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Scaling Responsible Artificial Intelligence For Sustainable Tourism in Mediterranean Cities [1]

Authors:

Adel Ben Youssef,
GREDEG-CNRS & University
Côte d'Azur, France

Email adel.ben-youssef@univ-cotedazur.fr

Adelina Zeqiri,
GREDEG-CNRS & University
Côte d'Azur, France

Email: adelina.zeqiri@univ-cotedazur.fr

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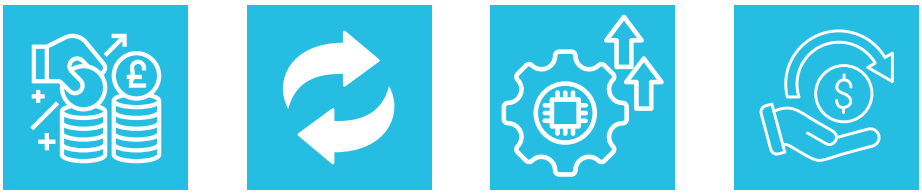
1. Executive Summary

This policy brief examines how artificial intelligence (AI) can support sustainable urban tourism governance in Mediterranean cities. It draws on empirical evidence from 46 semi-structured interviews conducted between May 2024 and December 2025 with municipal authorities, destination managers, tourism businesses, technology providers, and researchers across multiple Mediterranean city contexts.

The findings point to five recurring contributions of AI: improving destination management through forecasting and operational dashboards; enhancing visitor satisfaction and dispersing flows through real-time guidance and personalisation; widening local value capture through platforms that strengthen SME visibility and resident feedback; supporting environmental and cultural preservation through continuous monitoring linked to municipal interventions; and strengthening governance performance when collaboration and capacity building are sustained. The brief recommends prioritising interoperable data foundations, operational playbooks tied to thresholds and decision rights, inclusion-by-design with targeted SME enablement, responsible data governance and accountability arrangements, and structured partnerships for skills development and cross-city learning. Implemented at scale, these measures can help Mediterranean cities manage tourism pressures while improving equity, environmental performance, and institutional trust.

2. Introduction

Tourism is a major pillar of economic activity, employment, and local development for Euro-Mediterranean cities. Recent global estimates indicate that travel and tourism represented about 10% of the world economy in 2024 (US$10.9 trillion) and supported roughly 357 million jobs, close to one in ten jobs worldwide, with forecasts for 2025 pointing to a higher contribution (US$11.7 trillion; 10.3% of global GDP) and employment level (371 million jobs) (World Travel & Tourism Council, 2025). The Mediterranean basin, combining dense cultural heritage, coastal amenities, and strong urban attractiveness, remains among the most visited tourism regions. This success concentrates pressures in historic centres and fragile coastal environments and can generate significant negative externalities when growth outpaces governance capacity.



Unmanaged expansion can translate into overcrowding, pressure on water and energy systems, waste accumulation, mobility bottlenecks, degradation of ecosystems, and the erosion or commodification of cultural assets(Ben Youssef, 2020). These dynamics are frequently accompanied by distributional tensions, including rising inequalities between neighbourhoods, between residents and visitors, and between large operators and smaller local businesses. City authorities therefore face a persistent policy trade-off: how to sustain the economic benefits of tourism while maintaining liveability, safeguarding environmental and cultural capital, and ensuring that value creation remains inclusive.

These challenges align directly with the United Nations 2030 Agenda for Sustainable Development. Target 8.9 calls on governments to “devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products,” while SDG 11 emphasises inclusive, safe, resilient, and sustainable cities and communities, including the protection of cultural and natural heritage.

Achieving these objectives requires governance arrangements that can handle high-frequency variation in demand, coordinate multiple urban services, and correct inequalities in access, voice, and opportunity, rather than relying on incremental and sector-siloed interventions (Ben Youssef & Zeqiri, 2022; Fauzi, 2025; Nguyen & Hoang, 2023; Zeqiri et al., 2025).

Within this policy context, AI is increasingly used as a decision-support capability that can shift tourism management from reactive responses to anticipatory governance. AI applications can help forecast visitor flows, detect congestion and stress signals in real time, optimise resource use and service delivery, support demand steering through visitor guidance, and enhance transparency through better monitoring and reporting. Yet empirical evidence suggests that sustainability gains depend on the institutional and operational conditions of deployment: interoperability of data across city services, clear decision rights and response routines, privacy and accountability safeguards, and sufficient digital capabilities among municipal teams and local tourism actors.

This policy brief draws on 46 semi-structured interviews conducted between May 2024 and December 2025 across 19 city or metropolitan contexts in seven countries, spanning the French Riviera, the Barcelona Metropolitan Area, and South Mediterranean cities including Alexandria, Tunis, Sfax, Bizerte, Casablanca, Rabat, Zgharta, and Tripoli. Interviews lasted between 35 and 80 minutes, were conducted face-to-face or remotely, recorded with consent, and fully transcribed, covering municipal authorities, tourism operators, hotel managers, technology providers, sustainability experts, and tourism researchers. The evidence was analysed through an inductive thematic coding process that moved from interview-level observations to cross-case themes, validated across stakeholder groups and city contexts. Robustness was strengthened through double-coding of a subset of transcripts, triangulation across roles and locations, targeted member checking, and saturation monitoring.[2]

[2] Full methodological details are provided in the FEMISE Working Paper N:1

1. Predictive AI-driven governance strengthens sustainable destination management

Predictive AI can strengthen destination management by converting fragmented, fast-changing information into operational signals for municipal action. In the French Riviera, forecasting tools and AI-enabled dashboards are used to anticipate seasonal peaks and event-driven surges, monitor visitor distribution, and track site-specific pressures linked to consumption patterns and service loads. The policy value is highest when these insights are connected to clear intervention levers, such as crowd management measures, targeted maintenance in high-pressure zones, and adaptive communications that steer demand across space and time. Under these conditions, predictive governance supports earlier, lower-cost interventions that reduce overcrowding and resource stress while protecting urban liveability and cultural assets, with direct relevance for SDG 11, SDG 12, and SDG 13.

Operational impact depends on whether prediction is embedded into routine planning, especially for mobility and other services that transmit tourism pressure across the city. In the Barcelona Metropolitan Area, demand forecasting is used to optimise bus frequencies and fleet allocation, including the anticipation of peaks linked to specific flights or major events. This type of integration illustrates how predictive analytics can improve service continuity without mechanically expanding capacity, and how it can reduce congestion externalities by aligning transport supply with expected demand spikes. AI-enabled dashboards also support faster coordination by making pressure points visible in a shared format, reducing frictions between destination managers and city services when congestion, crowding, and service loads escalate.

South Mediterranean experiences Greening Female-Dominated Sectorsshow similar policy ambitions, alongside practical pathways that start from core municipal functions. In Tunis and Casablanca, efforts emphasise connectivity upgrades and the automation of municipal processes to improve responsiveness for visitors and residents.

More operational examples clarify how predictive or data-driven routines can be built with limited resources: in Sousse, a digital complaints channel linked to the municipal geographic information system strengthens traceability and spatial prioritisation of interventions; in Msaken, GPS tracking on waste collection vehicles supports route optimisation and fuel savings, improving service delivery during peak periods. These cases indicate that predictive governance can scale beyond pilots when enabling conditions are secured: basic data access, interoperability across municipal units, and coordination mechanisms that translate signals into decisions across mobility, waste, energy, safety, and heritage functions.

2. AI-driven personalisation of visitor experiences supports demand management and satisfaction

AI-enabled visitor tools can reduce pressure on saturated sites when personalisation is designed as a demand-management instrument rather than only a service enhancement. Evidence from the French Riviera points to the growing use of AI-driven mobile applications that combine visitor preferences with real-time signals on congestion to recommend alternative attractions, routes, and time windows. When these tools are integrated with destination operations, they help distribute visitor flows more evenly across the city, easing crowding in hotspots while maintaining experience quality. This mechanism links visitor satisfaction to urban liveability and supports SDG 11, while also broadening opportunities for local businesses beyond the most concentrated tourism zones, contributing to SDG 8 and SDG 10.

City experiences also show that personalisation becomes more effective when it is connected to flow management and proactive communication. The “Respect the City” initiative in Dubrovnik illustrates this approach by combining crowd monitoring with targeted messaging that encourages visitor self-management around the most congested gateways and peak periods. In policy terms, this type of intervention uses information architecture to influence behaviour at scale, reducing bottlenecks without relying exclusively on restrictive measures. It strengthens SDG 11 and SDG 12 by aligning visitor choices with capacity constraints and by supporting more responsible use of urban space and services during peak demand.

South Mediterranean cases highlight complementary pathways based on immersive and place-based digital systems that improve orientation, cultural engagement, and dispersion. Interview evidence points to the use of virtual and digital applications in cultural institutions in Ramallah to enrich experiences and strengthen cultural learning, and to GIS-based mapping in Madaba to provide real-time information on attractions, heritage assets, and urban infrastructure. In Alexandria, the consolidation of citywide GIS resources, heritage geodatabases, and 3D documentation in areas such as the Qaitbay precinct supports interactive mapping, storytelling formats, and cultural-route design, while also strengthening preservation-oriented planning. These tools can also contribute to safety and well-being when they communicate real-time information on congestion, disruptions, and risks, particularly in dense historic centres and during peak heat or peak visitation periods, linking to SDG 3 and SDG 11.

3. AI-enabled platforms broaden participation and strengthen local value capture

AI-enabled platforms can improve economic inclusivity by reducing the structural disadvantages faced by SMEs in tourism markets. Evidence from the French Riviera indicates that platforms supported by analytics increase the visibility of smaller businesses, help them interpret demand signals, and adjust offerings more quickly. This is relevant in destinations where micro and small operators have limited marketing capacity and limited access to data. When these platforms are integrated into destination ecosystems, they support wider access to tourism revenues beyond dominant operators and concentrated hotspots, aligning with SDG 8 (decent work and economic growth) and SDG 10 (reduced inequalities).

Platforms also strengthen governance quality when they widen participation and improve transparency in tourism-related decisions. Stakeholder evidence points to digital channels that make it easier for residents, local businesses, and civil society organisations to provide feedback and contribute to tourism planning. This mechanism can reinforce trust and institutional legitimacy when inputs are visible, traceable, and linked to municipal follow-up.

A concrete service-level example is reported in Sousse, where a complaints portal connected to the municipal GIS allows requests to be geolocated, tracked, and visualised on the same spatial layers used for asset management, improving traceability for residents and giving city teams a consolidated view of recurrent issues during peak periods. These pathways connect directly to SDG 16 (effective, accountable, and inclusive institutions) and SDG 11 (sustainable cities and communities).

Digital inclusion is not automatic, and the same evidence highlights risks when participation and services become digital-only. In the Barcelona Metropolitan Area, inclusivity is addressed through multi-channel access combining digital tools with call center and face-to-face options, which helps maintain access for groups facing skills, trust, or connectivity barriers. In Msaken, limited human resources and uneven uptake of national platforms point to the need for simpler instruments and structured surveys to ensure digital projects reflect local expectations. South Mediterranean interviews also refer to investments in fibre-optic connectivity, interactive platforms, and the automation of municipal processes to streamline services for visitors and local communities, illustrating a gradual pathway from foundational digitalisation to broader participation tools. Some accounts also link platforms to local supply chains through applications that guide visitors and residents toward local gastronomy and agricultural markets, strengthening place-based value creation. The policy implication is that platform strategies need explicit inclusion design, assisted access where required, and targeted SME support, otherwise digital tools can reproduce existing inequalities rather than reduce them.

4. Real-time monitoring and operational analytics support environmental and cultural preservation

AI-supported monitoring can strengthen environmental and cultural preservation when it provides timely signals and is connected to concrete interventions. Evidence from the French Riviera points to a shift toward continuous tracking of environmental pressures and visitor impacts at sensitive sites, including heritage locations and protected areas. These systems are used to monitor indicators such as air and water quality, biodiversity-related pressures, and congestion around high-value cultural assets.

The policy value comes from using these signals to trigger targeted actions, such as adaptive access management during peak periods, prioritised maintenance in stressed zones, and real-time visitor communications that reduce pressure on fragile locations. This pathway links directly to SDG 11 and SDG 12, with clear connections to SDG 6 and SDG 13 in destinations where tourism intensity interacts with water stress and climate risks.

Operational optimisation in city services is another preservation channel that affects tourism outcomes even when it is not labelled as a tourism policy. In tourism-intensive districts, the interviews highlight energy management as a recurring use case, with predictive analytics and sensor technologies used to monitor, forecast, and optimise energy use in hotels, heritage sites, and major attractions. A related city-service example appears in Sousse, where a GIS-based inventory of lighting infrastructure is connected to an energy dashboard that consolidates consumption signals and performance indicators for municipal buildings and lighting cabinets. Waste and cleanliness management follows a similar logic: in the Nice Côte d'Azur Metropolis, connected bins and sensor networks have been used to shift collection patterns from fixed schedules to needs-based rounds, improving service efficiency and reducing the footprint of collection operations in high-visibility coastal and tourist areas. These interventions align with SDG 7 and SDG 12, and they support climate objectives under SDG 13 through efficiency gains and emissions reductions in service delivery.

Preservation is also supported by pressure redistribution and spatial tools that help manage where and when tourism intensity accumulates. Stakeholders describe the use of AI-enabled visitor applications that redirect flows away from environmentally vulnerable or culturally sensitive locations toward alternative areas, reducing concentration in hotspots and lowering stress on ecosystems and heritage assets. Comparable approaches are visible in Dubrovnik, where crowd monitoring and communication tools support inflow management into a constrained historic core.

South Mediterranean evidence highlights the role of spatial infrastructures in preservation planning: in Alexandria, heritage geodatabases and interactive mapping are used to visualise cultural clusters, design itineraries, and communicate heritage narratives, while 3D documentation of sites such as the Qaitbay precinct supports conservation and resilience planning in a climate-exposed coastal setting. The implementation lesson is that monitoring and spatial tools deliver results when responsibilities, workflows, and maintenance funding are defined across environment, heritage, public space, and core municipal services, so that signals lead to action rather than reporting.

5. Collaboration and sustained capacity building determine whether AI becomes usable governance capacity

Evidence from the French Riviera indicates that AI adoption becomes durable only when municipalities invest in organisational capabilities, not only in tools. Local authorities and tourism actors emphasise the importance of continuous skills development to ensure that staff can interpret indicators, translate signals into operational choices, and maintain systems over time. Capacity building is also targeted beyond the administration, supporting SME digital readiness and the ability of local operators to use platforms and data-driven services. This reduces resistance to adoption, stabilises routines, and improves the quality and speed of public responses in tourism-intensive districts, linking directly to SDG 4, SDG 8, and SDG 11.

Implementation also depends on structured collaboration frameworks that can connect city services, destination actors, and technology partners around shared objectives and interoperable data flows. Interview evidence highlights that coordination improves when municipalities create mechanisms for regular information exchange and joint problem-solving across tourism, mobility, waste, public space, heritage, and safety functions. In the French Riviera, shared dashboards and platform-based coordination are reported to improve cross-department communication and reduce delays when pressures rise. This is reinforced when universities and research organisations are involved in piloting, evaluation, and skills transfer, strengthening the institutional conditions for scaling, with relevance to SDG 16 and SDG 17.

South Mediterranean cases reinforce the same enabling logic, while illustrating context-specific constraints and sequencing. In Casablanca, interviewees stress that connectivity upgrades and the automation of municipal processes are foundational steps to improve service responsiveness and enable more integrated digital governance. In Sfax, limited human resources and uneven uptake of national digital platforms point to the need for pragmatic designs, dedicated support functions, and simpler instruments that match local capacities. Across these cases, the policy implication is consistent: AI governance delivers inclusive and resilient outcomes when collaboration is institutionalised and when capacity building is sustained, targeted, and designed to include SMEs and community stakeholders rather than concentrating benefits in a narrow set of actors.

6. Conclusion

Evidence from the French Riviera, the Barcelona Metropolitan Area, and South Mediterranean city experiences shows that AI can support sustainable urban tourism when it is embedded in day-to-day municipal operations. The most consistent gains come from forecasting and dashboards that trigger early interventions, visitor guidance tools that steer flows away from saturated areas,[2] monitoring systems that improve waste, energy and site management, and digital platforms that widen SME participation and resident feedback. Technology alone does not deliver these outcomes. Results depend on interoperable data across city services, clear decision protocols, inclusion-by-design, and sustained skills development for municipal teams and local operators. In several South Mediterranean contexts, progress often starts with foundational digitalisation such as connectivity upgrades, GIS consolidation, and service automation, which then enables predictive and real-time governance tools.

7. Policy recommendations

Several policy recommendations are provided as following.

From Forecasts to Action: A Peak-Management Cycle

Link forecasts to concrete municipal actions by establishing a regular peak-management cycle that combines short-term forecasting with agreed operational responses. Define trigger thresholds for congestion, transport load, waste overflow risk, and pressure on sensitive sites, then attach each trigger to a named unit and a predefined intervention such as transport reinforcement, timed access, targeted cleaning, or real-time communications. Barcelona's use of demand signals to adjust bus operations illustrates how prediction becomes effective when it drives service decisions rather than reporting.

A Shared Data Backbone Across Services

Build a shared data backbone across services by prioritising a small set of datasets essential for tourism pressure management: mobility flows, accommodation occupancy signals, event calendars, crowd density in hotspots, waste and cleaning status, energy consumption in tourism-intensive zones, and visitation at heritage sites. Standardise formats, secure sharing, and interoperability across departments and contractors so that dashboards can be updated reliably. Insert data portability and interoperability requirements into procurement to avoid isolated pilots.

Using Visitor Applications to Disperse Flows

Use visitor applications to disperse flows, not only to inform, by integrating congestion and capacity signals into visitor-facing guidance so recommendations redirect visitors toward alternative neighbourhoods, attractions, and time windows. Coordinate guidance with transport operators and attraction managers so that recommendations match real capacity. Constrained historic-core approaches where monitoring is combined with targeted messaging and routing show how cities can reduce bottlenecks without relying only on restrictive measures.

Connecting Monitoring to Maintenance, Budgets, and Enforcement

Connect monitoring to maintenance, budgets, and enforcement because real-time monitoring creates value when it triggers interventions. Prioritise sensitive heritage areas, coastal zones, and tourism-intensive districts, and link monitoring outputs to maintenance routines and financing. Practical examples in the evidence base include sensor-supported waste management and energy dashboards in tourism zones, and spatial tools that support heritage preservation planning. Where feasible, extend monitoring to water quality, waste leakage, and site-level pressure indicators, with rapid-response procedures during peak periods.

Strengthening Participation and Local Value Capture

Strengthen participation and local value capture through platforms that work for everyone by using digital channels to improve traceability of issues and responsiveness, including complaint and request systems linked to GIS layers, as illustrated by service-level practices in Sousse. Maintain multi-channel access for residents and micro-operators who face connectivity or skills barriers, reflecting metropolitan practices that combine digital tools with assisted options. Pair platforms with practical SME onboarding so smaller businesses can improve visibility and adapt offers based on demand signals.

Investing in Skills and Responsible Governance

Invest in skills and responsible use as core governance functions by moving from one-off trainings to continuous capability building for municipal teams and local tourism actors, focused on interpreting indicators, managing interventions, and maintaining systems. Formalise partnerships with universities and competent providers for piloting, evaluation, and skills transfer. Put privacy, transparency, and accountability measures in place before scaling, including clear data-use rules, auditability for tools that influence routing or access, a human override procedure, and an accessible grievance channel.

Tracking Outcomes and Seasonal Adjustment

Track outcomes and adjust each season by selecting a limited set of indicators that reflect both tourism performance and urban sustainability, such as hotspot density during peak hours, public transport load, waste overflow incidents, energy use in tourism zones, resident complaints and response times, and SME participation. Review results after peak periods and major events, then revise thresholds, playbooks, and communication strategies accordingly.

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About FEMISE

FEMISE, the Forum Euroméditerranéen des Instituts de Sciences Économiques, is a Euro-Mediterranean network of over 100 economic and social research institutes from both shores of the Mediterranean. Established in Marseille, France, in 2005 as an NGO, FEMISE promotes dialogue on economic and social policies to foster cooperation and mutual benefit between Europe and its Mediterranean partners. Coordinated by the Economic Research Forum (ERF) in Egypt, FEMISE focuses on strengthening research capacity, fostering public-private dialogue, disseminating research findings, and building partnerships to support regional collaboration and sustainable development.

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The European Institute of the Mediterranean (IEMed), founded in 1989, is a think-and-do tank focused on Euro-Mediterranean relations. Guided by the Euro-Mediterranean Partnership (EMP), European Neighbourhood Policy (ENP), and Union for the Mediterranean (UfM), it promotes cooperation, mutual understanding, and intercultural dialogue to build a shared space of peace, stability, and prosperity. IEMed is a consortium of the Catalan Government, the Spanish Ministry of Foreign Affairs, the EU, and the Barcelona City Council, with contributions from civil society through its Board of Trustees and Advisory Council.

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Contact information

Address: 2 Rue Henri Barbusse, 13001 Marseille, France
Phone: ++33(0) 9 71 53 89 15

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