dissertation_in_city_planning_CN_LRVT1

by Henry Mellen

Submission date: 09-Jul-2021 03:03PM (UTC+0100)

Submission ID: 157645872

File name: 702045_Henry_Mellen_dissertation_in_city_planning_CN_LRVT1_2914221_576686057.pdf (15.88M)

Word count: 20556

Character count: 116915

UNIVERSTY COLLEGE LONDON

FACULTY OF THE BUILT ENVIRONMENT

BARTLETT SCHOOL OF PLANNING

Designing for social interaction in high-density housing: a multiple case analysis of recently completed design-led developments in London

Henry Mellen BSc

Being a dissertation submitted to the faculty of The Built Environment as part of the requirements for the award of the MPlan City Planning at University College London:

I declare that this dissertation is entirely my own work and that ideas, data, and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

.....

Friday 9th July 2021

Word count (main body): 15,892

Word count (including appendices and references): 19,096

Acknowledgements

The submission of this thesis marks the completion of my two-year journey at the Bartlett School of Planning. I've enjoyed the most wonderful learning experience at UCL and I want to thank all of my tutors, lecturers and fellow peers for making it so. In particular, I wish to thank my course director and dissertation supervisor, Dr. Michael Short, for his continual guidance and advice. My postgraduate experience would not have been the same without his care and dedication.

Secondly, I wish to thank the lead architects and residents of 95 Peckham Road, Royal Road, and Wharf Road. Without their contributions to this research, its findings may never have seen the light of day.

Thirdly, I must thank my parents, Angela and Joe Mellen, who fully supported my decision to return to university in an attempt to change my career direction. They have also admirably endured living with a young man in his mid-twenties who could not afford to pay rent in London during his studies.

Finally, I wish to thank my partner, Millen Brown-Ewens. She has been a continual support over what has been a difficult period for many during the Covid-19 pandemic. In addition to proof reading much of my writing, she has helped me to find perspective when I've been particularly overwhelmed by competing commitments.

Abstract

Over the past two decades, the Greater London Authority (GLA) has pursued the delivery of high-density development in London in order to respond to population growth whilst protecting the green belt. Though high-density places have been associated with sustainable outcomes, it is well documented that residents interact less frequently and build fewer relationships in these environments. This can be particularly detrimental since social contact is fundamental for our general well-being and happiness.

In response to this problematic, this study explored if and how we can design for social interaction in high-density housing. To do so, it adopted the process of inducting theory from case studies. Firstly, three case studies of recently completed developments were undertaken to determine whether social interaction was a driving factor in the design process, the type and location of social interactions, and clarify the influence of physical design on social contact in comparison to other factors. These design-led schemes were chosen for investigation as award-winning developments which had received commendation for creating the foundations for a strong community. Next, a cross-case comparison was undertaken to identify hypothesis that addressed the research question and objectives.

Providing support for existing literature in the context of high-density housing, it was discovered that limiting the number of apartments to a building allows for collective stewardship, and that communal areas shared by smaller groups are used more intensively. Moreover, combining shared paths and communal areas was observed to support fleeting interactions and helped to nurture a local sense of community. New findings included that externalising the circulation spaces of multi-storey apartment blocks can facilitate conversations between neighbours, and that bike stores can represent an epicentre for contact if internalised and co-located with shared paths. Notably, the impact of physical design factors was not deterministic.

Contents

Tables

Figures

All images and figures are authors own unless otherwise stated.

1 Introduction

Since the turn of the millennium, the Greater London Authority (GLA), has pursued the delivery of higher density development to respond to population growth whilst protecting the green belt. In the most recent version of the London Plan, published in March 2021, this strategy fell under the banner of "making the best use of land" (p. 15). It has had a significant impact over the past two decades, and increasingly, high-density developments are now being accepted by local planning authorities with regularity (HTA et al., 2007).

Higher density, mixed use places have been associated with increasing active travel, burgeoning local economies, and providing the critical mass of people required to support investment in public facilities. However, forthcoming high-density developments have also been criticised for limiting interaction between residents and inhibiting the formation of strong social ties. The quality of internal circulation spaces is regularly curtailed in these schemes in an effort to maximise net to gross ratios, making them less conducive to sociability. Moreover, they often include relatively small outdoor communal areas which are overshadowed by the buildings that surround them, reducing their attractiveness to use.

Herein lies the research problem; in the case that administrative bodies continue to pursue higher density development, can this be delivered in a way that permits sociability and the development of strong communities, and if so, how? The importance of this subject is underlined by the Covid-19 pandemic which swept across the world in 2019 and forced the imposition of restrictions on social contact internationally. As a result, people were prompted to acknowledge the influence of interaction on physical and mental well-being, in addition to the value of weak social ties in enabling mutual aid. To capture these benefits in future high-density developments, it should be considered an imperative that they are not designed in a way that inhibits social contact.

In a search for answers, this thesis adopted the research methodology of building theory from cases. Namely, a multiple case analysis of recently completed design-led developments in London was undertaken. Given the context of this study, density was understood using the GLA's definition – housing density – which is a measure of the number of homes per hectare. Moreover, high-density was considered to be around 250 dwellings per hectare. This is significantly greater than the judgements of previous academics in the UK but is reflective of

current trends. Each of the developments selected were designed by award-winning architecture practices and had received commendation for their high-quality design, thus making them a suitable point of departure.

Providing a strong foundation for this study, the next chapter critically assesses existing literature relevant to this investigation and highlights the gap in the research which this research attempted to address. Subsequently, an explanation of and justification for the adopted research methodology is discussed in Chapter 4. In brief, the research methodology and the methods embedded within it were selected based on their capacity to respond to the research question and objectives (Table 1). Chapter 5 sets out the data collected for each of the case studies in relation to the research objectives, this evidence is analysed collectively in Chapter 6. In addition to outlining the findings of the cross-case analysis, Chapter 6 also delineates hypotheses that respond to the research question and situates these findings within the literature. Finally, this thesis is concluded in Chapter 7 which summarises and reflects on its findings, highlights the new knowledge that this study has contributed, and makes recommendations for future work.

Research question	Case study objectives
Can we design for social interaction in high-density housing, and if so, how?	(i) To identify if and how social interaction was considered in the design process
	(ii) To determine the type, location and meaningfulness of social interactions
	(iii) To examine how physical design may help or hinder social interaction
	(iv) To understand the importance of non-physical (e.g., personal, socio-cultural, and temporal) factors on social interaction

Table 1: Research question and case study objectives

2 Literature Review

This chapter provides an overview of the literature relevant to this investigation. The material has been broken down into six sub-sections, all of which are necessary to understand the purpose of the study.

The first two sub-sections explain the importance of social interaction and differing understandings concerning the relationship between the built environment and human behaviour. Next, the findings of previous studies concerning how physical design can facilitate interaction are summarised. Fourth and fifthly, 'high-density' is defined and its impact on urban form and human behaviour elaborated upon. Finally, the policy approach in London to "mak[e] the best use of land" by permitting high-density development in locations of high transport accessibility is delineated (GLA, 2021, p. 15).

To conclude, this chapter reflects on the interconnectedness of these different topics and underlines the need for detailed research that seeks to understand how design can enable social interaction between residents of high-density developments in London.

2.1 The importance of social interaction

One outcome of the Covid-19 pandemic, which necessitated restrictions on social distancing in many countries around the world, has been an increased recognition for the importance of social contact. However, this is not new information and there exists a large body of research which links social interaction with positive physical and mental health outcomes, a higher level of trustworthiness, a greater sense of belonging, and increased happiness (Montgomery, 2013, House et al., 1988).

Notably, it is not only the meaningful relationships we have with friends and family which are important. The seminal argument of Jane Jacob's book *The Death and Life of Great American Cities* (1992) dictated that the net sum of lower intensity, more trivial contacts – exemplified by fleeting conversations with or borrowing from neighbours – is the development of invaluable social capital. She defined this as "a feeling for the public identity of people, a web of public respect and trust, and a resource in time of personal or neighbourhood need" (ibid, p.

56). Findings from recent studies of national surveys in Canada by John Helliwell reinforce this. He found that casual connections have a strong relationship to someone's sense of belonging to a community, which is in turn associated with a higher level of local trust and individual happiness (Helliwell and Barrington-Leigh, 2010). In fact, casual connections were found to be almost as important as familial connections and stronger than those we have with close friends (ibid).

2.2 The influence of the built environment on human behaviour

Understanding the relationship between people and their physical environment is essential for planners, architects and other built environment practitioners whose work creates the setting upon which life stories unravel. Despite the depth of research on this topic, there are number of different perspectives surrounding the degree to which the environment influences peoples actions (Carmona et al., 2010, p. 133). One view which has endured through time is that of environmental determinism. This ancient school of thought assumes that "nothing is free of the influence of environment" and thus "all events, including human actions, are predetermined" (Fekadu, 2014, p. 133). Notwithstanding the prevalence of environmental determinism, it has been heavily criticized. According to Franck (1984, p. 411), this view underestimates the impact of other factors on human behaviour, portrays people as passive agents incapable of making their own decisions, and assumes that the environment is "a given and immutable entity" unalterable through human intervention. Reacting to this traditional way of thinking, the counter-alternative of environmental possibilism emerged. This theory argues that:

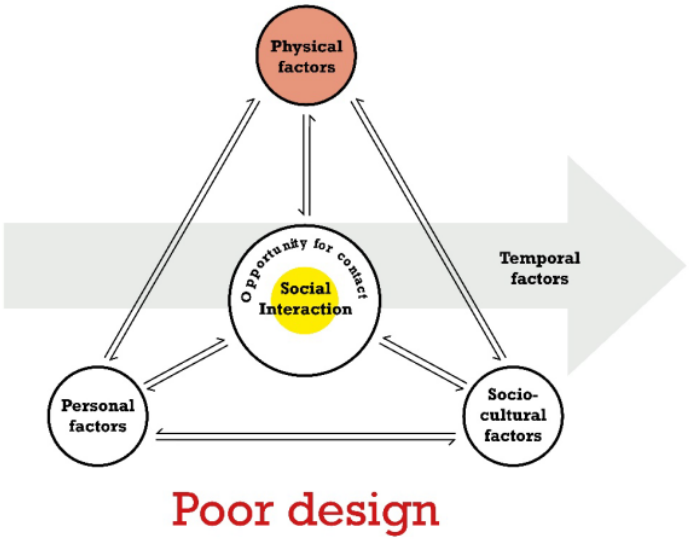
> "The milieu … does not compel or direct man to do anything. The milieu is simply there … In the possibilist doctrine, the milieu is conceived as a set of opportunities and limitations" (Sprout and Sprout, 1965, p. 83).

Although this theory acknowledges the bi-directional relationship between people and place, it reduces the role of the environment to providing 'affordances' for action (Lang and Lang, 1987). Such an approach suppresses the value in studying our human environments and insinuates that the design of place has little or zero significance.

The surfacing of environmental probabilism has broken the aforementioned dichotomy by recognising human agency whilst arguing that "the human environment makes some human

responses more probable than others" (Flowerdew, 2009, p. 29). One example of this is provided by research into alternative classroom design. Aware that students' grades and interaction with their peers declined in typical straight-row classrooms as you move from front to rear, Robert Sommer and his associates assessed the impact of a more 'soft' arrangement (Sommer and Olsen, 1980). By organizing fabric covered seating in hexagonal clusters, it was found that voluntary, non-voluntary, and student-to-student participation increased throughout the class. Design was found to be influential, but not deterministic – extraneous factors such as the temperature, time of day, type of class and gender all had an influence on the results.

The ideas of probabilism can be enriched by the theory of social ecology which seeks "to understand complex patterns of causation where individual and group behaviours are influenced by, and influence, social and physical structures" (Zimring et al., 2005, p. 187). Models of social ecology recognise that opportunity for social contact can be amplified through good design but assume that interaction will only eventuate through a combination of personal, socio-cultural and temporal factors. This study has adopted this worldview, the workings of which are presented in Figure 1.



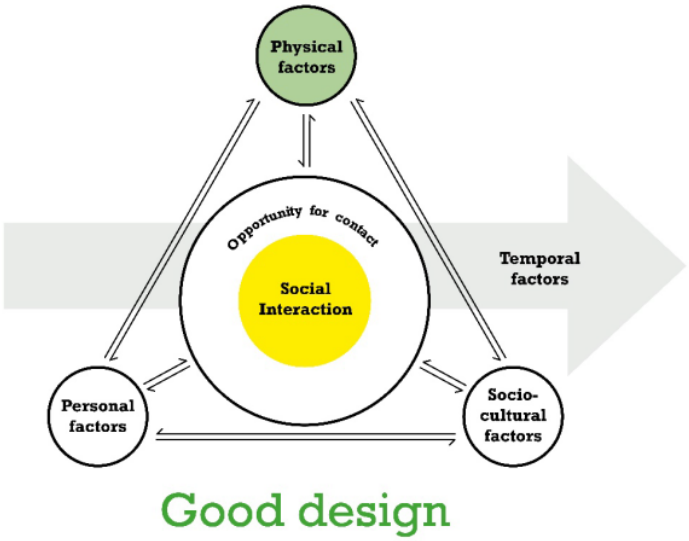


Figure 1: The impact of good design on the opportunity for contact

2.3 Designing for social interaction

Cognizant that social interaction is of great importance and that human behaviour can be influenced by physical design, research has been undertaken to study how it can be promoted in residential environments. For the most part, this literature does not directly analyse or clearly exemplify solutions for high-density housing, the research gap that this investigation intends to address. Nonetheless, its findings are worthy of attention and the following few sections represent a critical summary of these.

2.3.1 A hierarchy of space and smooth transitions between scales

To facilitate sociability, we must carefully moderate the frequency of our interactions. When people are repeatedly placed in situations where they must interact with others, it can lead to a sensory overload whereby "man regulates his social encounters by decreasing the intensity of his interactions" (Valins and Baum, 1973, p. 122). This is exemplified by the behaviour of a modern city dweller who might avoid eye contact with strangers on a busy pedestrian thoroughfare. According to Calhoun (1970, pp. 425-426), this neurological response is a holdover from "biological man" whose "way of life was one of a fairly close group of approximately twelve adults and their associated children". Due to this biological reaction, residents in high-density environments can experience feelings of isolation and over-stimulation at the same time (Montgomery, 2013). They withdraw from their local environment to avoid unwanted interactions, which in turn inhibits them from making more meaningful relationships.

According to Montgomery (ibid), the frequency of our interactions can be moderated by the design of our environment. Whilst it is influenced by human concentration it is not dictated by it. This is emphasized in a 1970 study by Valins and Baum (1973), who compared the behaviour of students residing in two similarly sized but differently configured accommodations. The first arranged dormitories along a long corridor, whilst the second grouped between four and six dormitories in suites. The results of the study indicated that the "corridor dormitories promote excessive social interaction" which leads residents to experience stress and thus develop stress reducing behaviours (ibid, pp. 421). When the students were called into an artificial waiting room as part of an associated experiment, the suite residents were seen to talk and make eye

contact with one another more frequently. It was concluded that those living in the suites had formed stronger relationships with one another.

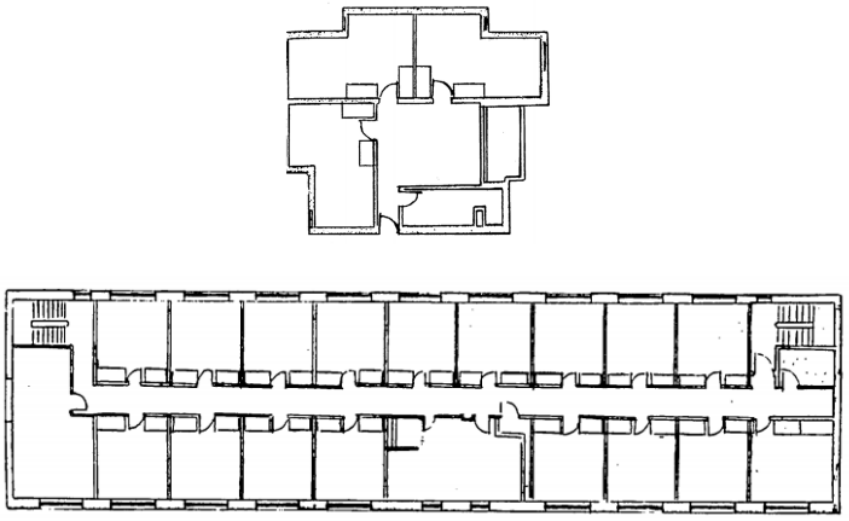


Figure 2: Floor design of suite and corridor dormitories analysed by Valins and Baum (1973)

Oscar Newman's analysis of developments belonging to the New York Housing Authority in the early 1970s further highlights the benefits of a hierarchal urban form. He found that designing space to be compatible with the multi-level organisation of human groups within society would "catalyse the natural impulses of residents" to act as stewards of shared spaces and foster feelings of safety and belonging (Newman, 1972, p. 11). Physically, this embodied a well demarcated hierarchy of public, semi- public, semi-private and private spaces. A key factor to Newman was that of 'number'. This can relate to the number of buildings in a project, apartments to a building, and the number of apartments to a floor or hallway. He argued that the smaller the number at each of these thresholds, the easier it is to build intimate relationships, recognize others and take ownership over common areas. Previous research has failed to suggest optimum limits for the aforementioned thresholds, though some planning authorities in London have adopted soft restrictions (Islington Council, 2013). Other academics have

reiterated that "there appear to be fewer social interactions in large communities … because residents are unknown to each other" (Williams, 2005, p. 199). It can be concluded from the literature that design is capable of regulating the frequency of our interactions with others, but it is unable to negate the feeling of anonymity that comes with being one of many.

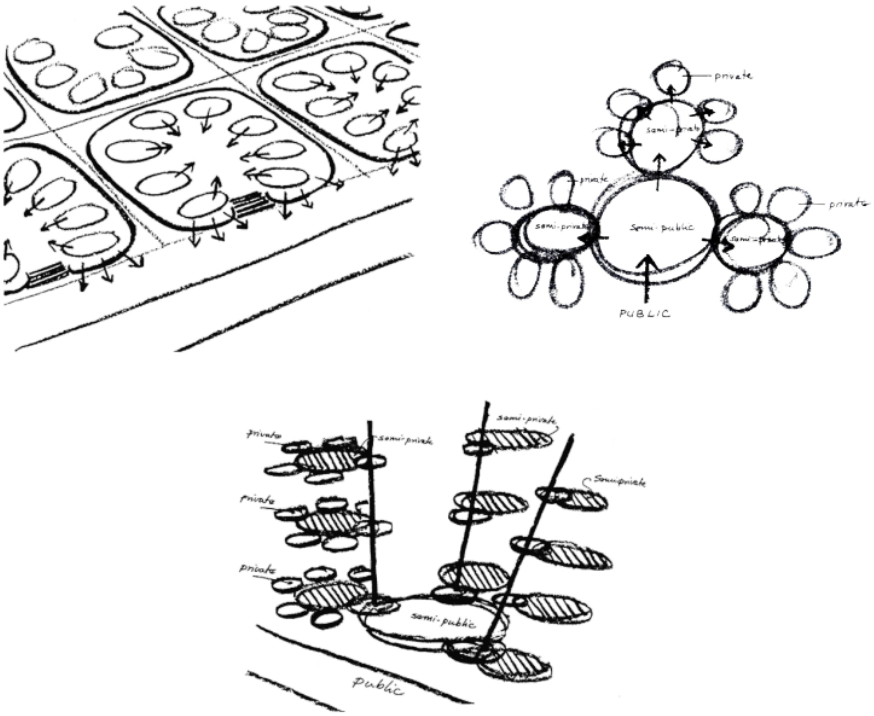


Figure 3: Oscar Newman's hierarchy of space (1972, pp. 9-10)

In some instances, such as where private residences are accessed from the street or public spaces, it is not possible to transition through semi-public and semi-private scales. This harsh public-private interface "has long been an issue of great concern in urban design, planning and architectural theory". Nonetheless, academics have argued that it can be mediated through the introduction of front and back gardens or terraces (Dovey and Wood, 2015, p. 1). In addition to delivering privacy, these spaces are said to provide "options for active contact into adjacent public space" (Skjaeveland et al., 1996, p. 193). They have also been associated with individual

expression and the reduction of crime through passive surveillance (Abu-Ghazzeh, 1999). According to studies conducted in Melbourne, the optimum depth of a front yard for the purposes of sociability is between three and four meters (Gehl et al., 1977). Shallow enough for interaction but deep enough to permit retreat.

2.3.2 High quality circulation spaces

The vast majority of social interactions between residents take place in the circulation areas of high-rise or multistorey apartments. Nguyen et al. (2020, p. 19) provided discrete justification for this in an analysis of four of these buildings for low-income people in Hanoi, Vietnam. She found that 46% of interactions took place in these areas including long chats, greetings and supervised play. In spite of this, academics have noted that the quality of these spaces in recent developments has succumbed to the combined forces of modernist architecture, the rise of the elevator, and developer greed. As early as 1977, Christopher Alexander wrote of modern architecture that "the ugly long repetitive corridors of the machine age have so far infected the word 'corridor' that it is hard to imagine that a corridor could ever be a place of beauty". Meanwhile, Mclennan and Oldani (2018, p. 10) more recently articulated:

> "Hallways are begrudged [by developers] as an unfortunate utilitarian necessity and minimized as much as codes will allow in pursuit of net-to-gross ratios that are as high as possible for maximum short-term gain".

Previous studies show that access to natural light and ventilation are key design principles for circulation spaces. If applied, they can encourage residents levels of activity, improve wayfinding, and enhance perceptions of security and control (Kennedy, 2015). With regards to multi-family high-rise developments in particular, Bee and Im (2016) has argued that sociability and the formation of 'micro-communities' can be encouraged through the incorporation of numerous small spaces within the existing movement network. This approach appears rational as it would simply make the environments that she has found most interactions take place in more appropriate for contact. It is also directly compatible with Newman's hierarchy of space (Figure 3).

2.3.3 Arrangement, amenity and flexibility of shared spaces

Shared spaces are reported to "provide excellent opportunities for social interaction" but their arrangement, amenity value and flexibility is paramount (Williams, 2005, p. 199). In the first instance, an effort must be made when composing the site layout to increase the possibility for casual encounters. Previous research on cohousing indicates that social contact can be intensified if community spaces are central, co-located with community facilities, visible to residents, and intersect with shared paths (Durrett and McCamant, 1989, Fromm, 1991, Torres-Antonini, 2001). Communal facilities and shared paths are of particular importance because they have a functional purpose, thus making them "major predictors of the interaction patterns of people who inhabit residential areas" (Lang and Lang, 1987, p. 157). These ideas were recognised by New American Urbanists who felt that orientating the front doors of dwellings towards the street could "give rise to weak social ties" and promote "increased neighbouring" (Roberts, 2007, p. 186). Concentrating public life in this way, by creating a more refined and integrated network of routes and spaces, maximises use and allows for informal policing (Armitage, 2011). Jacobs referred to this phenomenon as 'eyes-on-the-street' (Jacobs, 2016), and argued that it created safer spaces which were increasingly attractive to residents as a consequence.

At the detailed level, staying activities are more likely to take place in communal space if it is attractive to residents (Farida, 2013). In the eyes of Jan Gehl, "a pleasant place in every respect" is one that is safe, provides protection from unpleasant weather or environmental stressors, and allows you to enjoy good weather (Gehl, 2001, p. 171). Kuo et al. (1998) clearly illustrated the favourable impact of vegetation in communal spaces in their study of a low-rise development in Chicago. The complex included a number of identically sized common spaces, some were grey and barren whilst the others were filled with grass and trees (Figure 4). They found that the green common spaces were not only better used but fostered stronger neighbourhood ties and were safer too.

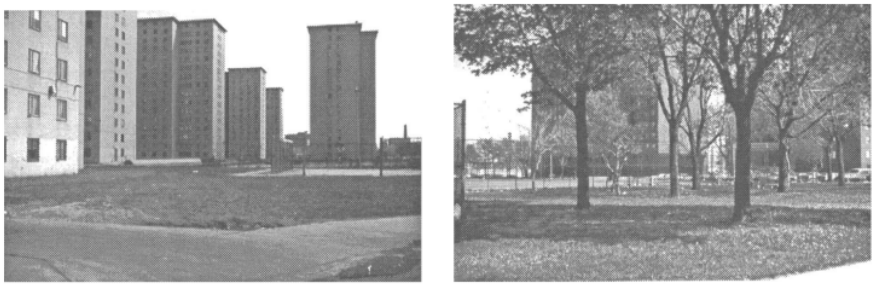


Figure 4: Kuo et al. (1998) studied the use of identically sized but differently designed communal spaces in a social housing development in Chicago

Finally, academics believe that the flexibility of a communal space is equally as important as its attractiveness (Carmona et al., 2010). A 'flexible' space "does not have assigned functions but various functional possibilities" and "allows continuous adaptation to changing circumstances" (Sennett and Sendra, 2020, p. 144). Creating conditions for spontaneity and improvisation increases the appeal of the space to a wider range of residents and provides residents the opportunity to assume responsibility and territoriality (Bee and Im, 2016).

2.4 High-density

Before discussing 'high-density', it is important to understand what is understood by the term 'density'. Language relating to 'density' is used habitually in contemporary planning practices as a tool to curtail sprawl and provide economic, environmental and social value. Nonetheless, academics have noted that there is no absolute measure for the term and it is poorly understood (Livingstone et al., 2021). Typically it is seen as something that is objective and calculated, such as a concentration of people, housing units, jobs or some other indicator of human occupation per unit area (Hess, 2014). However, it may also be seen as something that is perceived and measured according to one's subjective interpretation of the physical, temporal and sociocultural factors at play in a space (Rapoport, 1975).

This thesis is focused on the density of housing, around which there is greater clarity. The purpose for this is that is has "an intricate relationship with urban morphology" and is the density metric adopted by the Greater London Authority, who are responsible for the form of

development in the capital (Ng, 2009, p. 9). Housing density – also referred to as residential density – is calculated by dividing the number of homes by the area of land that they occupy (Pafka, 2013). It may be further classified in either 'net' or 'gross' terms according to the boundary of the land area in question. Net residential density focuses solely on the area of land covered by residential development. Meanwhile, gross density "considers the residential area in its integrity" by taking into account non-residential land uses such as community facilities, public streets, parks and civic spaces (Ng, 2009, p. 4). Since the definitions of net and gross densities vary across different cities and countries, making comparisons between residential density figures from different sources can be difficult (Pafka, 2013). In this study, residential density was understood using the GLA's definition of 'net residential area' (GLA, 2016). This means that major distributor roads, primary schools, open spaces serving a wider area and significant landscape buffer strips were excluded from the area boundary.

Cheng (2010, p. 14) has previously underlined that the meaning of high-density "is subjective and depends upon the society or individual's judgement against specific norms". As it is a qualitative judgement, it is ultimately influenced by the cultural and contextual factors specific to the individual making the assessment. This is clarified upon comparison of definitions of high-density from scholars in different contexts. It has been quoted as being between 100 and 150 dwellings per hectare in the UK, but up to 290 dwellings per hectare in Israel (Blanc et al., 2020, Churchman, 1999). In response to current trends in the density of forthcoming development in London, each of the schemes assessed in this research had densities of around 250 dwellings per hectare.

2.5 The impact of high-density on urban form and human behaviour

The relationship between residential density and urban form is a complicated one. In the first instance, it has been shown that "urban developments of the same density can exhibit very different urban forms" (Ng, 2009, p. 9). Equally, Alexander (1993) provided "a mixture of support for and contradiction of the proposition that densities are highly associated with dwelling forms or housing types" through the systemic analysis of 99 building layouts. He found that different dwelling types were associated with a range of possible densities due to constraints such as access, parking and the nature of the dwelling form (Figure 5). It follows that increasing density will ultimately increase the number of floors required from

development, thus leading to the delivery of multi-storey apartment buildings (Figure 6). Since these building forms have been reported to incur a host of barriers to social interaction, delivering high-density housing can be problematic.

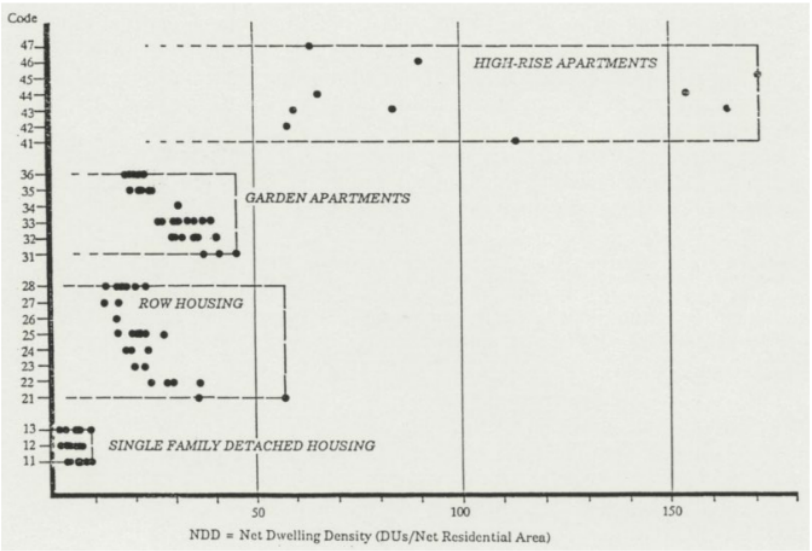


Figure 5: Alexander (1993) exhibited some support for the assertion that housing types are associated with density

Following an analysis of multi-storey apartment buildings in Jordan, Abu-Ghazzeh (1999, p. 63) found that social activities more or less cease outside the buildings because "it is too bothersome to come down and go out in the public areas". This resistance has a particularly detrimental impact on children. Since their parents are unable to supervise outdoor play from inside their homes, they tend to confine them indoors. Moreover, when they do make their way outside, they are typically unsupervised. A study which interviewed mothers of under 5s in Crus Park, an estate in Newcastle upon Tyne, found that this imprisonment was associated with health and personality disorders amongst children (Gittus, 1976). Notably, a lack of proximity is not the only reason for the underutilisation of communal spaces in multi-storey housing. Due to the scale of the buildings, these spaces are often overshadowed for large parts of the day. This can provide refuge for those living in hotter climates, but significantly reduces their

attractiveness in northern Europe where "both light and sun are highly valued qualities" (Gehl, 2001, p. 92).

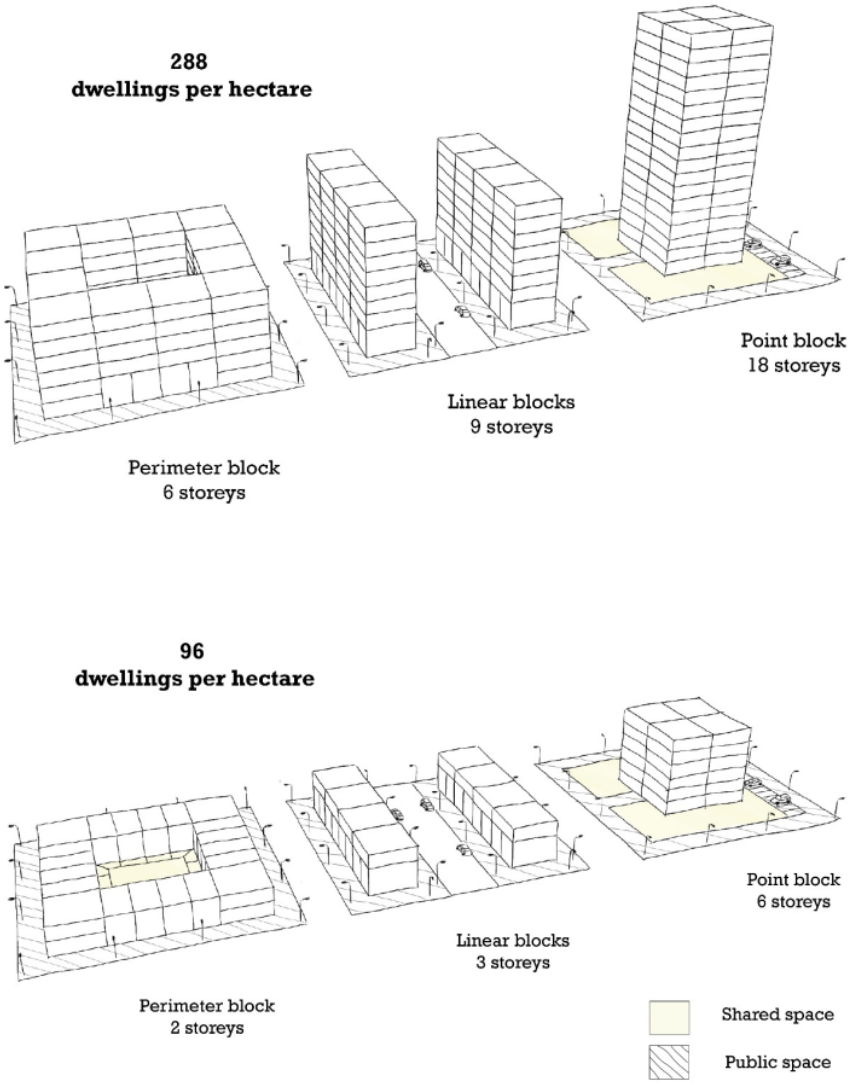


Figure 6: Potential variation in urban form at different densities. Dwellings are equivalent to 80m2 (i.e. 2b 4p 2 storey or 3b 4p 1 storey dwellings according to minimum space standards) (DCLG, 2015). 20% circulation space is also included.

Finally, communal spaces in high residential density developments are shared by a great number of residents. This can hinder sociability because residents are less inclined to participate in communal activities and use shared spaces when they belong to larger communities (Birchall, 2014). It was described in a previous section that establishing a hierarchy of space provision – whereby there are limits on number of residents at each layer of the environment – facilitates territoriality and interaction whilst ameliorating anonymity and overcrowding (Newman, 1972, Valins and Baum, 1973). There is a clear conflict in attempting to reduce the number of flats to a floor, core, building, and development whilst trying to maximise the number of apartments per unit area.

2.6 Planning for density in London

The London Plan (GLA, 2021, p. XII) has predicted that the city will imminently experience a "wave of [population] growth, the likes of which we've not seen for a century". Rather than divert this level of growth elsewhere, the GLA sees it as both a challenge, a "once in a lifetime opportunity", and is actively planning to deliver new homes at an unprecedented rate (ibid, p. XII). The solution proposed by the GLA to cater for this growth while protecting the green belt is to "mak[e] the best use of land" by creating high-density, mixed use places in locations that are accessible and well connected (GLA, 2021, p. 15).

This policy approach is not new and has been pursued by the GLA since the millennium. At around this time the Urban Task Force successfully encouraged the government to relax restrictions on density and promote development on inner city brownfield sites to cater London's growing population (DETR, 2000, Urban Task Force, 1999). To help "achieve an urban renaissance through higher density and intensification in line with public transport capacity" the sustainable residential quality (SRQ) matrix was adopted in 2004 which provided upper and lower residential density limits for different types of location (GLA, 2004, p. 6). It eventuated that the rhetoric concerning increasing density proved more powerful than the systems put in place to govern it – 50% of development exceeded the matrix maximum for its location by 2017 (GLA, 2017). In part due to its diminutive influence, the SRQ matrix was omitted from London Plan 2021 which favours a design-led approach to optimising density (LSE, 2019).

The impact of the GLA's policy response to development pressure is palpable. Throughout the 20th century it was uncommon for developments to take place in London at densities higher than 150 to 200 dwellings per hectare (HTA et al., 2007). In contrast, increasingly high-density developments have since been approved by London planning authorities and "hyperdensity" developments are now being approved with regularity. 'Hyperdensity' is a term coined by NLA to denote developments at densities of greater than 350 dwellings per hectare (HTA et al., 2015).

2.7 Summary

Though a consensus is yet to be achieved regarding the impact of the built environment on human behaviour, there exist a host of previous studies that outline how physical design can support social interaction. However, the design principles they recommend are particularly difficult to achieve in high-density environments. Notwithstanding a strong research base underlining the insociability of high-density housing, few studies have been conducted that analyse how we can increase the opportunity for social interaction in these environments. This is the research gap which this thesis has attempted to address. The importance of this study in the context of London is two-fold. Not only is social interaction essential for our physical and mental well-being and the development of weak social ties, but the GLA are continuing to pursue an agenda that is delivering environments which limit its emergence.

3 Methodology

The purpose of this section is to describe and justify the selection of research methodology and the methods embedded within it. Details will also be provided regarding the epistemological perspective of the research, selection of study participants, and any ethical concerns. Efforts made to ensure the reliability of the research undertaken will be intertwined within each subsection.

3.1 Philosophical statement

This research, in addition to the choice of the research methodology which informed its direction, was guided and influenced by the compatible philosophies of environmental probabilism and social ecology. Namely, that the physical environmental makes certain types of human behaviour more probable than others, but a person's actions are ultimately determined by a combination of physical, personal, socio-cultural, and temporal factors. This blended worldview is ill-defined by existing research paradigms and can be understood as both postpositivist and constructivist in nature. On the one hand, it is suggestive that there does exist a common reality in which "causes probably determine effects or outcomes" (Creswell, 2003, p. 25), and the factors influencing a person's behaviour can be determined and distilled through research with neutrality. Meanwhile on the other, it is recognised that a person's behaviour cannot be understood through empirical or numerical measurement and requires a detailed understanding of their motivations (Table 2).

Postpositivist Principles	Applicable?	Constructivist principles	Applicable?
Determination	Yes	Understanding and interpretation	Yes
Reductionism	Yes	Multiple participant meanings / realities	No
Empirical observation and measurement	No	Socio-cultural, and historical construction	Yes
Neutrality	Yes	Strong objectivity	No

Table 2: Breakdown of the postpositivist and constructivist principles applicable to the worldview of this study. Adapted from (Leavy, 2017)

3.2 Research strategy

In recognition of the worldview adopted by this study, and that little existing literature details how physical design can encourage social interaction in high-density housing, the research strategy of theory building theory from cases was adopted. First pioneered by Eisenhardt (1989), many scholars have since practiced this research strategy which can be understood as the application of the multiple case study approach within a grounded theory methodology (Alzaanin Dr, 2020). Theory building from cases combines the capacity of the case study "to gain an in-depth understanding of the situation and meaning for those involved" (Merriam and Tisdell, 2015, p. 19), with the ability of grounded theory to build theory inductively. Typically, research methodologies will deduce a hypothesis from a body of general theory at the beginning of the study to be tested. In contrast, the grounded theory approach aims to produce a hypothesis (or set of hypotheses) from the data collected that responds to the research question (Laws and McLeod, 2004).

Acknowledging the power of single-case studies to understand their particular in depth (Siggelkow, 2007), undertaking multiple case studies is deemed most effective when building theory. Firstly, this approach enables broader exploration of the research question and allows for comparison of findings between individual cases. Moreover, it improves the reliability of the study's findings, since the risk of making conclusions that are specific to the unique conditions of a particular case are negated (Yin, 2009). Only three case studies were undertaken as part of this thesis. Conducting a greater number would have been preferable, however the resources required to deliver each in depth and the time constraints applied made it difficult to do so. The research process is exhibited in Figure 7, and its constituent stages will be described in the remainder of this chapter.

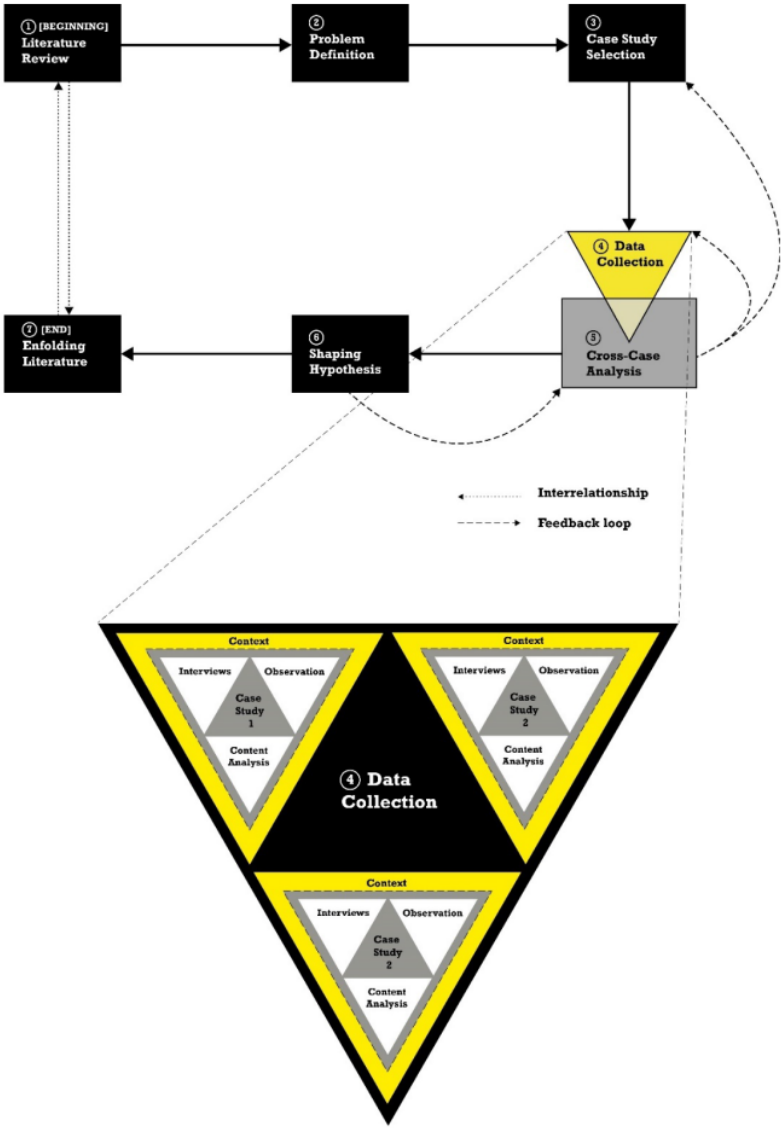


Figure 7: Illustration of the research process applied within this study (adapted from Eisenhardt's (1989) roadmap for building theory from cases)

3.3 Case selection

Following the problem definition, case studies were selected according to the 'theoretical sampling' approach. In other words, they were determined based on their likelihood to address the research question, generate theory, and "offer insights into the phenomenon of interest"

(Ridder, 2017, p. 286). This entailed choosing three high-density developments that had received commendation for their high-quality design and creating the foundations for a strong community. The three developments selected – 95 Peckham Road, Royal Road, and Wharf Road – are each introduced in Chapter 4. All of these schemes were situated in inner London, had a similar density of around 250 dwellings per hectare, and involved the delivery of a large number of units.

3.4 Data collection

Primarily, each of the case study developments were investigated through semi-structured interviews with architects and residents of the scheme. The focus of the interviews with architects was to understand the rationale behind the design of their schemes and identify to what extent facilitating social interaction was a driving factor. Conversely, interviews with residents were intended to determine the type, location and meaningfulness of social interactions they have with neighbours, and to understand non-physical factors that might influence their sociability. The questions asked of both architects and residents can be found in
.

Semi-structured interviews embody a list of questions or topics to be explored, whereby neither the exact wording or chronology of the questions is predetermined (Merriam and Tisdell, 2015). They are particularly useful in qualitative studies, since their openness enables the interviewer to probe for a deeper understanding and ask for clarification (Barriball and While, 1994). Moreover, they recognise the subjective experience of respondents since interviewees are able to use their own words, something that is not afforded by a structured interview or survey. In addition to these advantages, the lightweight structure of semi-structured interviews ensures that the two-way communication between interviewer and respondent remains on topic, thus resulting in the collection of useful data (DeJonckheere and Vaughn, 2019). All interviews were conducted using video conferencing software, using plans of the development as prop from which to facilitate the conversation. Each conversation was recorded and then transcribed to allow for post-interview data analysis.

Notably, interviews represented just one of three research methods used to investigate the case study developments. Content analysis and participant observation was also undertaken to

support interview findings. When building theory from cases, the use of multiple data collection methods is considered to build validity in the hypotheses that emerge from the study (Zohrabi, 2013). Here, content analysis is used to define the systematic investigation of texts and audio-visual content sources from books, newspaper articles, blog posts, and web pages. Meanwhile, participant observation was guided by the methods of Gehl and Svarre (2013), which included the taking of photographs and reactive field notes.

Typically, studies that build theory from cases stop collecting data when theoretical saturation has been reached. Theoretical saturation describes the point at which the researcher has certainty that no new information regarding the topic under study would result from further investigation of existing cases, or the addition of new ones (McLeod and Laws, 2004). Nevertheless, in this study time constraints determined the point of closure – an outcome that is not without precedent (Eisenhardt, 1989).

3.5 Overlapping data collection and analysis

A key feature of theory building from cases is overlapping data collection and analysis. This feature, known to grounded theorists as the "constant comparative method" (Glaser et al., 1967, p. 101), enables adjustments to be made during the data collection process. Making adjustments, which could include the addition of new cases or interview questions, allow the interviewer to further explore and evidence emerging themes in the data (Urquhart, 2012). Whilst contested, such an approach is deemed legitimate in the case of theory building research, whereby its aim is to study each case in as much detail as possible (Eisenhardt, 1989). In this study, initial interviews with residents from 95 Peckham Road highlighted the pervasive influence of social media groups on social interaction, a topic area that was later probed in interviews with residents of other cases.

3.6 Data analysis

Data analysis in studies that build theory from cases adopts a two stage process, with a "searching for cross-case patterns" following within-case analysis (Eisenhardt, 1989, p. 540). Taking the approach of Gersick (1988), descriptive and analytical case study write-ups were

composed for each development in the first instance, using the words of research participants wherever possible. These write-ups were formed iteratively, being manipulated as new data was collected, and condensed versions of these are included in this document. In enabling patterns and themes regarding the impact of building form on social interaction to emerge from each case, these write-ups proved of great value before the search for cross-case patterns. In this search, themes or concepts that emerged from one case were then investigated in others and vice versa.

The process of coding played a key role in assisting the analysis of collected data including interview transcripts, field notes, texts, and audio-visual content. Simply, coding refers to "assigning some sort of shorthand designation to various aspects of your data so that you can easily retrieve specific pieces of the data" (Merriam and Tisdell, 2015, p. 173). In this research, coding was used to highlight data which referenced different themes and concepts concerning the relationship under study. Coded data usually took the form of sentences rather than individual words, and was assisted using nVivo, a qualitative analysis software.

3.7 Shaping hypothesis and enfolding literature

Throughout the process of data analysis, relationships between social interaction and the physical design of the developments under study began to emerge. In the shaping of hypothesis, constructs were first defined before being tested rigorously against each case study. The overarching principle applied was that of 'replication logic'. According to Yin (2009) replication logic assumes that each case study is treated as an individual experiment which may or may not dispute a construct that has emerged from the data. Cases that directly support the definition of a construct build validity, whereas a contradictory case calls for its redefinition. To conclude the process, the hypotheses that emerged from the study were situated within existing literature.

3.8 Statement of ethics

This research was conducted in alignment with the UCL Code of Conduct for Research (UCL, 2013). As such, participant consent forms were shared with all study participants before their involvement. These forms detailed sufficient information about the purpose of the research, the

form of participation required, and the processing of personal information (which was undertaken in accordance with the Data Protection Act guidelines). Notably, participants were made aware that they could withdraw from the research at any time, and an example participant consent forms can be found in the Appendices. All data which has been presented in this thesis has been done so anonymously, meaning it is not possible to identify research participants.

3.9 Summary

This section has summarised and given justification for the research strategy of the study, which is centred around Eisenhardt's methodology of building theory from cases. Key principles of this approach including 'theoretical sampling', overlapping data collection and analysis, and the application of 'replication logic' have been explained. In the following chapter, the case study write-ups will introduce the developments under examination and detail the results from their analysis.

4 Case Studies

This section represents the output to phase 4 of the research process (Figure 8) and will set out the data collected for each of the case studies in relation to each of the research objectives. These included to identify whether social interaction was a driving factor in the design process, determine the type and location of social interactions, and clarify the influence of physical design on social contact in comparison to other factors. The data for each case study was collected using three research methods: interviews with the lead architect and residents, observation, and content analysis. This data will provide the basis for the cross-case analysis that will be conducted in Chapter 5.

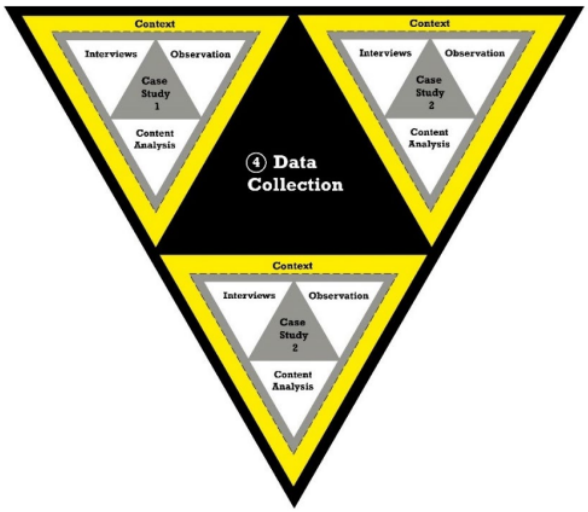


Figure 8: Phase 4 of the research process (excerpt from)

4.1 95 Peckham Road

Figure 9: 95 Peckham Road (Ravenscroft, 2020)

4.1.1 Introduction to the case

95 Peckham Road is a mixed tenure development of 33 apartments (including two social rented and six shared ownership properties) in Peckham, London that was completed in 2019. Designed by Peter Barber Architects (PBA), the development includes a combination of typologies including a "tenement-style mansion block" parallel and adjacent to the street that rises to six storeys, and a litter of maisonettes at its rear which enclose a small and slender

courtyard space (PBA, 2021). Since the size of the plot is just 0.13 hectares, the residential density of the scheme is 254 dwellings per hectare, making it the densest of the three schemes studied. Following its completion, the development received high acclaim for the quality of its design, winning the New London Awards Housing category in 2020 as well as being shortlisted for the RIBA Regional Awards and the Peckham Architecture Award (RIBAJ, 2020, Johnston, 2019). 95 Peckham Road was of particular interest and relevance to the study because it had been reported that PBA made a distinct effort to facilitate social contact in its design.

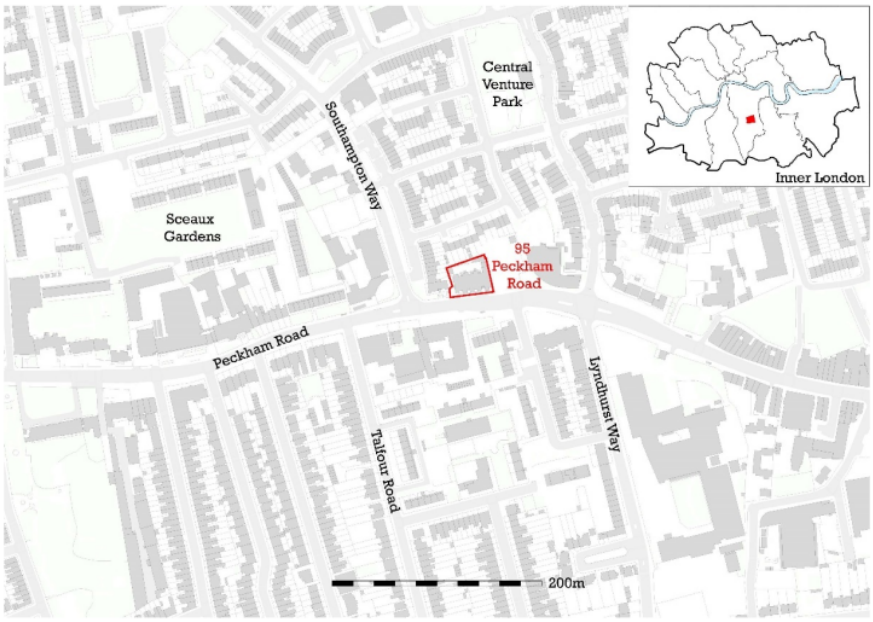


Figure 10: Location of 95 Peckham Road

4.1.2 Design approach and intent

Peter Barber Architects report applying a common approach to all of their projects; to design street-based neighbourhoods of medium-rise, higher-density housing which they endeavour to deliver through the use of houses instead of flats (Brown et al., 2018). Furthermore, by arranging their projects as a tight network of intersecting streets and spaces enclosed by rows

of repeating narrow and articulated building frontages, they make an effort to concentrate public life (Brown et al., 2018). In designing such environments, the practice sees itself as a facilitator of social activity, but not the creator of it.

> "We [PBA] never say that we create social interaction because we're not social engineers. What we try to do is provide the opportunity for and increase the possibility of social activity." (Architect A, 2021)

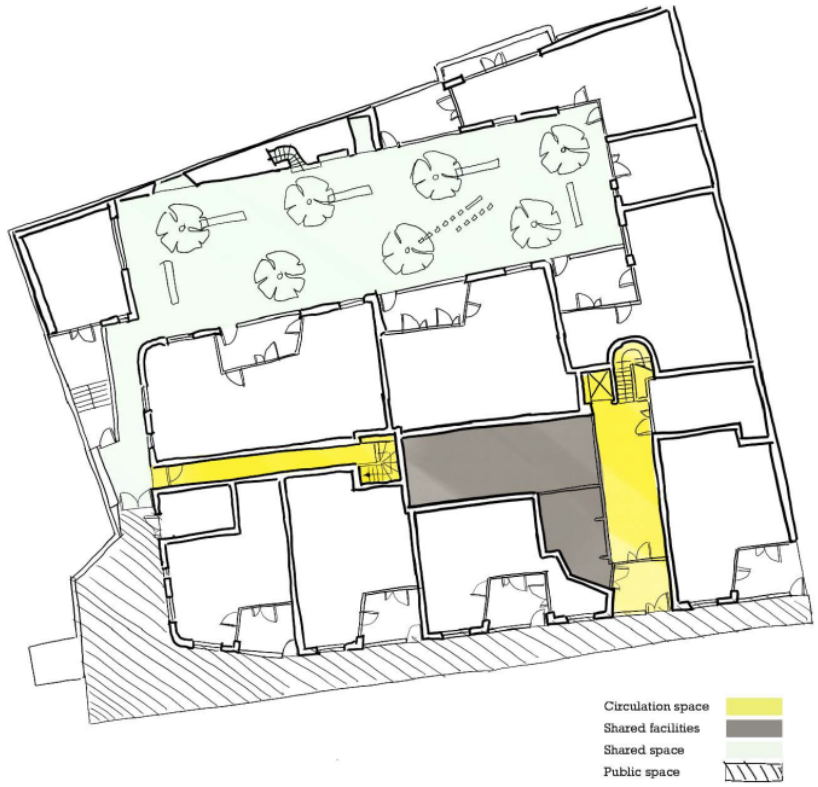


Figure 11: Sketchy ground floor plan of 95 Peckham Road

One method in which PBA attempt to maximize density whilst concentrating public life is through minimising internal circulation. In recognition that residents tend to interact with one

another in circulation spaces most, the practice seeks to draw these interactions out onto the street, an environment they see as being hospitable for social activity.

> "The circulation space is one of the most important spaces on the project where you get that social interaction. But we see the streets and the squares and the courts and so on as where we want our circulation to be … People are far more likely to interact and have a positive engagement in a street or in a square than in a corridor or door or a deck" (ibid)

These principles led to the adoption of the mansion block typology at 95 Peckham Road. Mansion blocks are capable of achieving relatively high densities, include minimal circulation, and have regular points of access. PBA modified this typology by ensuring that each of the homes on the ground floor were given private access to the street or courtyard at the rear, thus maximizing the number of doors opening out onto the public realm, and further decanting circulation patterns from inside the building to the streetscape. The upper apartments are accessed through a side entrance at the west of the building (six apartments), and the main entrance spills out onto the street (13 apartments). Excluding the top floor of the mansion block, the number of apartments is limited to three per floor.

The most distinguishing feature of 95 Peckham Road is its form. The massing of the building gradually steps back from the pavement, and its façade has a notched profile reflective of a castle parapet. The purpose of these design interventions was two-fold. Firstly, it responded to the local context. The first two stories of the building align with the low-rise health clinic to the east of the site, and the top two stories align with the buildings to the west. Additionally, the notched profile of the roofline was believed to lessen its perceived height. Secondly, it created private outdoor terraces for the majority of the apartments within the scheme, the outcome being that just three of the 33 apartments are without a garden or roof terrace (PBA, 2016). To further enliven these spaces, the practice endeavoured to locate living spaces adjacent to outdoor amenity spaces to ensure one permeated into the other:

> "It's a well-used mechanism to put floor to ceiling glazing between your living and outdoor amenity space. It brings the outside in and increases the sense of space both inside and out. That's definitely something that we will always look to do, and it goes entirely with our ethos of trying to have a really positive, proactive connection to the public space." (Architect A, 2021)

Prior to the buildings completion, PBA envisaged that the "terraces and balconies might have planters and pots with climbers, growies, trailing plants and trees in pots, surrounding pergolas, tables and chairs" (PBA, 2016, p. 32). It was hoped that such activity would animate the façade and create a playful image for passers-by along Peckham Road in the future.

Finally, as a general rule they apply to all their projects, PBA pay attention to the detailed design of public and shared spaces in order to create opportunities for people to engage with one another, whilst acknowledging that they have a secondary function as pedestrian routes (Architect A, 2021). Responding to this, planters, trees, recessed seating, and informal children's play features such as stepping stones were included in the design for the courtyard space at 95 Peckham Road. The architects, hoping that the courtyard would be used intensively by the residents, wrote in their planning application that "the space will be used for informal child's play as well as providing the opportunity for a tranquil moment to read a book on a bench in amongst the blossom trees" (PBA, 2016, p. 38). Ultimately the stepping stones and planters were not delivered.

4.1.3 Living at 95 Peckham Road

Notwithstanding the density of the scheme, residents did not report feeling overcrowded. Its design splits the residents into four subgroups (courtyard access, street access, side entrance, main entrance), meaning their interactions are mediated. In addition, the large windows give each flat a sense of openness, and they are well soundproofed too, thus providing auditory privacy.

> "Considering it's a high-density build, it doesn't feel overcrowded. It doesn't feel dark because the windows are large and we're not tripping over our neighbours." (Resident C, 2021a)

> "The sense of auditory privacy within our own houses, despite the fact that it's quite a high-density build, is really valuable … I'm not disturbed by the sound of my neighbours TV's or anything like that that reminds you that you live just on the other side of the wall to someone else." (Resident F, 2021)

Whilst alleviating feelings of overcrowding, the compartmentalisation of residents was said to have an imperceptible impact on their inclination to take stewardship over their shared environment. Residents have mobilised to rectify building defects, but this was adjudged to have been more significantly influenced by the tenure of their homes and eased by the overall size of the scheme. Nearly all of the apartments are in shared or private ownership, meaning the residents are financially motivated to maintain the quality of their homes and feel a "collective responsibility to the building" (Resident E, 2021a). Moreover, as the development is just 33 apartments large, they find it relatively easy to collectively strategize solutions to significant or persistent concerns through the use of social media and video conferencing technology. Instead of seeing other residents as "anonymous people that live in the same building" (Resident A, 2021a), they are recognised neighbours.

> "We would definitely not be in a WhatsApp group with 200 flats. If we lived in a massive development, I can only imagine that that wouldn't happen." (Resident A, 2021a)

> "There is definitely a sense that most people know each other on the WhatsApp group … I think a bigger group would have made that more anonymous." (Resident F, 2021)

In addition to helping solve practical matters such as leaky rooves, substandard planting and faulty motorised gates, the size of the scheme has benefitted its sociability too. These online forums are used to share personal news, tools and ingredients, and organise events and exchanges that residents felt would not have occurred in a larger group size.

This digitally enabled conviviality is physically apparent in the use of the rear courtyard, which is the site of the most meaningful interactions between residents. Gardening, homeworking, and small social gatherings all take place there, however the frequency with which residents use the space is affected by their visual and physical proximity to it. One resident described a "scale of usage" dependent on a person's location in the development, a diagnosis which was confirmed by the experiences of other respondents:

> "The design [of the space] works extremely well for courtyard residents because it brings them together all of the time. Then it works well but slightly less well for

the shared ownership flats that face the courtyard because our entrance is right by the gate and we are very aware that it is there. And then slightly less well for the owners in the main part of the building that face the courtyard but their entrance is on the road because they have to come all the way around to access the courtyard." (Resident F, 2021)

Figure 12: Rear courtyard, 95 Peckham Road

For the courtyard residents, the courtyard doubles up as an external circulation space, as well as a usable, social one. Over time, fleeting interactions between these residents have metamorphosised into meaningful relationships and they have begun hosting tea parties together on Saturday mornings. Those belonging to this micro-community reported having stronger connections between themselves than with others in the development.

Whilst the exposed brick walls and raw concrete details in the mansion block's internal circulation spaces are appreciated by residents, these narrow routes are monofunctional and "not the best for interacting" (Resident F, 2021). As such, residents belonging to upper flats

have not united in the same way as the courtyard residents. However, there is one space within the mansion block which has provided a source of social contact for some of them – the bike store. This secure and communal facility, which is accessed off of the main lobby and can store 60 bikes, is at full capacity. Several respondents noted having regular, more meaningful conversations in this space with others, and some had even formed relationships as a result. Accessible to everyone, it seemingly allows residents from different parts of the development to cross paths. Moreover, it further concentrates activity in the main hallway which other residents use to access their apartments.

> "I used to bump into another resident [in the bike store] every morning when going to work. I got to know him well and now we have drinks with him and his partner. Also, the bike store is shared with the whole building. The people who live in the courtyard do have to come round to get their bikes, but it does mean that you can interact with people there that you wouldn't bump into in the corridors. It's a very communal space." (Resident A, 2021a)

To conclude, 95 Peckham Road provides an interesting insight into the workings of public-private interfaces. The street-facing ground floor flats and those facing the courtyard have equivalent dimensions, but the lived experiences of residents are diametrically opposed. Whilst Peckham Road, is a busy, noisy and polluted road, the courtyard is a tranquil, relatively inactive and secure space. The observed behaviour of these residents was in direct response to the conditions of their environment. Residents in the rear flats leave their blinds open and utilise their outdoor amenity spaces, whereas those that face the street have blocked out their windows, and prefer not to dwell outside their homes. Interestingly, the comfort of residents facing the courtyard in leaving their largely glazed facades uncovered, in combination with the size of the courtyard, has an influence on the behaviour of other residents when using it. Prior to these homes being occupied, people used the space to exercise. However, following their arrival and aware of the presence of ground floor residents, they no longer feel comfortable doing so. This emphasises that the relationship between private homes and adjacent public or semi-public spaces is a bi-directional one.

Figure 13: The ground floor, street-facing apartments had a very close relationship with the public realm

4.1.4 Summary

Investigating the design of 95 Peckham Road highlighted that it was driven by the goal of sociability. A sense of community does appear to be developing within the scheme, however certain residents have developed stronger relationships than others, and the architecture cannot take sole responsibility for their formation. This case underlined the influence of home ownership on the inclination of residents to look after their shared environment, made a case for the delivery of high-density housing through smaller developments, and emphasised the impact of physical and visual proximity on the use of shared spaces. Unexpectantly, interviews with respondents also unearthed the value of well-designed bike stores as a source of social contact, and the bidirectional impacts of public private interfaces.

4.2 Royal Road

Figure 14: Royal Road (photo by Enrique Verdugo)

4.2.1 Introduction to the case

The square-shaped site of Royal Road is situated just to the east of Kennington Park in Southwark. The development, designed by Panter Hudspith Architects (PHA) includes 96 affordable homes (79% are social rent and 21% are shared ownership) and can be understood as a "a variant of a conventional courtyard block" (PHA, 2018, p. 8). The vast majority of

these homes are accessed from one of the four cores at its corners, whilst eight maisonettes are huddled around a central courtyard on the ground floor. With a site area of just 0.42 hectares, the scheme has a residential density of 228 dwellings per hectare and surpassed Southwark's recommended density threshold. Nevertheless, its plans were accepted by Southwark who believed it to be "an exemplar of high-density development" (ibid, p. 31). Following the development's completion, it won multiple national awards for its design quality and was praised as "a real model for housing at high-density". Moreover, in the eyes of PHA it had "created the foundations for a community, and what … will prove to be much loved homes" (Levitt and McCafferty, 2018, p. 161, PHA, 2018, p. 12).

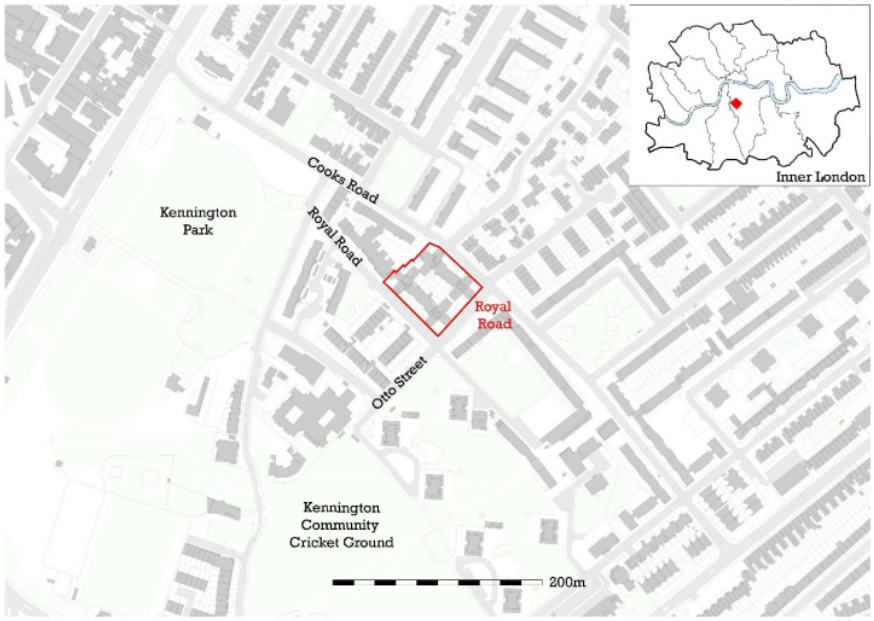


Figure 15: Location of Royal Road

4.2.2 Design approach and intent

Upon visiting the site for the first time, Panter Hudspith became aware of the healthy and mature trees that lined the perimeter of the site. Perceiving the trees as "a gift to the

neighbourhood and the project" and capable of "establish[ing] an immediate character and setting", the team set out to retain them (Architect B, 2021, Guillery and Kroll, 2019, p. 197). They succeeded in doing so by adopting a quartet of linked cruciform blocks, a layout which enabled the delivery of high-quality double and triple aspect homes and a shared courtyard at its heart. Thought and care was channelled into the design of the courtyard space, which included space for children's play with adjacent benches "so that parents could sit and supervise their kids in the playground" (ibid). Ultimately the initial vision for the play space was not delivered as intended due to a lack of funding, materialising as a pit of bark chippings accompanied by two car tyres. Nevertheless, Panter Hudspith had hoped that the courtyard space "might help to create some kind of community cohesion" (ibid).

Other design decisions were also centred around reinforcing the buildings' relationship with the outdoors. The circulation cores were externalised in order to infiltrate these spaces with light and air, and private outdoor amenity spaces were collocated with living spaces in nearly every home. In justifying the provision of front and rear gardens for the maisonettes on the ground floor of the development, Architect B (2021) explained that:

> "Having front and rear gardens is the best way to [promote social interaction]. When people are stopping and spending time in the gardens to maintain them, they have a greater chance of seeing a neighbour than when they are walking to or from their home."

Panter Hudspith's general approach to designing buildings reacts to the steadfast repetition of modernist housing which "results in anonymity and ultimately loss of identity" (Guillery and Kroll, 2019, p. 193). Inspired by medieval towns whose form fosters a strong sense of community whilst allowing room for individual expression, they seek to design places which respond to the questions 'Where is my home?' and 'Where do I live?' (ibid, p. 194). The impact of this ethos on Royal Road was evident both in its approach to circulation and on its façade. Subtle differences in balcony positions, fenestration and brickwork details mean no two homes are the same. Meanwhile on the inside, suites of apartments were adopted over long corridors, the number of doors to a floor is limited to five, and each front door has its own unique position off of the stair core. Panter Hudspith accurately postulated that this might allow residents to take ownership over the space beyond their front door:

"What's really nice is [that] people put their shoe rack or park their pram out there or might get away with storing a bicycle. Many people have [also] hung plants on either side of their front door in this space. You wouldn't do this in a plasterboard corridor with carpet on the floor." (Architect B, 2021)

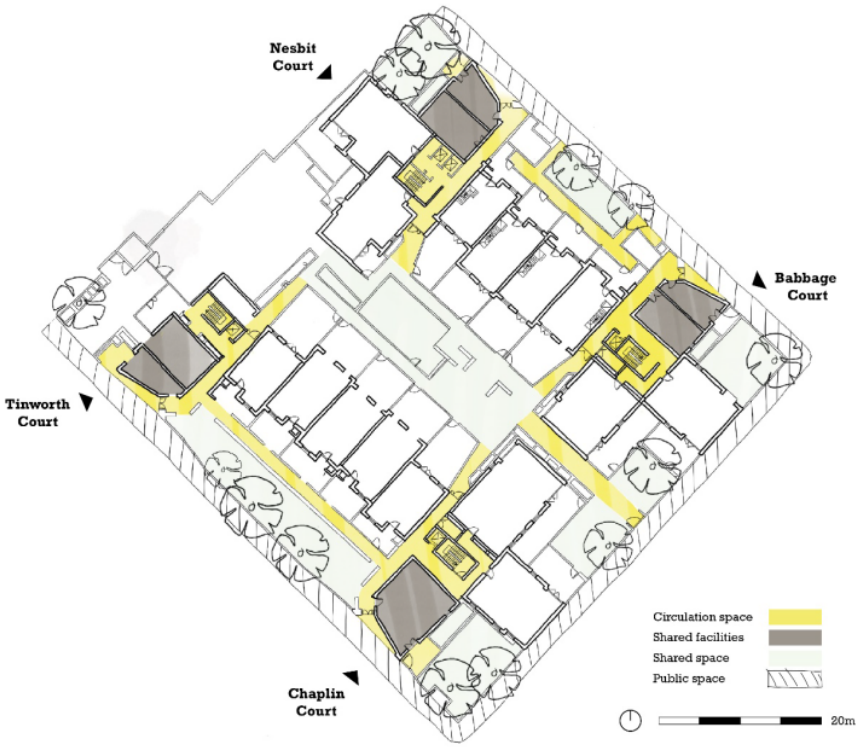


Figure 16: Ground floor plan of Royal Road

4.2.3 Living at Royal Road

The impact of the artistic subtleties carved into the buildings' exteriors did not feature in conversations with residents. If they have any impact at all, it is likely to be an immeasurable and subtle one. Nonetheless, its approach to circulation did. In compartmentalising the schemes

into blocks and adopting suites over long corridors, residents did not complain of having to negotiate unwanted interactions and developed good relations with the small number of neighbours on their floor. Moreover, the design of these circulation spaces, which left them open to the elements and framed views over London at their corners, was understood to increase their sociability. Given that the vast majority of encounters between residents in these buildings reportedly takes place in these areas, their quality represents a great social benefit.

> "This block does have a lot of natural light and air coming in which is very different to the speculatively built development we rented a flat in before … It was very warm and had very long corridors that were uncomfortable. It wasn't very sociable because the space was very tight and hot. Our building doesn't inhibit you from talking to your neighbours like that did. " (Resident A, 2021b)

As aforementioned, residents have expressed some degree of territoriality and ownership over internal circulation spaces in utilising and decorating their doorways. However, few residents have collaborated to take care of the shared spaces within their block or belonging to the wider development. This type of collective stewardship was only observed in the development's smallest block – Babbage Court – which includes 20 shared-ownership apartments. The residents here have created a Tenants Association through which they discussed issues to do with the cleaning, maintenance, and the safeguarding of their shared facilities (Resident C, 2021b). This digitally connected association has also served a social function, facilitating a culture of sharing (Resident B, 2021a).

Figure 17: Residents have taken ownership over their front porches. Left photo by Inge Laursen

In comparison to the other blocks in the development, Babbage Court is especially well maintained. Elsewhere lifts have been disabled, confining disabled residents to their homes, bin store doors have been broken, inviting rats and foxes, and the security of bike stores is regularly compromised. In the eyes of the shared-ownership tenants, their collective stewardship is driven by their financial interest in safeguarding their properties, and eased by the relatively small size of their block which reduces its upkeep and facilitates their collaboration (Resident A, 2021b). Meanwhile, the poor level of maintenance elsewhere in the development is largely blamed on the quality of management by the housing association, Clarion. They have no onsite presence, manage the property remotely, and are slow to act on reports of anti-social behaviour and vandalism.

> "Unfortunately, there are a lot of things that get broken and there is no one to report it to. When you report it to Clarion they take their notes and that's pretty much the end of it" (Resident D, 2021a)

The courtyard itself is very well utilised by children who use it to play football, cycle and run around. According to respondents, parents feel comfortable leaving their children to play within it unsupervised, thus allowing them unabated use. In addition to being a safe and enclosed space, it has a strong visual connection to many of the properties which allows parents to keep an eye on their children from afar. Nonetheless, the space is little used by older residents. To some, the children's use of it alone acts as a deterrence, meanwhile others felt its size and level of enclosure impacts its amenity value. In their downtime, these residents frequent their local parks or make use of their high-quality private outdoor spaces instead.

> "That place [the courtyard], I see as for the children. If I am sitting there and they are playing football and they hit me, then it's my fault for being there. I have to be out of their way." (Resident A, 2021b)

> "No one would ever dream of passing time in [the courtyard]. You would choose to go to the park instead. It was never going to be used for someone to sit down, listen to the birds, and read a book. It's too small." (Resident C, 2021b)

The rear gardens of ground floor apartments are situated adjacent to the courtyard space, meaning they experience identical environmental conditions. Nonetheless, the residents of

these homes have capitalised on their license to manage these spaces. Each and every rear garden is filled with garden furniture, plants, children's toys, and other paraphernalia, all of which indicate to their intensive use. This is suggestive that the way the courtyard is used is influenced by its inflexibility and structure of governance. In addition to being a small space, it is divided into fragments by fixed benches, low-lying walls, trees and rocks, thus restricting its usability and limiting spontaneity and improvisation. Moreover, the number of apartments that have access to the resource has made it difficult to develop collective choice arrangements over its use, or for individuals to assume responsibility or territoriality.

The architect of the scheme argued that rear gardens represented one of the greatest sources of social interaction in housing developments, and so it has proved in the case of Royal Road. Over time, fleeting interactions between ground floor residents have transformed into stronger relationships and nurtured a sense of community between them. However, other residents are little known to them. Not only do they spend little time staying in the central courtyard, but they don't walk through it either. The layout of the development allows those living in the four cruciform blocks to walk to and from their homes without crossing the courtyard, thus removing the possibility of impromptu contact with ground floor tenants.

4.2.4 Summary

The design of Royal Road was driven by a desire to deliver high-quality homes that have an intimate relationship with the outdoors within the constraints of delivering a high-density scheme that preserved existing trees on the site. It has met these goals admirably, as is emphasised by the number of awards it has achieved. Regarding its sociability, it was found that externalisation of circulation spaces has helped to transform them into sociable places, and that the rear gardens of ground floor homes have provided opportunities for fleeting interactions between these residents. Finally, the development's layout inhibits the potential for chance encounters between residents belonging to different parts of the development. This has made it particularly difficult for adults to form relationships, since they do not spent time in the courtyard either.

4.3 Wharf Road

Figure : Wharf Road (PTE, 2021)

4.3.1 Introduction to the case

Wharf Road is a tributary of City Road and marks the boundary between the London boroughs of Islington and Hackney. The development, which adopts the roads name, was designed by Pollard Thomas Edwards (PTE) and includes 98 apartments, predominantly made up of affordable housing (64 affordable rent, 15 shared ownership and 19 private sale) (PTE, 2015). With a site area of 0.4 hectares, the scheme has a density of 234 dwellings per hectare, which is marginally higher than that of Royal Road (PTE, 2021).

The layout of the development has been described as an "E-shaped" arrangement of four housing blocks (LB Islington, 2014, p. 6). The tallest of these flanks Wharf Road, meanwhile the other three are arranged in parallel, perpendicular to City Road basin. The block at the northern boundary is made up of three-storey houses, whilst the other three blocks are comprised of flats, duplexes and maisonettes. The layout of the scheme creates publicly accessible gardens at the edge of the canal said to "establish an immediate sense of community for both occupants and neighbours", making this high-density scheme an attractive subject for study (HDA, 2020).

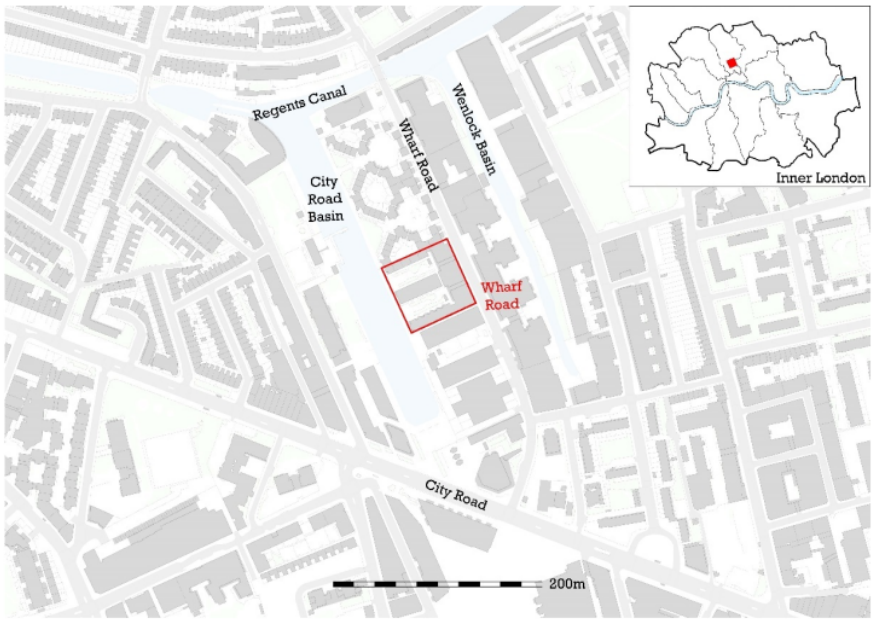


Figure 18: Location of Wharf Road

4.3.2 Design approach and intent

The driving objective of the scheme was to capitalize on its prime setting adjacent to City Road Basin by creating views and access to the water for the incoming residents and the public alike.

The design team at PTE "liked the idea of being able to offer this million dollar environment for genuinely affordable homes" and found a solution through investigating historic maps (Architect C, 2020).

> "Historically you didn't have buildings lining the basin, you had structures perpendicular to it with wharves and inlets in between them where you would come in to unload your goods. When we saw this, we had this instant idea to create two garden wharves. This then created a long, extended frontage, giving us the opportunity to create lots of views onto the basin. These two ideas drove each other. We wanted to make sure that almost everyone had views of it, and certainly that everyone had access to it." (ibid)

Given that targets for the number of homes, tenure split, and housing mix were fixed by the client at a very early stage, it was important to consider how the massing of the scheme could meet these whilst responding to its setting. At the south of the scheme sits a five-storey electricity sub-station belonging to the national grid. Meanwhile to the north is Pickfords Wharf, a low-rise public housing development completed by Islington Council in 1990. The design team made an early "strategic decision" to shield the substation and restrict building heights along the boundary with Pickfords Wharf to protect its amenity (ibid). Thus, the parallel blocks perpendicular to the basin step up as you move from north to south. This opposes the approach that you would take if you were designing for sociability, since it limits the amount of sunlight penetrating the communal spaces argued to facilitate staying activities.

Alongside decisions concerning the schemes layout and massing, a strategy was devised surrounding its circulation to enliven its shared and public spaces. An effort was made to integrate routes and spaces by ensuring flats had their own front doors "wherever possible" and by carefully locating the entrances of cores and facilities (Architect C, 2020).

> "We always try to locate our core entrances so that they relate strongly to the main spaces. You either come out in the garden, by the arches, or on the street. There is always a direct connection to shared space." (ibid)

These ideas are clearly visible in the development's plans. To enter its confines you have to travel through one of two double height arches from which cores, ground floor apartments and cycle stores can all be accessed. Then, if you walk through the arches, you find yourself

in the communal courtyards which are lined with front doors along two of their boundaries. Despite the benefits of natural ventilation and light in internal circulation spaces, internal cores were preferred in some cases in the block along Wharf Road to "create a compact layout which prioritises the homes themselves" (Architect C, 2020).

Figure 19: The arches of the development concentrate, paths, exits and shared facilities

4.3.3 Living at Wharf Road

Reflective of the developments driving ethos, the double height arches are seen to capitalise on "opportunities to create big openings" in the main block by "open[ing] up glimpse views of the Basin edge from Wharf road" (PTE, 2015, p. 30). In addition to doing this successfully, the

shared spaces are evidently attractive. Their orientation takes advantage of their setting, the possibility to sit down on a bench or lean on the waterside railings supports staying activities, and they are filled with socially attractive vegetation. Moreover, in spite of the decisions made surrounding the massing of the building, the courtyards still receive ample sunlight as they are not completely enclosed. Members of the public eat their lunch in these spaces, parents from the development across the road bring their children here to play, and even runners and cyclists are drawn to the water, unaware that it is a dead end.

> "It is beautiful place to live, we're very lucky. And it's quiet as well, even though you're right next to city road. I felt like I was on holiday when I first moved here, all you can hear is seagulls!" (Resident G, 2021)

Figure 20: Views into the development from Wharf Road

Though the development successfully provides new, much utilised and high-quality public realm, its level of activity negatively impacts some of the ground-floor residents by the canalside. Their homes have large, low-lying windows, and only narrow strips of planting or

terraces separate their private space from publicly accessible routes. As a result, some residents are discomforted by strangers looking directly through their windows, and unnerved by the proximity of motorcycles driving past their homes to drop off food takeaways.

> "A lot of people have started to have a picnic along the walkway as they can see they can walk right through. I think its lovely to see people do that but unfortunately some residents beg to differ. I suppose if you have a ground floor flat it can be quite intimidating." (Resident G, 2021)

> "I've been getting a little upset with people who walk past and look through the windows. They do it constantly. You also get food delivery couriers whizzing around here on their bikes. They've got no consideration for the people that are living here at all." (Resident I, 2021)

Notwithstanding their slightness, the terraces are still attractive to residents as quiet and peaceful spaces that have views to the canal and receive sunlight throughout the day. They are well used, have proved highly interactional, and allow for individual expression. This evidence suggests that for the purposes of sociability, harsher transitions between public and private space can be less devastating to sociability when the public realm is chiefly a tranquil environment.

> "We have neighbours over there with children who used to play with our dog. We got to know their parents through that and now we say hello to them whenever they walk past. It's really friendly." (Resident C, 2021c)

The ground floor flats along Wharf Road exhibit the impact of sharp public-private transitions in locations of lower amenity and higher activity. Despite signs of life and use within them, one or two inset balconies have been fortified with chicken wire mesh to help increase these residents' sense of security. Aware of this, the chief architect of the scheme felt that "there are particularly instances of amenity for ground floor flats that are put under too much pressure and would probably have been better to be compromised from a planning perspective to improve the scheme" (Architect C, 2020).

Figure 21: Some inset balconies along Wharf Road have been fortified with chicken wire mesh

Whilst used well by the public, the development's shared spaces are used more sparingly by people who live in the development. Many residents in the canalside properties reported regularly bumping into one another as they walked through these spaces, though they prefer to relax or host friends and neighbours in their own private amenity spaces. Moreover, parents do not allow their children to play outside unsupervised since there is no safety barrier along the canalside, illustrating that minor design flaws can have a major social impact.

> "Not many kids that live here use the outdoor space to play. It's usually people from outside the development that come in, sit down, and play here. … There's no barrier on the canal and that's probably why other parents don't let their kids out. It's dangerous and you have to keep an eye on your children." (Resident E, 2021b)

Similarly, the communal spaces are little frequented by residents of the main block who do not walk through them when travelling to or from their homes. Instead, their visits to these spaces are limited to summer evening excursions with guests. Highlighting the impact of the developments design, these residents reported interacting with others most frequently within

the arches of the development. With natural light and air, they provide a more amenable place for a conversation than the circulation spaces inside their building which are tight and somewhat utilitarian.

Figure 22: One of the garden wharves within Wharf Road

Rather than one community developing at Wharf Road, interviews indicated that there are many. Firstly, the private and shared ownership tenants have created their own WhatsApp group, highlighting the somewhat imperceptible but real boundary around this group of residents. According to one interviewee, this group formed because the issues encountered by private and shared ownership residents are disparate to those of social tenants. Owing to its size of around 40 apartments, it is principally used for more formal conversations about property maintenance, though it has facilitated new connections and weak ties between residents also.

> "We have a WhatsApp group with all the shared and private owners … It's mostly about house stuff. You never ask, "Hey people, how are you?" because there are like 40 people there. We are friendly but it's about common issues admin stuff." (Resident B, 2021b)

> "I met my neighbour through the WhatsApp group and now we've become friendly. I'll go to his house for dinner every once in a while, or we will meet for a beer." (ibid)

Concurrently, the frequency of casual interactions between some of the canalside, social tenants has resulted in the formation of an informal community of about 15 people. This assembled naturally through greetings, short conversations and acts of kindness. None of the residents from the main block, who are indistinguishable to those living by the canal from the public on their infrequent visits the development's shared spaces, are part of this community. Nevertheless, it is felt that the size of the development makes it difficult for an intimate community to encapsulate everyone anyway.

> "Absolutely [there is a sense of community]. There are about 15 of us by the canal who are very friendly. We do nice things for each other too. There are two girls opposite who are having babies and my wife is crocheting them both some little blankets" (Resident I, 2021)

> "Because there are so many people in the development, I think it's hard to have a close community that includes everyone. In the previous development I lived in everyone knew everyone but there was only 50 flats there." (Resident D, 2021b)

4.3.4 Summary

In their design of Wharf Road, PTE sought to create views and access to the water for the incoming residents and the public alike. This was achieved in reality, but its arrangement has proved more sociable for the canalside residents and leaves those living in ground floor flats feeling exposed and discomforted by the level of activity outside of their homes. As in the case of Royal Road, residents use the shared spaces in their development little, and prefer to spend time in their own private amenity spaces. Moreover, homeownership appears to be the driving factor behind stewardship over communal spaces, rather than physical design.

5 Cross-Case analysis, Shaping Hypothesis and Enfolding Literature

This chapter represents a summary of the final three elements of the research process including the cross-case analysis (5), shaping of hypothesis (6) and enfolding literature (7) (). These three steps represent the apogee of this study which provides an interpretation of the case study findings and addresses the research question and case study objectives (Table 1). Through the cross-case analysis, a search was conducted for patterns in the data by comparing findings between cases. In order to understand and define these patterns in the shape of hypotheses, the principle of 'replication logic' was applied (Yin, 2009). Using this logic, each case study was treated as an individual experiment which either confirmed, disputed or clarified an explanation for a pattern in the data. Situating this study's conclusions amongst previous research provided support for past literature in certain instances, elaborated on it in others, and also identified novel theory. At the end of this chapter, research limitations will be outlined to provide greater context for the findings.

The evidence in Chapter 4 provided support for the theories of environmental probabilism and social ecology which underpinned the worldview of the study. This worldview assumed that human behaviour is influenced by physical design, but recognised the impact of socio-cultural, personal, and temporal factors (Flowerdew, 2009, Zimring et al., 2005). Influential socio-cultural factors included social media and the quality of management of communal spaces. The former facilitated a culture of sharing, the creation of new relationships, and reduced anonymity, whilst the latter affected the cleanliness and perceived safety of shared spaces, thus influencing their use. The impact of personality traits was also recognised by both architects and residents. Some individuals are more inclined to engage with residents or likely to conduct certain activities. Unless you ride a bicycle, you're not going to be subject to fleeting interactions in the bike store. Likewise, if you don't enjoy gardening, you aren't going to spend time outside your home with a watering can. Nonetheless, the role of the built environment was not limited to providing 'affordances' for action, as is indicated by the possibilist doctrine (Lang and Lang, 1987). Specific interventions were found to increase the possibility for social activity.

In agreement with Ng (2009), this study found that developments of the same density can be delivered in several different ways. This highlights the importance of studying how the physical design of high-density developments can influence human behaviour. Each development delivered around 250 dwellings per hectare, but their form varied greatly (Figure 23). Additionally, 95 Peckham Road and Wharf Road exhibited that low-rise building typologies can be delivered in high-density schemes so long as they are accompanied by multi-storey apartment blocks. This adds nuance to the findings of Alexander (1993), who argued that different building types were associated with density ranges with upper and lower limits. Interviews with the lead architects illuminated the reasoning behind the design of each scheme. Sociability was a common concern but was not always a driving principle. In the case of Royal Road, a desire to preserve existing trees pulled the boundaries of the courtyard block away from the site's edges, thus squeezing the shared space at its centre. Meanwhile at Wharf Road, the layout of the scheme was arranged to optimise views and access to the canal basin. These overarching decisions impacted the eventual performance of each development. The 'E-Shaped' building layout at Wharf Road increased the publicness of its garden wharves, thus creating harsh public-private interfaces in some locations. In the same vein, the size and level of enclosure of the courtyard space at Royal Road reduced its appeal to a wider range of residents. To ensure future developments encourage social interaction, the following findings must lead the design process of high-density development rather than be subservient to other goals.

Figure 23: Cross-case ground floor plan comparison (to scale)

All three developments successfully moderated the frequency of residents' interactions. Despite the density of these schemes, none of the interviewees reported feeling overcrowded. As each development adopts a chiefly hierarchal form, being compartmentalised into discrete blocks and limiting the number of apartments per floor, these findings provide support for the research of Valins and Baum (1973) who argued that this approach prevents unwanted social interactions and social withdrawal. Nonetheless, the evidence both supported and contradicted the notion that a hierarchal urban form would encourage residents to act as stewards of their shared environment and foster a sense of belonging (Newman, 1972). This type of behaviour was only observed amongst the residents at 95 Peckham Road, Babbage Court at Royal Road, and in blocks C and D at Wharf Road. These micro-communities, whose boundaries were physically demarcated, were 33, 20 and 34 apartments in size, and residents felt a sense of

community within them. Facilitated by social media, these groups shared belongings and discussed issues relating to the maintenance of their properties and communal spaces. Since nearly all of these residents were living in shared-ownership or private properties, this indicates that cooperation between residents to take care of their shared environment is more greatly influenced by ownership than design. Social tenants did not create similar governance arrangements despite living in the same context. Yet, it was shown that an urban form which compartmentalises residents into smaller groups does allow for collective stewardship of shared spaces.

Existing literature states that communal spaces can provide opportunities for social interaction if they have the right arrangement and are flexible, amenable environments (Williams, 2005). This multiple case study provided support for this in the specific context of high-density development in London. At Wharf Road and Royal Road, relatively small and enclosed communal spaces were shared by around 100 apartments, many of which were family homes. These spaces were most used by children, who played in them regularly when parents felt comfortable leaving them unsupervised. This was also the case at Royal Road, where communal space was relatively secure and well overlooked, but not at Wharf Road, where the garden wharves were publicly accessible, and the canal basin presented a risk. Older residents spent very little time dwelling in these spaces and preferred to utilise their private outdoor amenity spaces. On the contrary, the rear courtyard at 95 Peckham Road, which was shared by just 33 apartments, was much more heavily utilised by this demographic. Despite the provision of high-quality private amenity for all apartments, this communal area acted as the stage for gardening, homeworking, regular intimate social gatherings between courtyard residents, and less frequent larger gatherings open to the whole development. These findings re-ignite the argument that to establish strong social ties, our built form should be guided by human psychology and create spaces beyond the private home that are shared by a smaller number of households (Wu and Ge, 2020). Acknowledging the impact of ‘number’, proximity, and visual connections to communal spaces impacted residents’ use of them in all cases. Those who could see them and were nearby used them more often.

Ground floor apartments often enjoy proximity and a visual connection to communal spaces. However, being too close to the action can cause discomfort to these residents. This is especially the case in high-density schemes, where architects seek to maximise the development potential of a site by pushing buildings up to its boundaries, and semi-public areas are relatively active. Dovey and Wood (2015) argued that public private interfaces can be

mediated by sandwiching semi-private space between the two, though the evidence detailed here suggests this is an oversimplification. At Wharf Road, regular public use of the garden wharves made residents in ground floor flats feel uncomfortable, despite the provision of a shallow strip of defensible, semi-private space. Its lack of depth combined with the size of apartments' low-lying windows contributed to feelings of exposure. This indicates that to achieve privacy in these locations, the interplay of several physical (e.g. height and size of the windows and depth of semi-private space), and contextual (e.g. level and type of activity in the adjacent space) factors must be considered. Privacy is essential for interaction because subjecting individuals to an endless series of unwanted interactions can force social withdrawal (Valins and Baum, 1973).

The evidence also suggests that semi-private buffers are only utilised by residents, thus provide "options for active contact into adjacent public space" and room for individual expression when the conditions are perfect (Skjaeveland et al., 1996, p. 193, Abu-Ghazzeh, 1999). Along Peckham Road, these spaces showed little signs of use. Despite being south facing, they fronted a noisy and polluted vehicular road which was accompanied by a constant flow of pedestrians. The idea that residents might sit outside and converse with anonymous passer-by's is misinformed here, whatever the weather. At Royal Road, where the roads at its boundaries were quieter, weather became the determining factor. The south facing front gardens were filled with garden furniture and potted plants, a clear indication of regular use. Meanwhile, the ever-dark north-facing front gardens were unkept and used for storage. These findings repeat Jan Gehl's diagnosis for active communal spaces in a different setting; front or back gardens will only be used by residents if they allow you to enjoy good weather, have attractive views, and are not subject to environmental stressors (e.g. noise and air pollution) (Gehl, 2001, p. 171). Unless they are used, they will not provide the opportunity for resident-to-resident interactions.

Respondents disclosed that the majority of resident-to-resident interactions occurred when travelling to and from their homes, such as when passing a resident who is lingering in their front garden. To best evaluate how design can support the quality of these interactions, it helps to consider internal and external circulation spaces independently. Inside multi-storey apartment blocks, residents often crossed paths outside the lift. At Royal Road, where this space was naturally ventilated and filled with daylight, residents felt comfortable stopping for a conversation. However, the internalised cores at 95 Peckham Road and Wharf Road had a unitary function – movement – and interactions were more fleeting here. Alexander (1977, p. 633) may have considered the short, turning corridors at Royal Road, framing long views over

London at their corners, as “a place of beauty”. In divergence, those at Wharf Road and 95 Peckham Road appeared to emerge from the common desire of contemporary developers to minimise the size and quality of these spaces in pursuit to high net-to-gross ratios (Mclennan and Avramovic Oldani, 2018). It has been argued that naturally ventilated and lit circulation spaces improve wayfinding and perceptions of security (Kennedy, 2015). The extent to which these benefits have been achieved at Royal Road is unclear, though it does provide a strong precedent for how circulation spaces in multi-storey apartment buildings can be externalised for the benefit of sociability.

Externally, the frequency of casual interactions was greatest in cases where shared paths intersected with communal spaces. The evidence indicates that this can be achieved by maximising the number of individual front doors opening onto communal areas and ensuring entrances to apartment blocks require you to walk through these spaces. The influence of the former was particularly evident in the two garden wharves at Wharf Road, and the small communal courtyard at 95 Peckham Road. These shared spaces supported frequent, low intensity contacts in a sheltered setting, which helped to nurture a sense of community and belonging. However, these two developments also exemplified the consequences of locating entrances to apartment blocks away from communal areas. That is, residents belonging to these blocks used these spaces less frequently and were deprived of its social benefits. These findings are not novel, but reiterate the conclusions of cohousing researchers regarding the optimum arrangement of routes and spaces (Durrett and McCamant, 1989, Fromm, 1991). Additionally, they support the argument of Jacobs (2016) who felt that the net sum of these low intensity contacts amounted to invaluable social capital.

Communal facilities, like circulation spaces, have a functional purpose and are recognised as strong predictors for the location of neighbourly interactions in residential areas (Lang and Lang, 1987). Analysis of the lived experiences of residents the high-density developments studied underlined the social value of bike stores. To some respondents, the bike store was their greatest source of resident-to-resident interaction. Visits to bin stores tended to be non-periodic, infrequent, and short in duration, thus limiting opportunities for social contact. Contrarily, residents spent a greater amount of time inside the bike store, and did so at a similar time each day – e.g. en route to or returning from work. Notably, it must be well-designed in order to have a social benefit. At Wharf Road and Royal Road, many of the bike stores were publicly accessible and poorly secured. They were vulnerable to vandalism and theft as a result, which led residents to store their bikes separately on their balconies or in their hallways. Conversely,

the bike store at Peckham Road was internalised and accessed off a reasonably sized entry hallway on the ground floor. In addition to being a safe, securitised, and well used space, its location created the possibility for encounters between those travelling by bike and on foot. In conclusion, the potential of bike stores promote sociability should not be underestimated. However, in order to realise this potential they must be secure, internalised, and located off of shared paths.

Ultimately, the findings of this research should only be considered in recognition of its limitations. To begin with, between March 2020 and the time of writing, government restrictions were enforced periodically which inhibited residents from spending time together. This will have had a significant impact on the experiences of residents at 95 Peckham Road and Wharf Road in particular who moved into their residences during the summer of 2019. Nonetheless, these interviewees were able to comment on their behaviour before the pandemic and during periods of relaxed restrictions. Secondly, just three case studies were undertaken and only a small number of residents were interviewed from each development. This will affect the generalisability of the results both within and across cases. Though, given that the research design necessitated speaking to each of the residents at length and transcribing these conversations, it was not possible to collect more data during the period of the study. Finally, this research was conducted in the urban context of London meaning its conclusions may not be directly applicable in other locations. This is underlined by the impact of socio-cultural factors on social interaction, which vary geographically. The next section provides a clear response to the research question, summarises and reflects on its findings, highlights the new knowledge that this study has contributed, and makes recommendations for future work.

6 Conclusion

The research question of this thesis probed if and how we can design for social interaction in high-density housing. It was found that there exist a number of different design interventions that can help increase the sociability of these settings. However, design was observed to be just one of a suite of factors (physical, socio-cultural, personal, temporal) that influence the level of opportunity for contact. Summarising, interpreting, and situating this study's findings within past literature has equally supported and elaborated upon it, as well as surfaced novel findings.

Firstly, support was provided for the notion that a hierarchal urban form can moderate residents' interactions, however its power to "catalyse the natural impulses of residents" to act as stewards of their shared spaces was called into question (Newman, 1972, p. 11). Property ownership appeared to play a much greater role in stimulating communal stewardship, which was also facilitated by social media and a built form which compartmentalised residents into smaller groups. Additionally, the evidence suggested that the impact of 'number' extended beyond communal stewardship and had an impact on the use, and subsequently, the interactivity of communal areas. Though children were happy to play in these spaces irrespective of their characteristics, older residents were less inclined to use those that were shared by a greater number of residents.

Secondly, findings concerning ground floor flats further elaborated on literature concerning public-private interfaces. It was shown that the front or rear gardens of these homes can complement the sociability of communal areas in high-density housing, however only in instances when they allow you to enjoy good weather, have attractive views, and are not subject to environmental stressors. Moreover, efforts to maximise the development potential of sites by pushing buildings to site boundaries was seen to load significant pressure on these residents in some cases. The evidence indicated that privacy cannot be achieved through the inclusion of semi-private space alone. Instead, the height and size of public facing windows, depth of the semi-private space, and level and type of activity in the adjacent space must all be negotiated. Achieving privacy for these residents is essential, otherwise overstimulation can lead to social withdrawal.

Finally, this study discovered that externalising the circulation spaces of multi-storey apartment blocks and well-designed bike stores and increase the opportunity for social contact in high-

density housing. Existing literature highlights the value of natural light and ventilation in circulation spaces in encouraging activity, improving wayfinding, and delivering a sense of security. However, it does not, as this study has, evidence that open cores in multi-storey buildings represent more comfortable environments to hold a conversation than internal ones. Additionally, it was found that if bike stores are secure, located along shared paths, and integrated with communal areas, they will be used regularly and provide ample opportunity for social interaction. Previous academics have recognised communal facilities as strong predictors of social contact in residential areas. Nonetheless, the value of bike stores in high-density settings has not been specifically acknowledged, and the gravity of this finding was unanticipated. The inclusion of bike stores in forthcoming development in London is becoming increasingly common in an effort to encourage active travel. These findings underline that their design must be carefully considered if they are to deliver social and environmental benefits.

Given that methodological and temporal constraints only allowed for the study of three high-density developments in London, its hypotheses may not be generalisable across all high-density housing in London, or in other urban contexts. For this reason, it is recommended that further research is conducted on this subject in order to address these limitations. Were it possible to analyse additional cases, high-density developments that incorporate indoor community spaces, roof gardens, or deck access would have also been selected. Doing so would have been in accordance with the 'theoretical sampling' approach adopted in this thesis, which dictated that cases should be selected based on their likelihood to address the research question and generate new theory. These three design principles did not feature in the three cases studied and could respond to two of this study's conclusions. Namely, that physical proximity to communal areas influences their use and externalising circulation spaces in multi-storey apartment blocks can facilitate fleeting interactions.

Further to clarifying the influence of built form on social interaction in high-density contexts, this thesis embodies a compilation of ideas which must be considered in the design of future high-density housing. In acknowledgement of the positive influence of interaction on physical and mental well-being and the value of weak social ties in enabling mutual aid, the importance of this is paramount. In particular, it has underlined that considerations of the lived experiences of future residents must guide the design process for the purposed of sociability. Assigning divergent goals primacy risks the adoption of arrangements which may lead to the inhibition of contact.

7 References

ABU-GHAZZEH, T. M. 1999. HOUSING LAYOUT, SOCIAL INTERACTION, AND THE PLACE OF CONTACT IN ABU-NUSEIR, JORDAN. *Journal of Environmental Psychology,* 19**,** 41-73.

ALEXANDER, C., ALEXANDER, P. D. A. C., ISHIKAWA, S., SILVERSTEIN, M., JACOBSON, M., STRUCTURE, C. F. E., FIKSDAHL-KING, I. & SHLOMO, A. 1977. *A Pattern Language: Towns, Buildings, Construction*, OUP USA.

ALEXANDER, E. R. 1993. DENSITY MEASURES: A REVIEW AND ANALYSIS. *Journal of Architectural and Planning Research,* 10**,** 181-202.

ALZAANIN DR, E. I. 2020. Combining case study design and constructivist grounded theory to theorize language teacher cognition. *The Qualitative Report,* 25**,** 1361-1376.

ARCHITECT A 2021. Designing for Social Interaction at High Density: A Conversation about 95 Peckham Road *In:* MELLEN, H. (ed.).

ARCHITECT B 2021. Designing for Social Interaction at High Density: A Conversation about Royal Road *In:* MELLEN, H. (ed.).

ARCHITECT C 2020. Designing for Social Interaction at High Density: A Conversation about Royal Road *In:* MELLEN, H. (ed.).

ARMITAGE, R. 2011. The impact of connectivity and through-movement within residential developments on levels of crime and anti-social behaviour.

BARRIBALL, K. L. & WHILE, A. 1994. Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing,* 19**,** 328-335.

BEE, A. S. & IM, L. P. 2016. The provision of vertical social pockets for better social interaction in high-rise living. *PLANNING MALAYSIA,* 14.

BIRCHALL, J. 2014. *Building Communities (Routledge Revivals): The Co-operative Way*, Routledge.

BLANC, F., SCANLON, K. & WHITE, T. 2020. Living in a denser London. London School of Economics (LSE).

BROWN, N., BARBER, P., MOUSSAVI, F., MACINTOSH, K. & ARCHITECTS, W. W. M. 2018. *Project Interrupted: Lectures by British Housing Architects*, Architecture Foundation.

CALHOUN, J. B. 1970. SPACE AND THE STRATEGY OF LIFE. *Ekistics,* 29**,** 425-437.

CARMONA, M., HEATH, T., TIESDELL, S. & OC, T. 2010. *Public Places, Urban Spaces: The Dimensions of Urban Design*, Architectural Press.

CHENG, V. 2010. Understanding density and high density. *Designing high-density cities for social and environmental sustainability***,** 3-17.

CHURCHMAN, A. 1999. Disentangling the Concept of Density. *Journal of Planning Literature,* 13**,** 389-411.

CRESWELL, J. W. 2003. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, SAGE Publications.

DCLG 2015. Technical housing standards - nationally described space standard *In:* GOVERNMENT, D. F. C. A. L. (ed.).

DEJONCKHEERE, M. & VAUGHN, L. M. 2019. Semistructured interviewing in primary care research: a balance of relationship and rigour. *Family Medicine and Community Health,* 7**,** e000057.

DETR 2000. *Our Towns and Cities: The Future : Delivering an Urban Renaissance*, Stationery Office.

DOVEY, K. & WOOD, S. 2015. Public/private urban interfaces: type, adaptation, assemblage. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability,* 8**,** 1-16.

DURRETT, C. & MCCAMANT, K. 1989. Cohousing: a contemporary approach to housing ourselves. *Berkeley, CA*.

EISENHARDT, K. M. 1989. Building Theories from Case Study Research. *The Academy of Management Review,* 14**,** 532-550.

FARIDA, N. 2013. Effects of outdoor shared spaces on social interaction in a housing estate in Algeria. *Frontiers of Architectural Research,* 2**,** 457-467.
FEKADU, K. 2014. The paradox in environmental determinism and possibilism: A literature review. *Journal of Geography and Regional planning,* 7**,** 132-139.
FLOWERDEW, R. 2009. Probabilism. *In:* KOBAYASHI, A. (ed.) *International Encyclopedia of Human Geography (Second Edition).* Oxford: Elsevier.
FRANCK, K. A. 1984. Exorcising the Ghost of Physical Determinism. *Environment and Behavior,* 16**,** 411-435.
FROMM, D. 1991. *Collaborative communities*, Van Nostrand, New York, USA.
GEHL, J. 2001. *Life between buildings : using public space / Jan Gehl*

translated by Jo Koch, Copenhagen, Copenhagen : Danish Architectural Press.
GEHL, J., BRACK, F. & THORNTON, S. 1977. The interface between public and private territories in residential areas. *Department of Architecture and Building, University of Melbourne*.
GEHL, J. & SVARRE, B. 2013. *How to Study Public Life*, Island Press.
GERSICK, C. J. 1988. Time and transition in work teams: Toward a new model of group development. *Academy of Management journal,* 31**,** 9-41.
GITTUS, E. 1976. *Flats, Families and the Under-fives*, Routledge & K. Paul.
GLA 2004. The London Plan. *In:* (GLA), G. L. A. (ed.).
GLA 2016. The London Plan. *In:* (GLA), G. L. A. (ed.).
GLA 2017. THE draft LONDON PLAN 2017 TOPIC PAPER Housing Density. Greater London Authority (GLA).
GLA 2021. The London Plan. *In:* (GLA), G. L. A. (ed.).
GLASER, B. G., STRAUSS, A. L. & PRESS, S. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*, Aldine Publishing Company.
GUILLERY, P. & KROLL, D. 2019. *Mobilising Housing Histories: Learning from London's Past for a Sustainable Future*, RIBA Publishing.
HDA. 2020. *Wharf Road* [Online]. Housing Design Awards (HDA). Available: https://hdawards.org/scheme/6571_scheme-2/ [Accessed].
HELLIWELL, J. F. & BARRINGTON-LEIGH, C. P. 2010. How much is social capital worth? : National Bureau of Economic Research.
HESS, P. 2014. Density, Urban. *In:* MICHALOS, A. C. (ed.) *Encyclopedia of Quality of Life and Well-Being Research.* Dordrecht: Springer Netherlands.
HOUSE, J. S., LANDIS, K. R. & UMBERSON, D. 1988. Social relationships and health. *Science,* 241**,** 540-545.
HTA, LEVITT BERNSTEIN, PRP & PTE 2015. Superdensity: The Sequel. NLA.
HTA, LEVITT BERNSTEIN, PRP & PTEA 2007. Recommendations for living at Superdensity.
ISLINGTON COUNCIL 2013. Islington's Local Plan: Development Management Policies.
JACOBS, J. 1992. The death and life of great American cities. 1961. *New York: Vintage*.
JACOBS, J. 2016. *The death and life of great American cities*, Vintage.
JOHNSTON, K. 2019. *Peckham Architecture Award Winner Announced...* [Online]. Southwark News. Available: https://www.southwarknews.co.uk/news/peckham-architecture-award-winner-announced/ [Accessed].
KENNEDY, R. The path less travelled: Vertical circulation spaces in apartment buildings in the subtropics. Proceedings of the International Conference on Dwelling Form 2015, 2015. Department of Architecture, Faculty of Engineering, Universitas Indonesia, 107-123.
KUO, F. E., SULLIVAN, W., COLEY, R. L. & BRUNSON, L. 1998. Fertile Ground for Community: Inner-City Neighborhood Common Spaces. *American Journal of Community Psychology,* 26**,** 823-851.
LANG, J. T. & LANG, H. S. A. U. N. S. W. D. U. D. J. 1987. *Creating Architectural Theory: The Role of the Behavioral Sciences in Environmental Design*, Van Nostrand Reinhold Company.

LAWS, K. & MCLEOD, R. Case study and grounded theory: Sharing some alternative qualitative research methodologies with systems professionals. Proceedings of the 22nd international conference of the systems dynamics society, 2004. 1-25.
LB ISLINGTON 2014. PLANNING COMMITTEE REPORT Wharf Road P2014-2131-FUL.
LEAVY, P. 2017. *Research Design: Quantitative, Qualitative, Mixed Methods, Arts-Based, and Community-Based Participatory Research Approaches*, Guilford Publications.
LEVITT, D. & MCCAFFERTY, J. 2018. *The Housing Design Handbook: A Guide to Good Practice*, Taylor & Francis.
LIVINGSTONE, N., FIORENTINO, S. & SHORT, M. 2021. Planning for residential 'value'? London's densification policies and impacts. *Buildings and Cities,* 2**,** 203-219.
LSE 2019. Written Submission from LSE London (London School of Economics, ID845)

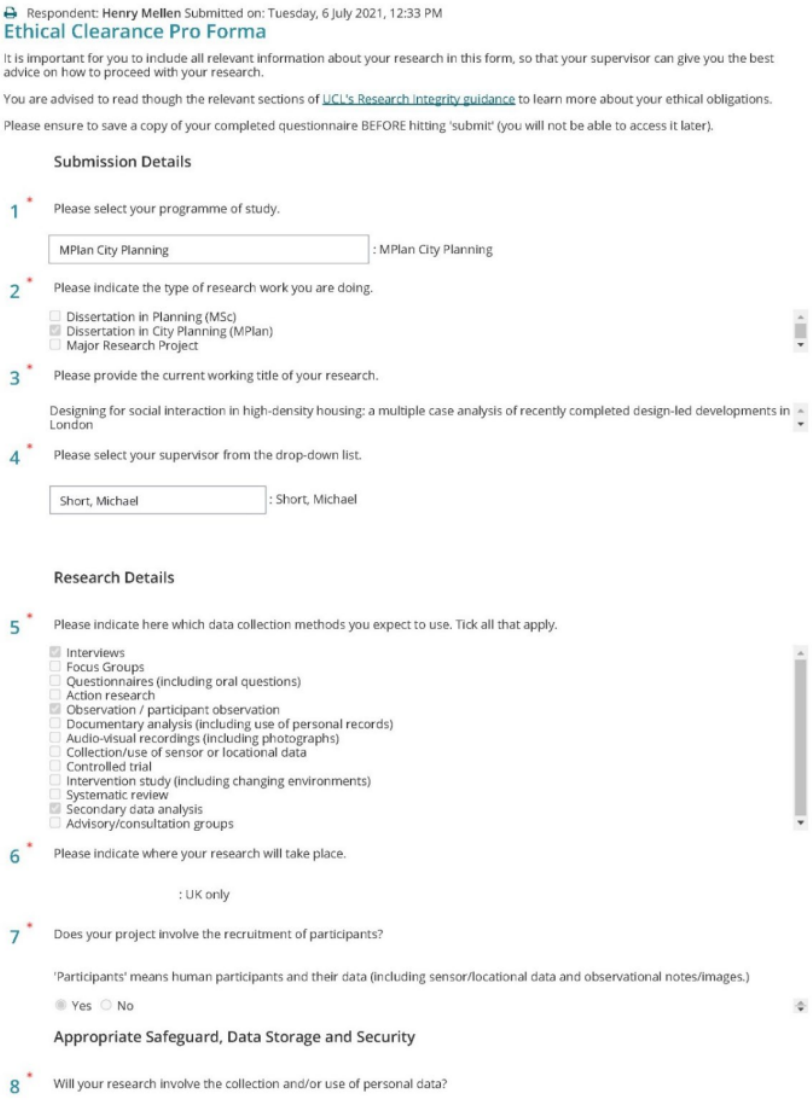
on Matter 39 for consideration in the Examination in Public of the New London

Plan, 2019. London School of Economics (LSE).
MCLENNAN, J. & AVRAMOVIC OLDANI, K. 2018. Architecture of the in-between. *Love + Regeneration.*
MCLENNAN, J. & OLDANI, K. A. 2018. architecture of the in-between. *Love + Regeneration.* McLennan Design.
MCLEOD, R. & LAWS, K. Case study and grounded theory : Sharing some alternative qualitative research methodologies with systems professionals. 2004.
MERRIAM, S. B. & TISDELL, E. J. 2015. *Qualitative Research: A Guide to Design and Implementation*, Wiley.
MONTGOMERY, C. 2013. *Happy City: Transforming Our Lives Through Urban Design*, Penguin Books Limited.
NEWMAN, O. 1972. *Defensible space*, Macmillan New York.
NG, E. 2009. *Designing High-Density Cities: For Social and Environmental Sustainability*, Taylor & Francis.
NGUYEN, L., VAN DEN BERG, P., KEMPERMAN, A. & MOHAMMADI, M. 2020. Where do People Interact in High-rise Apartment Buildings? Exploring the Influence of Personal and Neighborhood Characteristics. *International journal of environmental research and public health,* 17**,** 4619.
PAFKA, E. 2013. *Nothing Gained by only Counting Dwellings per Hectare: A hundred years of confusing urban densities*.
PBA 2016. Peckham Road Mansions Design and Access Statement. Peter Barber Architects (PBA).
PBA. 2021. *95 Peckham Road* [Online]. Peter Barber Architects (PBA). Available: http://www.peterbarberarchitects.com/peckham-road [Accessed].
PHA 2018. Royal Road Booklet. Panter Hudspith Architects (PHA).
PTE 2015. 37-47 Wharf Road Design & Access Statement, March 2015. Pollart Thomas Edwards (PTE).
PTE. 2021. *Wharf Road* [Online]. Pollard Thomas Edwards (PTE). Available: https://www.pollardthomasedwards.co.uk/projects/index/wharf-road/ [Accessed].
RAPOPORT, A. 1975. Toward a Redefinition of Density. *Environment and Behavior,* 7**,** 133-158.
RAVENSCROFT, T. 2020. Peter Barber Architects creates terraced tenement block in Peckham. *Dezeen*.
RESIDENT A 2021a. What is it like to live at 95 Peckham Road? *In:* MELLEN, H. (ed.).
RESIDENT A 2021b. What is it like to live at Royal Road? *In:* MELLEN, H. (ed.).
RESIDENT B 2021a. What is it like to live at Royal Road? *In:* MELLEN, H. (ed.).
RESIDENT B 2021b. What is it like to live at Wharf Road? *In:* MELLEN, H. (ed.).
RESIDENT C 2021a. What is it like to live at 95 Peckham Road? *In:* MELLEN, H. (ed.).
RESIDENT C 2021b. What is it like to live at Royal Road? *In:* MELLEN, H. (ed.).
RESIDENT C 2021c. What is it like to live at Wharf Road? *In:* MELLEN, H. (ed.).
RESIDENT D 2021a. What is it like to live at Royal Road? *In:* MELLEN, H. (ed.).
RESIDENT D 2021b. What is it like to live at Wharf Road? *In:* MELLEN, H. (ed.).
RESIDENT E 2021a. What is it like to live at 95 Peckham Road? *In:* MELLEN, H. (ed.).
RESIDENT E 2021b. What is it like to live at Wharf Road? *In:* MELLEN, H. (ed.).

RESIDENT F 2021. What is it like to live at 95 Peckham Road? *In:* MELLEN, H. (ed.).
RESIDENT G 2021. What is it like to live at Wharf Road? *In:* MELLEN, H. (ed.).
RESIDENT I 2021. What is it like to live at Wharf Road? *In:* MELLEN, H. (ed.).
RIBAJ. 2020. *95 Peckham Road, Peckham* [Online]. The RIBA Journal (RIBAJ). Available: https://www.ribaj.com/buildings/regional-awards-shortlist-2020-london-south-peter-barber-residential-95-peckham-road [Accessed].
RIDDER, H.-G. 2017. The theory contribution of case study research designs. *Business Research,* 10**,** 281-305.
ROBERTS, M. 2007. Sharing Space: Urban Design and Social Mixing in Mixed Income New Communities. *Planning Theory & Practice,* 8**,** 183-204.
SENNETT, R. & SENDRA, P. 2020. *Designing Disorder: Experiments and Disruptions in the City*, Verso Books.
SIGGELKOW, N. 2007. Persuasion With Case Studies. *Academy of Management Journal,* 50**,** 20-24.
SKJAEVELAND, O., GÄRLING, T. & MAELAND, J. G. 1996. A multidimensional measure of neighboring. *American Journal of Community Psychology,* 24**,** 413-435.
SOMMER, R. & OLSEN, H. 1980. The Soft Classroom. *Environment and Behavior,* 12**,** 3-16.
SPROUT, H. H. & SPROUT, M. 1965. *Ecological perspective on human affairs*, Princeton University Press.
TORRES-ANTONINI, M. 2001. *Our common house: Using the built environment to develop supportive communities*, University of Florida.
UCL 2013. UCL Code of Conduct for Research. University College London (UCL).
URBAN TASK FORCE 1999. *Towards an Urban Renaissance*, Spon.
URQUHART, C. 2012. *Grounded Theory for Qualitative Research: A Practical Guide*, SAGE Publications.
VALINS, S. & BAUM, A. 1973. Residential Group Size, Social Interaction, and Crowding. *Environment and Behavior,* 5**,** 421-439.
WILLIAMS, J. 2005. Designing Neighbourhoods for Social Interaction: The Case of Cohousing. *Journal of Urban Design,* 10**,** 195-227.
WU, W. & GE, X. J. 2020. Communal space design of high-rise apartments: A literature review. *Journal of Design and Built Environment,* 20**,** 35-49.
YIN, R. K. 2009. *Case Study Research: Design and Methods*, SAGE Publications.
ZIMRING, C., JOSEPH, A., NICOLL, G. L. & TSEPAS, S. 2005. Influences of building design and site design on physical activity: research and intervention opportunities. *American journal of preventive medicine,* 28**,** 186-193.
ZOHRABI, M. 2013. Mixed Method Research: Instruments, Validity, Reliability and Reporting Findings. *Theory & practice in language studies,* 3.

8 Appendices

8.1 Appendix 1 – Ethical Clearance Pro Forma



Respondent: **Henry Mellen** Submitted on: Tuesday, 6 July 2021, 12:33 PM

Ethical Clearance Pro Forma

It is important for you to include all relevant information about your research in this form, so that your supervisor can give you the best advice on how to proceed with your research.

You are advised to read though the relevant sections of UCL's Research integrity guidance to learn more about your ethical obligations.

Please ensure to save a copy of your completed questionnaire BEFORE hitting 'submit' (you will not be able to access it later).

Submission Details

1 * Please select your programme of study.

MPlan City Planning : MPlan City Planning

2 * Please indicate the type of research work you are doing.

- ☐ Dissertation in Planning (MSc)
- ☑ Dissertation in City Planning (MPlan)
- ☐ Major Research Project

3 * Please provide the current working title of your research.

Designing for social interaction in high-density housing: a multiple case analysis of recently completed design-led developments in London

4 * Please select your supervisor from the drop-down list.

Short, Michael : Short, Michael

Research Details

5 * Please indicate here which data collection methods you expect to use. Tick all that apply.

- ☑ Interviews
- ☐ Focus Groups
- ☐ Questionnaires (including oral questions)
- ☐ Action research
- ☑ Observation / participant observation
- ☐ Documentary analysis (including use of personal records)
- ☐ Audio-visual recordings (including photographs)
- ☐ Collection/use of sensor or locational data
- ☐ Controlled trial
- ☐ Intervention study (including changing environments)
- ☐ Systematic review
- ☑ Secondary data analysis
- ☐ Advisory/consultation groups

6 * Please indicate where your research will take place.

: UK only

7 * Does your project involve the recruitment of participants?

'Participants' means human participants and their data (including sensor/locational data and observational notes/images.)

◉ Yes ○ No

Appropriate Safeguard, Data Storage and Security

8 * Will your research involve the collection and/or use of personal data?

Personal data is data which relates to a living individual who can be identified from that data or from the data and other information that is either currently held, or will be held by the data controller (you, as the researcher).

This includes:

- Any expression of opinion about the individual and any intentions of the data controller or any other person toward the individual.
- Sensor, location or visual data which may reveal information that enables the identification of a face, address etc. (some postcodes cover only one property).
- Combinations of data which may reveal identifiable data, such as names, email/postal addresses, date of birth, ethnicity, descriptions of health diagnosis or conditions, computer IP address (of relating to a device with a single user).

(•) Yes ( ) No

9 * Is your research using or collecting:

- special category data as defined by the General Data Protection Regulation*, and/or
- data which might be considered sensitive in some countries, cultures or contexts?

*Examples of special category data are data:

- which reveals racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership;
- concerning health (the physical or mental health of a person, including the provision of health care services);
- concerning sex life or sexual orientation;
- genetic or biometric data processed to uniquely identify a natural person.

( ) Yes (•) No

10 * Do you confirm that all personal data will be stored and processed in compliance with the General Data Protection Regulation (GDPR 2018)?

(•) Yes
( ) No
( ) I will not be working with any personal data

11 * I confirm that:

[x] The information in this form is accurate to the best of my knowledge.
[x] I will continue to reflect on, and update these ethical considerations in consultation with my supervisor.

8.2 Appendix 2 – Risk Assessment Form Field / Location Work

RISK ASSESSMENT FORM

FIELD / LOCATION WORK

The Approved Code of Practice - Management of Fieldwork should be referred to when completing this form

http://www.ucl.ac.uk/estates/safetynet/guidance/fieldwork/acop.pdf

DEPARTMENT/SECTION

LOCATION(S)

PERSONS COVERED BY THE RISK ASSESSMENT

Site observation will be undertaken for each of the case study developments included in the research. All three case study developments are situated within inner London boroughs (Southwark and Islington).

Consider, in turn, each hazard (white on black). If **NO** hazard exists select **NO** and move to next hazard section.
If a hazard does exist select **YES** and assess the risks that could arise from that hazard in the risk assessment box.
Where risks are identified that are not adequately controlled they must be brought to the attention of your Departmental Management who should put temporary control measures in place or stop the work. Detail such risks in the final section.

ENVIRONMENT	**The environment always represents a safety hazard. Use space below to identify and assess any risks associated with this hazard**
e.g. location, climate, terrain, neighbourhood, in outside organizations, pollution, animals.	There exists some risk of adverse weather (low risk), assault (very low risk), and getting lost (very low risk). The researcher will wear appropriate clothing, will not carry valuable items and will plan routes to and from the case study developments under study.

CONTROL MEASURES **Indicate which procedures are in place to control the identified risk**

	work abroad incorporates Foreign Office advice
	participants have been trained and given all necessary information
	only accredited centres are used for rural field work
X	participants will wear appropriate clothing and footwear for the specified environment
	trained leaders accompany the trip
	refuge is available
	work in outside organisations is subject to their having satisfactory H&S procedures in place
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EMERGENCIES	Where emergencies may arise use space below to identify and assess any risks
e.g. fire, accidents	In the case that any emergencies arise (very low risk), the researcher will have access to contact numbers for emergency services and will have means of doing so.

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	participants have registered with LOCATE at http://www.fco.gov.uk/en/travel-and-living-abroad/
	fire fighting equipment is carried on the trip and participants know how to use it
X	contact numbers for emergency services are known to all participants
X	participants have means of contacting emergency services
X	participants have been trained and given all necessary information
	a plan for rescue has been formulated, all parties understand the procedure
	the plan for rescue /emergency has a reciprocal element
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EQUIPMENT	Is equipment used?	NO	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. clothing, outboard motors.			

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	the departmental written Arrangement for equipment is followed
	participants have been provided with any necessary equipment appropriate for the work
	all equipment has been inspected, before issue, by a competent person
	all users have been advised of correct use
	special equipment is only issued to persons trained in its use by a competent person
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

LONE WORKING	Is lone working a possibility?	YES	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. alone or in isolation *lone interviews.*	The researcher may have difficulty in summoning help following injury or assault (very low risk). The researcher will inform friends and family of the location, route and expected time of return of their trip to mitigate this risk.		

CONTROL MEASURES **Indicate which procedures are in place to control the identified risk**

	the departmental written Arrangement for lone/out of hours working for field work is followed
	lone or isolated working is not allowed
X	location, route and expected time of return of lone workers is logged daily before work commences
	all workers have the means of raising an alarm in the event of an emergency, e.g. phone, flare, whistle
	all workers are fully familiar with emergency procedures
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

ILL HEALTH	The possibility of ill health always represents a safety hazard. Use space below to identify and assess any risks associated with this Hazard.
e.g. accident, illness, personal attack, special personal considerations or vulnerabilities.	There is a risk of injury resulting from involvement in a traffic incident, fall, or assault whilst visiting the case study sites (very low risk).

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	an appropriate number of trained first-aiders and first aid kits are present on the field trip
	all participants have had the necessary inoculations/ carry appropriate prophylactics
X	participants have been advised of the physical demands of the trip and are deemed to be physically suited
	participants have been adequate advice on harmful plants, animals and substances they may encounter
	participants who require medication have advised the leader of this and carry sufficient medication for their needs
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

TRANSPORT	Will transport be required	NO		Move to next hazard
		YES	X	Use space below to identify and assess any risks

e.g. hired vehicles

Only public transport will be used to visit the case study sites, meaning there is no risk of accidents arising from lack of maintenance, suitability or training (very low risk).

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
X	only public transport will be used
	the vehicle will be hired from a reputable supplier
	transport must be properly maintained in compliance with relevant national regulations
	drivers comply with UCL Policy on Drivers http://www.ucl.ac.uk/hr/docs/college_drivers.php
	drivers have been trained and hold the appropriate licence
	there will be more than one driver to prevent driver/operator fatigue, and there will be adequate rest periods
	sufficient spare parts carried to meet foreseeable emergencies
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

DEALING WITH THE	Will people be		If 'No' move to next hazard

PUBLIC	dealing with public	YES	If 'Yes' use space below to identify and assess any risks
e.g. interviews, observing	During site observation, the researcher intends to observe activity within the developments under study and impromptu conversations may be shared with residents. There is a risk of causing residents discomfort or offence to residents.		

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	all participants are trained in interviewing techniques
	interviews are contracted out to a third party
	advice and support from local groups has been sought
X	participants do not wear clothes that might cause offence or attract unwanted attention
X	interviews are conducted at neutral locations or where neither party could be at risk
X	OTHER CONTROL MEASURES: please specify any other control measures you have implemented: Before entering conversation with a resident, they will be informed of the purposes of the study and no personal information will be obtained by the researcher.

FIELDWORK 3 May 2010

WORKING ON OR NEAR WATER	Will people work on or near water?	YES	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. rivers, marshland, sea.	Wharf Road (one of the case study sites) is situated near City Road basin. Falling into the basing could lead to drowning, injury, or illness (very low risk).		

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	lone working on or near water will not be allowed
	coastguard information is understood; all work takes place outside those times when tides could prove a threat
X	all participants are competent swimmers

	participants always wear adequate protective equipment, e.g. buoyancy aids, wellingtons
	boat is operated by a competent person
	all boats are equipped with an alternative means of propulsion e.g. oars
	participants have received any appropriate inoculations
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

MANUAL HANDLING (MH)	**Do MH activities take place?**	**NO**	**If 'No' move to next hazard** **If 'Yes' use space below to identify and assess any risks**
e.g. lifting, carrying, moving large or heavy equipment, physical unsuitability for the task.			

CONTROL MEASURES	**Indicate which procedures are in place to control the identified risk**

	the departmental written Arrangement for MH is followed
	the supervisor has attended a MH risk assessment course
	all tasks are within reasonable limits, persons physically unsuited to the MH task are prohibited from such activities
	all persons performing MH tasks are adequately trained
	equipment components will be assembled on site
	any MH task outside the competence of staff will be done by contractors
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

SUBSTANCES	Will participants work with substances	NO	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. plants, chemical, biohazard, waste			

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk

- ☐ the departmental written Arrangements for dealing with hazardous substances and waste are followed
- ☐ all participants are given information, training and protective equipment for hazardous substances they may encounter
- ☐ participants who have allergies have advised the leader of this and carry sufficient medication for their needs
- ☐ waste is disposed of in a responsible manner
- ☐ suitable containers are provided for hazardous waste
- ☐ OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

OTHER HAZARDS	Have you identified any other hazards?	NO	If 'No' move to next section If 'Yes' use space below to identify and assess any risks
i.e. any other hazards must be noted and assessed here.	Hazard: Risk: is the risk		

CONTROL MEASURES	Give details of control measures in place to control the identified risks

Have you identified any risks that are not adequately controlled?	NO ☐	Move to Declaration
	YES ☐	Use space below to identify the risk and what action was taken

Is this project subject to the UCL requirements on the ethics of Non-NHS Human Research? ☐

If yes, please state your Project ID Number ☐

For more information, please refer to: http://ethics.grad.ucl.ac.uk/

DECLARATION	The work will be reassessed whenever there is a significant change and at least annually. Those participating in the work have read the assessment.

Select the appropriate statement:

X	I the undersigned have assessed the activity and associated risks and declare that there is no significant residual risk
X	I the undersigned have assessed the activity and associated risks and declare that the risk will be controlled by the method(s) listed above

NAME OF SUPERVISOR DR MICHAEL SHORT

FIELDWORK 5 May 2010

8.3 Appendix 3 – Participant Consent Form (Architect)

UCL

Basic information

Project title: Designing for social interaction in high-density housing: a multiple case analysis of recently completed design-led developments in London
Type of project: Thesis
Date: 2021
Researcher: Henry Mellen
Contact details: henry.mellen.19@ucl.ac.uk

Participant information sheet

You are being invited to participate in a research project titled *Designing for social interaction in high-density housing: a multiple case analysis of recently completed design-led developments in London*. Please feel free to discuss any of the information above with others, and do not hesitate to speak with me if you wish to hear more information. It is up to you to decide whether to take part and choosing not to will not disadvantage you in any way. Moreover, if you wish to withdraw from the study at any time, you may do so with immediate effect.

High density residential environments present a number of barriers to social interaction. For example, outdoor spaces risk being overshadowed owing to the increased scale of the buildings that high density results in, which makes these spaces less inviting. Additionally, there are both psychological and physical impediments to residents using these spaces that are typically several floors above or below them. The aim of this research is to investigate a number of highly commended high density developments to understand how they have addressed these challenges, and whether they have been successful in encouraging social contact.

One of the development's that has been selected as a case study for this research is [name of development]. As the lead architect of [name of development], I am looking to interview you to hear about the design process for the scheme. Principally, I am interested to learn about the development's overarching design principles, whether or not social interaction was considered in the design process, and how you imagined different spaces in the scheme would be used by future residents. I intend for this interview to be semi-structured, and to take place online using video conferencing technology. If this method of communication proves unviable, we can seek an alternative arrangement. Any information you share could be used as evidence to support the findings of this research.

If you agree to take part, you will be asked for your consent for the interview to be recorded. The purpose of this is to allow for the generation of an audio transcript for later analysis. Furthermore, it may be included as an appendix in the final outcome of this research project to allow other researchers access to the content. Despite this, any personal data or information that could lead to your identification will be omitted.

Personal data and information will be held by the researcher for the duration of the project. The purpose of this is to facilitate further contact, if required. This will be stored by the researcher and held according to the Data Protection Act 2018 guidelines. As such, there is no risk of disclosure of this information to a third party. In addition, personal data will be stored separately from the information you have provided, both of which will be held in password protected folders.

Participant's statement

- I have read the Participant Information Sheet and understand what the study involves, and why I have been contacted to participate.
- I understand that participation is voluntary, and that I may decide to withdraw from the study at any time with immediate effect by notifying the researcher.
- I consent to the processing of my personal information for the purposes of this research study, which will be treated as confidential and handled in accordance with the provisions of the Data Protection Act 2018.
- I am aware that any information I provide may be used as evidence to support research findings.
- I understand that if I give permission for my participation to be recorded, this may be published as part of the final outcome of this research project.
- I agree to participate.

Participants name	Participants signature	Date

8.4 Appendix 4 – Participant Consent Form (Resident)

UCL

Basic information

Project title: Designing for social interaction in high-density housing: a multiple case analysis of recently completed design-led developments in London
Type of project: Thesis
Date: 2021
Researcher: Henry Mellen
Contact details: henry.mellen.19@ucl.ac.uk

Participant information sheet

You are being invited to participate in a research project titled *Designing for social interaction in high-density housing: a multiple case analysis of recently completed design-led developments in London*. Please feel free to discuss any of the information above with others, and do not hesitate to speak with me if you wish to hear more information. It is up to you to decide whether to take part and choosing not to will not disadvantage you in any way. Moreover, if you wish to withdraw from the study at any time, you may do so with immediate effect.

High density residential environments present a number of barriers to social interaction. For example, outdoor spaces risk being overshadowed owing to the increased scale of the buildings that high density results in, which makes these spaces less inviting. Additionally, there are both psychological and physical impediments to residents using these spaces that are typically several floors above or below them. The aim of this research is to investigate a number of highly commended high density developments to understand how they have addressed these challenges, and whether they have been successful in encouraging social contact.

One of the development's that has been selected as a case study for this research is [name of development]. As a resident of [name of development], I am looking to interview you to hear about your lived experiences. Principally, I am interested to learn about the type, frequency and location of: (i) any activities you carry out in the circulation and amenity spaces of your development; and (ii) the social interactions you have with neighbours. I intend for this interview to be semi-structured, and to take place online using video conferencing technology. If this method of communication proves unviable, we can seek an alternative arrangement. Any information you share could be used as evidence to support the findings of this research.

If you agree to take part, you will be asked for your consent for the interview to be recorded. The purpose of this is to allow for the generation of an audio transcript for later analysis. Furthermore, it may be included as an appendix in the final outcome of this research project to allow other researchers access to the content. Despite this, any personal data or information that could lead to your identification will be omitted.

Personal data and information will be held by the researcher for the duration of the project. The purpose of this is to facilitate further contact, if required. This will be stored by the researcher and held according to the Data Protection Act 2018 guidelines. As such, there is no risk of disclosure of this information to a third party. In addition, personal data will be stored separately from the information you have provided, both of which will be held in password protected folders.

Participant's statement

- I have read the Participant Information Sheet and understand what the study involves, and why I have been contacted to participate.
- I understand that participation is voluntary, and that I may decide to withdraw from the study at any time with immediate effect by notifying the researcher.
- I consent to the processing of my personal information for the purposes of this research study, which will be treated as confidential and handled in accordance with the provisions of the Data Protection Act 2018.
- I am aware that any information I provide may be used as evidence to support research findings.
- I understand that if I give permission for my participation to be recorded, this may be published as part of the final outcome of this research project.
- I agree to participate.

Participants name	Participants signature	Date

8.5 Appendix 5 – Interview Questions

As detailed in Chapter 4, interviews with architects and residents represented the primary method of data collection for this study. The nature of these interviews and the format of the interview questions were tailored to respond to the case study objectives. When speaking to the architects, it was important to identify if and how social interaction was considered in the design process. Meanwhile, the interviews with residents sought to determine the type, location and meaningfulness of social interactions, examine how physical design may help or hinder social interaction, and understand the influence of other factors on social interaction. Since the interviews were semi-structured, these questions represented a lightweight structure which guided their direction, rather than a predetermined agenda to be followed at all costs.

Questions for the lead architects:

- What were the driving principles behind the design of the development?
- Were the amenity and circulation spaces within the development designed as a forethought?
- What level of consideration was given to the climatic conditions in the development's outdoor amenity spaces (i.e. wrt wind effects and overshadowing)?
- How was it envisioned that amenity and circulation spaces within the development would be used AND how were they designed to cater for these activities?
- Were any design interventions made specifically in order to activate the development's amenity spaces or encourage social interaction?

Questions for residents:

- Where is your flat in the development (i.e. floor and orientation)
- Habitants (single, couple, family (with/without children?)
- Type of ownership
- How long have you lived there?
- What do you like/dislike about your development?
- How do you use (frequency and type of activities) the shared and amenity spaces (e.g. courtyard and terrace/garden) within your development?
- How often do you interact with your neighbours, and where do these interactions take place?
- Do you feel that there is a sense of community at 95 Peckham Road?

8.6 Appendix 6 – Excerpt from Interview Transcription with Architect B, Royal Road

Interviewer: What were the driving principles behind the design?

Architect B: You are probably aware from reading the article of how we won the project. It was a competition run by the Elephant and Castle regeneration team in Southwark Council. specifically it was one of the Early Housing Sites for the Heygate residents to be moved into. Heygate being the big social housing scheme of two and a half thousand homes. It was falling into disrepair and criminality and the council decided that there only option was to demolish and redevelop. That project is now nearly complete. So this was back in 2006. So we were mindful that the reason they were building the Early Housing Site's was because the early social housing experiment of the 50s 60s and 70s had failed. Or at least many of these mega blocks had failed. So when we approached Royal Road as a vacant site at that time there had been a building in the centre of the site. It was a two or three storey care home for the elderly, and it was surrounded by trees. They had demolished the building by the time we came to have a look at it but the trees were all still there and we just thought that this was such a gift first to the neighbourhood and to the project. So our first ambition was to retain as many of the trees as we could. Luckily there were on the perimeter, but that meant that we needed to design a footprint of a building that would step around the trees in order to maximise the amount of housing that we could get onto the site. The brief was for 110 homes. It wasn't social housing at that time. It was 35% social and 65% private homes. But we knew that the 35% would be residents coming out of the Heygate estate. We wanted to make sure that we didn't design a building that would be anything like the long corridor blocks of that type of housing. The other driving force was to, out of that, was also to make sure that we were designing the highest quality housing, irrespective of the fact that it was partly social or whatever. We set a mission for ourselves to create only dual aspect homes. So no corridors, no internal corridors with flats on either side. Because dual aspect, and now this is back in 2006 as I said, councils are now asking for no single aspect homes in developments. Back then it was totally common. And so we managed to, with our site layout, stepping in and out of the trees, to design flats that were either dual or triple aspect throughout, and no internal corridors. And no deck access, but there are a few elements such as the private bridges which we will talk about later. Those were the

primary ambitions. And also to make sure that any roof space was not simply a roof. Any roof space was primarily a private roof terrace or a green roof or a place to put PVs.

8.7 Appendix 7 – Excerpt from Interview Transcription with Resident A, 95 Peckham Road

Interviewer: Do you use the bike store?

Resident A: Yes, and everybody uses it. It's really packed already. There's just not enough room for every flat to have two bikes. There's about 60 spaces and it is already full.

Interviewer: There are a lot of apartment blocks which don't have any storage space whatsoever! This must be a space where you bump into other people?

Resident A: Yes, so the people who we have drinks with when you could have drinks, I used to bump into him every morning going to work when getting my bike. That's how I got to know him. So yes. And the bike store is shared with the whole building. So the people who live in the courtyard do have to come round to get their bikes, but it does mean that you interact with people there that you wouldn't bump into in the corridors because you technically have a different entrance to them. It's a very communal space.

Interviewer: So in a way your entrance lobby is shared, whereas the other lobbies are not?

Resident A: Yes, we don't have an excuse or reason to go into the other lobby.

Interviewer: And the folly. Is this used?

Resident A: When everyone moved in, you could go up there and see into everybody flats, so it was kind of. And then someone uses it to work out on, they use those kind of elastic strap things. So yes, in the first lockdown loads of people used the courtyard for workouts. Actually three or four people used it every day. The folly. Then there is a family who live in G.9, in one of the council units, and they seemed to go up it a lot at the beginning but then I just haven't seen them in months. We have this funny thing where you can really see into the courtyard from our balcony. You can't see into the other terraces, but you can see directly into the courtyard.

Interviewer: So the courtyard probably animated your lockdown a little?

Resident A: Yes, it was nice to have.

Interviewer: And shows that other people are around without having to leave your front door?

Resident A: Yes, absolutely. I like the folly. It's obviously unnecessary, but it's quite fun, nice to have and adds a certain interest. There are a few plants growing in there now. A couple in one of the courtyard apartments have really got into filling the courtyard with their plants and I think they have put a few plants in there as well. On new year's eve people go up onto it too because you can see more fireworks, it's a nice vantage point.