Green Urban Development

CARBON-INTENSIVE URBAN SPRAWL
Research suggests that about 30 percent of future, committed greenhouse-gas emissions will occur as a result of new urban buildings and transport systems, with inefficient urban development locking in future emissions. Controlling greenhouse-gas emissions from standalone buildings can be achieved relatively easily through better insulation, more efficient heating and cooling systems, and the installation of small-scale renewable energy sources, particularly on rooftops. Broader strategies, such as achieving optimum density, overall configuration or massing, and planning layouts to reduce wastage while ensuring comfort and affordability, require careful analysis and consideration.

Dense, mixed-use urban developments that are close to public transit nodes give people convenient and cleaner transport options. Many cities have mass transit options in place or in the planning stage, but are yet to fully adjust urban planning to maximise the benefits.

TOWARDS A GREENER AND MORE LIVABLE CITY
Green urban development typically includes the following features:

- Mixed-use development with shops, schools, other public services, and a range of housing types and prices.
- High-density and compact development to maximize land and improve affordability.
- More energy, water, and waste-efficient design of buildings and infrastructure.
- Public transit stations or transit corridors that are easy to access, reliable, and secure, as well as street and road planning for non-motorized transport.
- Public and private sector participation.

Planning and policy innovations have been critical for green urban development. In Barcelona, super blocks that combine city spaces into pedestrian-friendly, car-free mini grids have been designed. Copenhagen has used a finger plan, an urban plan...
composed of five well-defined, linear corridors (or “fingers”), separated by green wedges with open spaces, water sheds, and ecological preserves, to drive green growth. Curitiba created structural corridors to promote job creation and activities away from downtown and inner-city locations, and included housing and commercial density around mass transit lanes. As a result, the city has Brazil’s lowest share of car use.

**GREEN URBAN DEVELOPMENT CREATES VALUE FOR ALL**

Developing a reliable transportation system requires large capital expenditure, but a substantial pool of users will offset the costs over time. Decreased pollution and fuel consumption will provide economic benefits to users, governments, and companies, while enhancing a city’s ability to maintain its competitiveness and environmental sustainability.

Green urban developments can provide substantial cost savings for both city governments and citizens. A recent study concluded that China could save $1.4 trillion in urban infrastructure costs if its development plans optimized density over sprawl.

Incorporating transit into urban design allows developers to benefit from stable or higher property values. Mixed-use settings also create commercial opportunities that benefit from increased foot traffic in the area. A developer may also be able to access government incentives for such projects.

Hong Kong, for example, has created a financially successful rail and property funding model, allowing the Mass Transit Railway Corporation to partner with individual private developers to build along new and existing rail lines. Reducing residents’ dependence on private vehicles will help decrease their overall living expenses, while improving health outcomes by increasing physical activity. Living in such developments can increase a sense of community and wellbeing for residents and help improve living standards.

**MAKING IT HAPPEN**

Both market and policy tools can drive value creation in green urban communities by:

- Developing a transit-oriented development policy framework for integrated infrastructure planning that develops sustainable urban growth centers with high-density mixed land use.
- Reforming land-use regulations such as single-use zoning, low-density limits, and high parking fees to encourage mixed-used, transit-oriented developments with reduced car parking.
- Redefining policy definitions of affordable housing to include the combined cost of housing and transport.
- Creating incentives for the private sector. Cross-subsidization using tax abatement or value capture methods could help make the higher costs of transit-accessible locations less prohibitive for private developers and investors.
- Exploring alternative implementation options, including PPPs, to leverage private sector skills and financing to develop projects.
- Encouraging corporations to locate offices within green urban developments as an anchor tenant or employer through financial and non-financial policy incentives.

The World Bank Group has created a new tool to quantify the impact of green urban developments. The Excel-based Climate Action for Urban Sustainability (CURB) tool is the first of its kind. It helps cities act on climate change through an interactive scenario planning tool. It uses local data to provide tailored analyses that will help cities evaluate low-carbon actions in six sectors, namely private sector buildings, municipal buildings and public lighting, electricity generation, solid waste, transportation, and water and wastewater. As an investment planning tool, it provides details of implementation costs, cash flow, payback, and return on investment. Users can change discount rates and cost assumptions to evaluate the impact of alternative financing conditions. The tool is an addition to the array of EDGE tools for green building projects and aims to help developers influence clients to choose green urban development designs early in the project planning process. CURB is also one of the engines of the Google city emissions calculator (see box on Data: A Critical Lynchpin to Climate Action).
About 62 percent of the total population in the Middle East and North Africa live in cities today, and the urban population is expected to double by 2040. About 31 percent of the total population lives in just 30 of the biggest cities in the region. Megacities such as Baghdad, Cairo, Riyadh, and Tehran are major regional economic drivers with significant influence in the region. Cities such as Amman and Beirut are trade and commercial hubs that incubate new technologies and attract investment.

City leaders in the region are recognizing the risks and opportunities presented by climate change and are acting on them. Most capital cities in the region are already facing sharply rising temperatures, depleting water reserves, and reduced rainfall, and can expect to see up to four months of extreme heat per year if climate change is not addressed. Building resilience to the effects of climate change will also require economic and social resilience, enabling people to better weather urban shocks and stresses. Cities in the Middle East and North Africa are planning their development in a sustainable way. Even cities without formalized plans are developing projects and inviting investments that have significant climate-smart benefits.
Beirut has implemented a Sustainable Energy Action Plan to reduce its emissions by 37 percent from 2013 levels by 2020. Priority areas include transport, which accounts for the city’s largest share of energy consumption, and residential buildings, which accounts for the second largest share, or 26 percent of Beirut’s energy consumption. The city of Taiz in Yemen has worked with the World Bank for several years to mitigate the impact of flooding and strengthen critical infrastructure for water management. New Cairo, a satellite city outside of Cairo, is expected to grow from 550,000 people in 2013 to over 3 million people by 2030, and has developed a wastewater PPP to boost the city’s ability to meet its water demand over the coming years.

The region is facing increased energy and water demand, population growth, and concentrated urbanization. As cities in the Middle East and North Africa work to address these challenges and achieve their low-carbon transition plans, they will require significant investments in climate-smart infrastructure across sectors, including more efficient industry, transport, and utilities. IFC estimates a climate investment opportunity of $1.7 trillion in cities in the region to 2030.
A PPP FOR WASTEWATER MANAGEMENT AND WATER EFFICIENCY IN CAIRO (IFC)

New Cairo, a satellite city of Cairo, was established to alleviate overcrowding in Cairo’s city center. IFC helped Egypt’s government structure the country’s first PPP to finance, design, construct, operate, and maintain a wastewater treatment plant with capacity of 250,000 cubic meters (m³) per day to improve sanitation services for New Cairo’s residents. The New Cairo Wastewater Treatment Plant serves more than 1 million people and treated wastewater from the plant is being used to irrigate agricultural land and urban green areas.

THE FIRST ECO-CITY IN MOROCCO (EIB)

The EIB has provided a €150 million loan to help Morocco develop Zenata, a new town situated north of Casablanca. The development is government’s response to uncontrolled urbanization, with 30,000 people settling in the area across 26 informal settlements. The project aims to create 100,000 new jobs and house 300,000 residents over the next 30 years. Up to 30 percent of the land is reserved for public parks to moderate high temperatures and promote biodiversity. The building plans include energy-efficient lighting and building construction. The design has also been adapted for harsh natural conditions, storing seasonal flood water in retention ponds to better manage rainwater.

SUSTAINABLE BUS TRANSPORT IN PESHAWAR (ADB)

Peshawar, the capital city of Khyber Pakhtunkhwa in Pakistan, has experienced rapid population growth as a result of internal displacement and Afghan refugee migration. Traffic conditions on key arterial roads have become unmanageable, increasing air and noise pollution. The ADB provided a $335 million loan to restructure the 26km bus rapid transit corridor. Improvements will include building bicycle lanes along the corridor, introducing a bicycle-sharing system at Peshawar University, and implementing a modern fare-collection system using smart cards to enable distance-based fares. Satellite imagery will be used to map the corridor and inform the engineering design.
YEMEN INTEGRATED URBAN SERVICES EMERGENCY PROJECT IN SANA‘A (WORLD BANK)

In 2017, the World Bank designed and approved the $150 million Yemen Integrated Urban Services Emergency Project, which aims to restore access to critical urban services in Yemeni cities affected by ongoing conflict. This project is being implemented with the help of the UN Office of Project Services, which has partnered with three local entities to preserve and improve the capacity of national institutions.

The project targets four sectors, namely solid waste management, water and sanitation, urban roads, and electricity. The linkages between these urban sectors necessitate an integrated approach to restoring urban service delivery.

This approach has shown results already. The project has improved the energy supply and efficiency of Sana‘a’s largest public hospital by installing off-grid solar energy systems, replacing about 6,000 indoor LED lamps, and supplying street and outdoor lighting. Other interventions under way include a solid waste cleaning campaign that will help reduce health hazards and improve quality of life, as well as neighborhood-level projects that improve services (such as sanitation) and provide temporary local employment.
“In the past, there was not enough awareness of the effects of climate change on society and the negative impacts that any disruption of this system could cause. In Amman, we are working to address these effects both within local communities and among officials, partners, and institutions. We must unite in our efforts to work towards the United Nations Development Goals 2030—and to stay committed to the cause.”

— Yousef Shawarbeh, Mayor of Amman

The Greater Amman Municipality is the first city in the Southern and Eastern Mediterranean region to join the Green Cities Framework, to identify and address priorities for green development. With close to 4 million people, Amman is home to over 42 percent of Jordan’s population within 800km². Its annual emissions of almost 7.5 million tons of CO₂e (equivalent to 1.6 million passenger vehicles driven for one year) are attributed primarily to buildings (64 percent) and transport (31 percent). Meeting the needs of an unexpected surge in population due to the migration of refugees into the city presents a significant opportunity for investment in Amman.
Mitigation and Adaptation Plans

Amman is developing its first public climate action plan with support from the World Bank, committing the city to near-zero emissions by 2050 and outlining pillars for action to achieve this target. This is expected to be launched in early 2019. As part of its involvement with the Green Cities Framework, the Greater Amman Municipality is working with the Ministry of Environment in Jordan and the EBRD to develop a Green City Action Plan. The plan will focus on addressing key climate change-related challenges and providing opportunities for investment in solid waste management, water and wastewater, urban roads and lighting, urban transport, and public building energy-efficiency. Broader goals include reducing local pollution, improving energy and resource efficiency, and promoting climate adaptation.

The action plan is expected to be fully aligned with Jordan’s National Green Growth Plan, which is structured around five interlinked outcomes, namely sustained economic growth, social development, ecosystems services, resilience, and emissions reduction and avoidance. The Green Growth Plan prioritizes the development of Amman, particularly through the establishment of a green growth corridor between Amman and Aqaba, which will emphasize inter-sectoral transit-oriented projects using solar and other renewable energy, as well as smart urban clusters. The Jordan Economic Growth Plan 2018–2022 seeks green construction growth as the Greater Amman Municipality strives to meet its housing targets. Green measures include updating building regulations, introducing new requirements for energy-efficiency in buildings and linking them to obtaining building and construction permits, and providing more specific density and zoning guidelines in the area.

The Greater Amman Municipality has also signed a memorandum of understanding with the EBRD for help with transforming into a smart city. It establishes a framework for strategic and operational cooperation that will address major environmental, economic, and social challenges. Achieving this transformation will require large investments in infrastructure across sectors, providing a significant opportunity for the private sector to both finance and execute projects.
Amman faces both frequent droughts and heavy rains that often lead to flooding in the low-lying areas of the city. To address these issues, Amman has partnered with the City Water Resilience Framework project, which seeks to establish qualitative and quantitative indicators to measure city water resilience, and accurately diagnose water challenges to plan investment and policy decisions.274

The city recycles much of its groundwater for use in agriculture and is gradually improving water infrastructure by replacing old pipes. However, there is a significant opportunity for private sector involvement in the improvement of Amman’s water supply and distribution network to help increase water access for many neighborhoods that receive running water for only 12 to 24 hours each week.275 IFC estimates a total investment opportunity of almost $550 million to 2030 to improve Amman’s urban water infrastructure.

Integrating private involvement in solid waste management is a key strategic goal of Amman’s resilience strategy as it seeks to improve the cost effectiveness of the sector. The city intends to update its legislation and improve physical assets and infrastructure to strengthen the operational, financial, and environmental performance of the city’s waste management system. Currently, only the Al Ghabawi landfill site in Amman is lined, and the city seeks to prevent potential hazards to the environment and public health by ensuring that other landfill sites are similarly protected. Upgrades and construction of new waste management infrastructure presents an opportunity for the private sector, as does the potential for harnessing the energy potential of waste.271

Companies are recognizing the government’s commitment to unlocking private investment in the sector and are taking advantage of the opportunities being created. For example, China Tianyign Inc. and Acwa Power won the 2016 tender for a design-build-operate-transfer contract offered by the Greater Amman Municipality for a municipal solid waste-to-energy facility in the city.272 Another project in the pipeline is a PPP to develop an organic compost production project at the Al Ghabawi landfill site to be used as a soil conditioner for agriculture and landscaping.273 To fulfill Amman’s solid waste management goals, IFC estimates a potential investment opportunity of $385 million to 2030.

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Amman is seeking investment in urban transport networks both within the city and along its key urban corridors, to relieve traffic stress and meet transport demand. The city has shortlisted 24 projects, including a freight rail route between Amman and Aqaba and bus rapid transit lines between Amman and Zarqa.

The city also aims to catalyze a modal shift to public and non-motorized transport, institutionalize urban planning, and update its Transportation and Mobility Master Plan as part of the resilience strategy. The city seeks to increase journeys made using public transport from 14 percent to 20 percent of total journeys by 2020. To encourage partnership between the public and private sectors, the city intends to implement regulatory reforms and measures such as e-payments and tracking systems for taxis to create a competitive environment and secure the rights of all parties.

To generate the shift towards greener transportation, the Greater Amman Municipality has commissioned an assessment of areas with high parking pressures. This information will be used to create a demand management strategy through controlled parking zones. In addition, tenders for the construction of bus rapid transit in Amman are open for competitive private sector bidding as of 2018. IFC estimates an investment opportunity of over $4 billion in the city’s public transport sector to 2030.

In 2015, Amman launched a pilot project in partnership with the private sector to promote the transition to solar-charged electric vehicles, including 150 cars and 10 free-to-use charging stations. This pilot is expected to be scaled up, with the next phase involving the rollout of 10,000 electric vehicles and 3,000 charging stations supplied with electricity from a solar farm. Achieving this goal will require investments amounting to $3 billion in electric vehicles in Amman to 2030.

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**Financing and Policy Instruments**

The city has had significant experience over the last two decades with PPPs in various sectors, supported by a national PPP policy. Amman has seen particular success in PPPs for water and wastewater management, including the high-profile Disi-Mudawwara to Amman Water Conveyance System. More recently, it has also seen success through the $120 million South Amman wastewater treatment plant and trunk line PPP, which has a treatment capacity of 52,000m³ per day and serves 600,000 people in south Amman. The project to expand the As Samra wastewater treatment plant, which uses hydropower and is 80 percent energy self-sufficient, was completed through a PPP that included $100 million in private investment. The plant serves 3.5 million people in the metropolitan area. The Greater Amman Municipality has also worked with the EBRD to develop a PPP program for energy-efficient street lighting.

The Mayor of Amman has stated the city’s intention to increase its creditworthiness and bankability to attract private sector investment in green projects. To do so, the city is encouraging greater transparency and accountability by opening its books to potential investors. This will provide financial institutions with a clearer understanding of the risks for their capital, as well as reassure them of the opportunities, in an effort to attract their investment for new low-carbon projects.

With support from the C40, Amman hosted the first City Creditworthiness Academy for the region—an intensive one-week capacity-building workshop that brought together chief financial officers, treasurers, revenue directors, and planners to understand the underlying principles of creditworthiness and enhance the city’s financial management performance.