

Institution: University of Kent		
Unit of Assessment: 13: Architecture, Built Environment and Planning		
Title of case study: Informing Planners and Architects on the Design and Conservation of Historic Settlements		
Period when the underpinning research was undertaken: 2013-2019		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Dr Nikolaos Karydis	Senior Lecturer in Architecture (2017-present); Lecturer in Architecture (2012-17)	2012-present
Period when the claimed impact occurred: 2015-2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words)		
<p>Nikolaos Karydis is a practising architect as well as an academic. His research focuses on two areas: the development of construction technology, and the design aspect of city making, with specific focus on the European traditions and links between chronologically distant architectural forms. Karydis' interest in vernacular construction technology led to the rediscovery of previously overlooked historic building methods on the Greek island of Lesbos, which is transforming the way engineers are repairing the island's historic buildings after the earthquake of 2017. In addition, his research on contextual architecture in historic towns – in particular, ancient and medieval influences on nineteenth-century architecture – informed responses to a public consultation on a major new hotel development in Canterbury and has been used in the training of planning officers in the city council.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>This case study describes two examples of how Karydis' research in historic construction methods and the development of architectural forms has been used to inform the design, construction, and repair of buildings in historic settlements. Building on previous work, Karydis' research at Kent since 2012 uses fieldwork, design analysis, archival research, and visualisation to gain a better sense of the structure of historic buildings, as well as the design of historic towns and settlements and their development through time.</p>		
Learning from vernacular building systems in Lesbos, Greece		
<p>Karydis' research has informed contemporary understanding of historic building techniques, especially in the vernacular settlements of the East Aegean (Greece) [R1]. In spite of the work of Tobriner (1983), Toulaiatos (1995), and Langenbach (2002), certain traditional building systems in this area remain poorly documented. Lack of research in this field makes it difficult to understand the particularities of local construction methods and to develop suitable conservation strategies. This problem becomes very serious in earthquake-prone areas such as the East Aegean, where historic buildings are vulnerable owing to regular earthquakes.</p>		
<p>Karydis' research [R1] has involved the detailed survey of a series of houses on Lesbos (Greece) and Bergama (Turkey). This research has led to the discovery of a previously overlooked method of construction that employs an uncommon, double load-bearing system consisting of load-</p>		

bearing masonry and timber frame. Karydis used archival research, constructional analysis, and comparisons with similar systems elsewhere to evaluate the system's earthquake behaviour. On the basis of this work, he argued that the building system used in Lesbos has an increased ability to resist earthquakes. This theory was confirmed when a strong earthquake hit the island of Lesbos in 2017. Many of the buildings employing the system identified by Karydis behaved as he had predicted, reducing earthquake damage and saving lives. By highlighting the previously overlooked earthquake-resistant qualities of the building system, the author's research contributed to its systematic preservation after the earthquake.

Assessing the impact of new design on coherence in historic towns

Karydis' research has also been used closer to home, providing guidance for new design in the historic towns of Kent. Within the architectural profession, there is an increasing emphasis on sympathetic coexistence between new structures and the older neighbourhoods within which they are planted. Commentators such as Krier (1984; 1998), Kostof (1995), and Semes (2012) have called for a new, 'contextual' approach to design that will preserve the local tone and character of historic neighbourhoods. However, there is no consensus regarding the principles of contextual design, and a lack of criteria for assessing the adaptation of new buildings in some of England's most significant historic settings. This is reflected in the controversy surrounding recent proposals for the development of historic towns in Kent, including Canterbury and Folkestone. In spite of recent criticism of these projects (e.g. Dean, 2015), the criteria for assessing their impact on the character of historic cities remain unclear.

Karydis' work on the documentation and architectural analysis of the historic environment since 2013 has contributed to filling the above gap. His papers on the ancient and medieval influences on nineteenth-century architecture [R2, R3] identified previously overlooked links between chronologically distant architectural forms. These papers developed a new way of comparing buildings of different eras and identifying their similarities in terms of scale, facade design, and the way in which they interact with urban space. This helped the author to understand the reasons why historic towns such as Canterbury are stylistically coherent, despite consisting of buildings of different periods. Understanding this coherence is the key to establishing criteria for assessing the degree to which new buildings adapt to their historic environment.

3. References to the research (indicative maximum of six references)

[R1] Karydis, Nikolaos (2015). 'Learning from the Vernacular Building Systems of the East Aegean: Traditional Examples of Durable Construction in a Seismic Region'. In: Economakis, Richard, ed. *Durability in Construction*. Archives of New Traditional Architecture. Winterbourne, UK: Papadakis, pp. 68-82. ISBN 9781906506551. <http://kar.kent.ac.uk/59396/>

[R2] Karydis, Nikolaos (2019). 'The Revival of Classical Architecture in Athens, 1830-1840: Educational Institutions designed by Christian Hansen and Stamatios Kleanthis'. In: Temple, Nicholas, Piotrowski, Andrzej, and Heredia, Juan Manuel, eds. *Routledge Handbook on the Reception of Classical Architecture*. Abingdon, UK: Routledge. ISBN 978-1-138-04711-2. E-ISBN 978-1-315-17110-4. doi: <https://doi.org/10.4324/9781315171104>

[R3] Karydis, Nikolaos (2020). 'Discovering the Byzantine Art of Building: Lectures at the RIBA, the Royal Academy and the London Architectural Society, 1843-58'. *Architectural History*, ISSN 0066-622X. (In press). <https://kar.kent.ac.uk/70434/>

4. Details of the impact (indicative maximum 750 words)

Informing the repair of earthquake-damaged buildings on the island of Lesbos, Greece

Karydis' research on the traditional architecture of Lesbos [R1] has been used to inform the repair of local historic buildings and the construction of new houses after the earthquake that hit the

island in June 2017, and has led to the adoption of new conservation methods by architects and civil engineers on Lesbos and Mount Athos, Greece.

This impact originated from an article that Karydis published in the Greek press, demonstrating the durability of vernacular construction **[a]**. Following this article, the Lesbos-based amenity society 'Polion' and the Technical Chamber of Greece invited Karydis to organise a conservation workshop at Plomari, Lesbos, in 2018, at which he presented his findings regarding the local building system. Attended by 50 architects and civil engineers from Lesbos, Chios, and Thessaloniki, and widely reported in the Greek press **[b]**, this workshop raised awareness about the previously unknown building system and provided advice about its repair. Planners and architects who participated in the workshop have subsequently used the author's research in design and conservation projects on the island of Lesbos (particularly the villages around Vrisa and Plomari) and in the restoration of the Byzantine monastery on Mount Athos in northern Greece. The following examples demonstrate this impact:

- Dimitrios Malliaros (architect and Principal of Planning for the North Aegean Region) states: 'During the recent past, I had the opportunity to work on 4 projects in which I used the knowledge I acquired through the workshop [run by Karydis]. Two of these projects involved the conservation of [residential] buildings at Plomari and two others involved the settlement of Vrisa.' Malliaros' statement outlines the way in which Karydis' research influenced his conservation work. In particular, Karydis' research influenced Malliaros' decision to limit the use of reinforced concrete and cement-based mortars, which is very popular on the island, in favour of moderately hydraulic lime mortar and timber, which are more compatible with the region's historic structures **[c]**.
- Fani Chiotelli (an architect working in the technical office on Lesbos) states: 'I have worked both on: 1) the repair of dwellings damaged by the earthquake, and 2) on the construction of new houses replacing those that were demolished [after the earthquake]. In the first case, it was necessary to understand the construction of [traditional] houses, in order to propose the necessary interventions and compatible materials for the restoration. In the second case it was necessary to study the morphology and materials used in the area, so that the new structures are harmoniously integrated into the whole settlement. The workshop gave me the opportunity to deal in depth with the form, construction system and pathology of the buildings of Lesbos. This knowledge contributed to the selection of compatible materials in restorations in Vrisa and Plomari as well as the better comprehension of the local construction system of this area.' **[d]**.
- Melina Kaklamani (an architect based on Lesbos) has provided a breakdown of the influence of Karydis' scientific analysis of historic structures on four properties on which she worked in Vrisa: 'I see the knowledge of restoration methods [acquired through the workshop] using materials that are compatible to traditional structures as a convincing argument against the use of cement [...]. [Karydis'] scientific analysis of the behaviour of these historic structures helped me to understand their decay and to collaborate more efficiently with civil engineers in the future.' **[e]**.
- Dimitris Glykofrydis (a civil engineer based in Thessaloniki, and executive engineer in the current conservation of Docheiariou monastery on Mount Athos) has explained how the experience he acquired from Karydis' workshop contributed to his survey of the buildings of the Byzantine monastery, as well as to his discussions with local craftsmen regarding the choice of materials and repair methods: 'I am discussing with my line manager, the builders and the monks (who have built or repaired several of the buildings in the monastery) about the repair methods and the materials that will be used [in various repairs]. In these discussions, the survey of the buildings and their forthcoming repair, I have used the knowledge and experience I acquired from last year's workshop.' **[f]**.

As the above testimonies show, Karydis' work is changing conservation practice on Lesbos and Mount Athos (Northern Greece). Prior to Karydis' 2018 workshop, architects working in these areas had a more limited understanding of the properties of the stone and timber construction of local historic buildings and used unsuitable, cement-based materials in their repair. Demonstrating

the durability of long-overlooked traditional buildings, and promoting the understanding of previously overlooked construction methods, Karydis' research changed architectural and conservation practice in two ways: (1) it influenced the choice of building materials by local architects, encouraging the use of stone and lime mortar as opposed to cement-based materials; (2) it helped local conservation architects to rediscover previously overlooked historic structures and understand them in a new light. This has changed conservation practice, contributing to saving key historic buildings in Greece, and paving the way for a more sustainable approach to the preservation of the country's architectural heritage.

Preserving historical features of a nineteenth-century house in Canterbury

In the University of Kent's home city of Canterbury, Karydis has worked extensively and over a sustained period of time with local amenity societies and with planners and conservation staff in the evaluation of the design of new buildings. Through his public engagement work with organisations such as the Canterbury Society, the Canterbury Archaeological Trust, and the Folkestone Townscape Heritage Initiative, he has also given talks and lectures to non-academic audiences, informing public debate on local planning issues.

Karydis has used his methodology of looking at buildings of different periods and analysing their similarities [R2, R3] to demonstrate what makes historic towns coherent in spite of their stylistic diversity. In three workshops organised in Canterbury and Folkestone, he helped planners and amenity societies to develop a new awareness of the architectural continuities that characterise cities such as Canterbury by presenting these similarities graphically, through 3D models and elevation drawings. Awareness of these similarities can then inform criteria for the assessment of development proposals. These criteria were subsequently used by the Canterbury Society in their assessment of the design for the new Slatters hotel at the heart of Canterbury (St Margarets Place).

Karydis' research on nineteenth-century architecture helped him to identify the significance of the doorcase of a listed Georgian terraced house that forms part of the new hotel site, and which the architects had initially intended to remove. However, when the proposed designs were presented for pre-application public consultation in January 2015, the Canterbury Society, following Karydis' advice, recommended preserving this doorcase [g]. The architects of the hotel subsequently modified their design, retaining the original doorcase and thereby preserving the house's historic significance [h].

Training of planners in Kent and impact on planning practice in Canterbury

In October 2015, Karydis provided training for 30 planning officers and architects in a workshop organised by Canterbury Archaeological Trust in Folkestone [i]. Following his presentation in this workshop, planning officers from Canterbury, Shepway, and Dover district councils approached Karydis and requested the development of further training for planners at postgraduate level [i]. This in turn led to the development by the University of Kent of an MA programme in Urban Planning and Resilience.

The programme began in September 2019 and is intended for the professional training of planners. Karydis' knowledge sharing is already having an impact, providing planners with an enhanced understanding of the way in which the heritage of their districts is affected by new design. For example, Chris Pragnell, Team Leader at the Planning Department of Canterbury City Council states: 'The course has also provided me with an opportunity to formally study the principles of building conservation. In planning practice, understanding these principles within the context of resilience theory is key to ensuring preservation of our heritage assets.' [j].

The training is also having a practical impact on local planning practice in and around Canterbury. Pragnell explains: 'Key cases which I have managed include regeneration schemes in Whitstable Harbour and Herne Bay town centre, and the redevelopment of the former Debenhams department store in Canterbury's historic city centre. In respect of such projects, the programme

has helped provide me with the necessary criteria for assessing development proposals that adapt older buildings to modern sustainability requirements.' [j].

5. Sources to corroborate the impact (indicative maximum of 10 references)

[a] Article: Karydis, Nikolaos (2017). 'The durability of the historic buildings of Lesbos after the Earthquake', *Efimerida ton Syntakton*, pp. 22-23. This article evidences public engagement, which became an incentive for the generation of impact.

[b] Media coverage by the Greek press of the workshop run by Karydis on Lesbos (June 2018).

[c] Email from Dimitrios Malliaros (architect and Principal of Planning for the North Aegean Region), providing evidence that the choice of building material for four projects was influenced by the workshop run by Karydis on Lesbos in June 2018.

[d] Emails from Fani Chiotelli (an architect working in the technical office on Lesbos), providing evidence regarding the benefits of a changed understanding for the repair of houses and the building of new ones on Lesbos after the earthquake.

[e] Statements by Melina Kaklamani (an architect based on Lesbos), providing evidence that the workshop run by Karydis on Lesbos in June 2018 helped her to acquire a greater understanding of decay, thereby enabling a better collaboration with civil engineers.

[f] Email message Dimitris Glykofrydis (a civil engineer based in Thessaloniki, and executive engineer in the current conservation of Docheiariou monastery on Mount Athos), providing evidence that the insights in the workshop run by Karydis on Lesbos in June 2018 were applied in discussions about the building material and repair methods on Mount Athos.

[g] Correspondence from the Chair of the Canterbury Society confirming that the doorcase in a listed Georgian terraced house in Canterbury was preserved as a result of Karydis' advice.

[h] Planning papers from the architectural firm responsible for the new Slatters Hotel, Canterbury, demonstrating that the original design was modified (2015-20).

[i] Correspondence with Outreach and Archives Manager, Canterbury Archaeological Trust, with Human Resources Business Partner, Shepway District Council (now the Folkestone and Hythe District Council) and with Head of Planning, Canterbury City Council, providing evidence that there is a practical demand for Karydis' work.

[j] Statement by the Planning Department, Canterbury City Council, providing evidence that the MA programme in Urban Planning and Resilience at Kent provided the necessary criteria for assessing development proposals.