Amman’s Urban Response to Covid-19 & Institutional Performance
Covid-19 & City’s Resilience

The need for an immediate response by cities amidst the pandemic, The Mayor of Greater Amman Municipality (GAM) held an emergency meeting in April to form a Covid19 Taskforce in-charge of developing a rapid response by documenting all the tasks and services that were operational during the lockdown of the city, and how we can enhance the accessibility for critical urban services for all citizens.
Presentation Structure

- A short introduction about our city for familiarity
- Greater Amman Municipality in a glance
- Institutional Performance during the pandemic
- City’s Response to Covid-19
- Our vision for the future

The goal for this presentation is to spread awareness for urban planners, urban designers, policymakers and academics about our experience and how they can benefit from it.
Amman City
Amman is culturally diverse, with 4 Million inhabitants coming from different social and cultural backgrounds living together & accounting for 40% of Jordan’s population with an area of approximately 800 square kilometers.

Amman is the economic & political engine of the country; it holds the parliament, foreign embassies, the royal court & 80% of its capital enterprise. Nearly 40% of Amman’s population is under the age of 20.

It is worth noting that 48% of all lands within GAM borders are zoned and regulated. There are approximately (293) km² of the built-up area in the city, accounting for (37%) of the total area.

More than third of its 4 Million inhabitants are none Jordanian; were the highest percentage of them is from Syria (193,781 Refugees), 29.4% is the total number of Syrian refugees in Jordan.
Greater Amman
Municipality in a glance
Greater Amman Municipality (GAM) is a formidable leader in innovation throughout MENA region, adopting the latest urban trends & evidence-based policies to enhance the quality of life for its citizens.

The mission of GAM is to provide high quality municipal services to its 4 million inhabitants across 22 districts by focusing on various dimensions: (i) Environmental Services, (ii) Infrastructure related Services, (ii) Social Equity, (iv) Transforming Urban challenges into opportunities, (v) Enhance the City’s Resiliency. Resilience is a basic requirement to create integrated societies, address the needs of their people and ensure their well-being.

GAM is financially independent, and its functions are administered by The City Council, which includes the Mayor of Amman (Council Chairman). The City Council Members consists of 22 elected members by Amman residents and 9 appointed by the Prime Minister and 6 elected females by Quota.
GAM Structure

Total Number of Employees 24,747
7,857 Employees worked during the Pandemic, accounting 32% of Total Number
Institutional Performance during the Pandemic
Tasks & Achievements during Covid-19

Lending Support to other Municipalities

E-Services Availability during Lockdown

Community Programs & Awareness Campaigns

Innovative solutions like the Sanitization Devices

Strategies & Protocols for Medical Waste

Municipal Priorities review

GAM duties in the national strategy for Pandemics

- Strategies & Protocols for Medical Waste
  - Medical Waste Management Guidelines
  - Medical Waste Disposal

- E-Services Availability during Lockdown
  - E-Services for Sanitization Devices
  - E-Services for Community Programs

- Community Programs & Awareness Campaigns
  - Sanitization Devices Community Programs
  - Awareness Campaigns

- Innovative solutions like the Sanitization Devices
  - Innovative Sanitization Devices

- Municipal Priorities review
  - Municipal Priorities Review

- GAM duties in the national strategy for Pandemics
  - GAM Duties in the National Strategy for Pandemics

- Tasks & Achievements during Covid-19
  - Lending Support to other Municipalities
  - Sanitization Devices
  - Community Programs & Awareness Campaigns
  - Innovative solutions like the Sanitization Devices
  - Strategies & Protocols for Medical Waste
  - Municipal Priorities review
التدخين يجعلك أكثر عرضة للإصابة بفيروس كورونا (COVID-19)
Setting Local Indicators for GAM
Measuring the satisfaction of citizens during the lockdown

نتاج رضا المجتمع من أداء الخدمات في مجال خدمات التعليم

مراجعات فوائد الرضا من مهارات التعليم

نماذج رضا موظفي السوق المركزي من الخدمات العامة أثناء تضاعف الوباء

مراجعات فوائد الرضا من مهارات السوق المركزي

Greater Amman Municipality
Financial Impacts during the lockdown

The unprecedented challenges faced by the economy during the lockdown have had significant financial impacts. The chart above illustrates the percentage of businesses that have experienced financial difficulties.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Q1/2020</th>
<th>Q4/2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail</td>
<td>30%</td>
<td>40%</td>
</tr>
<tr>
<td>Hospitality &amp; Tourism</td>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>15%</td>
<td>25%</td>
</tr>
</tbody>
</table>

The data shows a decrease in financial performance across all sectors, with the hospitality and tourism sector experiencing the most significant impact.

Greater Amman Municipality
City’s Resilience in response to the Pandemic
RESILIENCE STRATEGY AND CLIMATE PLAN

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

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

- Carbon-free-sourced electricity
- Green building guidelines for newly constructed buildings along with renovations to improve energy efficiency
- Citizen engagement with awareness programs and information campaign
- Renewable energy for Greater Amman buildings and photovoltaics solutions for residential and commercial buildings
- Sustainable mobility with clean public transport, electric-powered private vehicles, and walking promoted by the improved walkability of the city center and main avenues
- Waste that is reduced, sorted, composted, and recycled, with the remainder to be processed to produce energy
- Harvesting of rainwater, efficient use of water, and treatment of wastewater
- Concerning urban planning and land use: New development focused on public-transit-oriented corridors and an increase in green open spaces.
Covid-19 & Air Quality

In an attempt to showcase the aftermath of quarantine on Air Quality in Amman, we gathered all the data about air pollution from real-time dataset in the 6 stations that are distributed in the city and we focused on PM10 distribution.

PM10 is part of the particulate matter family that is used to measure the level of air quality around the globe. In Amman we can measure this type but we still in the process to measure smaller ones like PM 2.5

Substance details:

Substance name: Particulate matter (less than 10 micrometers in diameter or less than 2.5micrometres in diameter)
Synonyms: dust, particulate matter, inhalable particles, respirable particles, smoke, mist

Physical properties:

Particles of any substances that are less than 10 or 2.5 micrometres diameter. Particles in this size range make up a large proportion of dust that can be drawn deep into the lungs. Larger particles tend to be trapped in the nose, mouth or throat.
Density Challenges

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

### POPULATION DENSITY, 2000

- **Municipal**
  - Maximum: 20,014 people/km²
  - Minimum: 2 people/km²
  - Average: 1,543 people/km²
- **Metro (using 2007–2013 boundary)**
  - Maximum: 10,463 people/km²
  - Minimum: 3 people/km²
  - Average: 107 people/km²

### POPULATION DENSITY, 2017

- **Municipal**
  - Maximum: 47,556 people/km²
  - Minimum: 2 people/km²
  - Average: 2,796 people/km²
- **Metro (using 2007–2013 boundary)**
  - Maximum: 23,614 people/km²
  - Minimum: 5 people/km²
  - Average: 265 people/km²
The need to develop through evidence-based digital tools reachability maps with the help of GAM’s GIS department to identify the weak areas in the city during the pandemic became a priority.

The biggest challenge was to produce a methodology to develop these reachability maps scientifically through GIS then enhance the accuracy by factoring Topography into the tool itself later.

The maps were created using a toolkit developed by the City Form Lab for Urban Network Analysis (UNA), this ArcGIS toolbox can be used to compute five types of graph analysis measures on spatial networks: Reach; Gravity; Betweenness; Closeness; and Straightness. Redundancy Tools additionally calculate the Redundancy Index, Redundant Paths, and the Way-finding Index.

Our gravity map shows the reachability to services in neighborhoods in all districts of Amman after simulation.
Neighborhood Sample

- Low Reach
- High Reach

- Housing B
- Housing A
- Parks
- Governmental
- Housing D
- Commercial within Housing
- Housing C
- Commercial
- Grocery Shop
To understand the accessibility of critical urban services during extreme events, a carefully designed survey was distributed in all districts during the lockdown to evaluate accessibility and reachability by citizens on foot to all possible services.

The results are shown on the right, these outcomes were overlayed on the simulated gravity maps to confirm their validity.

They overlapped with an accuracy of 75%.
What we learned so far:

- Access to urban services need to be monitored carefully in all cities when an extreme event take place like a pandemic or a natural disaster.

- We can simulate the reachability of any city for its critical urban services by utilizing advanced tools to help us later in developing quicker responses towards extreme events or give accurate predictions to economic growth based on the urban fabric of cities.

- Part of the resiliency of any city is the ability to predict various urban trends due to its physical form and infrastructure then provide enough incentives to upgrade economy and introduce new nodes for development.

- Veridical urban policies can be easily created through evidence, community involvement, and/or shared experiences from similar cities contributing to a paradigm shift in urban planning and urban design trends, climate change mitigation, and the overall approach to priorities in all urban strategies.

From that survey we also mapped the movement patterns across all 22 districts, whether it was walking or cycling or cars.
Moving Forward …

Our vision for the future is to enhance accessibility to urban services in compliance with SDG 11 through evidence-based technologies and make our city more resilient for future generations.

Self-sufficient Neighborhoods are needed to make Amman city resilient, ensure that the planning policies make critical urban services available for all.