed riparian management (ET1A1)
19. East Jerusalem urban redevelopment (CT2A4)
20. Bethlehem tourism hub (CT5C1)
21. Bethlehem multimodal hub (TN1A5)
22. Bethlehem BRT lines (TN1E3)
23. Bethlehem gateway (CT1A5)
24. Bethlehem industrial zone (CT5A4)

An Envisioned Typical Day

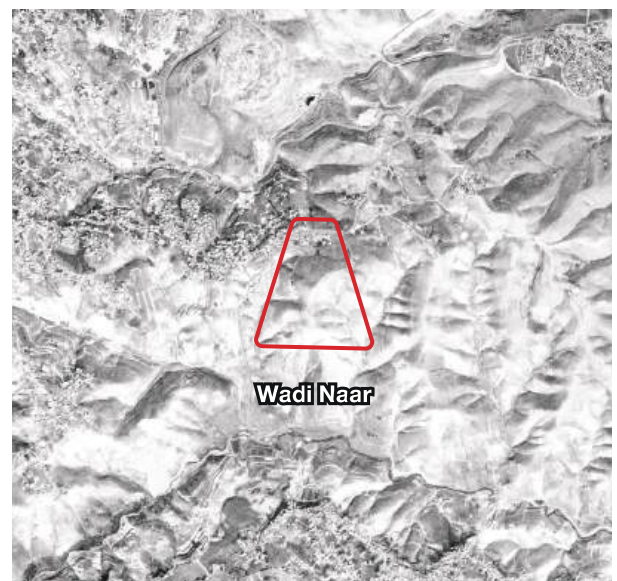
A businessman from Bethlehem is at his favorite spot on his daily drive to Ramallah: He is on one of the bridges that was built as part of the new eastern ring road that eliminated the debilitating congestion at the Wadi Naar checkpoint. From the bridge, he has a great view of the restored landscape of the wadis, a view that used to be marred by poorly managed landfills but is now full of people hiking and walking.

This drive, which used to take hours, can now be reliably done in about 35 minutes. So, he has time to make a stop at some of the mixed-use places where the ring road intersects with BRT corridors to the center of historic Jerusalem. Even the former checkpoint into Jerusalem is one of these destinations for offices, houses, and shopping. (See Figure 8.25.)

Meanwhile, a graduate student is sitting in on a session of the Palestinian Parliament. She is joining other students from around the world who are enrolled in the signature program on international relations at Al Quds University. The expanded university is part of a larger institutional and government complex near the Abu Dis multimodal station. Always a tourist destination, Jerusalem with these investments is strong in its identity as both a Palestinian and an Israeli world city, renowned for its multicultural richness and interfaith tolerance.

FIGURE 8.25

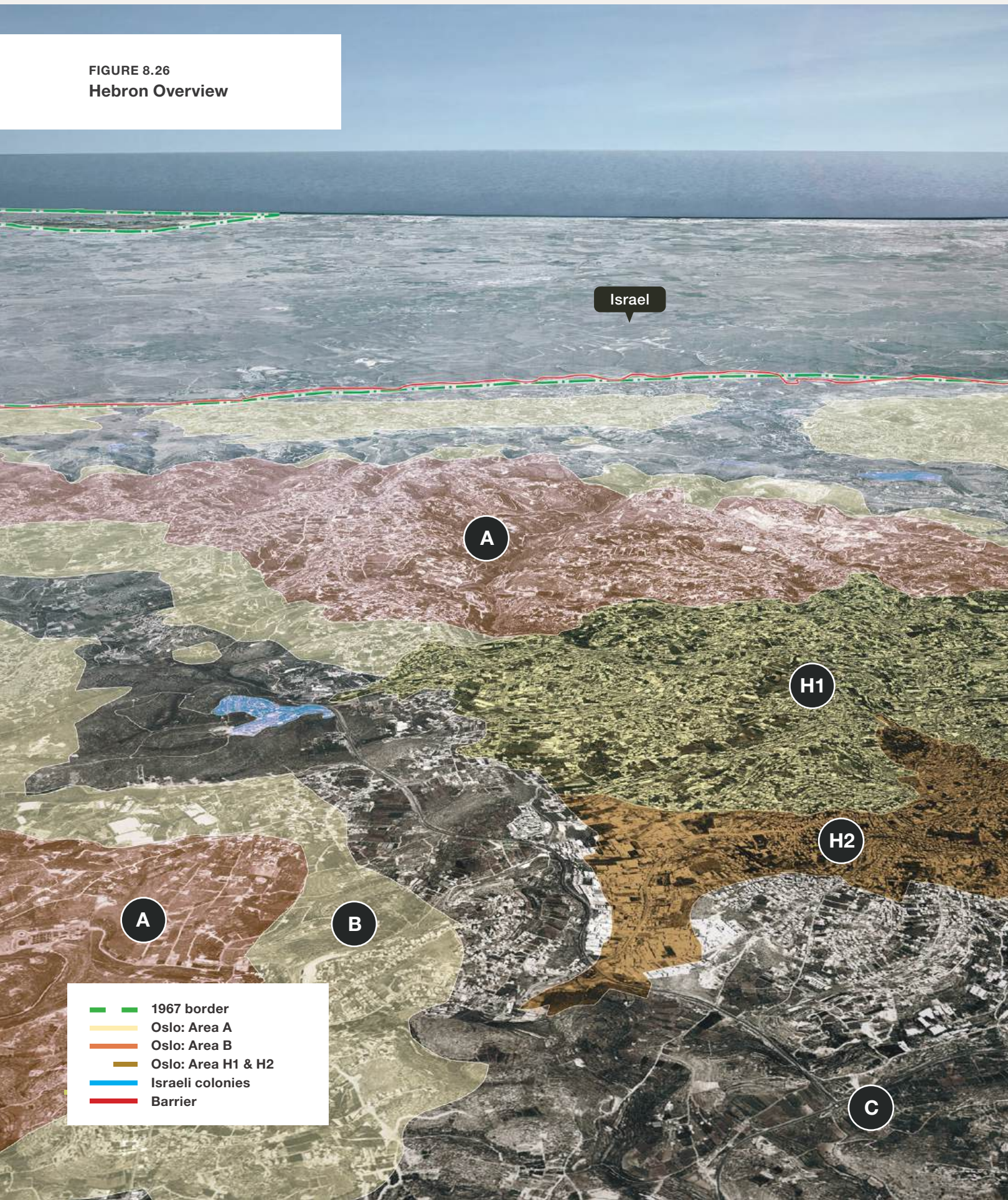
Jerusalem Future: From Existing Checkpoint Toward New Wadi Naar Bridge



View location map

HEBRON

FIGURE 8.26
Hebron Overview



Overview

Hebron, the largest city on the southern edge of the West Bank's ridgeline, serves as the cultural and economic anchor for several towns and villages, including Yata, Surif, and Adh Dharhiya. Its prominent, elevated location positions it at a critical national intersection between the cities of the West Bank and the Gaza Strip, located about 30 to 50 kilometers westward.

In this plan, Hebron's strategic significance in the region will be enhanced through the design of a unique intersection of transportation modes at the southern edge of the city, where a national rail line coming from the Jordan Valley will meet the intercity ridgeline rail, as well as the redesigned Road 60. This coincidence of passenger and goods flow, facilitated by a multimodal hub and a transit-oriented development surrounding it, could drive expansion of Hebron's already significant commercial and industrial sectors and will support population growth from 265,000 toward 1.3 million in 2050.¹ In addition to

¹ Calculation assuming a stable population growth rate of 2.4 percent, corresponding to the ratio in 2023 and the national average for the past 15 years.



View location map

HEBRON

1. New well (WR1A1)
2. Ecological bridge Hebron-Yata (ET1B8)
3. Hebron slopes agricultural development (ET3A5)
4. Gaza–West Bank connector (TN2A2)
Electricity feeder from Israel (EY2E2)
5. Riparian management zone (ET1A1)
6. South Hebron gateway (CT1A1)
7. South Hebron multimodal hub (TN1A6)
8. Urban redevelopment (CT2A5)
9. Industrial zone (CT4A5)
10. New dam (WR1B1)
11. Upgrade road network (TN2A5)
12. WB–South–S/S (EY2A3)
13. Hebron power plant (EY1D2)
14. Hebron central business district (CT5B2)
15. Tarqumiyah border crossing (GO1C1, TN3C1)
16. New institutional campus (CT3A5)
17. Tourism hub (CT5C3)
18. Rail network—intercity (TN1D2)
19. BRT lines (TN1E2)
20. Road 60 redevelopment (TN2A3)
21. National water carrier (WR2C2)
22. East Hebron gateway (CT1A8)
East Hebron multimodal hub (TN1A8)



FIGURE 8.27

Hebron Projects and Initiatives

LOOKING WEST



building on underused lands within existing development patterns, much of the population and commercial growth throughout the city center will benefit from the increased interconnectivity between Hebron and Yata in the south, where urban development and environmental conservation intertwine to optimize land use.



View location map

HEBRON

0 2 km

FIGURE 8.28
Hebron Synthesis Vision Plan

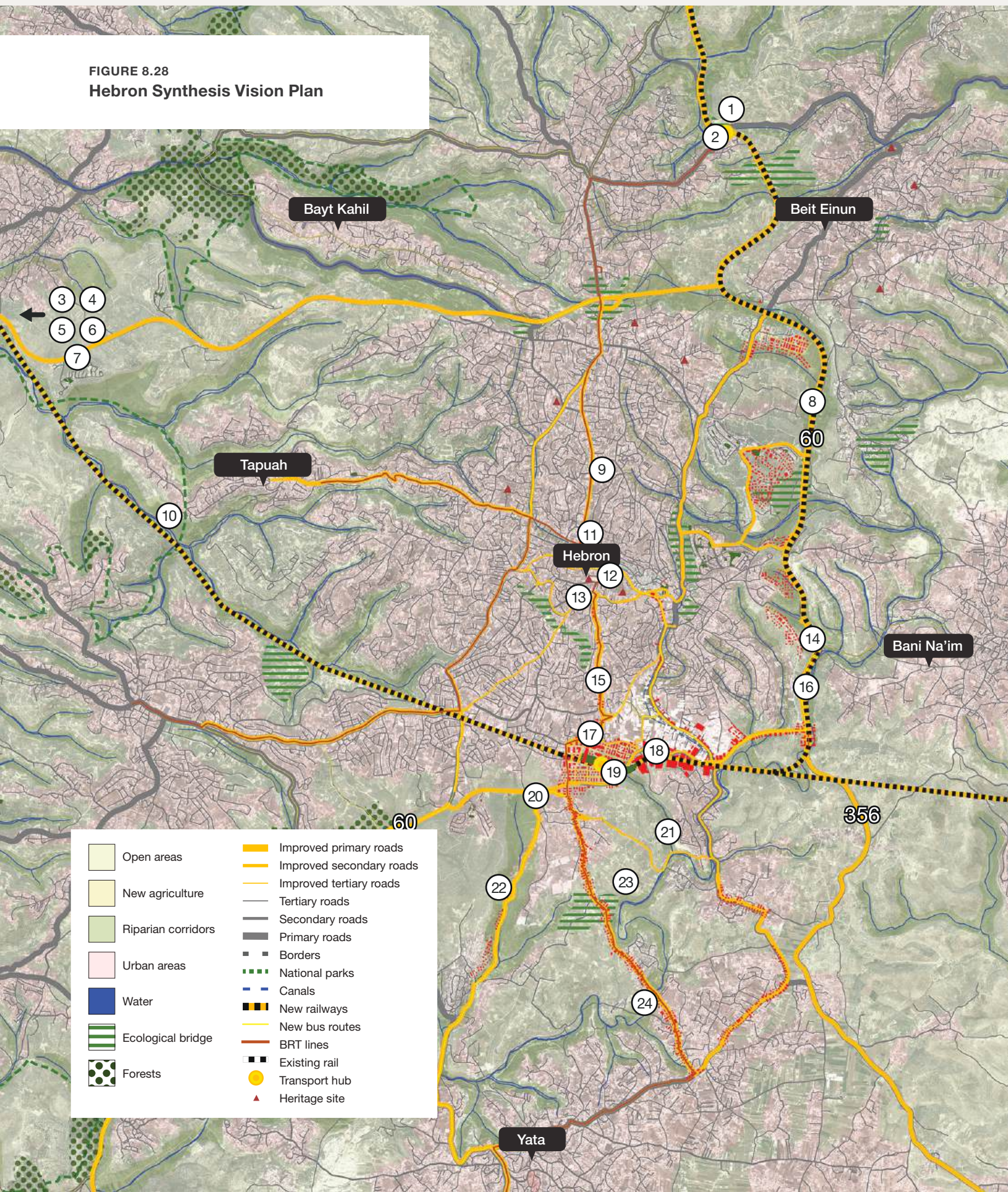


FIGURE 8.29

South Hebron Multimodal Hub (TN1A6)



The new transit-oriented development around the South Hebron multimodal hub benefits from connectivity to both light rail and heavy rail lines.

FIGURE 8.30

Ecological Bridge Hebron-Yata (ET1B8)



Between the cities of Hebron and Yata, urban growth and environmental restoration intersect to create a sustainable city embedded in nature.

1. East Hebron gateway (CT1A8)
2. East Hebron multimodal hub (TN1A8)
3. Hebron power plant (EY1D2)
4. WB—South—S/S (EY2A3)
5. Gaza—West Bank connector (TN2A2)
6. Tarqumiyah border crossing (GO1C1, TN3C1)
7. Electricity feeder from Israel (EY2E2)
8. National water carrier (WR2C2)
9. Hebron BRT lines (TN1E2)
10. New dam (WR1B1)
11. Hebron central business district (CT5B2)
12. Hebron tourism hub (CT5C3)

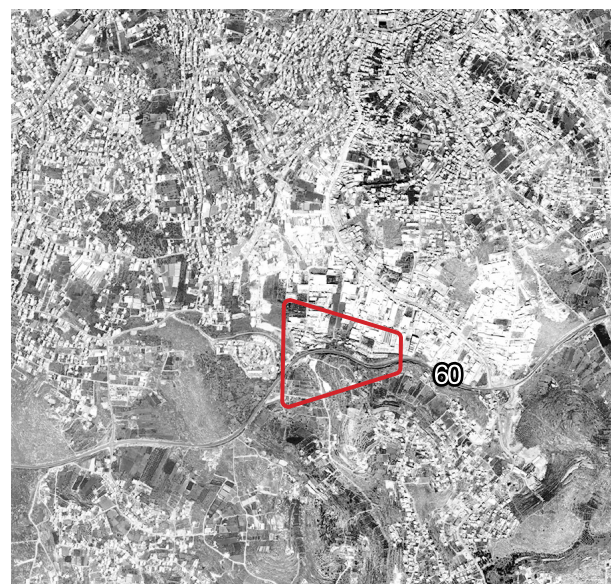
13. New institutional campus (CT4A5)
14. Road 60 redevelopment (TN2A3)
15. Upgrade road network (TN2A5)
16. Rail network—intercity (TN1D2)
17. Urban redevelopment (CT2A5)
18. Industrial zone expansion (CT4A5)
19. South Hebron multimodal hub (TN1A6)
20. South Hebron gateway (CT1A1)
21. Riparian management zone (ET1A1)
22. Hebron slopes agricultural development zone (ET3A5)
23. Ecological bridge Hebron-Yata (ET1B8)
24. New well (WR1A1)

An Envisioned Typical Day

A young entrepreneur is successfully launching his small manufacturing business. He started on the production floor, worked his way up to a managerial position, and, when he had learned what he needed, set out on his own. He was able to do this because Hebron, always a center for manufacturing, is now also home to one of the major innovation districts in the region, which is where the flex-manufacturing facility that he started is located. Like all successful innovation districts, this one relies on connectivity to the region and the world. And connectivity is made possible because it is here, at the southern edge of the city, where three major transportation investments come together: a redeveloped Road 60, the intercity ridgeline rail, and the national rail line. The entrepreneur can ship his products not only north and east but also west, taking advantage of the West Bank–Gaza connector road. And, like all successful innovation districts, this one relies on mixed use: proximity to commercial outlets, marketing services, and housing. (See Figure 8.31.) He lives in a modern apartment building in Yata, which is now just an express bus away along the BRT routes. But many of his younger employees live in the residential buildings in the gateway or in downtown Hebron, which has also benefited from this enhanced connectivity. Building on its existing industrial base and exploiting its exceptional intermodal connectivity, Hebron has become a center for live-work-play.

FIGURE 8.31

Hebron Future: From Road 60 Toward South Hebron Multimodal Hub Redevelopment

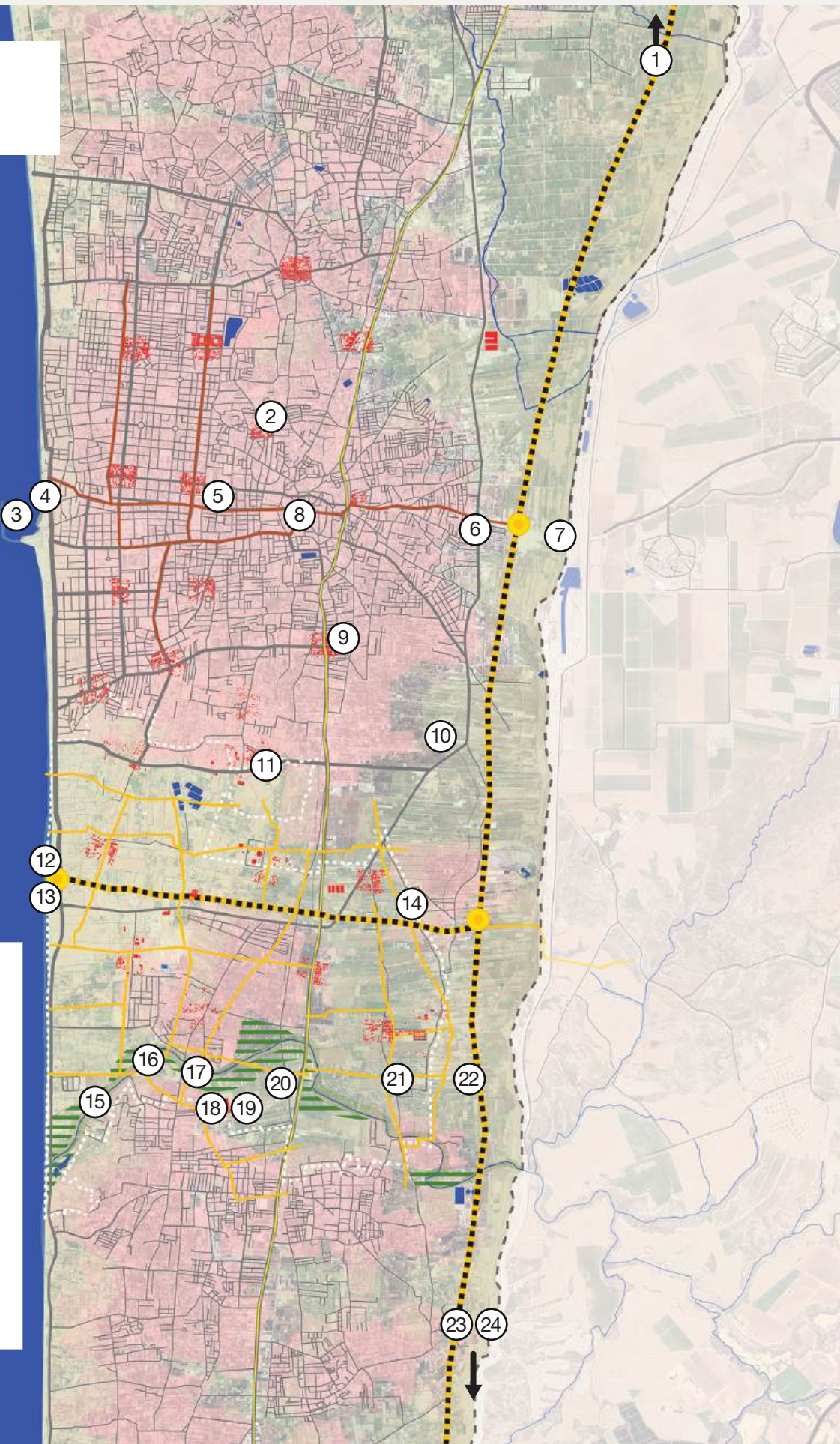


[View location map](#)

GAZA CITY

0 2 km

FIGURE 8.32
Gaza City Overview



- | | | | |
|--|--------------------|--|--------------------------|
| | Open areas | | Improved primary roads |
| | New agriculture | | Improved secondary roads |
| | Riparian corridors | | Improved tertiary roads |
| | Urban areas | | Tertiary roads |
| | Water | | Secondary roads |
| | Ecological bridge | | Borders |
| | Forests | | National parks |
| | | | Canals |
| | | | New railways |
| | | | New bus routes |
| | | | BRT lines |
| | | | Existing rail |
| | | | Transport hub |
| | | | Heritage site |

Overview

The immense task of rebuilding in the wake of the ongoing war between Israel and Hamas looms over any development plan for the Gaza Strip. That said, it is essential to consider both short- and long-term strategies and aspirations in parallel and devise an immediate postwar recovery plan with a clear trajectory toward a prosperous and sustainable Gaza Strip. We suggest an incremental redevelopment process that builds on the underlying physical and social fabric of Gaza and accommodates immediate resettlement of displaced populations with temporary housing and public amenities organized around civic hubs, which will gradually mature and develop into integral parts of the larger urban fabric, even as Gazans return to their rebuilt communities over time. At the same time, some neighborhoods have sustained such heavy damage that the best option may be to raze and redevelop them.

As the coastal area of Palestine, Gaza must function as an essential gateway for commerce and resources, including new commercial and fisheries ports, a new airport, and a terminal for gas imports (including the development of offshore resources), a role that will be even more salient when the connection to the West Bank is completed. New desalination

plants will provide water for industry, agriculture, and the growing population. Finally, as elsewhere in Palestine, ecological systems will be restored through improved waste management and the creation of a riparian park at Wadi Gaza.



View location map

1. Bayt Hanoun border crossing (GO1C10, TN3C10)
2. Gaza City urban development (CT2A1)
3. Gaza marine (EY1C1)
4. Gaza fisheries port (GO1B1, TN3B1)
5. Gaza City BRT lines (TN1E1)
6. Gaza City gateway (CT1A7, TN1A7)
7. Gaza City multimodal hub (TN1A7, CT1A7)
8. Gaza City central business district (CT5B5)
9. Salah ad-Din road redevelopment (TN2A4)
10. Gaza Strip agricultural development zone (ET3A6)
11. Gaza City industrial zone (CT5A6)
12. Gaza commercial port (GO1B2, TN3B2)
13. Gaza sea port (EY1B1)
14. Upgrade secondary road network (TN2A5)
15. Wastewater treatment (WR3A1)
16. Watershed riparian management (ET1A1)
17. New wells (WR1A1)
18. Gaza—North—S/S (EY2A4)
19. Gaza power plant (EY1D1)
20. Utility-scale solar production (EY1A1)
21. Gaza—North—SWTS (ET2B4)
22. Gaza—North—Landfill (ET2A4)
23. Gaza desalination plant (WR1D1)
24. Gaza international airport (GO1A2, TN3A2)

Postconflict Incremental Urbanism: From Tent Cities to Sustainable Neighborhoods

The estimated 90 percent of Gaza's residents displaced by the Israel-Hamas war urgently need support to return home and rebuild their cities and lives (UN Office for the Coordination of Humanitarian Affairs, 2024c). As damage and destruction continue to expand, it is clear that neither displacement camps nor urban planning as traditionally done can meet the enormous needs of devastated communities. Postwar urban reconstruction must guide a transition from a reality of a violent and devastating conflict to humanitarian support, social stabilization, and finally economic and urban development.

Experience shows that temporary encampments for displaced people in Palestine and elsewhere in the world, once established, evolve into long-term, impoverished communities. Camps can endure for many decades, as demonstrated by the 58 refugee camps managed by UNRWA to date across the region, which date to the 1948 and 1967 wars (UNRWA, undated-a). Some of Gaza's internally displaced people who originate from urban centers might be able to reside temporarily on nearby lands while rebuilding their homes. However, many will be forced to stay for longer periods in temporary housing as their blocks and neighborhoods are demolished and rebuilt in processes that may well take decades, given the extensive demolition, damage assessments, rubble removal, explosive hazard mitigation, and rebuilding that must take place at a large scale. Populating precious lands that are mostly vacant (e.g., because they are agricultural lands, flood zones, or other lands that are suboptimal for large populations) should be done in a structured and forward-thinking manner. Otherwise, camps for Gaza's newly displaced people may well turn into enduring, miserable places, incapable of restoring the civic life of the community in either the short or the long term.

Responding to this challenge, we have analyzed the situation in the Gaza Strip through two prisms—spatial and temporal—to develop a proposed solution. The spatial aspects of the analysis help identify priority locations and physical development strategies that urgently require attention and vision, and the temporal dimension enables planning for a sustainable future, considering the unique challenges presented in every phase of the postconflict recovery and development

process. We propose an implementation framework led by principles of “incremental urbanism” (Burdett, 2018). Incremental urbanism is a spatial planning approach used elsewhere in which communities build up over time on a foundation that meets good urban planning concepts. We are applying this concept to postconflict reconstruction and resettlement of displaced populations in a new way.

Our approach to incremental urbanism is through a structured process that simultaneously responds to short-term, urgent needs while progressing toward long-term goals and ambitions. See also our accompanying report, *From Camps to Communities: Postconflict Shelter in Gaza*, which expands on this concept (Culbertson et al., 2025). This approach is distinguished from conventional “top-down” modes of postconflict planning, which respond to immediate needs without being guided by longer-term spatial opportunities and ambitions of the community. Our approach to incremental urbanism is distinguished by the following strategies and planning principles:

- Use the prewar parcel and block structure by making sure that even temporary emergency facilities (water, electricity, sewer, etc.), as well as residential tent zones, are located in ways that reinforce the urban fabric, safeguarding continuous mobility networks and land ownership structures.
- Even in the earliest stages of rebuilding, strategically locate emergency facilities and public amenities in a manner that reinforces the structure of the reemerging neighborhoods.
- Facilitate collaborative decisionmaking, fostering local leadership and community participation in planning by providing a flexible framework that responds to specific context and needs.

We examine this approach to postwar redevelopment in the Gaza Strip in two typical locations as case studies for the redevelopment of similar environments. The first location is a typical urban center area that experienced significant destruction and population displacement: the Zeitoun neighborhood. In this location, some open spaces remain from before the war,

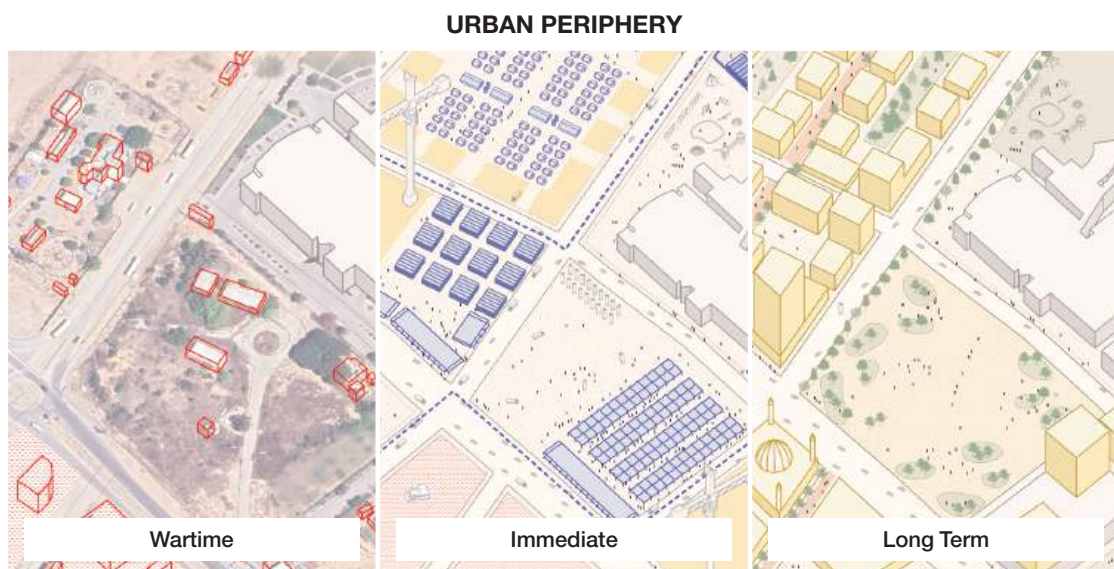
and other areas were destroyed during the war. We assume that most utility networks are inoperative or severely damaged (as is the general condition of utilities in Gaza at the time of writing) and that road access is impeded due to rubble accumulation and destroyed infrastructure. The second is a typical urban peripheral location, set in the Al Mughraqa neighborhood, where land was mostly agricultural before the war and population densities were very low. Following Israeli

military operations, this area has been completely razed. Situated between large concentrations of people (specifically, Gaza City and Nuseirat), lands surrounding this area are a strong candidate for the rehousing of a large number of internally displaced people in the short term, in a territory that would have faced urban development and higher population densities in the long run regardless of the war.

FIGURE 8.33
Gaza Future: Postconflict Incremental Urbanism



Incremental urbanism development illustrated for a central urban area in Gaza City.



Incremental urbanism development illustrated for a peripheral urban area in Gaza City.

An Envisioned Typical Day

A longtime resident, who works in the new hydroponics farm, lives in the same neighborhood he always did on the outskirts of Al Qarara. Even though the neighborhood had to be almost completely rebuilt after the war, it is still familiar to him because, even when it was just tents and emergency facilities, it was still organized around the streets and public spaces he always knew. And because special care was taken to rebuild the mosques and schools in their historic locations, somehow it all feels at once very modern and very familiar. He is proud of the house that he and his extended family built in stages over more than a decade.

The Port of Gaza is finally able to live up to the potential of its strategic location and has become a key entry point for goods, as well as fuel, coming and going from both Palestine and Israel to the rest of the region. Security and logistics are managed jointly by Israelis and Palestinians, something that was unimaginable in the immediate aftermath of the war. The development of the area around the port has spurred the rebuilding of Gaza City. Work is still ongoing, but enough of the existing building stock was salvaged so that here, too, the city feels both new and familiar to the residents.

After dropping her children off at school, a doctor is taking the new rail link that connects Gaza and the West Bank to the medical complex in Hebron, which has grown into a regional medical center of excellence and a boost to the economy.

A generation later, the tragedy of the Israel-Hamas war is not forgotten. But the residents of Gaza have found reconciliation through rebuilding.

Conclusion

With this report, we aim to provide a roadmap for transforming the region through pragmatic and collaborative planning. By improving lives now and preparing for the future, the proposed spatial and infrastructure projects can serve as a catalyst for peace, stability, and sustainable development in the West Bank and Gaza.

Thirty years after the Oslo Accords, there is an ongoing war, no solution to the Israeli-Palestinian conflict, no clear strategy for establishing an independent Palestinian state, and no plan for bettering Palestinian lives. Both Israelis and Palestinians have been heavily burdened by the unresolved and ever-evolving status quo.

The conflict is increasingly costly for all parties in terms of economics, security, regional risks for instability, and social well-being (Anthony et al., 2015). Israelis came under horrific attack on October 7, 2023, leading to a war that has killed 43,000 Gazans (a majority of whom were women and children) and nearly 2,000 Israelis, displaced 1.9 million Gazans and 250,000 Israelis, and spread to Lebanon, where 1 million civilians were displaced and 3,500 Lebanese killed. In earlier studies, RAND researchers found that the occupation is expensive for both Israelis and Palestinians and is more expensive for Israel in absolute terms (Anthony et al., 2015). Israel continues to pay a heavy price to police and occupy the West Bank. Palestinians in the West Bank have been living under Israeli occupation and military law for over 50 years without civil rights equal to those of Israelis in Israel or Israeli settlers. Palestinians lack civil control over their critical infrastructure, such as water, energy, and transportation. While Palestinians have ambitious plans for developing both the West Bank and Gaza, they face immense barriers that will remain as long as the political situation is unresolved.

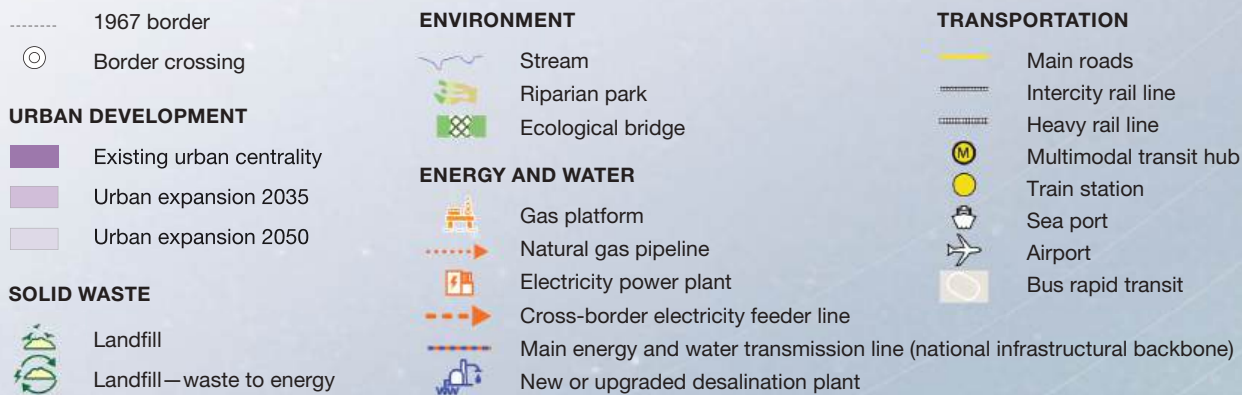
At the same time, development of a coherent spatial plan for Palestine appears to be increasingly in Israel's interests as well: Israel and Palestine are necessarily interdependent in their use of many resources, including water, waste, and energy. Community health and control of infectious diseases—such as the coronavirus disease 2019 (COVID-19) or bird flu, which do not respect national borders—benefit from mutual public health cooperation. If present trends persist, some Israelis fear that, instead of a two-state solution, they will get a “one-state reality” through increasingly integrated occupation of the West Bank, jeopardizing Israel's democratic and Jewish identity (Barnett et al., 2023).

An Opportunity for Renewed Dialogue?

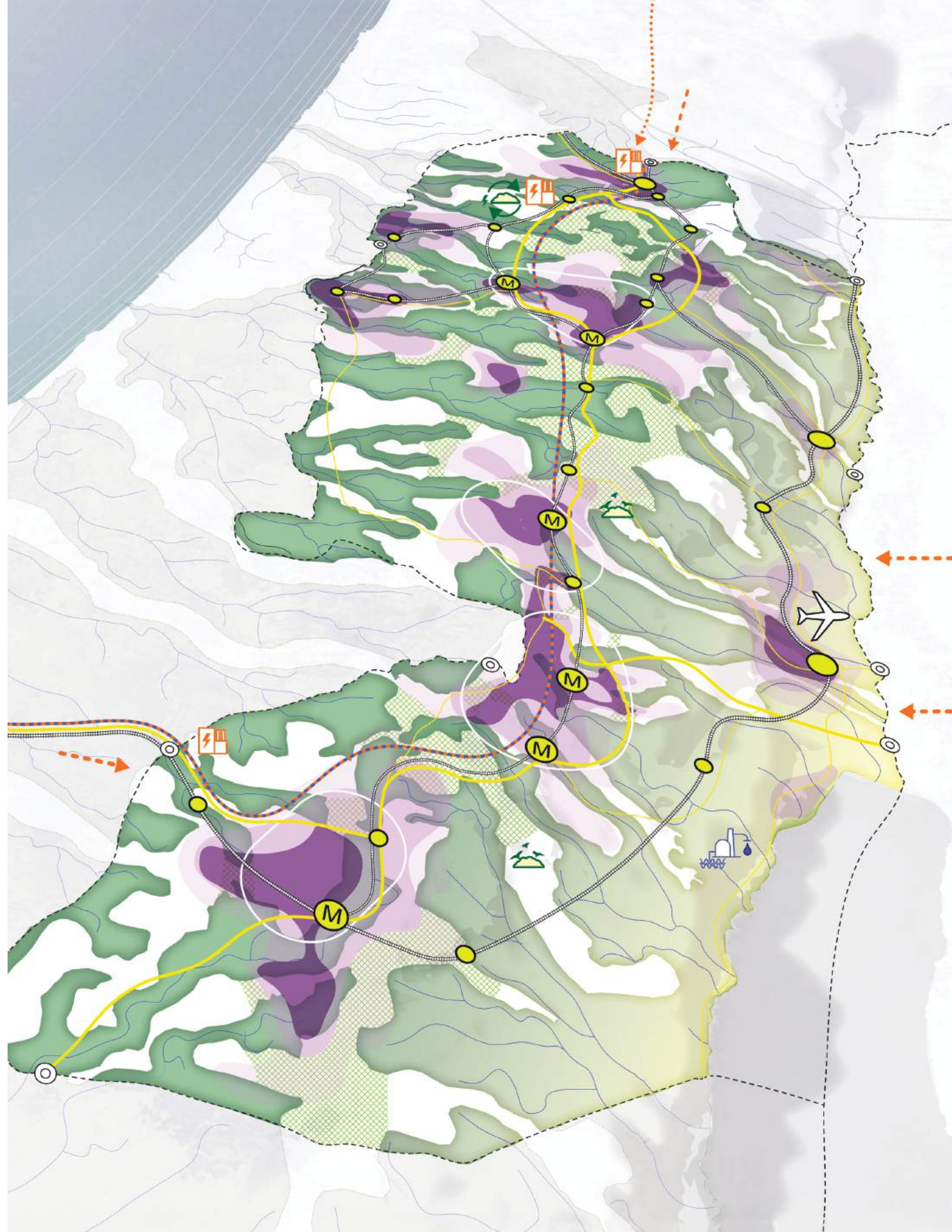
Negotiations to end the war in Gaza offer the prospect for renewed dialogue. We offer a spatial vision for a successful, vibrant Palestine that meets the needs of its people in well-designed and prosperous communities. The preceding chapters provide a roadmap to achieving that vision, including a set of transformative infrastructure projects to improve quality of life, many of which could begin now, even before a political resolution to the Israeli-Palestinian conflict is achieved.

Figure 9.1 reassembles the six sector layers, providing a vision of a future Palestine that emerges from our integrated design approach. Our analysis demonstrates that there can be a realistic vision for spatial planning, infrastructure, and resource management for Palestine. It is possible to create new infrastructure and redevelop existing infrastructure to create a sustainable future that meets the needs of a growing population.

FIGURE 9.1
Sector Layer Assembly



SOURCES: OCHA, NTMP, MoT, MoLG, Shaul Arieli, HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoA, CEP, CESVI, PCBS, Office of the Quartet, Israel MoE, Israel WaSA, PWA, CEP, ORG. See Appendix B for more information.



In Chapter 2 (“Governance”), we offer a vision for a Palestine that has established borders and that is contiguous, not divided into the enclaves of Areas A, B, and C. In Chapter 3 (“Environment”), we suggest how protecting natural systems can help to conserve water and ensure clean land for a growing population. In Chapter 4 (“Cities”), we show how an expanding population can grow into expanding urban footprints that provide high quality of life, offering optimal locations for growth based on the needs of the population and preservation of natural resources. In Chapter 5 (“Transportation”), we show how multiple modes of transportation can enhance mobility in the West Bank and Gaza. In Chapters 6 and 7 (“Energy” and “Water”), we provide steps to improve access to these important resources and to achieve financial sustainability.

An Incremental Plan for Moving Forward

The plan we describe focuses on incremental progress and identifies a broad variety of projects, both conservative and ambitious, that can improve the lives of Palestinians in the short term even as the long-term geopolitical challenges are worked out. To underscore the viability of this approach, we identified at least three projects in each sector that could begin in the next three to five years in each chapter. By highlighting these projects, we do not mean to imply that they are inherently more desirable than other projects listed in Appendix A. We chose them to illustrate that our project-based approach to development is feasible.

Each project serves as a building block that incrementally advances goals of improving the lives of Palestinians while laying the foundation for the evolution of an independent state. A combination of small-scale, community-oriented projects (such as urban redevelopment efforts) and larger infrastructure undertakings (such as waste-to-energy and sanitation reuse facilities) balance immediate needs with long-term impact. A succession of interlinked projects can turn an ambitious vision into a series of practical steps.

The projects highlighted here aim to foster economic development, improve environmental conditions, enhance mobility, and strengthen security. By being practical, mutually beneficial, and technically feasible, these initiatives can garner the approvals, permits, and resources needed for implementation.

These illustrative projects demonstrate that our vision is flexible. It need not be implemented sequentially. Rather, implementation can be incremental, ultimately achieving a reality that is greater than the sum of its parts. Because all projects are linked to the larger vision, sequencing can be opportunistic. Projects with demonstrated need, political agreement, and financing could begin now. We believe the approach can facilitate a process of dialogue between the two sides about which projects are more viable now and which may require more preparation to achieve.

Next Steps

The spatial vision we present initiates a process that remains incomplete. Next steps are to use this document as a basis for engagement with Palestinian, Israeli, and global stakeholders to establish priorities among potential projects.

We plan to conduct significant stakeholder engagement and further analyze these projects to determine those with the greatest net benefit in achieving a prosperous Palestine. In particular, we will compare and prioritize projects based on three criteria: potential impact, cost, and risk. We will also examine the timing and phasing of the projects. That exercise will be essential to identify a project list that promotes realistic ways to improve Palestinian lives and likely is achievable in the present political environment.

The world urgently needs a solution to the Israeli-Palestinian conflict. We realize that this end will require overcoming large challenges in security, governance, logistics, and financing; however, all of this is achievable with political will, good-faith negotiations, planning, and international support. The spatial vision we offer is part of the roadmap for achieving this solution.

Lists of Transformative Projects and Initiatives

This appendix presents the full list of transformative projects that we considered. Tables A.1 through A.6 provide a long list of transformative projects that emerged from this effort, organized by sector. These projects span a wide variety of possible interventions, including government policy measures, physical utility projects, and local development master plans, as well as symbolic projects with public value. To facilitate cross-referencing and future analysis, we provide a coding system in which each recommendation has a sector code. To show the approximate locations of these projects, their number codes are replicated on a map of Palestine in Figure A.1.

TABLE A.1
Governance Projects

Category	Subcategory	Project Title	Project Code
1. Border and jurisdiction	A. Ports of entry—Airport	1. Jordan Valley international airport	GO1A1
		2. Gaza international airport	GO1A2
	B. Ports of entry—Seaports	1. Gaza fisheries port	GO1B1
		2. Gaza commercial port	GO1B2
	C. Ports of entry (border crossing points)	1. Tarqumiyah border crossing	GO1C1
		2. Bayt Jala border crossing	GO1C2
		3. Tulkarm border crossing	GO1C3
		4. Jenin—Jalame border crossing	GO1C4
		5. Tell al Bayda border crossing	GO1C5
		6. Damia Bridge border crossing	GO1C6
		7. King Hussein/Allenby Bridge border crossing	GO1C7
		8. King Abdallah border crossing	GO1C8
		9. Freijat (Al Dahriya) border crossing	GO1C9
		10. Bayt Hanoun border crossing	GO1C10
		11. Rafah border crossing	GO1C11
		12. Kerem Shalom border crossing	GO1C12
2. Administration	A. International organizations provide support for capacity-building for a new Palestinian spatial planning institution		GO2A1
	B. Establishment of a special economic zone legislation, promoting bonded areas as tax-free zones for logistical and industrial activities in search of foreign direct investment		GO2B1
	C. Land ownership registration—Extending UNHabitat’s pilot, this effort will establish a property ownership inventory for all the West Bank and Gaza in order to enable decisions about land use and development		GO2C1
3. Security	A. Improvement to border crossing security technology		GO3A1
	B. Checkpoint removal, redesign, and modernization		GO3B1
	C. Improved security coordination between Israel, Palestine, Egypt, and Jordan		GO3C1

TABLE A.2
Environment Projects

Category	Subcategory	Project Title	Project Code
1. Environmental zones	A. Riparian parks designation and management	1. Watershed riparian management zone (x17)	ET1A1
		2. Jordan River environmental regeneration	ET1A2
	B. Transversal ecological bridges designation and management	1. Ecological bridge between Nablus and Jenin	ET1B1
		2. Ecological bridge between Nablus and Salfit	ET1B2
		3. Ecological bridge between Ramallah and Nablus	ET1B3
		4. Ecological bridge between Qalqiliya and Tulkarm	ET1B4
		5. Ecological bridge between Salfit and Tulkarm	ET1B5
		6. Ecological bridge between Salfit and Qalqiliya	ET1B6
2. Solid waste management	A. Landfill	7. Ecological bridge between Hebron and Bethlehem	ET1B7
		8. Ecological bridge between Hebron and Yata	ET1B8
		1. WB—North—Landfill	ET2A1
		2. WB—Center—Landfill	ET2A2
		3. WB—South—Landfill	ET2A3
	B. Solid waste transfer stations	4. Gaza—North—Landfill	ET2A4
		5. Gaza—South—Landfill	ET2A5
		1. WB—North—SWTS	ET2B1
		2. WB—Center—SWTS	ET2B2
		3. WB—South—SWTS	ET2B3
		4. Gaza—North—SWTS	ET2B4
	C. Solid waste treatment and reuse	5. Gaza—South—SWTS	ET2B5
		6. Giftlik—SWTS	ET2B6
		1. Jenin Zaharat Al Finjan—Waste to Energy	ET2C1
3. Agricultural development zones	A. Agricultural development zones	1. North Jordan Valley agricultural development zone	ET3A1
		2. South Jordan Valley agricultural development zone	ET3A2
		3. Jenin Northern agricultural development zone	ET3A3
		4. Western slopes agricultural development zone	ET3A4
		5. Hebron slopes agricultural development zone	ET3A5
		6. Gaza Strip agricultural development zone	ET3A6
		7. Tulkarem and Qalqilya area agricultural development zone	ET3A7
4. Postwar mitigation	A. Rubble removal and explosive hazard mitigation		ET4A1
5. Administration	A. Environmental protection agency		ET5A1
	B. Solid waste management standards		ET5B1
	C. Cleanup of informal dumpsites		ET5C1

NOTE: SWTS = solid waste transfer station; WB = West Bank.

TABLE A.3
Cities Projects

Category	Subcategory	Project Title	Project Code
1. Infrastructure-driven urban growth	A. Transit-oriented development	1. South Hebron gateway	CT1A1
		2. East Jerusalem gateway	CT1A2
		3. South Nablus gateway	CT1A3
		4. West Nablus gateway	CT1A4
		5. Bethlehem gateway	CT1A5
		6. East Ramallah gateway	CT1A6
		7. Gaza City gateway	CT1A7
		8. East Hebron gateway	CT1A8
2. Urban renewal and redevelopment	A. Priority urban redevelopment locations	1. Gaza City urban redevelopment	CT2A1
		2. Nablus urban redevelopment	CT2A2
		3. Ramallah urban redevelopment	CT2A3
		4. East Jerusalem urban redevelopment	CT2A4
		5. Hebron urban redevelopment	CT2A5
		6. Jericho urban redevelopment	CT2A6
3. New cities	A. Agro-industrial cities	1. Bardala new agro-industrial city	CT3A1
		2. Giftlik new agro-industrial city	CT3A2
	B. Tourism city	1. Jericho new tourism city	CT3B1
4. Civic institutions development	A. Development of symbols of state	1. Government campus in East Jerusalem	CT4A1
		2. National stadium	CT4A2
		3. National museum	CT4A3
		4. National performing arts center	CT4A4
		5. Universities, information technology hubs, and incubators	CT4A5
		6. Hospitals and medical campus	CT4A6
5. Economic centers	A. Industrial zone development	1. Jenin industrial zone	CT5A1
		2. Tulkarm industrial zone	CT5A2
		3. Jericho industrial zone	CT5A3
		4. Bethlehem industrial zone	CT5A4
		5. Hebron industrial zone	CT5A5
		6. Gaza City industrial zone	CT5A6
		7. Rafah industrial zone	CT5A7
		8. Giftlik industrial zone	CT5A8

Table A.3—Continued

Category	Subcategory	Project Title	Project Code
6. Administration	B. Central Business District (CBD) developments	1. Ramallah CBD	CT5B1
		2. Hebron CBD	CT5B2
		3. Nablus CBD	CT5B3
		4. East Jerusalem CBD	CT5B4
		5. Gaza City CBD	CT5B5
	C. Tourism hub development	1. Jerusalem and Bethlehem tourism hub	CT5C1
		2. Jericho and Dead Sea tourism hub	CT5C2
		3. Hebron tourism hub	CT5C3
		4. Nablus tourism hub	CT5C4
		5. North Jordan Valley tourism hub	CT5C5
	A. Regional planning councils		CT6A1
	B. Smart growth incentive program		CT6B1
	C. Public-private partnership initiatives		CT6C1
	D. Affordable housing development program		CT6D1
	E. Special economic zone development program		CT6E1

TABLE A.4
Transportation Projects

Category	Subcategory	Project Title	Project Code
1. New public transportation infrastructure	A. Multimodal hub	1. West Nablus multimodal hub	TN1A1
		2. South Nablus multimodal hub	TN1A2
		3. Ramallah multimodal hub	TN1A3
		4. Jerusalem multimodal hub	TN1A4
		5. Bethlehem multimodal hub	TN1A5
		6. South Hebron multimodal hub	TN1A6
		7. Gaza City multimodal hub	TN1A7
		8. East Hebron multimodal hub	TN1A8
		9. Jenin multimodal transit hub	TN1A9
		10. Jericho multimodal transit hub	TN1A10
		11. Giftlik multimodal transit hub	TN1A11
	B. Central station	1. Tulkarm central station	TN1B1
		2. Rafah central station	TN1B2
	C. Local stations	1. Local stations	TN1C1
	D. Rail network	1. National line	TN1D1
		2. Intercity ridgeline	TN1D2
	E. BRT lines	1. Gaza City BRT lines	TN1E1
		2. Hebron BRT lines	TN1E2
		3. Bethlehem BRT lines	TN1E3
		4. Jerusalem BRT lines	TN1E4
		5. Ramallah BRT lines	TN1E5
		6. Nablus BRT lines	TN1E6
2. Roads and internal connectivity	A. Upgrading of primary roads	1. Wadi Naar bridges	TN2A1
		2. Gaza–West Bank connector	TN2A2
		3. Road 60 redevelopment	TN2A3
		4. Salah ad-Din road redevelopment	TN2A4
		5. Upgrade and development of secondary road network	TN2A5

Table A.4—Continued

Category	Subcategory	Project Title	Project Code
3. Ports of entry	A. Airport	1. Jordan Valley international airport	TN3A1
		2. Gaza international airport	TN3A2
	B. Seaports	1. Gaza fisheries port	TN3B1
		2. Gaza commercial port	TN3B2
	C. Border crossings	1. Tarqumiyah border crossing	TN3C1
		2. Bayt Jala border crossing	TN3C2
		3. Tulkarm border crossing	TN3C3
		4. Jenin–Jalame border crossing	TN3C4
		5. Tell al Bayda border crossing	TN3C5
		6. Damia Bridge border crossing	TN3C6
		7. King Hussein/Allenby Bridge border crossing	TN3C7
		8. King Abdallah border crossing	TN3C8
		9. Freijat (Al Dahriya) border crossing	TN3C9
		10. Bayt Hanoun border crossing	TN3C10
		11. Rafah border crossing	TN3C11
		12. Kerem Shalom border crossing	TN3C12
4. Administration	A. Combined mobility coordinating capacity		TN4A1
	B. Expanded mandate for Ministry of Transportation		TN4B1
	C. Coordination with Israel		TN4C1
	D. Adapt best-practice technology		TN4D1
	E. Negotiation of Jordanian-Palestinian free trade zone		TN4E1
	F. Demobilization of checkpoints		TN4F1

TABLE A.5
Energy Projects

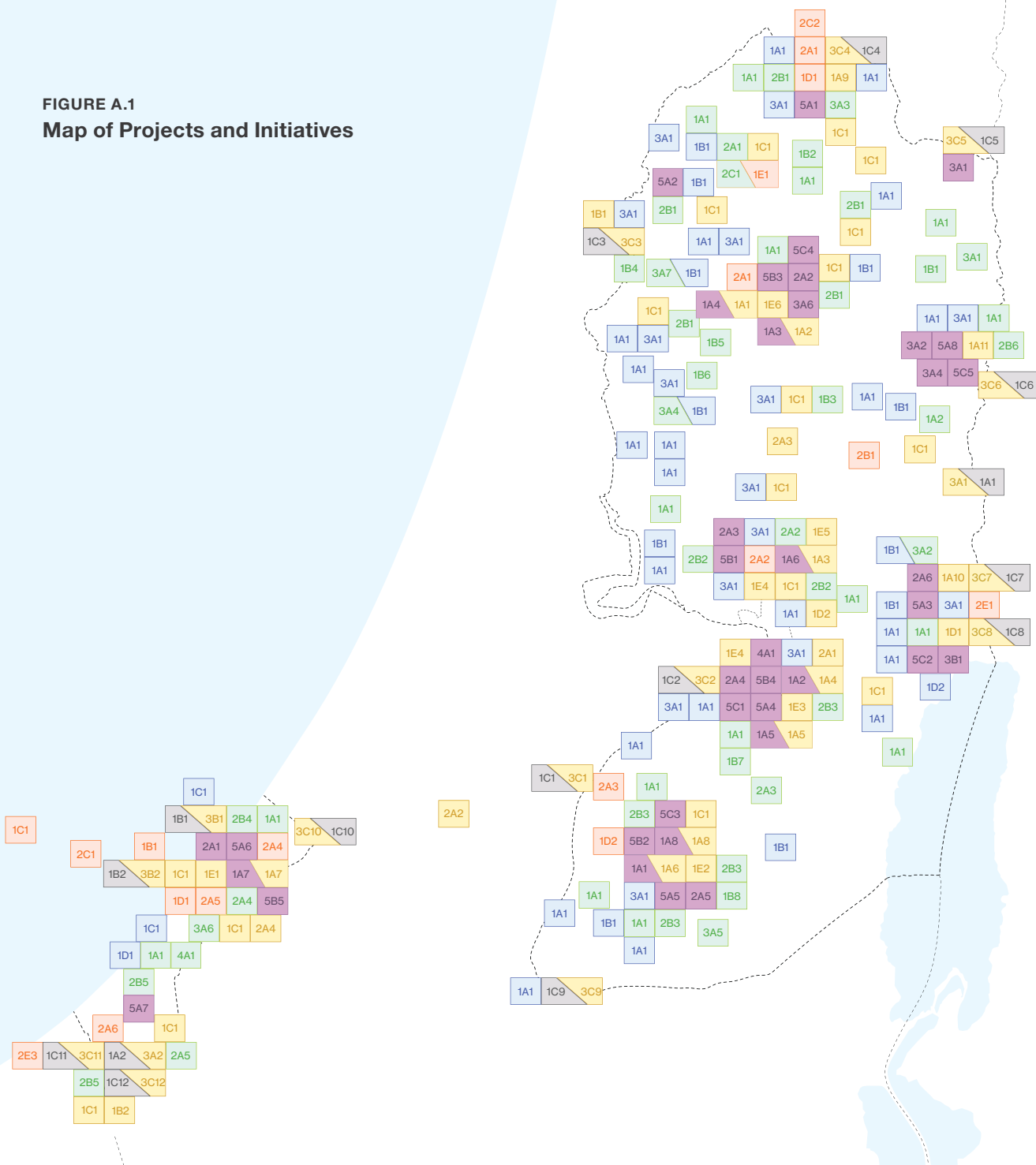
Category	Subcategory	Project Title	Project Code
1. Energy sources	A. Utility-scale solar production	1. Utility-scale solar production	EY1A1
	B. Fuel terminal (Gaza seaport)	1. Gaza seaport	EY1B1
	C. Gaza marine	1. Gaza marine	EY1C1
	D. Power plants	1. Gaza power plant	EY1D1
		2. Hebron power plant	EY1D2
		3. Jenin power plant	EY1D3
	E. Waste to energy	1. Jenin Zaharat Al Finjan—Waste to Energy	EY1E1
2. Energy networks and transmission	A. Substations	1. WB—North—S/S	EY2A1
		2. WB—Center—S/S	EY2A2
		3. WB—South—S/S	EY2A3
		4. Gaza North S/S	EY2A4
		5. Gaza West S/S	EY2A5
		6. Rafah S/S	EY2A6
	B. DISCOs upgrade	1. Upgrade of municipal grids and DISCOs	EY2B1
	C. Gas pipelines	1. Gas pipeline to Gaza	EY2C1
		2. Gas pipeline to Jenin	EY2C2
	D. National energy distribution line	1. National energy distribution line	EY2D1
	E. Proposed cross-border feeder lines	1. Electricity feeder line from Jordan	EY2E1
		2. Electricity feeder line from Israel	EY2E2
		3. Electricity feeder line from Egypt	EY2E3
3. Administration	A. Regulations and policies toward the stabilization of energy prices		EY3A1
	B. Postwar redevelopment of energy infrastructure in Gaza		EY3B1
	C. Security for big projects against risk of war, risk management		EY3C1
	D. Enhanced energy efficiency policies promoting sustainable building codes		EY3D1
	E. Development of frameworks for improved planning, investments, and operations toward productivity and sustainability goals		EY3E1
	F. Promotion of unified planning authority for the energy sector		EY3F1
	G. Improved energy bill collection		EY3G1

NOTE: S/S = substation; WB = West Bank.

TABLE A.6
Water Projects

Category	Subcategory	Project Title	Project Code
1. Water sources	A. Proposed new wells (22 wells totaling 30 MCM)	1. Proposed new wells (22)	WR1A1
	B. Proposed new dams for irrigation	1. Proposed new dams for irrigation in Jenin, Tubas, Nablus, and Jericho governorates	WR1B1
	C. Increased capacity (30 MCM) of short-term, low-volume (STLV) desalination plants	1. STLV desalination plants	WR1C1
	D. Proposed new desalination plants	1. Gaza desalination plant 2. Dead Sea brackish water desalination plant	WR1D1 WR1D2
2. Distribution	A. New connection points to Israeli water system	1. New connections to Mekorot	WR2A1
	B. Grid repairs and upgrades addressing leakages	1. Network grid repairs	WR2B1
	C. National water carrier (ridgeline)	1. National water carrier	WR2C1
3. Sanitation and reuse	A. Wastewater treatment with reuse scheme for irrigation	1. Wastewater treatment with reuse scheme for irrigation, including more than two dozen wastewater processing facilities	WR3A1
4. Administration	A. Consolidation of over 300 service providers		WR4A1
	B. Reform in water system payment collection through meters		WR4B1
	C. Legal reform with new wastewater treatment and reuse regulations, guidelines for gray water reuse in agriculture, and guidelines for collection, treatment, and sustainable practices		WR4C1

FIGURE A.1
Map of Projects and Initiatives



THEMATIC CATEGORIES (The first two letters of the project code are indicated by color)

- | | | |
|----------------------------|--------------------------|------------------|
| Governance (GO ____) | Cities (CT ____) | Energy (EY ____) |
| Environment (ET ____) | Transportation (TN ____) | Water (WR ____) |
| Synergies between projects | | |

GIS Sources for Maps

GIS Sources—Short-Form Summary

- Figure 2.1 sources: OCHA, NTMP, MoT, MoLG, CEP, ORG.
- Figure 2.2 sources: OCHA, NTMP, MoT, MoLG, CEP, Shaul Arieli, ORG.
- Figure 3.1 sources: HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoA, CEP, CESVI, ORG.
- Figure 3.2 sources: HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoG, CEP, CESVI, ORG.
- Figure 4.1 sources: OCHA, MoLG, CEP, PCBS, ORG.
- Figure 4.2 sources: MoLG, CEP, PCBS, ORG.
- Figure 5.1 sources: OCHA, MoT, NTMP, CEP, ORG.
- Figure 5.2 sources: MoT, NTMP, CEP, ORG.
- Figure 6.1 sources: OCHA, Office of the Quartet, Israel MoE, CEP, ORG.
- Figure 6.2 sources: OCHA, Office of the Quartet, Israel MoE, CEP, ORG.
- Figure 7.1 sources: OCHA, HydroBASINS, Israel WaSA, MoLG, CEP, PWA, Office of the Quartet, ORG.
- Figure 7.2 sources: HydroBASINS, Israel WaSA, MoLG, CEP, PWA, Office of the Quartet, ORG.
- Figures S.2 and 9.1 sources: OCHA, NTMP, MoT, MoLG, Shaul Arieli, HydroBASINS, Viewfinder Panoramas, HydroRIVERS, MoA, CEP, CESVI, PCBS, Office of the Quartet, Israel MoE, Israel WaSA, PWA, CEP, ORG.

Key

- CEP—Center for Engineering and Planning data (Center for Engineering and Planning, undated).
- CESVI—CESVI Foundation; data from Zoccatelli et al. (2019).
- HydroBASINS—HydroBASINS data (Lehner and Grill, 2013; data are available at HydroSHEDS, undated).
- HydroRIVERS—HydroRIVERS data (Lehner and Grill, 2013; data are available at HydroSHEDS, undated).
- Israel MoE—Israel Ministry of Energy and Infrastructure data (Israel Ministry of Energy and Infrastructure, undated).
- Israel WaSA—Israel Ministry of Water and Sewage Authority data (Israel Ministry of Water and Sewage Authority, undated).
- MoA—Palestine Ministry of Agriculture data (Palestine Ministry of Agriculture, undated).
- MoLG—Geomolg Portal for Spatial Information in Palestine (Palestine Ministry of Local Government, undated).
- NTMP, MoT—National Transportation Master Plan (Palestine Ministry of Transport and Communications, 2016).

- OCHA—UN Office for the Coordination of Humanitarian Affairs data (UN Office for the Coordination of Humanitarian Affairs, undated).
- Office of the Quartet—See Office of the Quartet, undated-a.
- ORG—ORG Permanent Modernity (see ORG Permanent Modernity, undated).
- PCBS—Palestinian Central Bureau of Statistics data (Palestinian Central Bureau of Statistics, undated).
- PWA—Palestinian Water Authority data (Palestinian Water Authority, undated).
- Shaul Arieli—See Shaul Arieli, undated.
- Viewfinder Panoramas—Digital elevation data from Viewfinder Panoramas, undated.

Abbreviations

BRT	bus rapid transit
COGAT	Coordination of Government Activities in the Territories
DISCO	energy distribution company
GIS	Geographic Information System
MCM	million cubic meters
MW	megawatts
PA	Palestinian Authority
UN	United Nations
UNHabitat	United Nations Human Settlements Programme
UNRWA	United Nations Relief and Works Agency for Palestine Refugees in the Near East

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The authors propose both quick-win projects that could begin immediately at the local level, even without a political solution, and longer-term, strategic infrastructure investments that would require regional agreements; incrementally, over time, these projects can comprise the essential infrastructure of a future state. The goal of this report is to contribute a tool for dialogue and rational planning, offering an integrated, technical approach to aid diplomacy and economic development.



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