Port Heritage, Planning Challenges and the Role of GIS Tools in Multi Layered Cities

Yenikapi Metro Station, Istanbul

Adem Erdem Erbas [1], **Bedel Emre** [2]

[1] Faculty of Architecture
Mimar Sinan Fine Art University
Istanbul, Turkey
[2] Eurasia Institute of Earth Science
Istanbul Technical University
Istanbul, Turkey

Abstract

The aim of this study is to present arguments showing that on the port heritage area, underground cultural inventory should be considered from the historic landscape point of view within the framework of the conservation plans. This study focuses on the Yenikapı region, whose settlement history of the Historical Peninsula changed following the rescue excavation performed at the end of The Bosphorus Rail Tube Crossing Project (Marmaray). The area covering the Port of Theodosius, whose multi-layered urban formation started in the Neolithic period and which was one of the most significant grain trade ports in the Byzantine era, and the port heritage within the background of this area consist of important spatial formations. However, waterfront regeneration projects have disrupted the spatial continuity of cultural heritage under the effect of neoliberal policies. The methodology of the study, which involves the use of GIS, is based on the overlapping of the archaeological surveys from the Istanbul Archaeology Museum, geological structure data from the Istanbul Metropolitan Municipality, and historical maps. The conservation planning approach in a metropolitan city like Istanbul, whose archaeological layers reflect the port heritage, should be developed by applying the concept of historic urban landscape.

Keywords

port heritage, multi-layered city, underground cultural inventory, historic urban landscape, conservation, renewal

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Introduction and Conceptual Frame

The concept of space has maintained its requirement-based anthropogenic transformation from the Neolithic settlements to modern, capitalist-inspired cities (Marull et al., 2010). The human requirements aspect mentioned here mainly refers to sheltering and eating. Over time, the first settlement formation based on the relationship between sheltering and eating gained a multi-layered quality and bore the traces of the era, resulting in the formation of significant heritage areas in today's historical cities.
The relationships that arise over time from meeting basic needs have developed in line with the socio-economic relationships formed through surplus agricultural products and have thus deeply affected the structure of settlements. The historical background of the relationship between settlements and ports feature certain factors, like the transportation and marketing of the surplus agricultural products that help to shape urban planning. The city-states of the ancient periods, the commercial cities of the medieval age, the industrial cities of the 19th century, and the information cities that emerged following the industrial revolution always had a strong relationship with their ports (Benevolo, 2006; Wycherley, 1993; Pirenne, 2014). Similar to the function of buildings, the port territory within the urban pattern of the port cities are regarded as a part of the city, and the ports are considered to be equated with the cities themselves, that is, they morphologically and typologically complement one another. The buildings of the port territories have qualities that integrate with the urban characteristics of these territories as they develop (Hoyle & Pinder, 1992). However, a need for larger ports has emerged today due to the decentralisation of production based on different human needs and to the performance of production activities at certain centres, both of which arose from technological developments, an increase in communicational options and capital flows and easy circulation of goods and services. Because of the greater distance now between consumption and production spaces, the ports of an era that are not protected, that are not surrounded by hinterland, and that are no longer able to grow have started to see changes in their importance and where they are positioned (Tümertekin, 1987). After ports have left their old locations to their cities, they require new physical areas outside the cities for their container traffic (Schubert, 2008). As the relationships between the abandoned ports and cities form the basis of the socio-economic structure, the renewal of cities is the primary factor impacting the characteristics of port cities (Chaline, 1995).

Although the concept of territory is argued as "area of land," as a metaphor it is the surface boundary of a country, a city, or a function. When the boundary of sovereignty transforms to a "geobody," it would be subjected to spatial planes with height and depth from a levelled area. For this reason, although it is logical to ask questions about the horizontal plane of a territory, it can be thought that it would be more appropriate to evaluate through the "volumetric geobody" in terms of spatial studies (Nieuwenhuis & Crouch, 2017). The territory of the port is the port itself and the development area of the port (Serry & Loubet, 2019). In this context, the port is involved in urban and regional development. The development of port activities reflects the economy of the city and region. Ports have a great impact on the economy of the city and the region in which they are located. Therefore, this effect can be expressed as economic territory within a geographical territory (Eurostat, 2017). Therefore, facilities for storage and transhipping areas constitute a large part of the port area (Meyer, 2020).
However, in this paper, the concept of port territory is accepted as a spatial plane in a geographic area, taking into account the existing archaeological inventories, through the "volumetric geobody."

The qualities governing the spatial characteristics of port cities are affected by the economic-political relationships based on their ports' conjuncture (World Bank, 2001). Within such a balance of power, requests for places for the ports deeply impact both the old port territories and the urban development dynamics (Hoyle & Pinder, 1992; Charlier, 1992). What totally changes the use of shores is the significance of the interface between the port and city (Daamen, 2007). The traces of the past can be seen in the heritage areas in the aforementioned interface as well as in the ports themselves. The formation of areas with

customs has created qualities altering the definition of this interface throughout history. Accordingly, a port should be regarded not only as an area of commerce but also as a significant part of the city (Rosselli, 2005). The physical evolution of the city-port interface is believed to be the result of the countries' nautical policies and regulations on the use of shores; this is particularly true in European countries (Hoyle, 2000; Vigarie, 1995; Vallega & Smith, 1991). As the old port territories in central urban locations have recently been reconfigured as part of preserving the cultural heritage, the processes of transforming these territories into social, cultural, and commercial areas have started (Akın, 2002; Hoppenbrouwer & Louw, 2005). The transformation of these old port territories should be considered as part of industrial transformation (Schubert, 2008). Some of the reasons port transformation activities have been performed include abandonment of old port territories due to their removal to points where more extensive port functions can be utilised, complete financial development of the port, accessibility problems in the old port territories, inability of the old port territories to keep up with the technological advancements in nautical and shipping activities, and decrease in the rate of employment in the old port territories. Consequently, it is clear that the transformation activities for the port territories are necessary for urban development. While the urban projects conducted to redevelop port functions and port territories provide new opportunities to ensure sustainable urban development, they also create significant threats against the heritage areas of the cities (Borja & Castells, 1997; Gunton, 2003; Savini & Salet, 2017). Every port city should perform renovation activities that are suitable to their own characteristics, such as their geographical territory, socio-economic structures, and heritage qualities (Shubert, 2011).

In addition to the port heritage, the relationship between urban projects that are present in the territories, considered to be important in terms of industrial and nautical heritage, and other urban functions should be holistically planned. Urban project approaches that involve a disconnected and fragmented plan and project relationship can cause irremediable harm to the sustainability of the spatial cultural structure. The protection of ports' authentic values requires a review of the qualities related to the place and location, pattern, design, style, compatibility, identity, traditions, methods, spirit, and emotions as a whole (Morley & Robins, 2002).

The alteration process for the port and industrial heritage is closely related to the needs of the territory hosting them. The port-related concepts presented in Figure 2 and the conceptual analysis reflecting the functional and periodic changes presented in Table 1 should be examined in relation to the change of needs. The optimum use of space by modern cities is necessary for securing sustainable life dynamics. Accordingly, when addressing the issues of spatial transformation and change, the most fundamental question to be asked is how much of a transformation should be conducted (AIVP, 2015). Due to their geographical locations, the developments of port cities have been carried in a multi-layered manner to ensure spatial and functional sustainability from the past to the present time. Traces of the layers accumulated over time in port cities can occasionally be seen in above-ground reconstruction and new construction processes. However, most of the time, it is not possible to find these traces in the waterfront areas hosting the underground and underwater heritage and forming part of the multi-layered urban systems. The aforementioned traces can be identified only within the context of cultural heritage inventory. When it comes to port-related studies, assessments must be performed using concrete and probative information and documents related to the concept of heritage. Accordingly, these evaluations can be conducted using a wide array of resources, including historical maps, gravures, miniatures, manuscripts, cadastral records, qadi registry books, travel books, commercial records, pictures and photographs. The available documentation coupled with the limitation of the studies regarding the maps of the period (Kubilay, 2010) provide significant opportunities for researchers in this field. In this context, gravures are the oldest documents related to the port heritage of Istanbul. For instance, the copy of the oldest picture of 16th century Istanbul is a woodprint gravure made by Vavassore, who is believed to have lived in Venice during the early years of that century (Eyice, 1988). This gravure is also known for its versions made from a lost prototype dated 1479 (Mülayim, 2015).

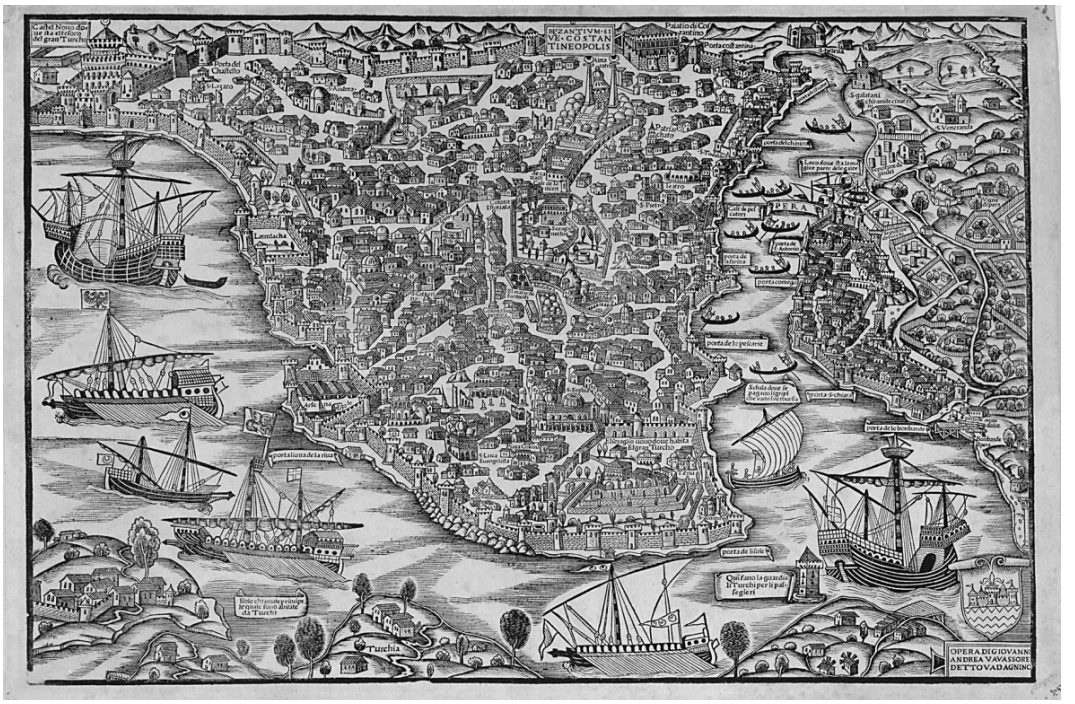

FIGURE 1 *Byzantine Constantinople*

Note. Byzantine Constantinople in G. A. Vavassore's painting of the oldest map following the Conquest of Istanbul. (Kubilay, 2010).

FIGURE 2 Conceptual schema for the aquatic heritage elements and port heritage.

Note: Created by https://wordart.com/create

WATER/SEA HERITAGE	COASTAL HERITAGE	PORT HERITAGE	DEFENSE HERITAGE
Water-Natural	Cost Specific?	Tangible and Intangible	Military
Water-Related	Seaside	Post City	War
Deltas	Coastal Areas	Port-Related	Shipyard/Dockyard/Navy Yard
Water and Culture	Landscape	Maritime	Arsenal
Water Management	Harbour (front)	Cultural	City Wall/Fortification
Water System/Hydraulic	Water (front)	Industrial	
Water Infrastructure (Aqueduct, Water Pipelines, Cisterns and Sewer)	Agriculture	Archaeological	
Water Works		Architectural/Buildings	
Water System/Hydraulic	Water (front)	Industrial	

TABLE 1 Conceptual schema for the aquatic heritage elements and port heritage

Guided by the idea of protecting and passing down heritage areas to future generations, the main aim of this study is to raise awareness on port heritage, to draw attention to the importance of cultural heritage inventory in port heritage areas and to discuss different evaluation approaches, vis-à-vis historical urban landscape approaches, to the possible impacts of urban projects conducted in port heritage areas and the buffer zones of these areas. This study also emphasises that Heritage Impact Assessments (HIA) cannot be considered in isolation and there is a need to include a holistic assessment of the relationship between the cultural heritage inventory and urban projects to ensure that the urban layers in the areas with port heritage can be analysed in ArcGIS. The assessments related to the "significance of effect or overall impact," as laid out in the document entitled "Guidance on Heritage Impact Assessments for Cultural World Heritage Properties" published by ICOMOS in January 2011, should be made in accordance with the authenticity value of the areas. This document suggests that while GIS, 3D-modelling, and databases can be used in complicated cases, a proper heritage impact assessment report does not always require GIS practices (the use of databases and GIS, or 3D-modelling, changes the way in which HIAs are undertaken). The use of GIS in HIA assessments of the urban projects to be conducted in the areas that contain port heritage zones is among the major topics of importance with regard to waterfront planning, which is one of the most complicated aspects of urban planning in Turkey.

Accordingly, the Yenikapı zone, which was revealed following the Marmaray Subway excavations within the Historical Peninsula of Istanbul, was selected as the study settlement. This zone has hosted living spaces in various periods ranging from the Neolithic Age to the present day. Traces of the Port of Theodosius, which is one of the largest known ports of the ancient world and dates to the Eastern Roman Empire, were uncovered in Yenikapı archaeological excavations. This study, therefore, reviews the database model developed based on the findings related to the stratigraphic layers in the Yenikapı zone from the Neolithic Age and from the Port of Theodosius (Portus Theodosiacus) of the Eastern Roman era. This zone and its vicinity host many urban projects, including the "Yenikapı Transfer Point and Archaeopark Area" and the "Yenikapı Cruise Port Project," as part of the planning agenda of the city. Accordingly, rather than using the "Heritage Impact Assessments-HIA," a heritage inventory database was developed, using ArcGIS-based "georeferencing" and "overlay analysis" methods, to evaluate the cumulative impact of every project, to be able to reveal the collective effect of these projects.

From the finds uncovered during the excavations performed around Yenikapı by The Directorate of Archaeology and Museums in Istanbul as part of the The Bosphorus Rail Tube Crossing Project (Marmaray), Istanbul has a history that dates back 8000 years. Moreover, the housing that constitutes the focal point of the settlement and the historical pattern in Istanbul and that forms the essence of the physical pattern in the area currently referred to as the Historical Peninsula was developed by colonists from Megara in 657 BC. The borders of Istanbul and the settlement established under the name of Byzantium on the edges of the triangular-shaped Historical Peninsula gradually expanded to the west after coming under the control of the Roman Empire. This expansion can be partially seen from the traces of the wall. The cultural heritage of Istanbul, which throughout its history served as the capital of Roman, Byzantine, and Ottoman Empires, has a historical quality which can be compared to only a few cities in other countries. Some of the works constituting this heritage were recognised by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) as World Heritage Sites for their "Outstanding Universal Values," and they gained special status under relevant national and international legislation.

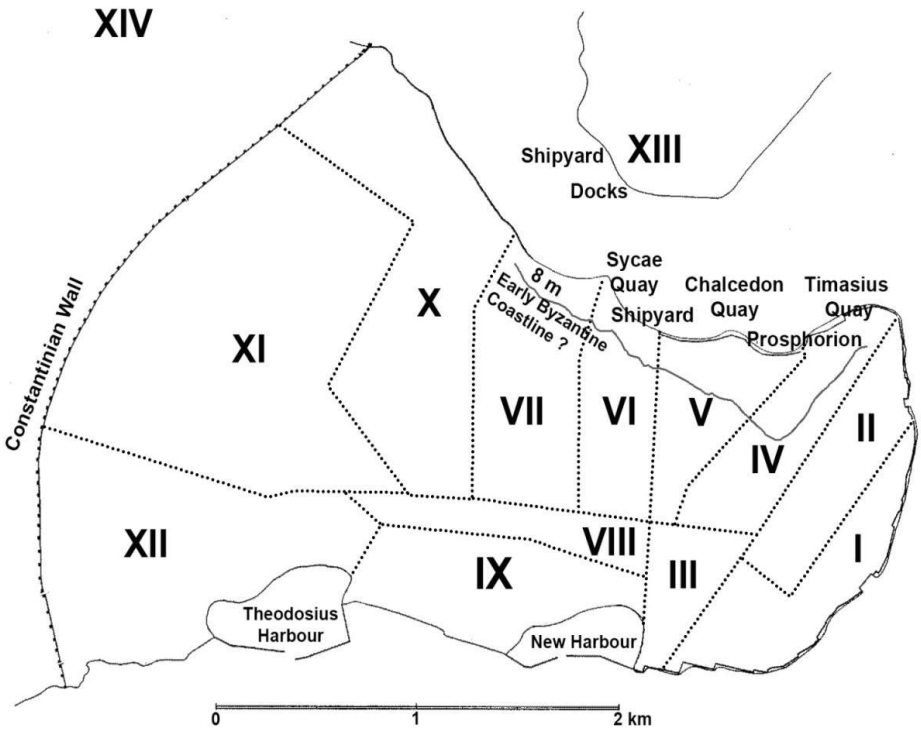

FIGURE 3 *Map of Istanbul and 14 Regions in 5th Century*

Note. Map of Istanbul and 14 Regions in 5th Century (Adopted from Berger, 1997; Dark, 2004a; Dark, 2004b; Mango, 2001; Matthews, 2012)[1]

1 III Region, New Harbour; IV Region, Quay (scala) of Timasius; V Region, Portus Prosphorianus, Chalcedon Quay (Scala); VI Region, Shipyard, Neorion Harbour, Sycae Quay (Scala), XII Region, Harbour of Theodosius; XIII, Docks

One of the main factors governing the establishment of the city of Istanbul, which from earlier times was designated the "metropolis mundi" (Ortaylı, 1977), is the power of control over the commercial activities in the Mediterranean basin, whose geopolitical location includes the Bosporus, which links the Mediterranean and Black Sea basins. Moreover, it is fair to state that many of the settlements formed on the shores of the Marmara and Black Sea by merchant colonies, particularly those from Megara and Phoenicia, were established in line with the same purpose. "The intersection of important terrestrial and nautical routes from all four directions in Istanbul and the presence of the Golden Horn (Haliç) as a natural port protected from wind have made the city one of the most important commercial centres in history" (Ağır, 2001).

The Neolithic lifestyle, often mentioned with "The Fertile Crescent", is believed to have spread to the Marmara Region and Europe after 9000 BC (Esin, 1979; Ammerman & Cavalli-Sforza, 1984; Özdoğan, 1990; 1992; 2007a; 2007b; 2007c; 2008; 2013; Frangipane, 2002; Hauptmann & Özdoğan, 2007). The performance of archaeological studies in the Marmara Region will help to determine whether this change was spread through migrations corresponding to the period of the neolithisation of Marmara or whether the prehistoric life forms in the area simultaneously initiated the neolithisation period. Among these settlements, Fikirtepe has particular importance, so much so that the Neolithic Period in the Marmara Region is referred to as *Fikirtepe Kültürü [Fikirtepe Culture]* (Arne, 1922; Janse, 1925; Mordtmann & Gottwald, 1907; Özdoğan, 1979). The Yarımburgaz, Pendik, and Fikirtepe excavations were the first settlements found in the Marmara region after the 1990s. However, the Marmaray subway system passing from Kadıköy-Üsküdar to the Historical Peninsula under the Bosporus resulted in many rescue excavations in the Historical Peninsula, particularly in the station areas, as those of 2009. These excavations uncovered significant archaeological finds that helped to identify the changes in the urban history. One of the sites of these excavations was Yenikapı.

The peninsula was exposed to the siege of Septimus Severus for three years at the end of the second century AD, and the entire city, including its walls, was demolished. In addition to waterway and infrastructure activities performed in the city after it came under the control of the Roman Empire upon the siege of Severus, the Hippodrome and Mese routes were also constructed. The city gained the name of Constantinople in 324 and was declared as the seat of government in 328.

The ports continued to exist thanks to their protected locations when Constantinople was newly established in the fourth century. Referencing the Notitia Dignitatum, Müller highlighted that all urban usage activities were formed around the ports (Müller, 1998). The old port lost its importance in the seventh century as the agricultural deliveries from Egypt stopped. Moreover, it became the place for unloading debris before merging with the shore during the early Ottoman periods. According to Müller, there are only a limited number of buildings from Constantinople from the period between the seventh and tenth centuries, which makes it difficult to regenerate the appearance of the city from that period (Müller, 2001). It is important to note here that defence-based shipyards became important actors in the use of shores. Walls and doors were reinforced for the conduct of defence activities, and the need for a powerful fleet emerged. For Constantinople, a process where this triple structure existed as complementary elements in the physical space was experienced. Müller states that fleet shipyards related to defence activities and fortified with doors and walls were built as systems that served to address defence deficits in this period, and that research should be focused on the most important fleet shipyard of the era located at "Tersane-i Amire," as this would help to reveal the impact of spatial and functional sustainability in the decisions of selecting a location. The protected Golden Horn shipyards formed by military and defence-based structures host the shipyard heritage; therefore, the relationship between new urban projects, such as Haliçport, and this heritage should be recognised. The city was controlled by Latin authorities after the tenth century but was then recaptured by the Byzantine Empire in the twelfth century. The changes in this period were so radical that only the port territories featured an urban space quality, while other settlements were similar to miscellaneous rural spaces around the churches.

Genoese citizens and merchants were granted privileges from the Byzantine Empire after the eleventh century, and from the Levantines during the Ottoman times. Their commercial activities of the area around Galata (across the Historical Peninsula) made it one of the major commercial centres in the city (Erbaş, 2018). As the port underwent financial changes, the Golden Horn ports lost their significance and the Galata ports became more important. Ports that turned into transit harbours triggered the alteration of supportive functions in the interface of ports and cities. As seen in all port cities, the Galata and Golden Horn shores were densely crowded with inns, storehouses, warehouses, sites for repairing and supplying ships with goods, customs buildings, prayer sites, entertainment venues, brothels, hospitals, courts, and prisons, all of which were important for the interface of the port and the city in the past. This function of the region continued with new buildings during the Ottoman period. As part of the urban planning conception during the Ottoman Era, a featured pattern was formed around specific commercial buildings in the Golden Horn, such as specialised piers (Yağ İskelesi, Odun İskelesi, Yemiş İskelesi etc.), places for the goods delivered by ships, "kapan" (a place where goods were purchased and sold), "inns," "covered bazaars," "arasta (a type of Ottoman bazaar)," "shops," "markets," and the "Grand Bazaar" (Cezar,1983; Türkantoz, 2011). After completion of the gaps in building structures and the repositioning of the buildings within a great commercial relationship network, these commercial buildings created innovations in the service sector, such as the stock market, banking, and insurance. For instance, the Turkish Coffee Culture and Tradition was recognised as an Intangible Cultural Heritage (UNESCO, 2013), meaning that the coffee culture should be regarded as a part of port heritage considering that this culture developed and spread in the Eminönü-Tahtakale zone in accordance with the port activities of the 16th century.

The defence system in Istanbul was reinforced with walls and gates. Evidence indicates that port-related commercial activities developed along the Golden Horn shores of the Historical Peninsula, which is a natural port, in line with the principle of "drop anchor safely." These sites along the ports and piers on the shores of Golden Horn, and the ports and piers bordered by the walls along the shores of the Marmara Sea, represent important heritage areas. These sites should be seen as locations that are integrated with the city according to the concepts of "new faces of harbour cities" (Dündar et al., 2014) and "living in the harbour" (Rembarz, 2018).

Over the course of time, some of this heritage in Istanbul was damaged or even destroyed due to fires, earthquakes, storms, epidemics, demolitions, and the construction of monumental and civil buildings. Although traces of the heritage have been partially discovered in the excavations performed for subway projects, it should be noted that urban projects are both an opportunity and a threat for these kinds of heritage areas. The port territories from the period between the Roman and Ottoman Eras includes:

- the Galata Port, used by the Genoese trade colonies per the agreements with the Byzantine Empire during the late 12th century,
- the commercial pier built outside the wall in the Ayios Mamas settlement (currently known as Beşiktaş) during the fifth century,
- the Port of Damalis in front of the Maiden's Tower in Üsküdar (Port of Öküz), the Port of Chalcedon (currently known as Haydarpaşa-Kadıköy), which was around even during the second century BC,
- and the port territories of Chalcedon in the area where the Kurbağalıdere (river) flows into the sea (currently known as Kuşdili-Kadıköy).

Although archaeological excavations partially continue in these areas, the holistic assessment of the activities sheds light on the cultural wealth in Istanbul. Old traces of port territories at the station locations in Haydarpaşa, Üsküdar, Sirkeci, and Yenikapı have been found during the recent Marmaray subway system project, and these findings have deeply changed our understanding of the known history of the city (Kızıltan & Polat, 2013; Kocabas, 2014; Girgin, 2007; Karagöz, 2007).

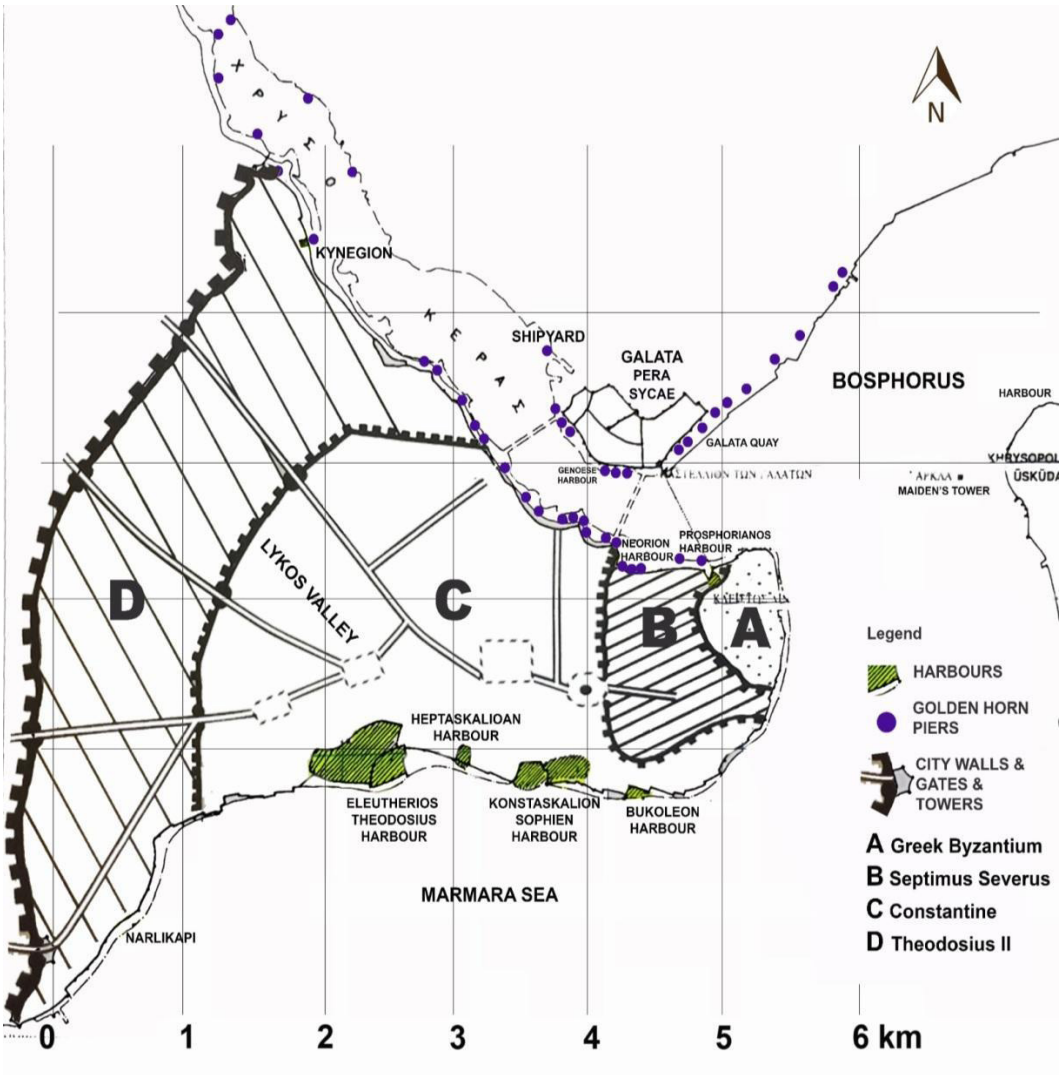

FIGURE 4 *Important port territories from Roman, Byzantine, and Ottoman periods in Istanbul*

Note. Important port territories from Roman, Byzantine, and Ottoman periods in Istanbul (Adopted from Müller, 1998; Berger, 1994; Eyice, 1994, Krautheimer, 1983)

Accordingly, the important port territories in the Historical Peninsula, which were used in the Roman, Byzantine, and Ottoman Eras and which have a multi-layered urban quality (Müller, 1998; Berger, 1994; Eyice, 1994), include the Port of Prosphorianos (Portus Prosforianus), the Port of Neorion (Portus Neorii), the Port of Bukoleon, the Port of Sophia (Port of Kontoskalion, the Port of Iulianus, Port of Kadırga), the Port of Eleutherius (Port of Vlanga), and the Port of Theodosius.

After coordinating the waterways to the Black Sea, the Sea of Marmara, the Bosporus, and the Golden Horn, this small peninsula hosted Roman, Eastern Roman, Latin, Ottoman, and Turkish states following its urban revolution. In determining an urban planning approach based on the Historic Urban Landscape (HUL) concept, it is critical to first gain an understanding of the change in the organisation of urban space during different periods and in land use patterns against the background of port function (Ginzarly et al., 2018; UNESCO, 2011).

LOCATION OF/AND INFLUENTIAL URBAN PROJECTS	CONFLICTS RELATED TO PORT HERITAGE CONSERVATION
Eminönü The Bosphorus Rail Tube Crossing Project (Marmaray) (Sirkeci Excavations) Arrangement of Gülhane Park Construction of New Galata Bridge and Eminönü Square Stack Interchange Kabataş-Sirkeci-Beyazıt Trolley Line Projects of restoration and refunctioning projects in Hanlar Bölgesi (Area of Inns) Restoration and transformation of Vakıf Han into a hotel	Urban development and transformation pressure from the projects impacting the archaeological layers of the Ports of Neorion and Prosphorianos (on the shore of Golden Horn) from the Byzantine and Ottoman periods; Urban development and transformation pressure on the old Venedik street, a multi-layered cultural landscape area bearing the traces of Ottoman and Republican periods
Sultanahmet Transformation of Sultanahmet Prison for use as a hotel Project for arranging and pedestrianizing Sultanahmet Square Arrangement project for of Topkapı Palace & Gardens of the Palace Demolition of Eminönü Municipality Building Restoration of Theodosius Cistern Basilica Cistern and environmental arrangement Improvement of the area hosting hotels around Hagia Sophia	Archaeological area covering Sultanahmet and Great Palace ruins in the vicinity, pressure of settlement on water routes and cisterns Urban development and transformation pressure from the projects impacting the archaeological layers of the Ports of Boukoleon and Sophia from the Byzantine and Ottoman periods
Yenikapı Marmaray tube passage and subway project (Yenikapı excavations) Yenikapı fill area project Langa Gardens & Emniyet Bus Station Improvement of the area hosting hotels in Aksaray	Urban development and transformation pressure from the projects impacting the archaeological and settlement-based layers of the Ports of Theodosius and Eleutherius (on the shore of the Sea of Marmara) from the Byzantine, Ottoman and Neolithic periods
Beyazıt-Süleymaniye Exit of Laleli Subway Station Süleymaniye renewal area Change in the sunction of sandal covered bazaar (in the Grand Bazaar) (Nusr-et Steakhouse)	Urban development and transformation pressure on the historical settlement and commercial areas on the shores of the Golden Horn
Beyazıt-Süleymaniye Exit of Laleli Subway Station Süleymaniye renewal area Change in the sunction of sandal covered bazaar (in the Grand Bazaar) (Nusr-et Steakhouse)	Urban development and transformation pressure on the historical settlement and commercial areas on the shores of the Golden Horn
Yedikule-Cankurtaran Inclusion of the Coastal Road on the coast leading towards the outside of the walls Eurasia highway tube tunnel project Arrangement of the gardens with the restoration of sea and land walls Yedikule Cer housing project Transformation of Lifeguard Cavalry Post into Faruk Saraç Vocational School of Design	Urban development and transformation pressure from the projects impacting the archaeological layers of the Byzantine and Ottoman ports with walls along the Sea of Marmara
Golden Horn/Fener- Balat- Ayvansaray Rehabilitation project for Fener Balat towns (1996-2009) Urban renewal project for Fener Balat Ayvansaray (2008-2013) Sulukule renewal area Restoration of Palace of the Sovereign Project Haliçport in Golden Horn shipyards Golden Horn passage bridge Golden Horn coastal arrangement project	Urban development and transformation pressure from the projects impacting the Golden Horn walls, Ormanlı Shipyard, and Republican Period industrial heritage areas
Karaköy- Beyoğlu Persembe Pazari Conservation Master Plan, Galataport İstanbul Project	Urban development and transformation pressure from the projects impacting Byzantine, Genoese, Ottoman, and Early Republican port territories and the projects in this regard.

TABLE 2 Significant Projects for the Historical Peninsula between 1980 and 2020 and conflicts related to Port Heritage Conservation

LOCATION AND INFLUENTIAL URBAN PROJECTS	DEGREE OF IMPACT ON THE HERITAGE IN THE MULTI-LAYERED PORT HERITAGE AREAS				
	Neolithic Period	Roman	Eastern Roman	Ottoman	Early Republican
Eminönü					
Marmaray Tube Passage and Subway Project (Sirkeci Excavations)	?	++	++	++	++
Arrangement of Gülhane Park	?			+	+
Construction of New Galata Bridge and Eminönü Square Stoack ExInterchange	?	++	++	++	++
Kabataş-Sirkeci-Beyazıt Trolley Line	?	-	-	+	+
Projects of Restoration and Refunctioning Projects in Hanlar Bölgesi (Area of Inns)	?	-	+	++	++
4. Restoration and Transformation of Vakıf Han into a Hotel	?	--	--	++	++
Sultanahmet					
Transformation Regarding the Function of Sultanahmet Prison into a Hotel Function in Sultanahmet Archaeological Area	?	+	+	+	+
Project of Arranging and Pedestrianizing Sultanahmet Square Project	?	-	-	+	+
Arrangement of Topkapı Palace & Gardens of the Palace	?	++	++	++	++
Demolition of Eminönü Municipality Building - Restoration of Theodosius Cistern	?	--	+	+	+
Basilica Cistern and Environmental Arrangement	?	--	+	+	+
Improvement of the Area Hosting Covering Hotels in Hagia Sophia	?	+	+	++	++
Yenikapı					
Marmaray Tube Passage and Subway Project (Yenikapı Excavations)	++	++	++	++	++
Yenikapı Fill Area Project	++	++	++	++	++
Langa Gardens & Emniyet Bus Station	++	++	++	++	++
Improvement of the Area Hosting Covering Hotels in Aksaray	--	+	+	+	+
Beyazıt-Süleymaniye					
Exit of Laleli Subway Station	?	--	-	-/+	-/+
Süleymaniye Renewal Area	?	-	-	+	+
Change in the Function of Sandal Covered Bazaar (in the Grand Bazaar) (Nusr-et Steakhouse)	?	--	--	++	++
Yedikule-Cankurtaran					
Inclusion of the Coastal Road on the coast leading to towards the outside of the walls	?	++	++	+	+
Eurasia Highway Tube Tunnel Project	?	-/+	-/+	+	+
Arrangement of the Gardens with the Restoration of Sea and Land Walls	?	-	++	++	++
Yedikule Cer Housing Project	?	-	+/-	+	+
Transformation of Lifeguard Cavalry Post into Faruk Saraç Vocational Designing High School	?	-	+/-	+	+
Golden Horn/Fener-Balat-Ayvansaray					
Rehabilitation Project for Fener Balat Towns (1996-2009), Urban Renewal Project for Fener Balat Ayvansaray (2008-2013)	?	--	+	++	++
Sulukule Renewal Area	?	--	+	++	++
Restoration for Palace of the Sovereign	?	+/-	++	++	++
Project Haliçport in Golden Horn Shipyards	?	--	--	++	++
Golden Horn Passage Bridge	?	++	++	++	++
Golden Horn Coastal Arrangement Project	?	++	++	++	++
Karaköy-Beyoğlu					
Project Galataport	?	+/-	++	++	++
Persembe Pazari Conservation Master Plan	?	+/-	++	++	++

TABLE 3 Significant Projects for the Historical Peninsula between 1980 and 2020 and conflicts related to Port Heritage Conservation

Post-1980 urban policies led to the harm of the multi-layered urban structure due to plans and projects involving excessive interventions, irreversibly damaging the cultural heritage. The influence of neoliberal policies on urban interventions is primarily responsible for this damage (Brenner & Theodore, 2005).
The transportation projects had a major impact on the change in the urban archaeological layers and heritage areas. Rational methods, like decision-making processes involving multi-criteria and analytical hierarchy, should be used in planning investment projects that affect the historical urban centres, and these should be applied in a manner that covers multiple fields of specialisation, regardless of whether this is performed on building scale or protection zones scale. A planning approach to the physical pattern and socio-economic structure of small retailers has been applied, albeit without taking protective measures, within the historical urban centres that aim to maintain their traditional structures. Accordingly, the "Cumulative Cultural Heritage Impact Assessment" (C-HIA) method suggested in this study should be an integral part of planning approaches based on the concept of historical urban landscape.
The issue of "Heritage Impact Assessment" requires the development of tools for a cumulative assessment within the framework of transdisciplinary, cross-sectoral, and planning and design strategies. In this subject, one of the European Union's Horizon 2020 projects is very valuable. The project is integrated with new ideas, tools, and training to ensure that interdisciplinary, research-based heritage, landscape management, and spatial planning is undertaken (Heriland, 2020).
Currently, the preparation of HIA reports is based on the World Heritage Convention and the ICOMOS Guidelines of Cultural Heritage Impact Assessment (28.05.2014 / 2014-50). In this context, there should be strong consistency between the proposed and implemented management approach and projects (Zeren, 2020).

Historical Urban Landscape and Planning and Cumulative Heritage Assessment Approach based on GIS

With the increasing concerns and approaches on protection, a new method that combines the old and new, and the past and present, is needed. One such method is HUL, which has intrinsic values, provides communicational and instrumental rationalism, and combines the protection and management model for organising private and public areas using a holistic and systematic approach (Girard, 2013; Bandarin & Ron, 2012). According to HUL, the management plan and programme take on a central role in utilising new and innovative multi-dimensional instruments (Rosa & Palma, 2013). However, the neoliberal-inspired urban interventions on the Historical Peninsula have been devastating for the underground and overground cultural inventory and stand in contradiction with the aforementioned role. Major transportation projects have continued, but the fragmented structure in the national legislative amendments has negatively affected the protection of heritage areas.
Various studies related to understanding and specifying the conceptual framework of cultural landscape were conducted in the 1990s, when the management of cultural heritage was included in planning activities (Jacques, 1995; Taylor, 2009). HUL was defined in the text entitled *Recommendation on the Historic Urban Landscape* as follows: "Urban areas that are formed as a result of the historical stratification related to the cultural and historical qualities and values, that reach beyond the definitions of 'historical centre' or 'formation', and that have an urban and geographical context" (UNESCO, 2011). The most basic definition made at the end of the development of the concept of Cultural Landscape covers the traces of the natural or anthropogenic effects. Accordingly, the aquatic/port heritage was assessed as a cultural landscape element, and the harm these areas suffered due to the current neoliberal policies were reflected upon. The criticisms directed at the current situation will help develop a new planning approach.
A GIS-based database was developed to discuss the impacts the spatial interventions would have on these heritage areas. The content of this database can be summarised as follows:

– A study was initiated on the satellite image of the Historical Peninsula by using GIS. A total of 414 drilling holes were marked on the smart maps of GIS in a coordinated format (Saner & Kızıltan, 2011).
– Historical maps and natural environment data (Metropolitan Plan, 1:5000 Land Use Plan, and 1:1000 Master Plan), existing plan analyses for the Historical Peninsula, and other existing plans (Metropolitan Plan, 1:5000 Land Use Plan, and 1:1000 Master Plan) were added to the data system[2].
– A literature review was performed for the Historical Peninsula and integrated into the database covering the archaeological studies[3].
– The Geological Base-Map and boreholes data from micro-zoning and the relevant database were integrated[4].

The data from archaeological and geological studies were integrated into the database[5].

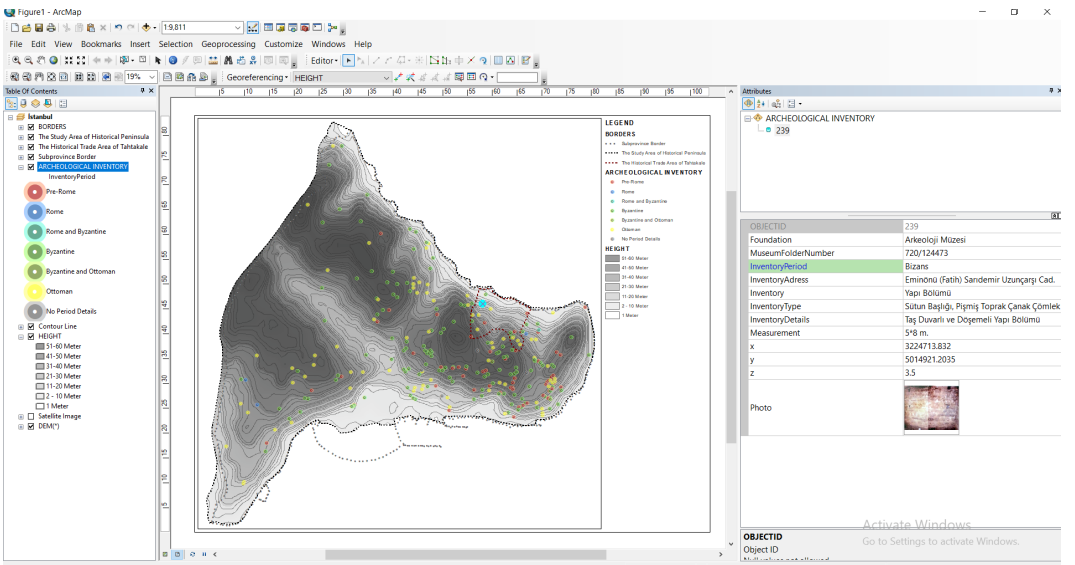

FIGURE 5 *Database Infrastructure on GIS.*

Note: In the study, period data of archaeological finds were grouped and visualised. These groupings are based on various presuppositions, and detailed chronology studies have not been conducted for all archaeological finds. For example, the finds from the Late Antique Period were classified as pre-Rome. Finds from the late, middle, and early Byzantine period were included in the single classification of Byzantine period. For this reason, it is very important forresearchers who want to work with the data in question to reach out to the authors and obtain the raw data.

2 Fourteen historical maps were received as a result of the interview carried out with İhsan İZLE, Head of the Section of Protecting Cultural Heritages under the Directorate of Cultural Assets in the Metropolitan Municipality of Istanbul. Interview Date: 26.10.2016.

3 The additions made from the literature in regard to the underground cultural inventory of Istanbul are as follows:
Tuna, N., 2003, İstanbul Suriçi'nde Kentsel Arkeolojik Kültür Mirası, Istanbul Dergisi, S:46, p: 88-93.
Altuğ, K. (2014). Tarihi Yarimada'nin Bazi Bilinmeyen Bizans Dönemi Sarniçlari. *TÜBA-AR*, 161.
Lordoglu, N. Byzantion ve Kalkhedon'un Şehircilik Açısından İncelenmesi: Kuruluşlarından Roma İmparatorluk Dönemi'ne Kadar. *Cedrus*, *7*, 169-194.

4 General Geology and Micro Zoning studies were obtained as a result of the interview conducted with Geology Professor Emeritus Turgut ÖZTAŞ from Mimar Sinan Fine Arts University. Interview Date: 09.04.2017

5 The data obtained from the archaeological and geological studies conducted in Yenikapı and added to the database include the following:
Bulut, M., Yalçın, N. & Algan O. (2019). Sedimentological properties and depositional environments of the Holocene sequence in Yenikapı, Istanbul. Maden Tetkik Arama Dergisi, 160:21-43.
Özsait & Kocabaş, I. (2018). The Yenikapı 12 shipwreck, a 9thCentury merchant from the Theodosian Harbour in Istanbul, Turkey: construction and reconstruction. *International Journal of Nautical Archaeology*, *47* (2), 357-390.

Using this database, the dynamic process of the area was assessed within the frame of the cultural heritage inventory that still exists today for the aquatic/port heritage. The spatial transformation analysis was performed in accordance with major post-1980 urban interventions. The Golden Horn and the Marmara shores of the Historical Peninsula were selected as the subject of this study, and the impacts of project-based interventions on the port heritage were discussed within the context of concrete facts.

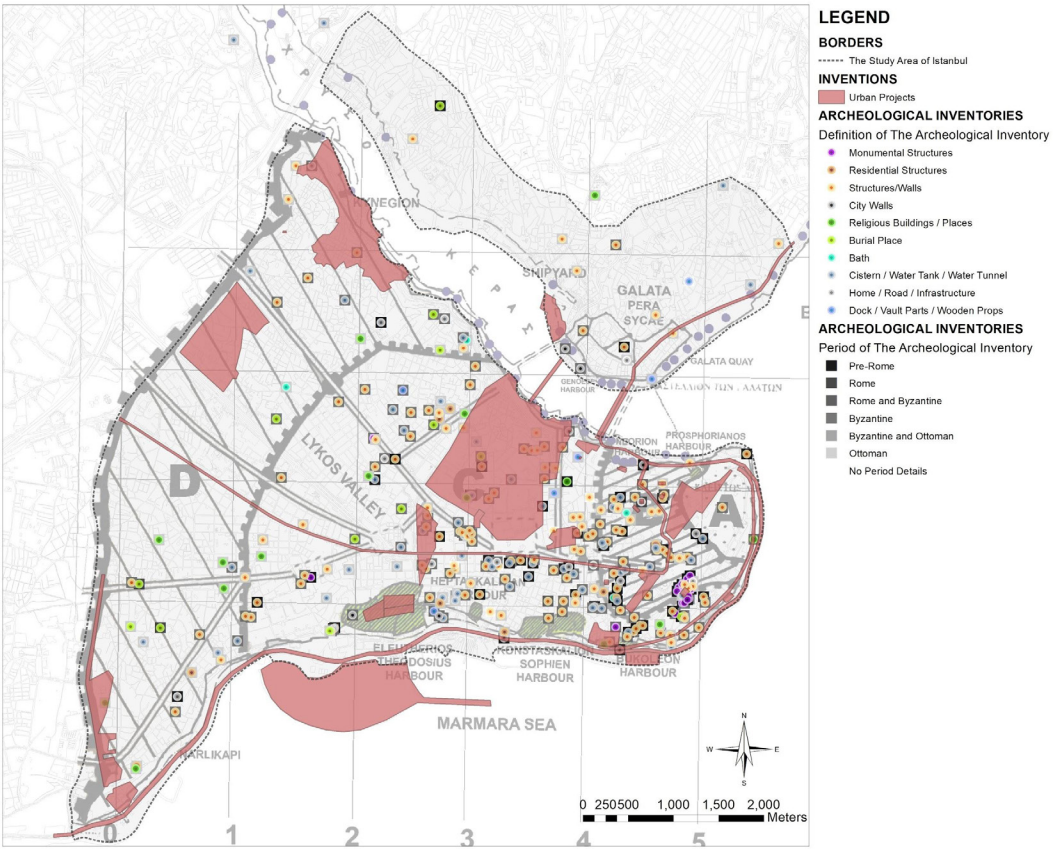

FIGURE 6 *Intervention Data with Ruins Related to the Port Function.*

Planning Decisions and Impact of the Legislation on Aquatic/Port Heritage Areas

The aquatic/port heritage has undergone constant change around the Historical Peninsula and the Golden Horn. The traces of such changes can be tracked below and above ground. To understand the effects of spatialised projects on port heritage for the post-1980 period, ruins from the underground and overground cultural heritage, as they related to the port heritage, were collected and entered into the database.
The commerce, storage, housing, and worshipping functions that were active on and behind the port were considered when entering this information, and the inventory from the Metropolitan Municipality of Istanbul was examined and then separated from all data using the spatial section method for the overground cultural heritage. As a questioning method based on usage function was not possible for the underground inventory, a visualisation of the archaeological cultural inventory was made so that it could be used in correspondence with the information about the periodic and defined architectural elements over time. These two inventory elements were overlapped through GIS, and the spatialised intervention data were added for the period between 1980 and 2020 (Figure 6). Accordingly, how cultural assets like periodic port heritages

were affected by urban projects was determined, and the harms suffered by heritage areas in this period were reflected clearly. All-based urban interventions on the building and heritage area scale had negative impacts on the port heritage of the Historical Peninsula, erased a large part of the heritage, and significantly impacted the urban memory.

There are three types of archaeological sites in the Historical Peninsula: *First Degree Archaeological Site, Urban Archaeological Site*, and *Urban Historical and Archaeological Site.* The Archaeological Site and First Degree Urban Archaeological Site areas refer to formations like old palaces or hippodromes that have a strong urban image; only a limited number of urban interventions should be allowed in these areas. However, rescue excavations performed for the Marmaray Subway and Yenikapı Transfer Station reflected the multi-layered development of the Historical Peninsula (Dönmez, 2006) and provided evidence showing that the heritage of the Ports of Prosphorion and Thedosios existed underground (Gür & Emre, 2018). Therefore, determination of the potential underground cultural inventory for the Historical Peninsula and revision of the site status, legislation, and plan decisions would be necessary for the protection of port heritage areas.

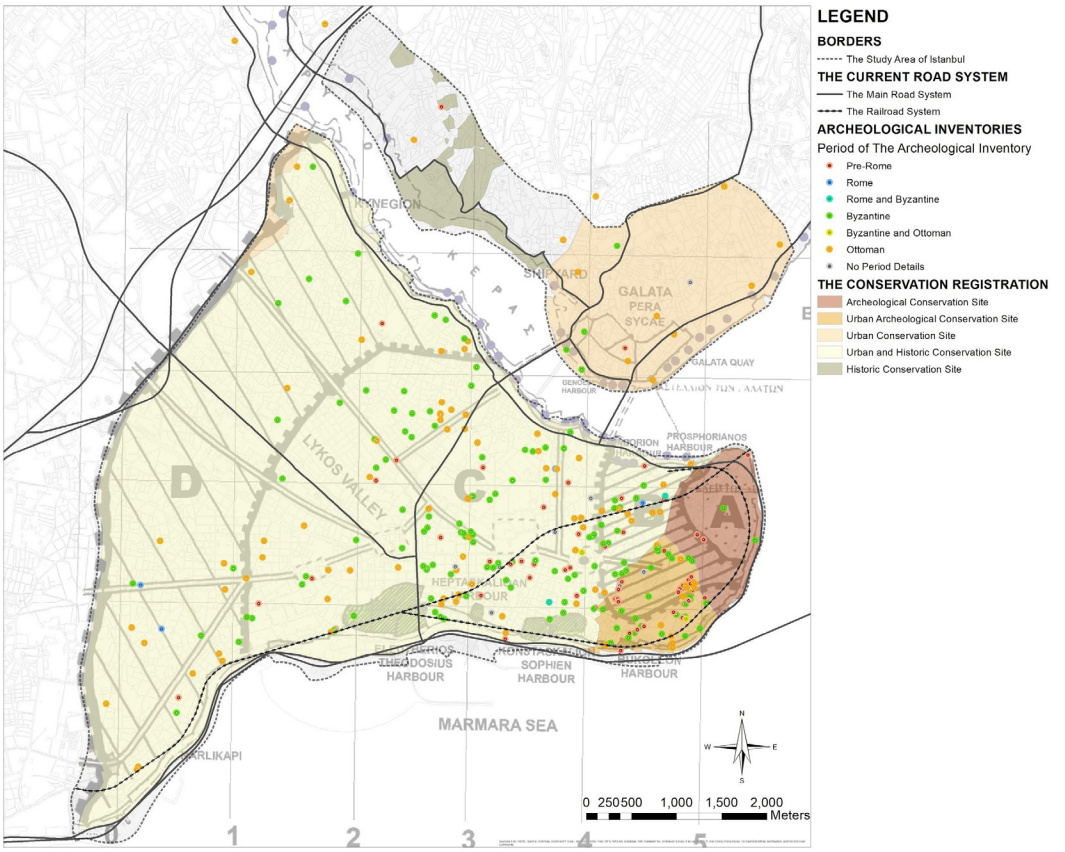

FIGURE 7 *Archaeological and Urban Site Areas with Underground Cultural Inventory.*

There are four protected areas in the Historical Peninsula that were recognised by UNESCO for their superior universal qualities. It is not possible to separate and protect these sites, which were identified during the UNESCO World Heritage Candidacy process, without taking into consideration the multi-layered historical development of the Historical Peninsula. Nevertheless, restoration areas were declared under Law no 5366 without first performing studies to determine the current cultural inventory and port heritage on

this important historical landscape. Impacts of this decision and conflict with the protected areas, such as Süleymaniye, which are quite important for the urban landscape, resulted in heated discussions on the protection of the architectural heritage. Some of the restoration areas determined in these discussions were the old port territories, but no activities other than determining the rescue drilling points and excavations were performed for the archaeological cultural assets in these areas.

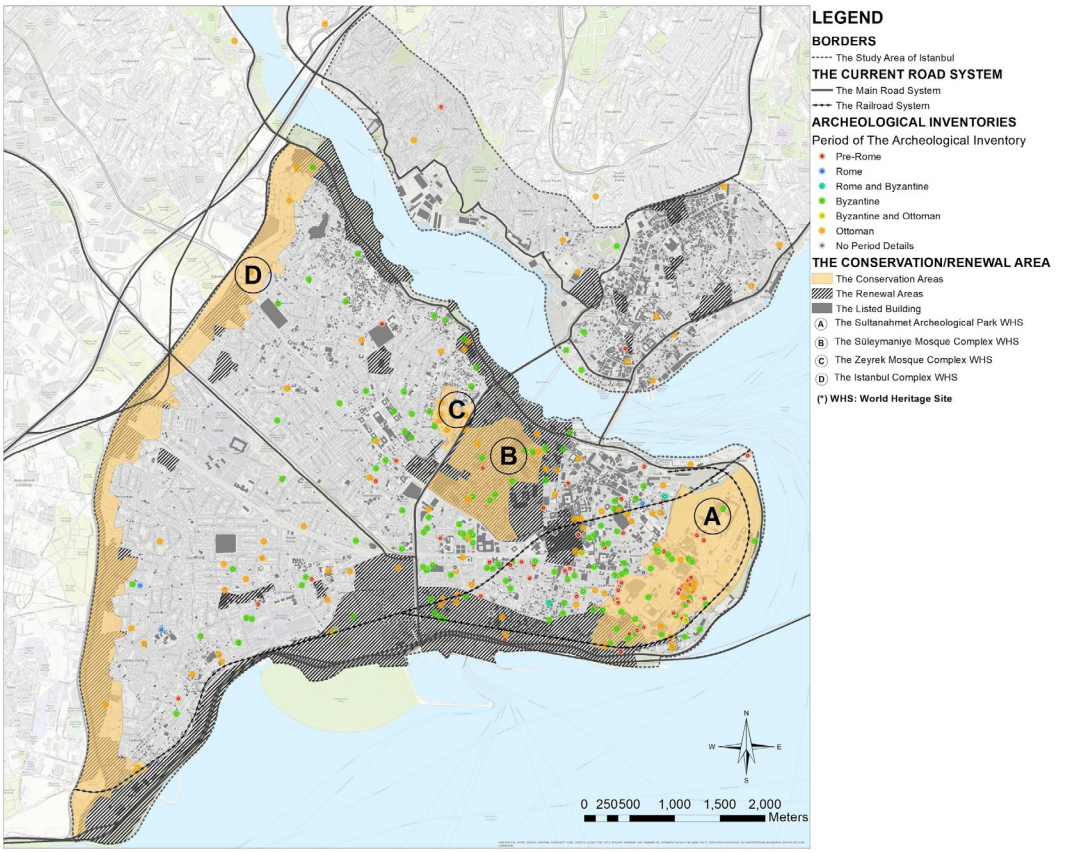

FIGURE 8 *Protection and Restoration Areas with Underground and Overground Cultural Inventory.*

There are two main criteria governing transportation projects. The first is to determine drilling activities based on the depth-related information from the rescue excavations performed by the Archaeology Museum when making decisions on transportation. Moreover, for determining geological fill thickness, the data derived from scientific archaeological studies should be taken into account for any decisions on transportation. The second criterion is to avoid segmental arrangements based on projects developed with no relation to the plans. Digitalising the depth of works within the urban archaeological inventory to form a database in the GIS environment and considering such data as part of the first decision-making step in transportation projects will help prevent the port heritage from becoming extinct and guide the decisions in this regard. This issue is highly important for creating a cultural memory and ensuring sustainability.

Studies indicate that planning decisions in the Historical Peninsula allow for the construction of multi-storey basements. The fact that such decisions were made without first determining the archaeological inventory reflects poorly on the process. The legislative provisions, the costs of archaeological excavations to be performed are born by the property owners and such planning decisions display attitudes permitting the basement floors, which are great obstacles before approaching these areas objectively. With the initiation

of multi-story housing, as enabled by the technology of the 21st century, in the Historical Peninsula and interaction areas, cultural assets have been significantly affected. The current housing conditions have caused underground and overground assets to suffer harm from many different aspects. In this article, although there are difficulties in drawing the port territory in terms of the existing archaeological inventories and period traces within the study area, the studies aimed at drawing these borders are very valuable. It is not an aim to draw the port territory within the scope of this article, but the outputs of the article can be helpful in providing opportunities for other academic researches.

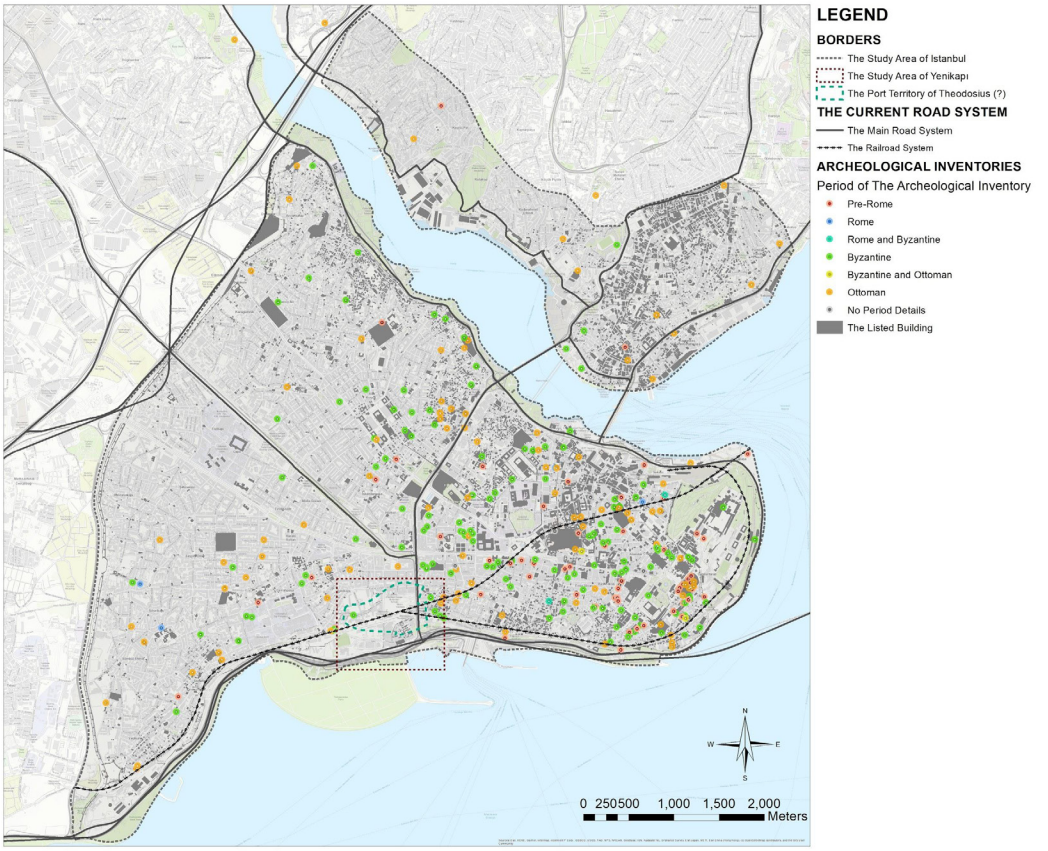

FIGURE 9 *Archaeological Finds in the Buildings and Transportation Infrastructure within the Port-City Interface.*

The database in this study and other scientific studies indicate that the port heritage in the Historical Peninsula, which has been continually used as a settlement location since the Neolithic Period, displays a multi-layered configuration. Evidence further shows that humans' relationship with water started with the Neolithic settlements dating back to 6500 BC, which was understood from the excavations in Yenikapı. People lived a life based on aquatic activities in the Historical Peninsula, and that relationship between the people and water has continued to the present day. The quality of the relationship with water has been examined more extensively thanks to the new methods applied in archaeological studies, which provide information on the topography, climate, and vegetation cover of the past. It is critical that these studies be referred to in relation to planning decisions to be made for the Historical Peninsula. However, the current status reflects the contrary.

Cumulative Cultural Impact Assessment with the Historical Urban Landscape Approach in Yenikapı Study Area

Using the data from the rescue excavations performed for the Yenikapı Subway Station, this section presents the assessment of Cultural Heritage Impact Evaluation processes for protecting the cultural heritage areas from a multidisciplinary and participative perspective and provides feedback within the Historical Urban Landscape at the stages of plan and project development.

With the recent increase in archaeological activities performed in the Historical Peninsula, where Istanbul is believed to have gained its urban identity, it became clear that the first settlement on the Historical Peninsula dated to the Neolithic Age, and that this settlement reached the Colonization period through migrations or other various settlements (Dönmez, 2011). Considering the importance of the archaeological material found as a result of the subway station activities, excavation activities were conducted in an area of approximately 58 ha. It was understood that the history of settlement in the Historical Peninsula (e.g. the first Neolithic settlement) dates back to 6500 BC (Kızıltan, 2016), prompting exploration of what is now considered a significant territory.

The excavations for the Port of Theodosius took place in the Yenikapı zone, located along the shore of the Sea of Marmara within the Historical Peninsula. Ports were generally located along the Golden Horn shores during the Byzantine period. Within the chain, two large ports were constructed on the shore of the Sea of Marmara to transport and unload the grain coming from Egypt. One of them is the Port of Sophia located in the area currently known as Kadırga, and the other is the Port of Theodosius in the location currently known as Yenikapı. Although the finding related to the Port of Theodosius dates all the way back to the fifth century, the evidence clearly shows that the grains brought from Egypt via ships were stored in the warehouses. After the Arabs took control of Egypt after 641, grain transportation to the country was occasionally interrupted, which eventually led to the port losing its significance. The port was filled with alluvium carried by the Stream of Lykos (Bayrampaşa). The geoarchaeological data indicate that the Neolithic settlement that is present in the historical layer of the Port of Theodosius on the location where Bayrampaşa Stream, known as Lykos in the ancient world, flows into the sea was -6.50 metres below the current sea level (Dönmez, 2011).

Yenikapı Marmaray excavations were conducted in four different regions. In these excavations, a great part of the Port of Theodosius present under layers from the Republican and Ottoman Eras, commercial ships from the fourth and fifth centuries and a cistern that is believed to be from the 20th century were found. However, the most attractive finds from these excavations were the Port of Theodosius and 37 Byzantine shipwrecks (Kızıltan, 2016; Asal, 2007; Başaran et al., 2007). The geological evolution of the territory should be assessed based on the archaeological findings in the Byzantine Port of Theodosius (Kocabaş & Kocabaş, 2006), which is also called the Port of Eleutherios (Wiener, 2001) in other sources, as this would be quite important for understanding the filling layer of the port and for reviewing the territory through the cultural landscape approach. In order for Yenikapı to be assessed within the Historical Urban Landscape (HUL), it is not sufficient to solely digitalise the archaeological cultural inventory of the area and highlight it as an historical urban landscape element. The aforementioned area is a location where human and natural actions, such as the rise of sea level, change of climate and vegetation cover, and the difference of topography, have been united ever since the Holocene period. Therefore, it is crucial to present the archaeological importance of the area and to plan it through the HUL approach.

The archaeological and geological studies performed for Yenikapı were compiled, and Figure 10 presents the relationship between the archaeological cultural inventory and geological stratification. Accordingly, the natural and human processes that the multi-layered urban system has gone through since the Neolithic Period provided a trackable dataset. The rock formations on the south side of the Historical Peninsula

consist of elements dating to the Palaeozoic and Cenozoic periods (Figure 10); the unit designated base rock, whose surface was seen in the Yenikapı excavation site, represents the Thracian Formation from the Early Carboniferous Period, which forms the highest section of the Istanbul Paleozoic Collection. The lower section of the unit was not found in the shallow drilling points opened during the foundation excavations or in engineering geology studies. However, the relationship with the Güngören Formation above is discordant. Another unit whose surface was seen in the Yenikapı excavation site, particularly at a location from the Miocene period, is the Güngören Formation from the Late Miocene period. Broad surfaces are also present in the unit setting area. The Holocene collection located on the Güngören Formation from the Miocene Period and swamp clay from the Early-Mid Holocene Periods reflect two different environments, namely, nautical (from Unit 2 to Unit 7) and stream (Unit 8). The Holocene collection in Yenikapı was first affected by the sea level, and the Neolithic Period settlement was also probably affected and had to alter its location. Results indicated that the coast settled in an environment that was formed due to the materials transported by the stream and their eventual accumulation and as a result of regression in the direction of the sea. The shipwrecks found as a result of archaeological activities indicated that the area was used as a port territory. The port was buried under the stream sediments (from the Holocene Period) of the Lykos (Bayrampaşa) Stream and used as a garden during the Ottoman Period (Table 4).

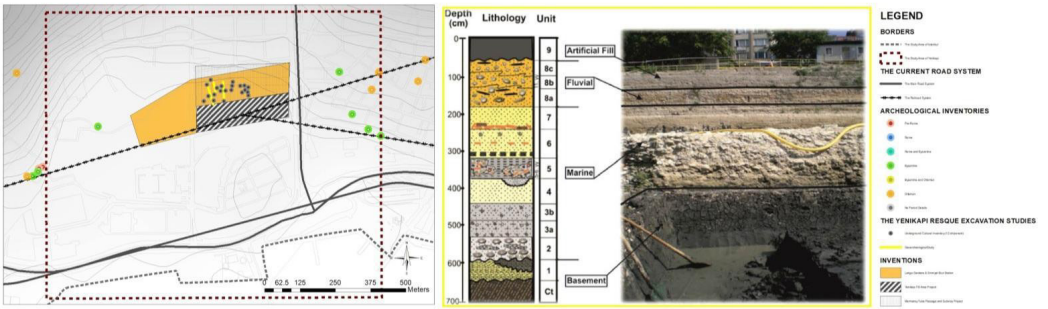

FIGURE 10 *The Geological Base-Mad with Yenikapı Archaeological Excavations Area (Shipwreck Remnant of Theodosios Harbour and Geo-Archaeological Stratification).*

Note. This table unites the archaeological and geological activities performed in Yenikapı and presents the definition of the geo-archaeological stratification in the area. References used in this regard include: Dönmez, Ş. (2011)., Perinçek, D. (2008)., Bulut, M., Yalçın, N. & Algan O. (2019), Özsait & Kocabaş, I. (2018).

Archaeological studies were performed until the parent rock on the Yenikapı zone was located. The elements forming the layered structure consist of the Neolithic Period settlement, the Port of Theodosius, and the Garden area. This multi-layered urban structure can be seen throughout the entire Historical Peninsula, but most of the archaeological studies fail to reach the location of the parent rock (Table 4).

Recovery excavations conducted as a result of a transportation project dated the settlement history of the Historical Peninsula to 8000s BC, and efforts were made to perform field-specific geological and archaeological studies from a multi-disciplinary perspective. As a similar study cannot be performed before every plan decision, various difficulties can arise from this. Despite such conditions, protecting the cultural heritage and planning the design of cities so that they retain their identities according to the historical urban landscape approach is still a must.

ARCHAEOLOGICAL STRATIGRAPHY HISTORY	ARCHAEOLOGICAL STRATIGRAPHY PERIOD	ARCHAEOLOGICAL RESULTS	GEOLOGICAL UNIT-IZING	UNIT CHARACTER-ISTICS	ELEVATION
15th-20th century (AD)	Ottoman Era	Pottery items, small finds	Ninth Unit (Terrestrial)		50 cm
			Eighth Unit (Stream)	"İstfi" (to be asked to the author) type delta environment.	50-80 cm
5th-20th century (AD)	Byzantine Era	Port of Theodosius, shipwrecks, chapel	Seventh Unit (Nautical) Sixth Unit (Nautical) Fifth Unit (Nautical)	Unit number 6 dates back to the 10th-11th century as evidenced by the result of the shipwrecks.	Seventh Unit, 40-70 cm, Sixth Unit 70 -130 cm.
4th century (AD)	Late Roman Period	Construction of Constantine's Wall, Establishment of the Port of Theodosius, city renamed of the city as Constantinople	Fifth Unit (Nautical)	Dated through relative dating.	20-50 cm
1st century (BC) - 3rd century (AD)	Roman Period	Pottery items	Fifth Unit (Nautical)	Dated through relative dating.	
4th-3rd century (BC)	Hellenistic Period	Pottery items	Fifth-Fourth Unit (Nautical)	Dated through relative dating and Unit number 4 and 5.	
5th century (BC)	Classical Period	Pottery items	Fifth-Fourth Unit (Nautical)	Dated through relative dating and Unit number 4 and 5.	
7th-6th century (BC)	Establishment of Colonization Period (Archaic Age) Byzantium	Pottery items	Fourth Unit (Nautical)	Geoarchaeological studies indicated the 6th century (AD).	50-100 cm
1200-1000 (BC)	Early Iron Age/Dark Age Thrako-Phryg. migrations	Pottery items	Third Unit (Nautical) Second Unit (Nautical)	Lenticular shell and shell cracks	60-120 cm
5300-5200 (BC)	End of the Neolithic Age	Completion of glacial melting, Formation of the Bosporus, Yenikapı Neolithic Age settlement being totally covered by sea	Second Unit (Nautical)	sands with shells	25-30 cm
6500 BC	Neolithic Age	Simple wooden architecture, "hoker mezar" (to be asked) with wooden construction, urnae, small wooden finds, grain silos	Unit	Güngören Formation from Miocene Period and Swamp Clay from Mid-Holocene Period	80-90 cm

TABLE 4 Unity of Geological Building Data and Archaeological Culture Inventory

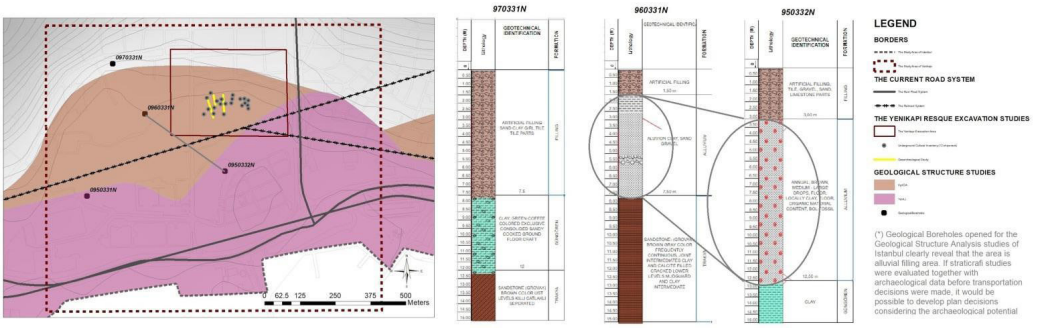

FIGURE 11 *Assessment of Cumulative Cultural Heritage Impact in Yenikapı*

Accordingly, it is essential to identify all the archaeological materials ever found, to conduct historical background assessments, and to determine archaeological fill layers or areas sensitive for historical urban landscapes when using the data from the studies on general urban geology and micro-zoning as a layer in multi-layered, historical and developing urban centres. A prediction was made for the potential cultural fill layer in the cumulative assessment of studies, as shown in Figure 15, and an impact transition area was suggested as an addition to the buffer zone for the archaeological area. Performing these studies within the preparatory process of Cultural Heritage Impact Assessment Reports and providing feedback to projects will ensure the adoption of the HUL method as a planning approach.

Assessment and Conclusion

This study clearly indicates that port heritage territories reflect the spatial traces of their social, environmental, economic, and political settlements. Thus, these areas qualify as urban spaces that should undergo a sensitive review in order to be protected as a part of our cultural heritage. As the modern planning activities and project-based urban interventions cause changes to the coastal lines that are a part of ancient topography, it is becoming increasingly less possible to spatially reveal the traces of these heritage areas. However, it is possible to plan, project, and pass down these areas, which constitute part of our identities, to the following generations by reviewing them from the HUL perspective. Accordingly, the results from this study and suggestions can be summarised as follows:

- Transfer the cultural heritage inventory to an extensive database, include the underground and overground cultural inventory and historical maps as spatial data, and interactively consolidate the archaeological studies, and beyond the historic ensemble (to include the "port territories")
- Determine the potential cultural heritage fill areas for the potential locations of underground cultural heritage areas through a holistic approach, using a multi-layered urban database (GIS) provided by the general database, and develop unique plans and projects for these areas in accordance with (the authentic) values of heritage areas and the relevant attributes
- Prepare cultural heritage impact assessment reports by using the extensively prepared database for all decisions which are derived from community involvement, ranging from protecting the architectural heritage to changes in the legislation on protection, as these will impact the historical urban patterns
- Review the data on Potential Cultural Heritage Fill Areas within the Cultural Heritage Impact Assessment Reports and form the report in a manner that reflects all components of the relevant cultural potential, and develop a proactive approach for the integration of these areas in the urban fabric
- Finally, ensure that Cumulative Cultural Heritage Impact Assessment Reports provide feedback to plan decisions

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