

The digitally empowered smart holy city

Region	Middle East and North Africa
Award Scheme	Others
Themes	Data-Driven Process and Management Environmental Resilience Innovation Urban Governance and Legal Frameworks Others
Sustainable Development Goals	Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable

Summary

Madinah, Saudi Arabia, has evolved into a pioneering “smart holy city” that integrates Islamic values with advanced digital governance and sustainability principles. Through its Smart City Strategy, guided by the “North Star” vision, the city combines faith, innovation and resilience to build a sustainable and inclusive urban future. Central to this transformation are flagship projects such as the Manarah Urban Data Platform (UDP), the Madinah Bus System, and the Environmental Rehabilitation of Al-Aqiq Valley. These initiatives collectively enhance mobility, environmental resilience, housing accessibility and participatory governance. The Manarah platform consolidates fragmented data from over 50 agencies into a unified system supporting 300+ indicators, enabling data-driven decision-making. Simultaneously, the Madinah Bus improves public transport accessibility and reduces emissions, while Al-Aqiq Valley’s restoration reclaims cultural landscapes and enhances biodiversity. The city’s governance model embeds collaboration, open data and PPPs ensures inclusivity and transparency. By linking the SDGs, Saudi Vision 2030 and global monitoring frameworks, Madinah demonstrates how technology and tradition can coexist to shape equitable, resilient and spiritually grounded urban development.

Background and Objective

Madinah, the second holiest city in Islam, is redefining urban development through a digitally empowered and people-centred model. With a population of 1.41 million and over 18 million annual visitors, the city’s Smart City Strategy aligns with the SDGs, the New Urban Agenda and Saudi Vision 2030. Its objectives include integrating Islamic values into smart urban management, enhancing mobility, preserving heritage, improving housing and ensuring environmental sustainability. Guided by its “North Star” vision, Madinah seeks to become the world’s most tranquil and inclusive smart city; one that harmonizes faith, innovation and well-being while delivering data-driven, citizen-focused urban governance.

Actions and Implementation

Madinah's transformation is driven by three flagship initiatives. The Manarah Urban Data Platform integrates spatial and non-spatial data from over 50 agencies, enabling real-time governance and evidence-based planning. The Madinah Bus Project enhances public transport with 177 buses, 455 stops and a GPS-enabled app promoting inclusive mobility and reduced congestion. Meanwhile, the Environmental Rehabilitation of Al-Aqiq Valley merges ecological restoration with cultural preservation, transforming heritage landscapes into vibrant green corridors. Complementing these are housing modernization projects using smart infrastructure, digital permitting and flood risk mapping. Together, these actions establish a comprehensive ecosystem of sustainable, data-driven and inclusive urban development.

Outcomes and Impacts

Madinah's initiatives have yielded measurable progress in sustainability, inclusivity and efficiency. The Manarah platform has reduced data acquisition time by 40 per cent and digitized 300,000 buildings, transforming fragmented data into decision-ready intelligence. The Madinah Bus Project improved accessibility, reduced emissions and expanded transport equity. Al-Aqiq Valley's restoration revived biodiversity, improved flood resilience and created new public green spaces. The Urban Observatory's analytics support transparent governance and informed investment. Collectively, these actions have improved urban livability, enhanced digital transparency and reinforced Madinah's role as a global model for integrating technology, cultural heritage and sustainability within a smart city framework.

Sustainability and Scalability

Madinah ensures long-term sustainability through institutionalized governance, capacity building and cross-sector partnerships. The Madinah Region Development Authority coordinates implementation with over 50 agencies, ensuring alignment with Vision 2030. Financing mechanisms include PPPs, national funds and innovation-linked investment programmes. The Urban Observatory monitors 300 indicators to evaluate performance in sustainability, governance and well-being. Institutional sustainability is reinforced through collaboration with UN-Habitat and ISO 37120 standards for urban data benchmarking. This integrated framework combining open data, green infrastructure and citizen engagement makes Madinah's model highly scalable. It offers a replicable blueprint for cities seeking to balance heritage preservation, innovation and environmental stewardship.

Gender and Social Inclusivity

Madinah's development approach is deeply inclusive, ensuring equal access to mobility, housing and public spaces. The Madinah Bus incorporates universal design, benefitting women, the elderly and persons with disabilities. Housing reforms improve affordability and accessibility while integrating old neighbourhoods into the city's socio-economic fabric. Public green spaces like Al-Aqiq Valley promote

community interaction across social groups. The Urban Observatory tracks social inclusion indicators such as accessibility, affordability and citizen participation. Training programmes and digital literacy initiatives further empower women and youth. Through inclusive planning and governance, Madinah reinforces equity, ensuring that its smart city transformation benefits all residents.

Innovative Initiative

Madinah's Smart City Strategy showcases innovation through data integration, technological advancement and institutional reform. The Manarah Urban Data Platform employs AI, LiDAR and 3D mapping to modernize planning and infrastructure monitoring. The flood simulation system enhances disaster preparedness, while the Urban Observatory's real-time analytics support adaptive governance. PPPs encourage co-investment in smart services and sustainable housing. Madinah's innovation ecosystem linking start-ups, SMEs and academia fosters entrepreneurship and civic innovation. By blending Islamic architectural heritage with smart technologies, Madinah creates a distinctive urban identity. This synergy of culture, data and design exemplifies how innovation can serve sustainability, inclusivity and faith-based urbanism.

Resources devoted to delivery

Madinah's implementation framework mobilizes financial, human and technological resources efficiently. Funding is supported by the Public Investment Fund, PPPs, and city-owned development companies such as Ro'a Al Madinah and Knowledge Economic City. Technical resources include partnerships with over 50 government bodies, universities and private enterprises. The Urban Observatory ensures transparency by linking budgets to performance metrics. Continuous capacity-building programmes enhance staff expertise in GIS, IoT and data analytics. Smart financing tools, such as green bonds and digital payments, improve efficiency and accountability. This integrated resource system enables sustainable delivery of projects aligned with the city's long-term smart vision.

Conclusion

Madinah's digitally empowered smart city model exemplifies how tradition, technology and sustainability can coexist within a unified vision. Through projects such as the Manarah Data Platform, Madinah Bus and Al-Aqiq Valley restoration, the city has enhanced mobility, inclusivity and environmental resilience. Its governance system anchored in transparency, collaboration and evidence-based decision-making has strengthened public trust and efficiency. By integrating the SDGs, New Urban Agenda and Saudi Vision 2030, Madinah presents a global model of faith-driven innovation and sustainable urban transformation. Its approach demonstrates how smart governance and data can empower cities to achieve resilience, prosperity and cultural continuity.