

Greater Muscat Structure Plan

Toward Achieving the Green and Connected City Aims of Greater Muscat by Sustaining the Urban Development and Supporting Oman's Decarbonization Strategy.



This map highlights strategic flood protection schemes that are incorporated to the GMSP to enhance the city's resilience to flash flooding as well as provides an overview of areas earmarked for enhancement.

Background

Greater Muscat is the capital region comprising 137,218 hectares with more than 100km of coastline. The population is expected to grow from 1.37 million to 2.7 million by 2040. The Greater Muscat Structure Plan (GMSP) is under preparation to support forecast growth with strategies for urban, infrastructure, economy, transport, and the environment. This includes the planning of accessible open space at all communities' levels to support the growing population and promote physical health and mental well-being in equitable manners in all of its neighborhoods, while addressing climate change hazards with nature-based resilience solutions.

The city has a rich and diverse range of natural assets that have ecological, social health & wellbeing, tourism, and educational potential, including sites of regional and national interest. Most have policy protection from the impacts of development, including protected areas, special planning zones, aquifer recharge areas, important bird areas, coral reef and important plant areas which include mangroves.

Today, 45% of Greater Muscat land is at risk of flood; diabetes affects over 24% of residents (2021), while 92% of trips are made by car - maintaining Oman's soaring per capita carbon count (6th highest globally). Urban heat island effects are exacerbated by escalating temperatures and unrelieved urban sprawl making summer living intolerable for many. The GMSP seeks to tackle some of these issues and others under its Connected and Green Muscat Vision Aims by utilizing the natural open spaces in the city while mitigating the climate change risks.

Approach

Five Vision Aims have been initiated to guide the future urban growth through the challenges ahead, including Green and Connected Aims. Green Muscat seeks to integrate the north-south network of wadis with the proposed east-west environmental corridors and street greening strategy. This is to create an ecologically diversified green lattice to rebalance the access network in favour of sustainable transport, promoting physical exercise, access to open spaces, nature-based solutions designed to accommodate local habitats and engineered to mitigate meteorological risks. This is done by connecting Muscat's local centres with its rich natural landscape setting of coves, beaches, mountains and nature parks while supporting universal mobility and safeguarding cultural heritage. The strategy includes strategic environmental corridors which will further rekindle the natural characteristics and species endemic to the city and create a distinctive, liveable, resilient metropolis by greening key pedestrian and cycling routes, open spaces and wadis.

Connected Muscat Vision seeks to transform the wadis into linear parks and making them an ideal location for investment in infrastructure for soft mobility to improve the city connectivity. By providing number of safe crossing points between both sides of the wadis and providing crossing links to overcome existing physical barriers such as major roads and other urban encroachments. Such measures will support a viable soft mobility network of safe, accessible links for all age groups and backgrounds including those with physical disabilities to improve urban connectivity across the city and supporting Oman's decarbonization strategy.

Impact

Both Aims, Green and Connected Muscat, are seeking to create a complete city-wide green network of accessible linked open spaces connecting the city components in more effective way. GMSP is targeting to green 13km² of Wadis and channelized 250km of storm water by 2040 to reduce heat, expand the green area and mitigate climate change hazards. Fallow wadi areas will be greened to retain freshwater habitats that incorporate native plants hosting local species as part of an enhanced green network linking mountains and sea utilising nature-based solutions that connect existing and planned communities with safe accessible pedestrian and cycle routes. Specific programmes are being set for mangrove expansion, irrigated tree planting, beach replenishment, the dark sky lighting policies, ponding and attenuation will all serve to enrich and extend existing ecosystems. These measures and more will support the ambitious greening and connectivity aims and targets being set for 2040 which will help Oman attain carbon net zero status by 2050. Supportive plans such as for implementation and governance will be delivered to ensure the GMSP will meet its ambitious Vision Aims by 2040.

Conclusion

To limit the exposure of Greater Muscat to flood risks and heat island, it is essential to control development in inland areas that are liable to flash flooding. The GMSP adopts a planning approach that protects and preserves the wadis to ensure development actively contribute to the GMSP Aims, Connected and Green Muscat Aims, across the city and achieve the following:

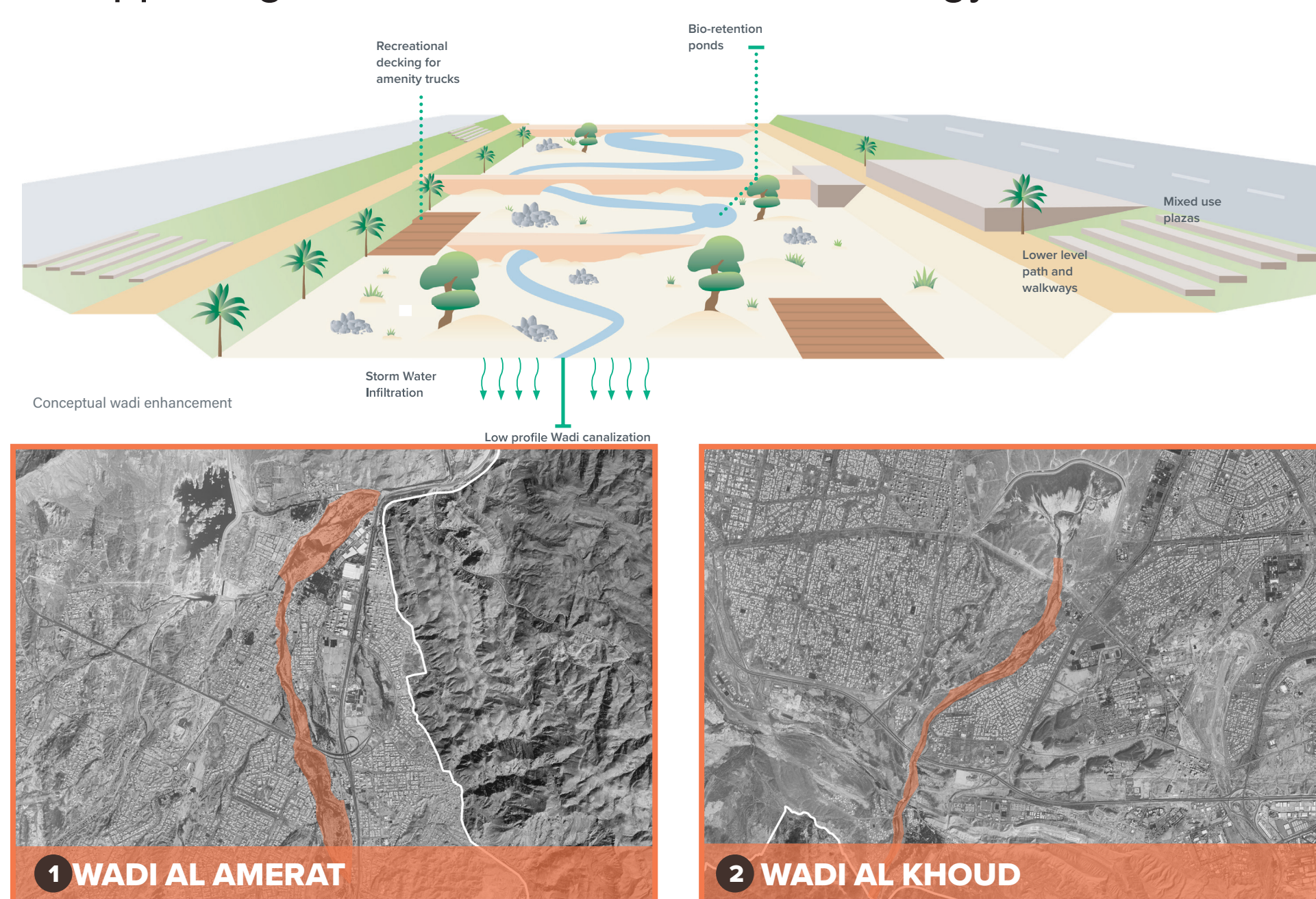
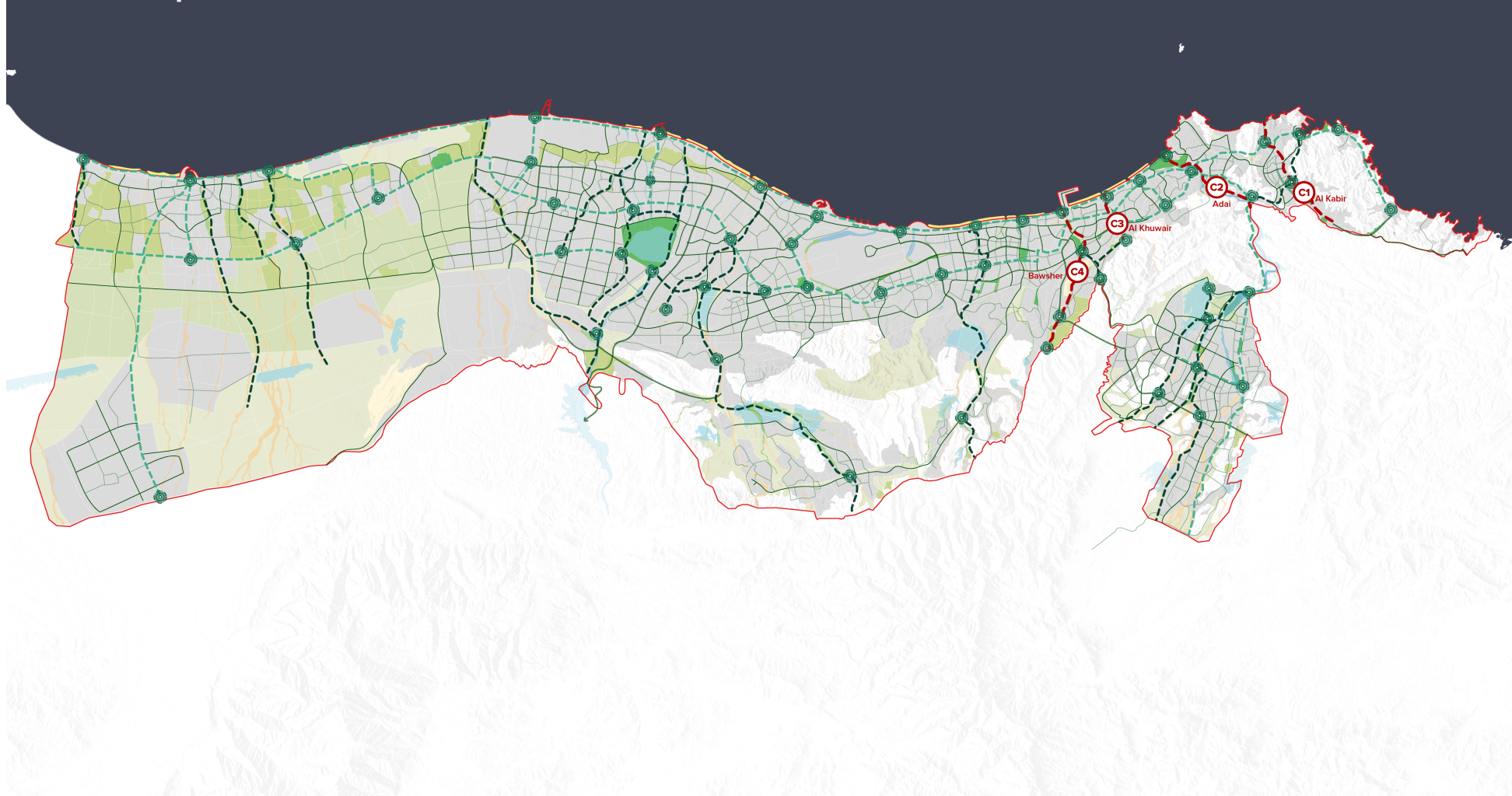
- Mitigated urban heat island effects via increased green spaces and tree cover.
- Improved biodiversity and habitat connectivity through green belt restoration and wadi enhancement
- Enhanced public amenity and recreational opportunities in interconnected green spaces.
- Strengthened community involvement in conserving and enhancing the natural environment.
- Providing comfortable and weather protected paths for soft mobility
- Bolstering 15-minutes neighbourhoods and community centres
- Feeding into high-quality public transport system
- Creating a walkable and attractive city for all

An enhanced and resilient Greater Muscat is able to accommodate the future socioeconomic trends, develop current strengths and explore new paths to develop and grow to a metropolitan epicentre of the region.

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Proposed micromobility corridors and hubs



Wadi Al Khoud and Wadi Adai are examples of two of the five priority wadi sites within the GMSP identified for enhancement. The intention of enhancement is to promote biodiversity and combat urban heat island effects. These sites were identified using earth observation techniques, publicly available satellite imagery and incidental observations during site visits. Further assessments are to be conducted to determine the capacity for endemic species, in particular flora through a nature-based solutions approach, prioritizing resilience, while also considering the implications of flood events. The greening strategy for these Wadis will cultivate interconnected green spaces, benefiting local residents, contributing to the GMSP's sustainable future and potentially enhancing property value.

GMSP Flood Zones

- Flood Zone 1 Very Low Probability (<0.5% AEP)
- Flood Zone 2 Low Probability (0.5% - 1% AEP)
- Flood Zone 3 Medium Probability (1% - 4% AEP)
- Flood Zone 4 High Probability (>4% AEP)

