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Roman neighbourhoods by the numbers: A space syntax view on ancient city quarters and their social life

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Neighbourhoods and the social use of urban space are areas of growing interest that concern both contemporary city planners and archaeologists. The latter focus on the built space of the past and can offer a long-term perspective on spatial trends and patterns in urban development. Based on a detailed examination of the archaeological remains of two distinct city blocks (IV ii and iv) from Ostia (Imperial Rome's principal port city), the article explores the spatial properties of these urban quarters and seeks to identify spaces which potentially fostered social cohesion and community building. By combining archaeological and syntactical methods of spatial analysis (space syntax), novel insights have been generated regarding the physical environment in which Roman city dwellers lived their daily lives. The shared courtyards and passage spaces of Block IV ii suggest a continuity of community focus over a period of almost four hundred years. In contrast, Block IV iv appears to lack shared spaces and revealed a spatial organisation of self-contained buildings focused on individual access to public space. Block IV ii is characterised by shared internal courtyards suggestive of collective use within its own perimeter; Block IV iv looks outward toward external community building with activities centred on the street confining the block. The combined results reveal insights into the flexibility of ancient Roman urban structures and allows for several suggestive glimpses into the urban community that sustained these blocks and the wider city in the long-term.

Keywords:
Roman Neighbourhoods, ancient city blocks, courtyards, archaeology, Ostia.

Introduction

In the mid-second century CE the Roman Empire comprised more than 2,000 cities and towns, making Roman culture essentially an urban one. Intensive investigations of well-preserved Roman towns like Pompeii (including Laurence, 1994, 2007; Wallace-Hadrill, 1994; Pirson, 1999; Allison, 2004), and large-scale comparative studies across the Empire have increased our knowledge about Roman urbanism and its economic, demographic and socio-political implications (for example, de Ligt, 2012; Bowman and Wilson, 2011; Laurence et al., 2011). However, as these studies often take a regional or empire-wide perspective, they lack the small local scale of specific urban areas; hence we still know little about the 'physical urban space' and the immediate habitat surrounding the ancient city dwellers. The author's current post-doctoral research into *Neighbourhoods of Roman Ostia* seeks to respond to this imbalance.¹ The project strives

to extend and complement our existing knowledge of the Roman city through an in-depth study of local city quarters in Ostia. The principal port town of ancient Rome is one of best preserved Roman cities, with about one third of the urban area excavated and well-documented. The city's architectural remains and the rich archaeological record allow us to explore various aspects of Roman daily life.

This neighbourhood study comprises three city blocks (IV ii, IV iv and V ii), two of which (IV ii and iv) are discussed here in greater detail (see Figure 1). Ostia's city blocks offer a long-term perspective on neighbourhood development from the Republican period to Late Antiquity (c. 100 BC to AD 500). These selected urban quarters constitute a representative sample of the physical environment in which the ancient inhabitants would have experienced daily life. Presumably, such a shared built environment must have had an impact on the social

Notes:

¹ The research is carried out at the University of Leiden, The Netherlands, with the kind permission and support of the *Soprintendenza Speciale per i Beni Archeologici di Roma, Sede di Ostia*.

and economic lives of the ancient residents who were living in close proximity of each other. However, can we really speak about ancient urban neighbourhoods, or are we confronted with culturally specific phenomena that differ from our contemporary understanding of well-functioning urban units? To find answers to these questions this study offers a close archaeological and spatial reading of Ostia's past urban space, focused on blocks IV ii and iv. The complexity of the archaeological remains and the social questions central to this research require a combination of methods. These include a thorough archaeological assessment and documentation of the extant standing structures, a critical examination of published and unpublished (archival) material, and above all, a space syntax analysis of the city blocks' spatial organisation. Space syntax theories

and methods are central to this study; they help the research to move beyond the static archaeological data (i.e. the past built environment) to enable greater insights into the social dynamics within these urban areas than would otherwise have been possible. The aim of this enquiry into Ostia's neighbourhoods is to identify spatial factors which might have contributed to fostering social cohesion and neighbourhood life, and to explore how neighbourhood vitality might have helped to sustain the long life of these city blocks at a local and city-wide level.

Having briefly introduced the study of neighbourhoods in Roman Ostia, the paper commences by discussing the relationship between space syntax and archaeology from the position of an archaeologist. It proceeds by asking why neighbourhoods are of interest to both archaeologists and urban



Figure 1:

Site plan of Ostia indicating the urban neighbourhoods (city blocks) earmarked for archaeological and spatial examination (IV ii, iv). The designations IV ii, iv signify the location of these city blocks within the excavated terrain of Ostia.

planners, and seeks to define neighbourhoods as a unit of urban enquiry. The final and major part of the paper is dedicated to research into the neighbourhoods of Roman Ostia through a combination of archaeological studies with space syntax methods of spatial analysis.

Between space and spatiality: Space syntax and archaeology

Space syntax has enjoyed a lasting, steadily growing popularity within archaeology; similarly archaeology's research interests in humans and their spatial frameworks have not remained unnoticed within the domain of space syntax. In the eyes of space syntax's pioneer Bill Hillier (2008, p.223), archaeology holds an exceptional position within the humanities and social sciences, since it is more concerned with 'real space' than the other disciplines. Hillier (2008, p.223) perceives archaeology as an inherently spatial discipline, given that an interest in space is deeply rooted in the archaeological tradition and is constantly renewed through archaeological practice. Even though archaeology's preoccupation with physical space and its pronounced interest in mapping past activities are valued as chief characteristics of the discipline, most archaeologists would not consider their field to be more spatial than other studies, such as geography or anthropology. At the same time, critical voices within archaeology, notably Laurence (2007), Kaiser (2000) and above all Blake (2004, p.234), regard archaeology as not being spatial enough, and see a greater hesitation in engaging with the theoretical discourse stimulated by the 'spatial turn' in the humanities and social sciences. Blake's thorough assessment of archaeology's manoeuvring between space and spatiality gives interesting insights but requires some further qualification. She acknowledges that archaeology experienced its own selective spatial turn, evident in the increasingly numerous studies on landscape,

monumentality, biographies of ancient places, and space and power. In terms of their spatial significance, ancient cities and urban spaces remained largely underexplored by archaeologists, while geography made big strides in the fields of urban studies (cf. Blake, 2004, p.236-239). This seems surprising in view of the long-standing tradition of archaeology with its emphasis on urbanism and the study of the ancient cities of the Old and New World (e.g. Marcus and Sabloff, 2008). This discrepancy appears even larger given that two of the earliest archaeological sites to be discovered and excavated were the Roman towns of Pompeii and Herculaneum. These sites helped to shape the discipline of archaeology itself (Kaiser, 2001, p.1); indeed, a number of pioneering studies in archaeology have had their origin in Pompeian studies (for example, Wallace-Hadrill, 1994; Laurence, 1994, 2007; and Zanker, 1998).

Over the last 30 years archaeology has been incorporating various methodological and theoretical approaches termed 'spatial analyses'. However, as Hillier pointed out (2008, p.220, p.223), most of them seem to share the common assumption that space acquires significance, shape, and meaning only through some other agency or social process. Consequently, spatial forms should (and could) be studied only in light of their social causes. Such a preoccupation with the dominant role of human agency in spatial transformation has led and continues to lead to a methodological problem in archaeology, in that material culture, in our case the physical spatial form, appears deprived of any influence on human life. At the same time, archaeological practice constantly confirms that knowledge of the past can be retrieved from the rich material culture remains of past daily life. Therefore the material forms themselves (i.e. patterns of shaped and interlinked spaces) should be of central interest and worthy of study, making past urban space an object of investigation and an entity of theoretical interest in its own right.

Despite a high degree of mutual appreciation and acknowledgement, the relationship between archaeology and space syntax is not entirely unproblematic. Space syntax confronts archaeology with unique theoretical and methodological challenges (for example, sample size, quality and statistical viability), while problems inherent in archaeology impose a number of demands on space syntax methods. Above all, the fragmentary nature of archaeological evidence limits the application of space syntax to a relatively small number of well excavated and thoroughly documented archaeological sites. These include the Roman cities of Pompeii (Laurence, 1994, 2007; Grahame, 2000; van Nes, 2011), Ostia (DeLaine, 2004; Stöger, 2011, 2014), and Empúries (Kaiser, 2000), where space syntax studies have been successfully conducted.

Archaeological data are by definition incomplete since hardly any site has been entirely excavated and fully documented. Added to this is the well-known problem of missing upper floors for almost all buildings in Roman cities, with Herculaneum being a rare exception where houses with lavish upper floors have survived. For Ostia, as with most other past built environments, we find the ground floor levels generally preserved, while the presence of staircases clearly points to the existence of upper floors. This is also supported by the thickness of the standing walls (60cm, approx two Roman feet), which confirm that structures would have been able to support a number of upper storeys. The missing upper floors certainly render a building incomplete in terms of its functional division and spatial configuration.

Space syntax emphasises the significance of spatial configuration, referring to the simultaneously existing relations of discreet parts constituting the whole layout of space of a building or a city. The configuration of space is the means by which space acquires social significance and has social consequences (cf. Hillier and Vaughan, 2007, p.207). A

space syntax approach therefore relies on complete house plans for all types of analysis. Archaeology can only respond to this problem by considering ground floor plans as delimited subsets suitable for syntactic assessment, even though incomplete (cf. Thaler, 2005, p.326). This allows us at least to evaluate the building's spatial organisation as defined at ground floor level, but still affects or even compromises any further assessment regarding functions or activity zones. From the existing archaeological record we can observe that in the case of Ostia, large sections of ground floor space were dedicated to commercial activities, including shops, storage, small workshops, warehouses, as well as pubs and inns, while residential space at ground floor levels seems sparse (see, for example, Heinzlmann, 2005, p.116-117, Figures 2 and 3). Habitation space appears to have been largely outsourced to upper floors. This affects our assessment of land-uses and, if not critically evaluated, might even lead to a contorted impression of the city as being almost entirely dedicated to commercial activities. At the scale of the individual entities we lack the ability to assess the building's vertical adjacencies. These adjacencies are crucial for our understanding of the physical movement and access points on the upper floors, and also inform us about design and construction elements related to water facilities and light sources. In a densely built up Roman city like Ostia, with city blocks of up to five storeys high, the missing upper floors obscure a large section of urban space, and with it a range of social activities which cannot otherwise be understood.

Another topic often raised when space syntax is applied to archaeological data sets concerns chronology and changes over time as observed in the past built environment. If the archaeological evidence permits, secure chronological phasing would be a perfect solution, allowing a consecutive series of space syntax analyses for different time periods. The selected time slices need to establish

that all buildings or all spaces of a building were forming a simultaneously existing spatial association within a certain period of time. In this way the space syntax study has to rely on the good quality of the archaeological data, otherwise the results of the analysis would be compromised. For the study presented here, only one time period could be established, the early third century AD, when both city blocks were active and all buildings under study were functioning and forming a coherent spatial configuration.

Why study ancient neighbourhoods?

Neighbourhoods are an area of interest that concerns both contemporary urban planners and archaeologists. The latter are focused on past built space, and can offer a long-term perspective on spatial trends and patterns in urban development (see above all, Smith, 2010b, p.229-230). The quality of urban quarters has long been recognised as highly indicative of residential stability and the sustained development of cities (see for example, Gans, 1962). Neighbourhoods play a vital role in the daily lives of urban dwellers; they not only constitute the physical reality of spatial vicinity but also go further to create a sentiment of belonging and may generate feelings of stability and security. Conversely, urban neighbourhoods that are too tightly knit can be experienced as closed communities, exerting a high degree of social control over their residents, and perhaps making it difficult for any newcomer to integrate and feel part of the shared space. Well-functioning neighbourhoods on the other hand bring about a multitude of personal and social benefits. They create safety for people and their property, since residents look out for each other and each other's homes.

A heightened demand for security is reflected in the growing numbers of gated residential communities in modern cities worldwide. These gated compounds can be defined as a residential social

system that closes itself off from other areas through a form of social and physical mechanism (Bert Lott, 2004, p.18-23). While providing a safe haven for certain groups of the urban population, the gated communities produce new forms of exclusion and residential segregation (Low, 2001, p.45-58), and might also weigh negatively on the spatial and social cohesion of the entire city. Then again, a vibrant neighbourhood unit can generate helpful and satisfying social ties among its inhabitants, between residents and local services and commercial establishments, as well as promoting greater care for public and private space in general (cf. Sampson et al., 2001). Neighbourhoods contribute to community development and can act as pivotal sites for initiating and implementing social change (Moulaert et al., 2010, p.5).

Recent archaeological studies reflect a growing interest in neighbourhoods and neighbourhood studies, covering urban and rural environments from antiquity to historical periods. Neighbourhoods have been studied in, amongst others, Pompeii (Ynnilä, 2011; Laurence, 1994, 2007), Augustan Rome (Bert Lott, 2004), Mesoamerican cities including Teotihuacan and Tikal (Arnauld et al., 2012), Anatolia (Çatalhöyük) (Düring, 2006) and Mesopotamia, for example in Nippur (Stone, 1987). Neighbourhoods from historical periods include the London Guildhall and its surrounding tenements. This study offers an archaeological history of a neighbourhood from post-Roman occupation to the modern periods (Bowsher and Dyson et al., 2007), while explorations into urban slumlands (Mayne and Murray, 2001) provide case studies from socially marginalised urban neighbourhoods during the eighteenth to the twentieth centuries.

By researching ancient sites at a city block scale, not only can light be shed on the everyday activities of the inhabitants, but also on the functional interpretation of the diverse buildings which constituted the neighbourhood. Roman cities in

particular prove to be a rewarding research field for neighbourhoods as they provide substantial amounts of well-preserved architectural remains together with textual evidence on everyday life, such as the Epigrams of Martial and the Satires of Horace. However, most written sources on city life are focused on Rome itself, while similar textual references to quotidian Ostia are largely absent. As the archaeological evidence for daily life in Rome is obscured by the continuity of habitation and sporadic excavation, the past built environment of Ostia can stand as a proxy.

For the study of Ostia's neighbourhoods presented here, a neighbourhood is defined as the spatial subsection of a city, in which residents live out their daily lives. This implies that neighbourhoods are characterised by close ties between their residents, and are often marked by daily face-to-face interaction and contact through the architectural layout (Suttles, 1972 in Smith, 2010a). The sense of social cohesion is fostered by the presence of shared amenities such as water fountains (cf. Laurence, 2007), shops, and other necessities for daily life. Within the context of our examples from Ostia, these include also a local sanctuary and a temple serving a particular community.

The ancient city blocks selected for this study represent a spatial middle ground, and act as an interface between the individual household units and the larger city. This places the neighbourhood at the intersection between the requirements of the residents and the infrastructural demands imposed by the city. The dual 'local-global' nature of neighbourhoods challenges traditional archaeological approaches which are usually focused on the local aspects of urban units, and neglect their relationship with the wider city (for example, Boersma, 1985; Gering, 2002). This study investigates the neighbourhoods both as local places and as constituent parts of a wider urban landscape. This is achieved by assessing the internal spatial organisation of the

city blocks and how well each of these neighbourhoods is integrated into the urban street network, and by examining their degree of access to public buildings, places, services and amenities offered by the city's infrastructure.

A dialogue between ancient and modern cities

The ubiquitous nature of neighbourhoods in today's cities around the globe suggests the presence of an underlying formal structure that would allow urban researchers (and archaeologists) to objectively assess and measure neighbourhood organisation over time (Dalton, 2006; Smith, 2010a). This study of Ostia's city blocks (often also referred to as *insulae* in the literature) is inspired by advancements in contemporary neighbourhood research and the growing interest in the spatial organisation of ancient cities (Laurence, 2007; Smith, 2010a; Stöger, 2011; Scott, 2013). Recent studies into Ostia's urban landscape, such as Medri and Di Cola's work on the Baths of the Swimmer (2013), have contextualised the building within Insula V and the wider city, and have also started to position spatial considerations at the forefront of their research agenda. City blocks in Roman cities are frequently referred to as *insulae*, which are groups of buildings that are often bounded by streets on four sides, or otherwise distinctly divided from the neighbouring *insula*. Essentially they make up the fabric of a Roman city.

The study of Ostia's neighbourhoods seeks to create a dialogue between ancient and modern urban neighbourhoods by combining archaeological methods and analytical techniques from today's urban disciplines. Various methods of spatial analysis have been developed to confront the challenges posed by contemporary urban planning. Although initially developed for and by today's architects and urban designers, space syntax theories and methods have been successfully used by archaeologists studying Roman cities (Laurence, 1994,

2007; Grahame, 2000; Kaiser, 2000, and Stöger, 2011). Moreover, applying the same methods to the study of ancient and modern cities might allow us to find a common language in the study of urbanism, recognising the potential of archaeology for illuminating long-term development and distinct trends or other temporal patterns in cities (see Smith, 2010b).

The site – A brief history of Roman Ostia

The archaeological site of Ostia, Rome's principal port city, offers a promising testing ground for enquiries into past built environments. The port city's continuous history illustrates a millennium of Roman urban culture, from its foundation in the third century BC to its final abandonment in the seventh century AD. The earliest settlement was the so-called *Castrum*, a rectangular military structure built to protect the coastal area and the mouth of the Tiber. While its foundation dates are not securely established, the most likely dates point to 300-275 BC, based on pottery finds from the foundation layers (Martin, 1996, p.19-38). In 267 BC the small town became the seat of one of the *quaestores classici*, the officials responsible for the Roman fleet (Meiggs, 1973, p.24-25), and served primarily as a naval base. During the Republican period, Ostia developed from a colony with presumed military character, administered from Rome, into a small civic town with its own local government. Concurrently a shift from a naval base to a commercially oriented port town took place, primarily focused on supplying Rome, but also supporting Ostia's growing urban population (Stöger, 2011, p. iii). In the Early Imperial period Ostia's urban character was further developed, featuring new public buildings including new temples and a theatre; however urban progress moved along at a normal pace, similar to many other cities of the same period. Ostia's impressive transformation started at the end of the first century AD, and particularly during the first half of the second century, when Ostia's growth accelerated in a way that was

unparalleled in the ancient world (Heinzelmann, 2002, p.105). The vast urban expansion was related to the construction of the new imperial harbours at nearby Portus, and the subsequent increase in trading volume. Ostia and Portus became Rome's principal harbours, bringing supplies to the city of Rome, but also trading with the Roman provinces. The increased port activities brought prosperity to Ostia as well as an influx of new residents. Diverse ethnic groups, religions, and cultures from across the Mediterranean and the Empire interacted in this dynamic port setting, fostering an environment that was especially sensitive and responsive to changes in the wider Roman world. While Ostia still enjoyed prosperity during the third century AD, the urban boom experienced during its commercial heyday had, however, ebbed considerably. During the middle of the third century the city also lost its political autonomy and came again under the direct control of Rome, which placed Ostia under the authority of the prefect responsible for the grain supply of Rome (*praefectus annonae*), the curator of the harbours (Meiggs, 1973, p.84, p.186). The fourth and fifth centuries saw a turn to scattered luxury with several pockets of lavishly decorated Late Roman *domus*, distributed over wide areas of the town, while other parts were gradually abandoned. From the fourth and fifth centuries onwards, Ostia was slowly abandoned and eventually became a quarry for marble and building materials which were reused in the nearby Mediaeval Borgo. An interest in the site developed once again when the earliest excavations started in the eighteenth century, when Ostia was part of the papal property (Stöger, 2011, p.iv).

Ostia's city blocks closely examined

The blocks selected for detailed analysis are located in the south-eastern part of the city (see Figure 1 above); they vary in layout and spatial composition but cover similar time periods of occupation (Late Republican period to the fifth century AD). Extensive

archaeological and spatial data are available for Block IV ii (Stöger, 2011), while Block IV iv has until now attracted only limited scholarly attention (Lorenzatti, 1992; Guidobaldi, 1995; Terpstra, 2014²) and remains largely unstudied and unpublished.

The spatial analysis presented here builds on a thorough archaeological assessment carried out by the author over a period of several years (Stöger, 2011; Terpstra, 2014). The period of interest for this study is the first half of the third century AD (Severan period); during this time all existing buildings in Block IV iv were in use, while Block IV iv experienced considerable activities of redevelopment. In terms of Ostia's long-term history, selecting the early third century as a time-slice for analysis places the spatial discussion within two major urban developments: the city's urban expansion in the second century AD and its changing role during the early third century which saw a transformation from a commercial hub with an outward focus to a city responding to the needs of an increasingly local clientele (Stöger, 2011, p.160).

City Block IV ii – a textbook neighbourhood?

The insula covers a total area of 7,321 square metres, comprising 14 buildings, characterised by diverse land-uses. These potentially accommodated spaces for commerce (shops and storage), industry (workshops and small-scale production), recreation (baths and inns), religion (mithraeum), community (open courtyards, entrance passages and porticos), and habitation space (ground floor and upstairs dwellings). Located on the southern *Cardo Maximus*, near the *Porta Laurentina* yet still inside the Late Republican city walls, Block IV ii enjoyed a location that benefitted from a relative proximity to the city centre, as well as from the closeness to a city gate. The latter provided a connection to the south-eastern extra-mural zones of Ostia and the area of *Laurentum*. Placed at the intersection between the *Cardo* and the *Via della*

Caupona, a side road leading south off the *Cardo*, the block appears well positioned within the urban street network. Towards the east, the triangular area of the *Campo della Magna Mater*, one of Ostia's major sanctuaries, delimits the city block. The northern and the western sides are confined by streets, whereas its eastern and southern extents are bounded by retaining walls of about 1.50-2.00 metres tall, supporting a fill layer presumably placed when the terrain was levelled prior to the building development during the Trajanic period (AD 98-117). The southern boundary coincides with the limits of the city's excavated area.

An earlier study of *Insula IV ii* (Stöger, 2011, 2014) successfully applied spatially-driven enquiries, and pioneered methods of formal spatial analysis (space syntax) in the study of Ostia's ancient urban environment (Figure 2). The approach proved to be a suitable and valuable research strategy to gain a deeper understanding of this particular neighbourhood within its urban setting. The study was able to demonstrate that the 'Insula Neighbourhood' (IV ii), although composed of 14 individual buildings, was essentially a collective spatial unit. The city block's spatial structure was organised by means of common spaces which were accessible to inhabitants and visitors alike (Figure 3). These shared spaces consisted of a series of interlinked courtyards which allowed a variety of circulation paths, some of which were function-specific (to reach workshops and commercial spaces), while others were suited to articulate formal and informal social relationships within the city block. With regard to the insula's quality as a lived space, in many instances it could be established that space was designed and used to promote encounters between residents and between residents and visitors. The insula's inner courtyards and shared passage spaces seem to have engendered relationships of reciprocity, privileging integration over segregation and exclusion (see Table 1). The interior courts pro-

Notes:

² The MA thesis of D. Terpstra was supervised by the author. The thesis focused on Block IV iv, specifically on the buildings IV iv 6 and 7.

Figure 2:

Insula Neighbourhood IV ii, the topological graph of the total configuration comprises 183 individual spaces including the outside carrier space (=183).

(Source: Stöger, 2011).



vided inner protection but also openness towards the outside. The block's capacity to generate social encounters would have made it a safe and friendly urban environment, thus providing urban qualities which were not only appreciated in Roman Ostia of the second and early third century AD, but are also highly relevant in today's cities.

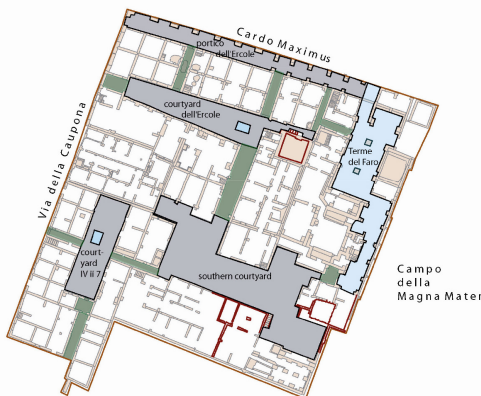
The block's integrative capacity seems the key to its long period of occupation (first century BC to

the fifth century AD). Its collective spatial structure appears to have prevented its later fragmentation into highly individualised luxury dwelling units, which was the fate of the neighbouring insula IV iii (Becatti, 1948). A number of Ostian city blocks underwent spatial fragmentation in the Late Antique period, with a partial conversion of discrete buildings into luxury *domus*. The insertion of luxury dwellings into an existing urban fabric is not unfamiliar to us and suggests processes of transformation similar to gentrification known from today's cities (see for example, Lees et al., 2008).

Block IV ii demonstrates the physical characteristics of spaces which allow us to assume that they were shared by a community: accessible inner courtyards, joint passage spaces, protecting porticoes and intersecting movement pathways. The block's self-contained nature strongly suggests that it could have functioned as a coherent neighbourhood in its own right. This does not exclude the possibility that it could have also formed part of a larger urban unit, most likely one of the five regions into which the ancient city was subdivided (CIL XIV 353, see Bakker, 1994, p.197).

Figure 3:

Block IV ii; the internal space structure is characterised by collective interconnected spaces (corridors = green, courtyards = grey) including the baths, Terme del Faro, IV ii 1 (light blue).



Building	Room/function	No.	Depth	RRA (MRRRA 0.937)	Global interaction potential	Local interaction potential	Control values	Potential presence availability
IV ii 1	Entrance	1	1.0	0.682	Moderate	Low	0.432	Mod/low
IV ii 1	Corridor	4	2.0	0.745	Moderate	Low	0.793	Mod/low
IV ii 1	Frigidarium	7	3.0	0.735	Moderate	Low	0.500	Mod/low
IV ii 1	Passage	9	4.0	0.838	Moderate	Low	0.458	Mod/low
IV ii 1	Passage	22	4.0	0.784	Moderate	High	3.458	High/mod
Common	Courtyard	27	5.0	0.757	Moderate	Low	0.759	Mod/low
IV ii 2	Portico	28	1.0	0.622	High	High	7.652	High
IV ii 3	Corridor	32	2.0	0.658	Moderate	Moderate	1.371	Moderate
IV ii 3	Passage	38	2.0	0.659	Moderate	Low	0.705	Mod/low
IV ii 3	Passage	41	3.0	0.694	Moderate	Low	0.809	Mod/low
IV ii 3	Courtyard	42	2.0	0.558	High	High	7.699	High
IV ii 3	Passage	47	3.0	0.742	Moderate	Moderate	1.009	Moderate
IV ii 3	Entrance	53	1.0	0.602	High	Low	0.928	High/low
Common	Passage	66	3.0	0.617	High	Moderate	2.302	High/mod
IV ii 6	Corridor	86	1.0	0.733	Moderate	High	4.035	High/mod
IV ii 7	Courtyard	105	2.0	0.703	Moderate	High	9.416	High/mod
IV ii 7	Passage	109	3.0	0.724	Moderate	Moderate	1.233	Moderate
IV ii 7	Passage	122	1.0	0.663	Moderate	Low	0.602	Mod/low
IV ii 8	Passage	130	3.0	0.973	Moderate	High	4.000	High/mod
Common	South. court.	180	4.0	0.617	High	High	5.783	High
Common	Fronting 14	181	5.0	0.783	Moderate	High	2.910	High/mod
IV ii 13	Passage	182	4.0	0.699	Moderate	Low	0.660	Mod/low
Common	Outs. carrier	183	0.0	0.562	High	High	165.386	High

Table 1:

The Insula's (IV ii) movement and encounter spaces (marked in darker grey): spaces directly connected to the outside space are marked in light grey (1, 28, 53, 86, 122 and 130), while all internal courtyards (42, 105, and 180) and the outside carrier (183) are marked in darker grey.

City Block IV iv – did it function as a neighbourhood?

To achieve a more nuanced understanding of ancient neighbourhoods, the second selected city block (IV iv) serves as a comparative study (see Figure 4). Its close vicinity to the *Forum* and its long period of occupation, stretching from the Republican period to Late Antiquity, makes Insula IV iv of particular interest for this study. The block comprises nine individual buildings which demonstrate remarkable qualities: some reflect the city's conservative traditions, others its vivacious energy for renewal. The buildings include four residential houses (*Domus* IV iv 2, 3, 7 and 9); one housing block - *Caseggiato* IV iv 6; a bath complex – *Terme*

Byzantine IV iv 8; two fountains - *Nymphaea* IV iv 1 and 5; and a public latrine – *Forica* IV iv 4. This specific urban quarter (IV iv) provided a home to its residents for more than six centuries. Located at the corner where the *Cardo Maximus* and the *Via del Tempio Rotondo* meet the *Forum*, Insula IV iv enjoyed a very prominent and central position in the city. The block is bounded by streets on four sides: its northern side is confined by Ostia's *Cardo Maximus*, its southern extent by the *Via di Iside*, its north-western side by the *Via del Tempio Rotondo*, and on the south-eastern part a small alley separates the block from the neighbouring Insula IV iii.

Figure 4:

City Block IV iv, from a low altitude aerial photograph showing the insula in its overgrown state.

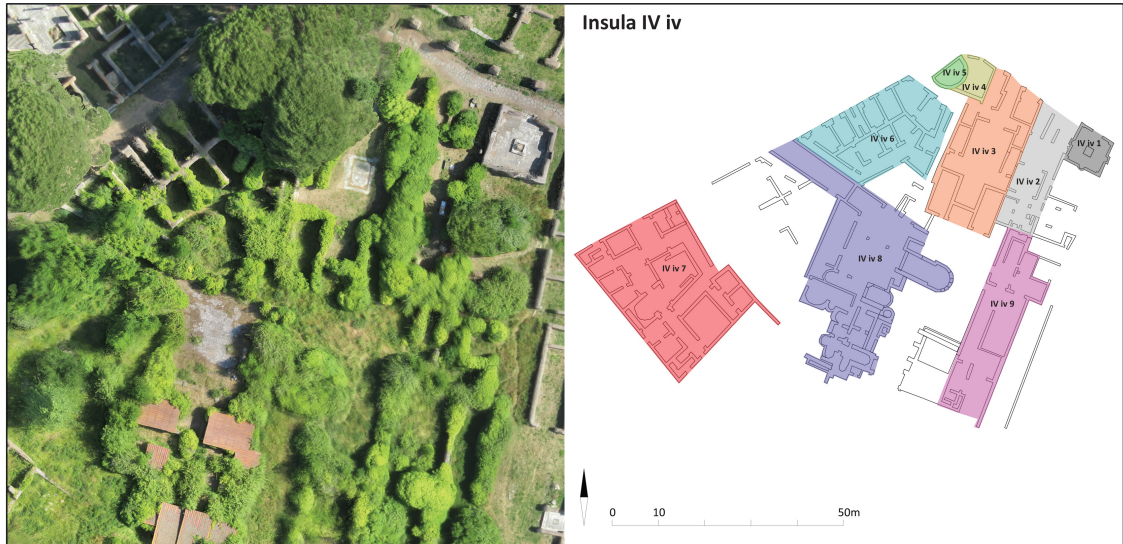
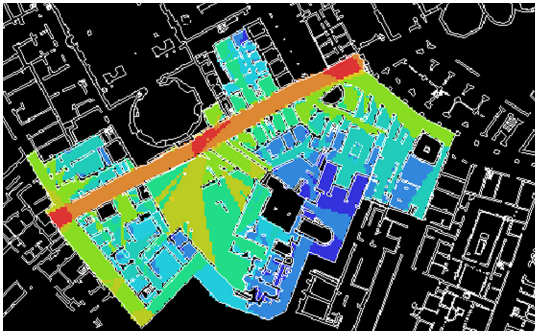


Figure 5:

The Via del Tempio Rotondo forming part of a larger urban neighbourhood; VGA of visual integration along the Via del Tempio Rotondo. The street is characterised by highest integration values, found where visibility converges in the centre of the street and at the point of intersection with other streets (Integration HH: Average: 340,844, Minimum 147,015, Maximum 594,093).



Contrary to Block IV ii, which fostered a structure of communal spaces, Insula IV iv is characterised by individual buildings which do not share common collective spaces. Instead, the buildings are focused directly outwards, towards public space, except for the Late Antique baths (IV iv 8), which nestled into the centre of the insula during its final period of occupation (the fifth century AD). During their long period of use, all nine buildings underwent numerous transformations that reflected changes in the city's economy and the way the inhabitants produced and interacted with space. The block

boasts two fountains (*nymphaea*) both located along the prestigious *Cardo Maximus*, which mark the southern and northern corners of the block. While these fountains potentially presented focal points for the local neighbourhood, they are clearly directed towards public space and are articulated to attract the attention of visitors and passers-by. On the whole, the insula does not demonstrate much concern for a collective identity through shared space between residents. This makes one wonder whether Insula IV iv functioned as a neighbourhood at all, or whether it formed part of an urban unit larger than its own nine buildings.

A number of indications, most noticeable along the *Via del Tempio Rotondo*, lend support to this hypothesis (see Figure 5). This street delimits Block IV iv on its northern extent. In their preserved state, the buildings derive from the same era of development in the Severan period (first quarter of the third century AD). The buildings located along both sides of the *Via del Tempio Rotondo* suggest a cohesive unit, and there is a conspicuous correspondence between the buildings facing each other across

the Via del Tempio Rotondo. On the northern end of the street, the housing block Caseggiato IV iv 6 seems to create a 'face-block' with the Domus del Tempio Rotondo (I xi 2-3) on the opposite side. These buildings directly face each other, whilst their corresponding door openings allow (and promote) visual control over each other's buildings and entrances (see Figure 6). On the southern side of the Via del Tempio Rotondo, before it intersects with the Via di Iside, we find two buildings with corresponding street fronts on each side of the street. The Domus su via del Tempio Rotondo (IV iv 7), located at the south-western corner of the block, parallels the building across the street (Building I x 4, a guild building which housed the Tempio Collegiale and the Mitreo di Fructosus). Both buildings are characterised by similar dimensions and closed street fronts along the southern stretch of the Via del Tempio Rotondo, thus creating a homogenous

and unified visual impression of this section of the street. Both buildings date back to the same period (AD 222-235) and, together with the other buildings along the Via del Tempio Rotondo, belong to a larger project of re-development that occurred in this part of the city. These buildings seem to form part of an urban renewal project centred around the construction of the large Tempio Rotondo (I xi 1). This was the very last monumental statement built within Ostia. From the mid-third century onwards the city slowly declined and transformed into a Late Antique city and was finally abandoned in the eighth century AD.

In the case of Insula IV iv, if one wishes to identify a neighbourhood it is necessary to extend the block's social reach beyond its spatial confinement and conceptualise a larger neighbourhood unit which might include the entire Block IV iv, or perhaps only its northern part along the Via del Tempio Rotondo. Interestingly enough, along this street

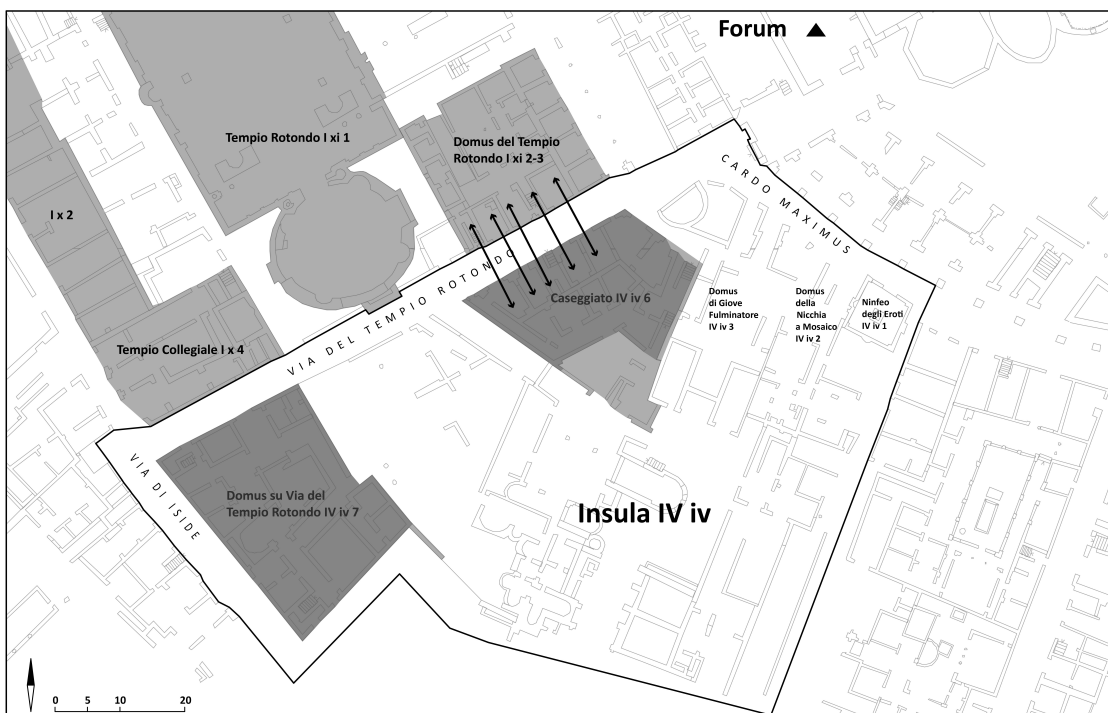


Figure 6:

Face-block along the Via del Tempio Rotondo consisting of Caseggiato IV iv and Domus del Tempio Rotondo (I xi 2-3). Note the face-to-face contact and visual control between these buildings. The Severan Urban renewal project (AD 222-235) is marked in grey.

many neighbourhood criteria seem to be present. First and foremost we observe a high degree of the daily face-to-face contact created by the architecture of the buildings (Figure 6). Additionally the fountain at the intersection with the *Cardo Maximus* (nymphaeum IV iv 5) and the *Tempio Rotondo* offer opportunities for social interaction. In contrast, Block IV iv by itself would not easily qualify as a neighbourhood; it lacks those common spaces which help to create a sense of community. In addition, the individual buildings composing the insula seem to have retained their spatial independence over most of their long period of use. Only at a late point in time (late fourth and early fifth century) was a bath complex inserted into the centre of the insula. The baths could have possibly taken on the function of a social centre and thus helped in creating a sense of neighbourhood within Block IV iv.

A space syntax view on buildings along the Via del Tempio Rotondo

A closer look at one of the buildings located on the *Via del Tempio Rotondo* makes it possible to gain a deeper understanding of the relationship between buildings and their local setting. The housing block *Caseggiato* (IV iv 6) points to a number of factors which might have influenced or even conditioned its form and function. *Caseggiato* (IV iv 6) is located at the intersection between the *Via del Tempio Rotondo* and the southern *Cardo Maximus*. Its trapezoidal layout indicates an adaptive usage of space in response to pre-existing buildings. On its northern extent it responds architecturally to the semi-circular nymphaeum (IV iv 5) by moving inwards behind the nymphaeum, with an alley separating the two buildings to promote accessibility. On the southern side, the *Caseggiato* (IV iv 6) is bounded by the area which was occupied by the later baths (*Terme Byzantine* IV iv 8), and at the time of its construction by the structures of preceding buildings. On the eastern side it is flanked by the *Domus di Giove*

Fulminatore (IV iv 3). Here it should be pointed out that no party walls were shared between the *Caseggiato* IV iv 6 and the *domus*, rather we find the *Caseggiato*'s eastern wall aligned parallel to the western wall of the *domus* - a fact that suggests a clear property division between these neighbouring buildings. The *Caseggiato* can be dated to the Severan period (ca. first quarter of the third century AD) and should be grouped together with other buildings along the *Via del Tempio Rotondo*, thus forming a coherent building programme associated with the construction of the monumental *Tempio Rotondo* (see Figure 6).

The building's ground floor is well-preserved, with surviving walls standing between three and four metres tall, and three staircases leading to upper floors which are, however, not preserved. The building comprises 20 rooms in total, including corridors and staircases. The layout shows a division into two distinct parts. All northern rooms along the street front open directly onto the street, with each room individually accessible (1, 2, 5, 6, 7, 8, 9 and also stairs 3, 4, and 11). In contrast, all southern rooms (15, 16, 17, 18, 20, and 25) are only reachable through a series of corridors (13, 14 and 19) (Figure 7).

Such a clear division predestines the southern rooms for residential use, while all rooms along the street front make excellent commercial premises. The j-graph (Figure 8) clearly illustrates this division into a commercial (semi-public) and residential (private) section. This commercial/residential split seems to be aided by the specific location of the building within the city. The proximity to the *Forum* and the building's corner position made it a prime commercial location and also a prestigious residential address. The residential section on the southern side appears sheltered and secluded, accessible from the street only by means of a corridor and from within the insula from an inner courtyard. The range of rooms along the street front (1, 2, 5, and 6) conforms to roughly the same dimensions, while rooms

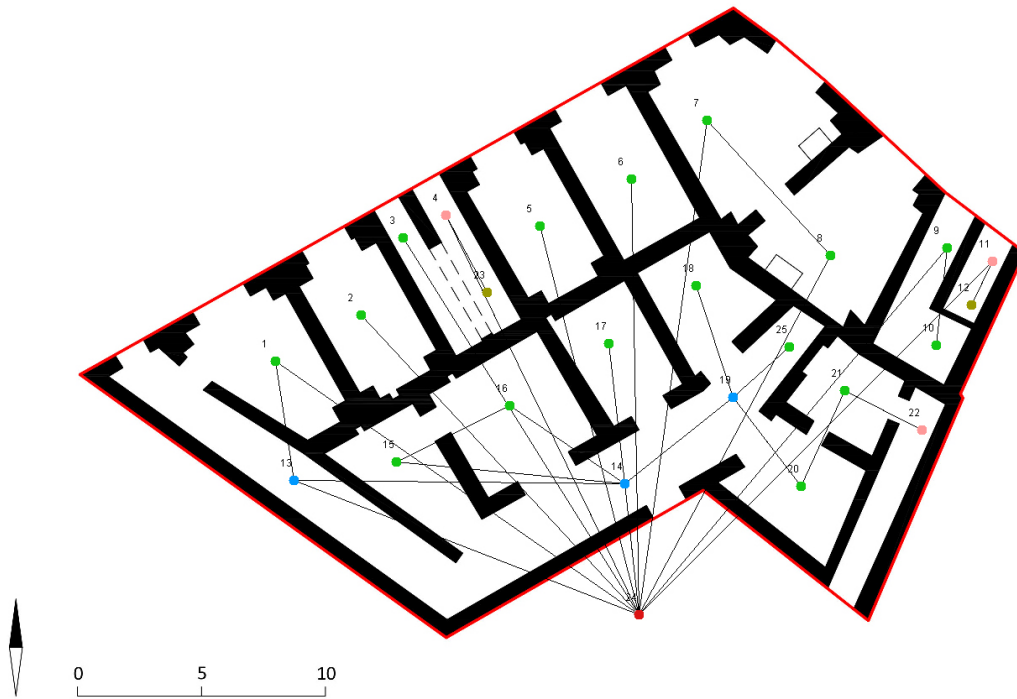


Figure 7:

*Caseggiato (IV iv 6),
topological graph (pro-
duced with the help of
JASS software).*

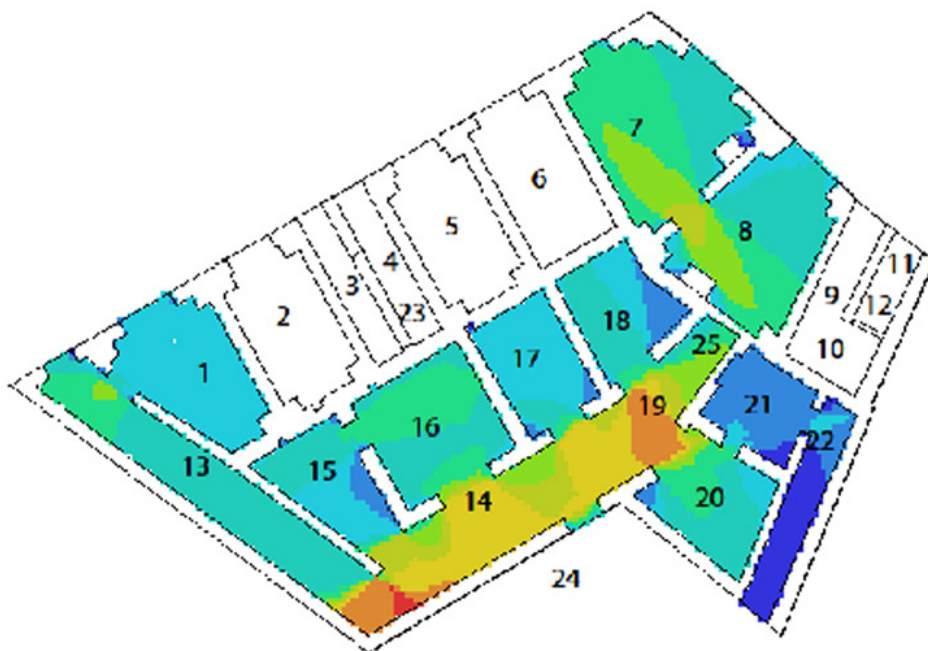


Figure 8:

*Caseggiato IV iv 6,
j-graph: all commercial
spaces (1,2,5,6,7 and 8)
along the street front
are directly connected
to public space; the
residential spaces (14,
15, 16, 17, 19, 18 and 25)
at the southern side of
the building are secluded
and allow for privacy
while being close to the
city centre. 13, 14 and
19 are corridor spaces
which generate move-
ment (j-graph produced
with JASS software, KTH
Stockholm).*

7 and 8 are interconnected and of larger size. The preliminary results of ongoing excavations point to workshop activities (based on this author’s personal communication with the excavator Axel Gering). Again, these rooms seem to be a perfect location for a combined workshop and showroom/shop. The commercial attractiveness of the location, next to the *Forum* and the *Cardo*, supports this type of functional use. In a rather ingenious way, the industrial section of the workshop seems to be tucked away behind the *nymphaeum* and was therefore slightly out of sight when approaching from the *Forum*. The corner room (7), due to its two openings, appears visually well integrated and seems to make good use of its position, as can be seen from the VGA of Figure 5 (above). Interestingly enough, the door that opens onto the *Via del Tempio Rotondo* is rather narrow (1.11 metres), while the opening towards the *Nymphaeum* is wider (2.53 metres). Structural considerations could account for this, since the building’s north-western corner required a reliable volume of built wall. At the same time it is possible to

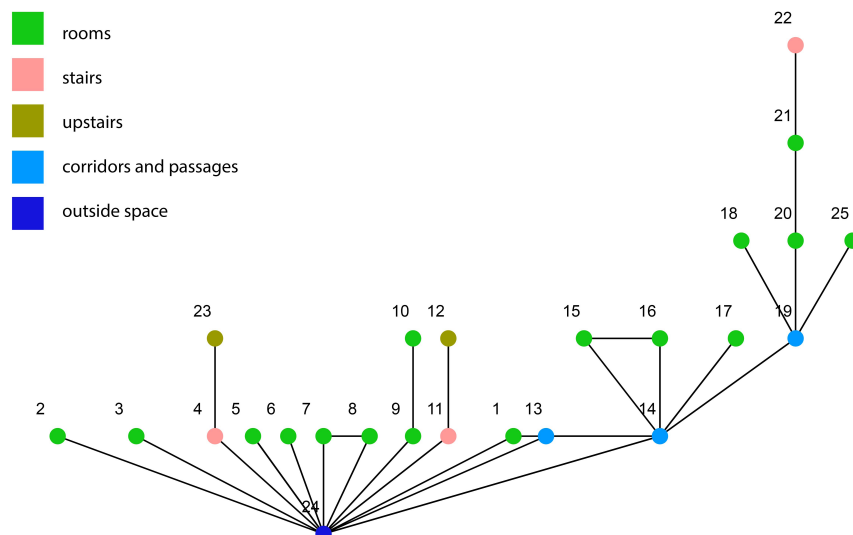
suggest a functional division, whereby rooms 7 and 8 were given a different orientation from the other rooms, and perhaps a distinct functional quality; this makes the spaces more suitable as a workshop, rather than a commercial outlet like the other rooms (1, 2, 5 and 6) along the *Via del Tempio Rotondo*.

The j-graph (Figure 8) reveals a relatively shallow structure with 12 spaces, which indicates that more than half of the building’s rooms are directly linked to public space. The building’s spatial structure has a depth of five steps when counted from the outside space. All spaces which suggest residential use are two or more steps-depth away from the outside. The building’s spatial organisation offers only nominal circulation, while internal movement appears linear and directly focused on specific rooms.

The rooms with a likely residential function are not only accessible (Figure 9) but also structured by means of corridors. The arrangement of rooms 15, 16, 17 and 18, with the central corridor 14, suggests a so-called *medianum* apartment, a dwelling type typical of Ostia (cf. DeLaine, 2004). In these

Figure 9:

Caseggiato IV iv 6, VGA of the interconnected ground floor spaces of the building. The visually most integrated spaces are the passage and corridor spaces (13, 14 and 19) leading to the private dwelling located at the southern side of the building. The access analysis (Figure 8) and the VGA corroborate each other, identifying the passage space (14 and 19) as the most integrated parts of the dwelling (VGA generated in Depthmap, UCL).



dwelling, a central corridor replaces the traditional courtyard known from the *domus*-type of houses. Examples of other *medianum*-type of residence can be found in many locations in Ostia (including I, iv 3-4, II iii 3, 4, II vi 3, II vi 6, III ix 3, 4, 6, 10, 18, 21, III xii 1, III xiii 1, V iii 3, 4). DeLaine's detailed study of *medianum* apartments in Ostia revealed diversity in individual layout; while only a few fit the picture of apartments with multiple occupancy, others seem suitable as owner-owned residences, or have been associated with the upper end of the rental market (DeLaine, 2004, p.171). Also in the particular case of Caseggiato IV iv 6, the excellent location of the building would have made this apartment an attractive residence, which could have been suitable for Ostia's more affluent citizens.

Neighbourhood and urban infrastructure

Whilst being self-contained spatial units, Ostia's city blocks are also part of the entire city and are connected through the street network to all other parts of the city. The ease of access to public buildings, infrastructure and other shared amenities depends on how well a city block is integrated within the street network. Ostia's extended street network comprises 467 streets, including streets in the unexcavated areas based on the results from geophysical prospection (Martin and Heinzelmann,

2000). A number of selected space syntax methods have been employed in the analysis of Ostia's street network. As expected, axial analyses identified the Decumanus Maximus as the street with the highest integration values, while the Via del Tempio Rotondo also enjoys high levels of integration (see Table 2). This is not overly surprising in view of its central position and its connections to nine streets (including two small alleys) despite its short length of only 100 metres. Its proximity to Ostia's major thoroughfares (Decumanus Maximus and Cardo Maximus), places the Via del Tempio Rotondo at a point where large-scale through roads converge with the actual city centre. The latter was formed by the area concentrated around the *Forum* (Figure 10), while Ostia's major access roads include the Via Ostiensis which connected Ostia with Rome, the Via della Foce, leading from the *Forum* to the mouth of the Tiber River, and the Via Laurentina, linking Ostia with the rural areas in the south-east of the city. The points of intersection where local and regional scales meet have been identified as powerful locations in the urban fabric which often assume a pivotal function. These are mostly the streets where regional traffic and local residents meet and interact, and hence they form ideal arenas for political, religious, administrative and commercial activities. The nearby *Forum* marks the area

Value	Integration (HH) all streets (n-467)	Selection Via del Tempio Rotondo
Average	1.01881	1.38441
Minimum	0.532099	1.38441
Maximum	1.84646	1.38441
Standard Div.	0.227051	0
Count	467	1

Table 2:

Axial analysis: Integration (HH) values for Ostia's street network. Selection: Via del Tempio Rotondo.

Figure 10:

Ostia's extended street network (n 467), angular depth calculated from the Via del Tempio Rotondo (indicated in black). The graph displays the streets which were easily accessible from the Via del Tempio Rotondo and hence formed the street's local environment (graph produced by Depthmap, UCL).



where a number of these activities were played out, while the pronounced commercial street face of the Caseggiato IV iv 6, and the Domus del Tempio Rotondo (I xi 2-3) on the opposite side, point to the area's economic attractiveness. Surely, a number of different reasons could have influenced the decisions of the ancient citizens regarding the location for investment. Nevertheless, when considering the concentration of the positive spatial factors which converge here, it should not surprise us at all that Ostia's final large-scale urban renewal occurred in this specific area and was focused on the Via del Tempio Rotondo.

Conclusion

This study of the neighbourhoods of Ostia has made it possible to examine closely the spatial properties of two Roman city blocks (insulae IV ii and iv). The organisation of the physical spaces of Block IV ii suggests collective use, possibly facilitating the development of a neighbourhood through the use

of common courtyards, passages and porticoes. The boundaries of Block IV ii, defined by the grid structure of the street network, seem to have encouraged the development of activated collective space within the city block: recursive types of movements and encounters might have reinforced awareness and social cohesion between the inhabitants of the block, while also encouraging co-presence between visitors and residents. The insights into the block's spatial dynamics gained through space syntax give rise to the assumption that the insula's spatial design contributed to the formation of neighbourhood and, above all, helped to sustain the block's collective spatial structure over a period of almost five centuries (first to the fifth centuries AD). In contrast, the comparative study of Block IV iv revealed a different organisation of neighbourhood which developed along, and focused on, a particular street, the Via del Tempio Rotondo. A number of spatial factors contributing to neighbourhood life could be identified on both sides of this street. These

support the assumption that an urban community might have developed along this specific street. This extends the social reach of Block IV iv beyond its physical confinement and possibly includes areas outside the block. In addition, the positive effects of the street network enjoyed by the Via del Tempio Rotondo allowed this street to benefit from both the local centre of the *Forum* and from the access routes which brought regional activities into the centre. The street would have assumed a pivotal role within the city's movement economy and therefore attracted investment for urban renewal even at a stage when the city had already begun its gradual demographic and architectural transformation, foreshadowing its slow decline. Through the case of Ostia's neighbourhoods a space syntax perspective provides broad insights into the flexible urban structure of ancient Roman cities. Syntactical methods offer a non-invasive approach to archaeological investigation and generate a wealth of spatial data able to reveal suggestive glimpses of the urban community that lived within the city blocks of Ostia.

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