

PRIENE AND MAGNESIA AD MAEANDER:

MAIN ARCHITECTURES AND URBAN MORPHOLOGY

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Despite differences in scale, origin, and topographical context, Priene and Magnesia ad Maeander share fundamental planning principles rooted in the Hippodamian urban model, characterized by orthogonal layouts and a clear hierarchy of civic, religious, and residential spaces. The impact of environmental dynamics, including seismic activity and fluvial processes, has a significant impact on the urban evolution of both cities. Recent digital survey campaigns using photogrammetry and 3D laser scanner technologies in the present time are essential tools for documenting, analysing, and interpreting these complex archaeological contexts.

The cities of Priene and Magnesia ad Maeander represent two important examples for the study of urban development, the relationship between environments and settlements, and architectural expression in the Hellenistic area, in a territory later known as Asia Minor. Both communities, situated in the Maeander valley of western Anatolia, reflect the dynamics of power in the aftermath of Alexander the Great's conquest and the subsequent events of his sudden and premature death, through the Roman conquest, subsequent transformation and abandonment. The

two cities have different origins, scales, and urban trajectories, but both share a series of events in which the local Greek communities negotiated autonomy and identity within a rapidly transforming geopolitical environment until the Roman intervention. They also share a series of natural disasters and transformations that should impress and prompt reflections on how an odd environmental transformation may bring ruin and chaos to formerly wealthy settlements.

Their archaeological remains, particularly the well-preserved urban fabric of Priene and the monumental sanctuaries of Magnesia, offer opportunities to read and interpret the urban setup originally defined by the civic ideologies of Hellenistic cities and later adapted, expanded, and transformed in the Roman period. Both cities share the specific urban rational layout defined by Hippódamos of Miletus, with rigorous planning and a coherent integration of architecture, public, social, religious, and private spaces into a system that would shape and influence the future developments for centuries.



Fig. 01 - Map of the area with Priene, Magnesia and Miletus with the progressive transformation of the coastline, data from R.J.A. Talbert (base map from [openstreetmap.org](https://www.openstreetmap.org)).

THE URBAN CONTEXT IN PRIENE

Priene is situated on the southern slope of Mount Mykale, overlooking what in antiquity was a gulf opening into the Aegean Sea. By the Hellenistic period, however, the silting of the Maeander had already begun to push the coastline westward, thus gradually detaching Priene from the seashore that had once defined its economy and strategic importance. The city was architecturally replanned in the fourth century BCE, providing a model for a rational, orthogonal urban plan organized into a series of large terraces. The sloppy topography imposed serious constraints that required a specific architectural attention, producing one of the clearest surviving examples of Hellenistic city planning.

Priene is a paradigmatic example of urban planning of that time (Wycherley, 1945). Its street grid, which recognizes Hippodamian principles, organises the city into regular sectors aligned with the cardinal directions, though subtly adapted to the mountain slope. Public buildings, including the Agora, the Bouleuterion, the Prytaneion, and the Theatre, share a coherent architectural vocabulary, offering specific solutions while remaining consistent with the city's layout. The Temple of Athena Polias, designed by the architect Pytheos, stands as the city's principal monument and embodies the refined Ionian tradition. It was dedicated by Alexander the Great during his campaign. The temple symbolised the city's religious devotion and

its strategic engagement with broader geopolitical forces. At the same time, the city suffered from the compromise of the harbour; its economy likely faced serious problems from the progressive silting of its port, which probably led to a shift in efforts toward agriculture, craftsmanship, and cultural institutions, helping realign productive activities. At the same time, the occurrence of some unfortunate events, such as strong earthquakes and occasional rocks falling from the mountain's sides, certainly created difficult situations. After its final abandonment, the city preserved a substantial amount of its original architecture; the laborious work required to remove blocks probably made the ruins less interesting for



Fig. 02 - View on the Bouleuterion in Priene, 3D laser scanner pointcloud, July 2022, H.B. Yavuz, F.D. Tekin (Litech, Turkey), with a QR code to access a youtube video about the workshop held in Priene in 2022.

reuse, leaving them to wait for centuries before being rediscovered and excavated.

The German archaeological campaign at the end of the XIXth century brought to light the main buildings and revealed the urban pattern. Intervention by French and English missions led to the discovery and expansion of the excavated areas. The present Turkish activity led by Ibrahim Hakan Mert is mainly oriented to maintenance and specific exploring interventions.

THE URBAN CONTEXT IN MAGNESIA AD MAEANDER

Magnesia ad Maeander, instead, occupied a lowland setting on the south bank of the Maeander River, several kilometres East of Priene. Unlike its neighbour,

Magnesia developed in a flatter environment that facilitated expansion and allowed the construction of monumental sanctuaries and civic spaces on a scale beyond the capacity of Priene's terraced hillside. Although less well preserved, Magnesia's remains, especially the Artemision and the stadium, demonstrate how a city with strong regional connections and external patronage could reshape its urban environment to communicate prosperity, cultural refinement, and political significance. Both cities navigated the shifting imperial administrations of the Hellenistic period. Initially subject to Persian authority, they were successively incorporated into the realms of the Diadochi,

most notably the Seleucid and Attalid kingdoms. The interests of these monarchies, whether expressed through benefactions, administrative oversight, or military imposition, significantly influenced the development of the two communities. Yet both Priene and Magnesia retained strong civic identities, expressed in epigraphic culture, religious activity, and the maintenance of traditional institutions.

Magnesia's urban organization is less comprehensively preserved, but archaeological evidence suggests a dynamic and ambitious program of monumental construction, particularly during the second century BCE, when the city benefited from the patronage of the Attalid



Fig. 03 - View on the Agora in Magnesia, on the background, at the right, the Temple of Zeus, 3D laser scanner pointcloud, September 2025.

dynasty and later from Roman domination. The Artemision of Magnesia, dedicated to Artemis Leukophryena, was celebrated in antiquity as one of the most impressive temples in Asia Minor (Dunand, 1978). Designed by the architect Hermogenes, the building introduced the pseudodipteral plan, a significant innovation that influenced temple architecture throughout the Hellenistic and Roman worlds. The sanctuary served not only as a religious focus but also as a symbol of civic prestige, emphasizing the city's role as the guardian of a renowned cult and host of the Leukophryena festival, which attracted participants from across the Aegean. The urban fabric of Magnesia was further

enhanced by its stadium, still well preserved (notwithstanding a series of significant disruptions), and by numerous public buildings. The scale and the quality of these structures show how a city positioned inland, away from the major coastal circuits, could nevertheless thrive through agricultural wealth and strategic alliances.

The city was economically shaped by its position in the Maeander valley, a fertile region that produced agricultural surpluses and supported a network of overland and fluvial trade routes. Magnesia probably enjoyed more sustained prosperity than Priene, due to its more adaptable geographical position and the benefits of royal patronage. Its sanctuaries

attracted pilgrims and visitors, adding a religious dimension to the local economy. The recent archaeological discovery demonstrates the reuse and insertion of buildings over a wide span of time; the final abandonment caused the city to completely get lost in the mud of the floods until its rediscovery by French and German archaeological missions at the end of the XIXth century (Humann, 1904). After almost a century, the interventions resumed in 1984 with a mission led by Orhan Bingöl, which identified new sectors and improved the urban layout (Bingöl, 1998). The richness of the discoveries yet to be made is confirmed by ongoing archaeological work led by Görkem Kökdemir, which is unearthing



Fig. 04 - Photogrammetry of a series of columns in the Agora of Magnesia, September 2025.

vast, complex areas, limiting the still-present menace of floods, and reconstructing significant parts, giving visitors a better opportunity to read the original aspects.

DIGITAL SURVEY CAMPAIGNS

The digital survey interventions, operated in 2022 (Priene), 2024 and 2025 (Magnesia) allowed the gathering of both architectural and urban data, defining an archive previously usable for further research and study works. The interventions in 2022 and 2025 were conducted using 3D laser scanner units, terrestrial and aerial (drone/UAV) photogrammetry (the intervention in 2024 was based only on photogrammetry of the stadium and of some sparse findings). In this way, the level of detail gathered may range from the city scale to the single building to the specific detail, enabling a continuous reading in a real interdisciplinary mode. This was widely achieved through the use of 3D laser scanner units with a consistent operating range and high accuracy, UAVs combined with terrestrial image capture, and terrestrial photogrammetry with varying distances for specific details. In this way, we have obtained different densities in describing architectural parts and artworks while maintaining the overall context without increasing computational time or model complexity.

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ABSTRACT

Priene and Magnesia ad Maeander constitute two emblematic case studies for investigating Hellenistic urban planning, architectural form, and the relationship between cities and their environmental settings in western Anatolia. Both settlements developed within the Maeander valley during the Hellenistic period, under complex political and cultural conditions following Alexander the Great's conquests, and later underwent significant transformations during Roman rule before abandonment. Despite differences in scale, origin, and topographical context, the two cities share fundamental planning principles rooted in the Hippodamian urban model, characterized by orthogonal layouts and a clear hierarchy of civic, religious, and residential spaces. Priene, founded on the steep slopes of Mount Mykale, represents one of the most complete examples of an orthogonal urban system adapted to a challenging terrain. Its preserved street grid, domestic quarters, and monumental buildings, including the Temple of Athena Polias, reflect the ideological coherence of Hellenistic urbanism. Magnesia ad Maeander, established in a flatter landscape, developed on a larger scale, enabling the construction of extensive monumental complexes such as the Artemision and the stadium, which expressed civic identity and regional importance. The impact of environmental dynamics, including seismic activity and fluvial processes, have a significant impact on the urban evolution of both cities. Recent digital survey campaigns using photogrammetry and 3D laser scanner technologies in the present time, are essential tools for documenting, analysing, and interpreting these complex archaeological contexts.

KEYWORDS

ARCHITECTURE; ARCHAEOLOGY; URBAN DEVELOPMENT; SURVEY; HELLENISTIC PERIOD; SURVEY; 3D LASER SCANNER; PHOTOGRAMMETRY; UAVS; MAPPING

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