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TUDelft

On the Edge

A study into social integration within community boundaries

Photograph - Whitechapel Road
(Deying Chen)

Contents

The Lonely Londoners

Samuel Selvon

1. Preface: personal interest into edge conditions

London is a place like that. It divide up in little worlds, and you stay in the world you belong to and you don't know anything about what happening in the other ones... them people who have car, who going to theater and ballet in the West End... they don't know nothing about hustling two pound of brussel sprout and half-pound potato, or queueing up for fish and chips in the smog.

– "The Lonely Londoners", Sam Selvon

As part of the graduation studio architectural design crossovers "Heterogeneous City", this research paper is written to support the individual theoretical research and design project. The personal interest of urban edge conditions comes from the heterogeneous quality of London, in terms of both built environment and cultural background, as indicated by the report 'The Changing Anatomy of Economic Inequality in London'[1]. The focus point of social inequality within community boundaries later developed into the interests for the relationship between social contrast and morphological contrasts. Therefore a social issue is intrinsically connected with the discussion of the built environment.

In recent years, London has gradually become the most diverse city in the world in terms of ethnicity. People coming from different backgrounds have been forming their own communities in different neighborhoods of London, the significant ones include the Bangladeshi community in Whitechapel, the Jamaican community in Brixton, the Arab community in Edgware Road.[2] Visible or invisible urban boundaries were formed on the edge of these communities. However, the edges are formed not only by the difference of ethnicity, but also the economic status.

Gentrification describes the process of urban renewal in deteriorating urban districts, which increases property values but frequently pushes out low-income families and small businesses. Gentrification in London has led to enclaves of new development surrounded by working class neighborhoods, therefore creating an 'edge' area between these two. The gentrification process of London was caused by the growth of business opportunities and population. On one hand, Gentrification has led to the increase of hygiene and quality of life, on the other hand, the rising cost of living that comes with its process has pushed locals out of the city center, or led to the loss of identities of certain communities.[3]

This research paper focuses on the phenomenon of social and urban morphological contrasts within community boundaries caused by socio-economic inequality and the process of urban development. This paper also discusses the reason and the spatial needs for social integration. This topic is becoming increasingly relevant in London because of the gentrification process in multiple urban edges around central areas of the city. However, it is also relevant in cities around the world where gentrification has

1. Vizard, Polly, et al. "The changing anatomy of economic inequality in London (2007-2013)." Social Policy in a Cold Climate Research Report 6 (2015).
2. Coates, Sarah. "Population Estimates by Ethnic Group and Religion, England and Wales." Office for National Statistics, 16 Dec. 2021, https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/articles/populationestimatesbyethnicgroupandreligionenglandandwales/2019. Accessed 3 Oct. 2022.
3. "Gentrification." National Geographic Society, https://education.nationalgeographic.org/resource/gentrification. Accessed 4 Oct. 2022.

caused social segregation problems. Hence there is an urgent need for an urban development strategy that provides spatial opportunities for interactions and innovations.

Keywords: urban edges, integration, openness, porosity, interaction

Main Research Question:
In the process of gentrification, how to design with openness within the 'edge' area to both promote social integration and innovative collaboration?
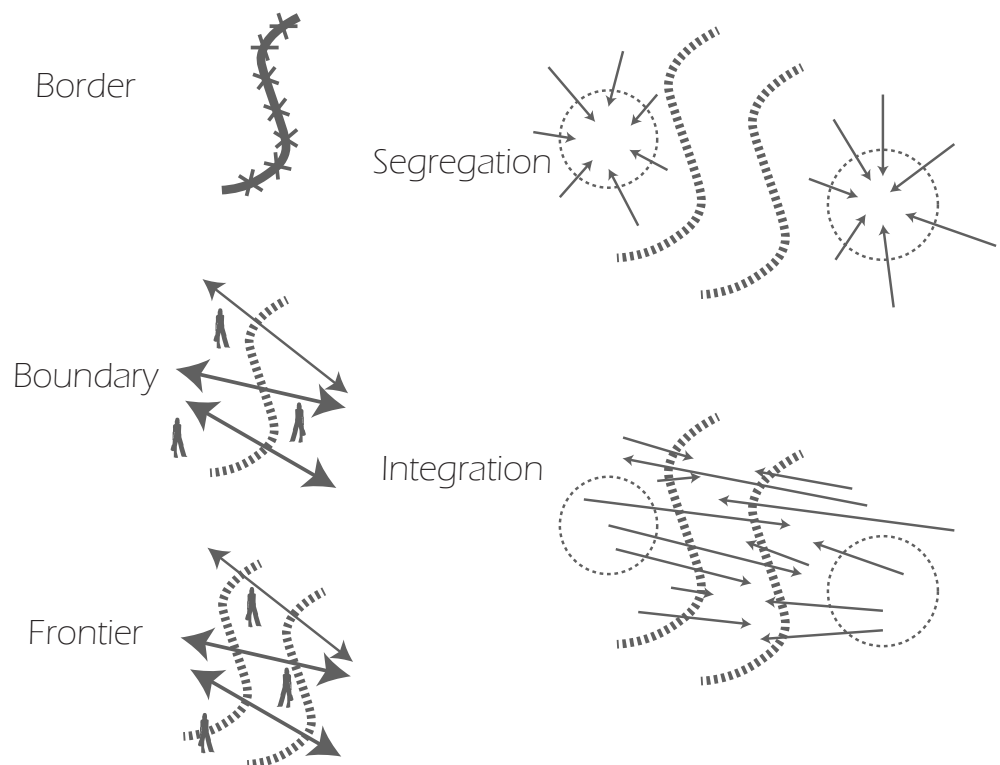
Border

Segregation

Boundary

Integration

Frontier

Figure 1 - Edge condition diagram

2. Introduction: the definition of urban Edges

To understand the definitions of the urban 'edges' we need to identify the common description towards 'edges' by different architectural theorists. Some theorists identify 'edge' as a 'boundary', some use the word 'border', while others describe it as a certain 'frontier'. The 'edge' can be described as a certain physical spatial condition characterized by a large contrast in urban fabric. For example, the space between new developments of high rise buildings and the surrounding low rise neighborhoods. Additionally, the 'edge' could be linked to a social phenomenon which describes a zone of contact, associating physical condition with human's interaction coming from different communities.

In his book 'Designing disorder', British professor of sociology Richard Sennett pointed out the important role social divisions play in the definition of urban edges. He states that there are two possible different definitions for an urban 'edge'. For edges where social interactions end, it should be called a 'boundary', as for an edge where different groups interact, it should be called 'border'. "In natural ecologies, borders are the places where organisms become more interactive, due to the meeting of different species or physical conditions."[4] The emphasis on the interactive character of borders is important because this means " the study of borders cannot be approached solely according to any one type of division or social force", it is crucial to recognize the complexity of edge conditions, which include not only physical forms but also territorial, economical and many other social phenomena.[5]

An American Philosopher of politics named Thomas Nail defined edge concepts with similar complexity in his book 'Theory of the Border'. He proposed several definitions of different edge conditions, including 'the border', 'the boundary', 'the frontier' and 'the limit'. Nail defines 'the border' as 'a limit junction of social circulation', while all the other words are specific functions of the border.[6] 'The border' is the name of commonality together with distinct phenomena in social history. All in all, the border is "a process of social division."

According to Nail, the nature of 'the limit' is its defensive character in historic context, just like the Romans built their limit structures at the limit of their marked territories. However, it is worth noting that the 'limit' not only defends but also allows some activities to pass through, as it is in every modern day political borders.

4. Sennett, Richard, and Pablo Sendra. Designing Disorder: Experiments and Disruptions in the City. Verso Books, 2022.
5. Ibid.
6. Nail, Thomas. Theory of the Border. Oxford University Press, 2016.

Nail considers 'the boundary' more of a political concept in comparison, because it is a process of compelling part of the outside to the inside, by introducing social flows into the recirculation of the inner social orbit. The concept of 'the frontier' is defined as a zone or a belt, instead of a line, of disjoined flows around the conjoined ones. It is "a process of constant disjunction and indetermination: a zone of experimentation". [7]

Political theorist David Newman concluded on the progression of border studies in general, which shifts its focus from the international territorial line between states towards the inclusiveness and exclusiveness of groups, affiliations and identities between territories and peoples.[8] The diversity of border types and boundary experience makes it almost impossible to conclude on one edge phenomenon, therefore Newman argues that the explanation of edge conditions should be constructed with a common set of theoretical frameworks. According to Newman, the significant characteristic of 'borders' is the creation

of differences and that it maintains order both for the group within space and the group that encompasses. The nature of these 'boundaries' lie in the trans-boundary interactions, whether it is through sealed borders or porous borders that enables freedom of movement. Newman thinks that it is important to study the types of crossings, for example "the crossing of borders between cultural and religious groups" or "the crossing from one state to another".[9]

In order to describe the activity of border crossing, Newman points out that we should understand the concept of transitional zones. In German, the word 'Frontier' has been translated into notions of 'borderland', which reflects the sphere of activities that are directly affected by the existence of a border. Therefore the lens of geographical description is bonded with the lens of human activities within the zone. (Figure 1. edge conditions diagram)

7. Ibid.

8. Newman, David. "On Borders and Power: A Theoretical Framework." Journal of Borderlands Studies, vol. 18, no. 1, Mar. 2003, pp. 13–25, https://doi.org/10.1080/08865655.2003.9695598.

9. Ibid.

3."Thick description"of urban edges

Due to the heterogeneous nature of London, it is necessary to approach the study of urban edges with the methodology of constructing a set of theoretical frameworks, in order to build a thorough analysis of urban edge conditions. 'Thick description' is a concept in anthropological study that was first introduced by British Gilbert Ryle. It indicates the analytical method to describe things in a multi-layered structure, in contrast to the traditional single layer analysis, or a description that only showcases the surface.[10] In the context of urban edges analysis within London, thick description is fitting for its nature of layering complex information and comparatively organizing the definition framework of different edges. At the same time it prevents the anthropological analysis from being overly mechanical or technical. Therefore in this research I have decided to create a multi-layered thick description of the urban edges of London.

The urban edges of London sit in the contemporary border phenomenon that David Newman describes, which contains a certain degree of porosity, in contrast to political borders between states that are generally more sealed off. Even though the urban edges of London exist with certain spatial characteristics or even sometimes physical boundaries, often they are blurry, porous and hard to define. Therefore, many times they are best described as a 'frontier' which represents a zone where goods and knowledge are exchanged and human interactions between communities occur, instead of a physical wall. Therefore the study of edges in London should both reflect on the morphological differences and social contrasts. The word 'edge' indicates a certain contrast between both sides of the transitional zone. I construct the framework of urban edges based on the types of phenomenal contrasts between both sides of a certain edge. The types of urban edges I studied within the context of London are historic edges, morphological edges, socio-economic edges, demographic edges, social and physical infrastructural edges.

Mapping of these edges on a geographic perspective, which means mapping out the collection of edges on an urban map with traditional urban analysis features, showcases the location relationships between these edges. (Figure 4.2. Mapping collection of edges) However, the limitations are apparent, since reading the overlapped information required

10. Ryle, Gilbert. "The thinking of thoughts: What is 'Le Penseur' doing?." Collected Essays 1929-1968 . Routledge, 2009. 516-532.

separating different elements to make ideal comparisons and further extract information. (Figure 4.1. Mapping Urban Analysis on Edge Fragments) In comparison, the method of 'thick description' in urban analysis allows overlapping and extracting information in a multi-angle perspective, the multilayer structure helps with processing complicated information with all types of variables.

3.1. Morphological edge

"Cities within a city" is an academic proposal and a collection of thesis that focus on the urban development with social phenomenon that coexisted in Berlin in the 1970s, especially the forming of enclaves within the city. Renowned urbanists and architects that participated in the proposal includes Rem Koolhaas, Peter Riemann, O.M. Ungers. London and Berlin shared a lot of common characteristics both as metropolitan cities, as mentioned in 'Thesis 4: The differentiated urban structure', they are characterized by an "overlapping of many opposite and divergent conceptions".[11] These opposition and diverse elements led to the divergence of the traditional urban concept that sees the city as a whole. The idea of cities within a city is to view Berlin as a city-archipelago, then during the urban planning process, extract the identifiable districts and strengthen their features through definitive urban planning. The overall principle is, in a high building density area, demolish some buildings in order to create public parks, gardens and squares, while in low density areas, design is intensified by integrating residential centers. The intentions for creating each of these "islands in the city" are to create zones that each

11. Akademie, Sommer, "Cities within the city Proposals" , 1977.

receive a configuration of its own. (Figure 2. cities within a city)

Driven by unbalanced development policies between different zones of the city, as well as urban planning strategies such as "cities within a city" as mentioned above, neighborhoods with each of their own identities grows within London. Enclaves such as the City of London, Canary Wharf and Elephant and Castles became the business and commercial hubs of the city, which comes with the ecological needs for higher density and vertical growth. Therefore these enclaves distinct themselves with their surrounding by their skyscrapers, the bigger street scale and enlarged public spaces. The east end of London, in particular the whitechapel and shedwell area were historically dense workers housing, factories and docks. After the war these areas were transformed and densified, driven by the system of providing affordable housing. Yet the morphology of post war housing estates have vast contrast from the office buildings and apartments nearby that were constructed due to redevelopment programs that occurred after the 2000s. Three morphological edges were mapped in my research, each with their own characteristics. Urban sections of designated areas are lined up, overlaying with urban plans to showcase different scales of built environments along the morphological edges. The stacking of urban sections not only indicates sectional conditions but also the density and discontinuity of urban fabrics. (Figure 3. morphological edges)

The morphological edge in Canary Wharf is very pronounced on the diagram because of the high contrast of

Opportunity
Brownfields in London

Dramatic Change
areas that moved up in socio-economic statues

Controling urban sky lines
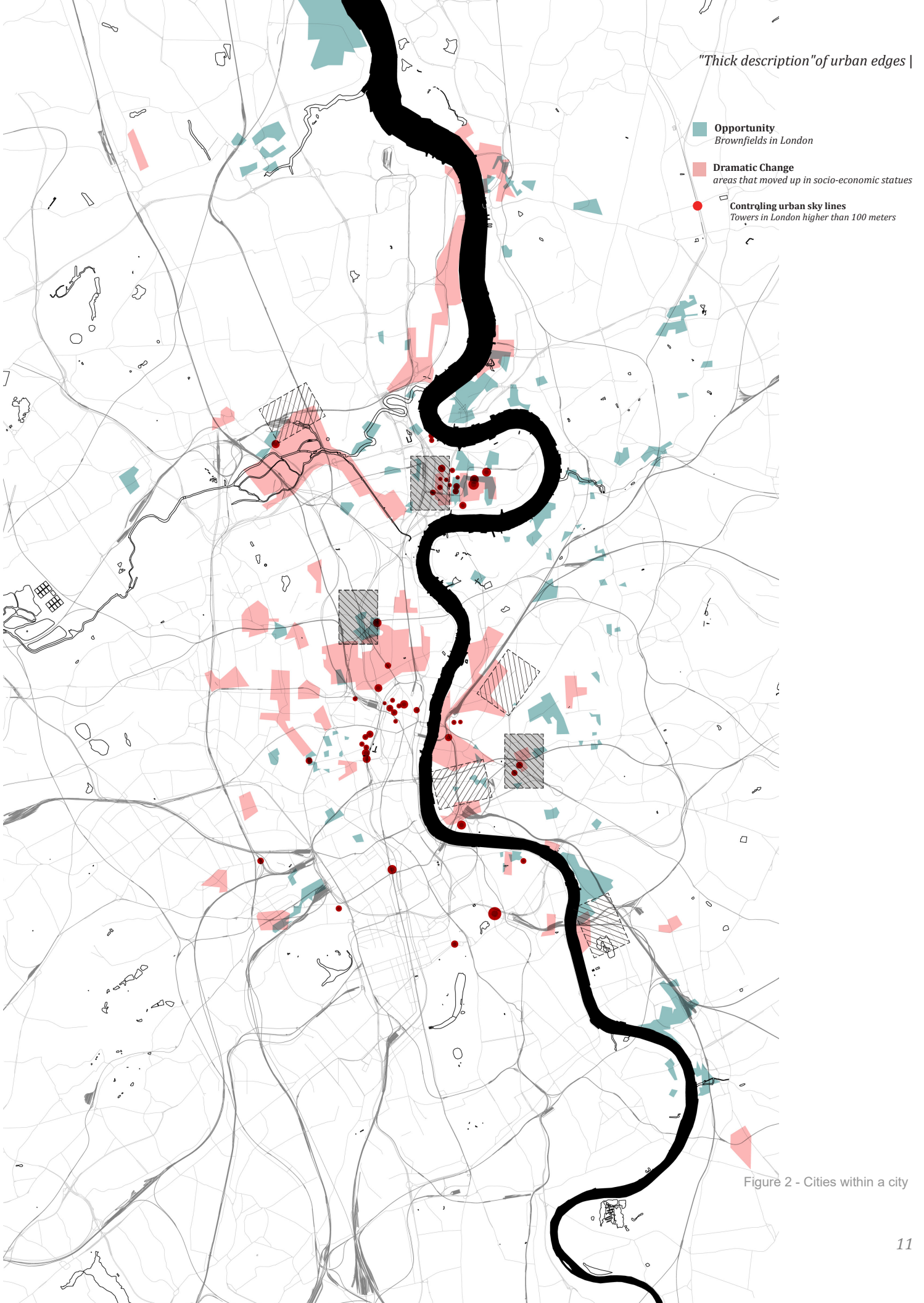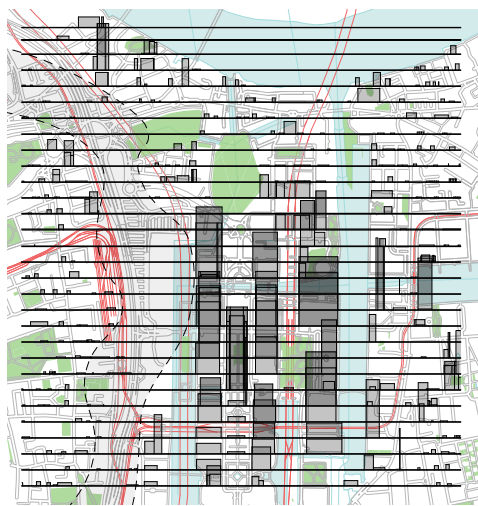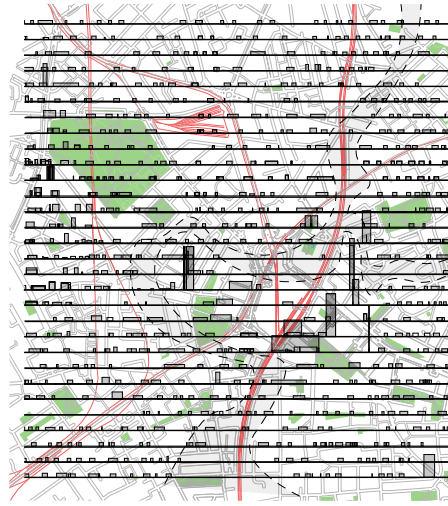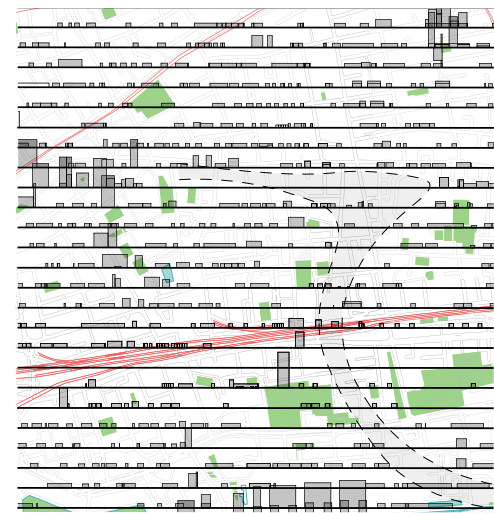*Towers in London higher than 100 meters*

Figure 2 - Cities within a city

Canary Wharf

Elephant and Castles

West Tower Hamlets

buildings
Rails
Water
Parks

Figure 3 - Morphological Edge

12. Sibley, David. Geographies of Exclusion: Society and Difference in the West. Routledge, 2002.
13. "Living in a Denser London: How Residents See Their Homes" — Levitt Bernstein. https://www.levittbernstein.co.uk/now/living-in-a-denser-london-how-residents-see-their-homes/. Accessed 18 Jan. 2023.

building heights and density between both communities, while the edge in Whitechapel is less clear because even though the building heights on one side is significantly higher, the density on both sides could be considered high and the shift is less dramatic. Both the enclave and the existing community in Elephant and Castles sit on relatively lower dense street scale, what differentiates the edge is the building heights on the new development side of the edge.

The morphological edges in London create both visual contrast and psy-chological contrast between both communities. David Sibley explained the act of border crossing and how crossing "from a familiar space to an alien one which is under the control of somebody else, can provide anxious moments", but at the same time, people who are surrounded by boundaries could also be provided a certain feeling of closure and securi-ty.[12] For outsiders at the side of the existing communities, street space can be perceived as more enclosed, clus-tered and intimate, while at the new development side, street scales are generally bigger and open with more

public space. However, as pointed out by a report conducted by LSE, the perceptions on morphological edges are highly dependent on the context. For example, the problems with over-heating, lack of privacy and excessive noise were found by surveying afford-able housing that tended to be located on lower floors of high rise buildings, while they are less present on bigger and higher-priced apartment units in the upper floors.[13]

It would be interesting to study the relevance of building morphology and its influence on the symbolic object of the city. As in historic London, the height of buildings used to represent the symbol of control, for example the religious control represented by the church towers resulted from their symbolic positions in the urban fab-ric and the city's skyline. Nowadays, with the high rise buildings housing financial companies and private apartments, the control of the city's skyscrapers has shifted to capitalism. This raises the question whether the contrast between the building foot-prints of a commercial area and the residential area around them influ-ences how people interact with spac-es? Therefore, it is necessary to not only study urban morphology of these edges between new developments and pre-existing communities, but also look into smaller scales or other social angles, to find the inner connec-tion between human behavior and the urban environment. By comparing the three locations of the morphological edge, I chose the whitechapel area for further investigation on the other pro-files, for its relatively smaller urban scale but big social contrast.

3.2. Socio-economic edge

The inequality of socio-economic developments in London is shown in 'the gentrification map' published by Trust of London. On the city level areas across the east and south of the city, particularly western side of Tower Hamlets are considered gen-trification hot spots due to their close proximity to the City of London, while much of the west and north side of London have seen little change.[14] On one hand, gentrification has improved the sanitation and living environment, bringing new fashionable and afford-able housing to young London profes-sionals, on the other hand, it has led to socio-economic edges throughout the hot spots. A resident of Canary Wharf told me during an interview that she finds the phenomenon almost Utopian: "In Canary Wharf you have million-pound mansions in these glass towers, on the other side of the street there are people living off food banks."

The phenomenon of "the missing middle" has been documented by the Fairness Commission Report of 2013 subtitles 'Is Tower Hamlets rich or poor?". The report states that there is a lack of any clear 'middle' between rich and poor in Tower Hamlets. Com-pared to the rest of London, Tower Hamlets has a significantly higher share of low- and high-earners but proportionally fewer middle-earners.

Zooming in to the western side of Tower Hamlets, it could be concluded that areas with higher household income are at the west side, water-fronts, and along the main roads, with median household income above 45,000, while household in-come median in central Whitechapel and shawell districts are lower than

14. "Gentrification across Lon-don." Trust for London, https://www.trustforlondon.org.uk/data/gentrification-across-london/. Accessed 18 Jan. 2023.
15.https://www.towerhamlets.gov.uk/Documents/Borough_statistics/Income_poverty_and_welfare/income_2019_l.pdf

Morphological Edge
Historical Edge
Socio-economic Edge
(on-going gentrification area)
Demographic Edge

Social Infrastructural Edge
Physical Infrastructural Edge
(underground)
Physical Infrastructural Edge
(overground)
Water

Socio-economic Edge
(on-going gentrification area)
Social Infrastructural Edge
Buildings

Social Infrastructural Edge
Main streets and over
ground

Parks
Water

Figure 4.1 -
Mapping Urban
Analysis on
Edge Fragments

Main streets and over ground

Parks

Water

Social Infrastructural Edge

Buildings

.... Morphological Edge

– – Historical Edge

Socio-economic Edge (on-going gentrification area)

Demographic Edge

:::::::: Physical Infrastructural Edge (underground)
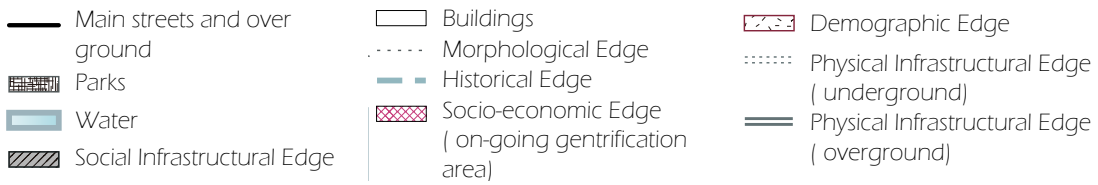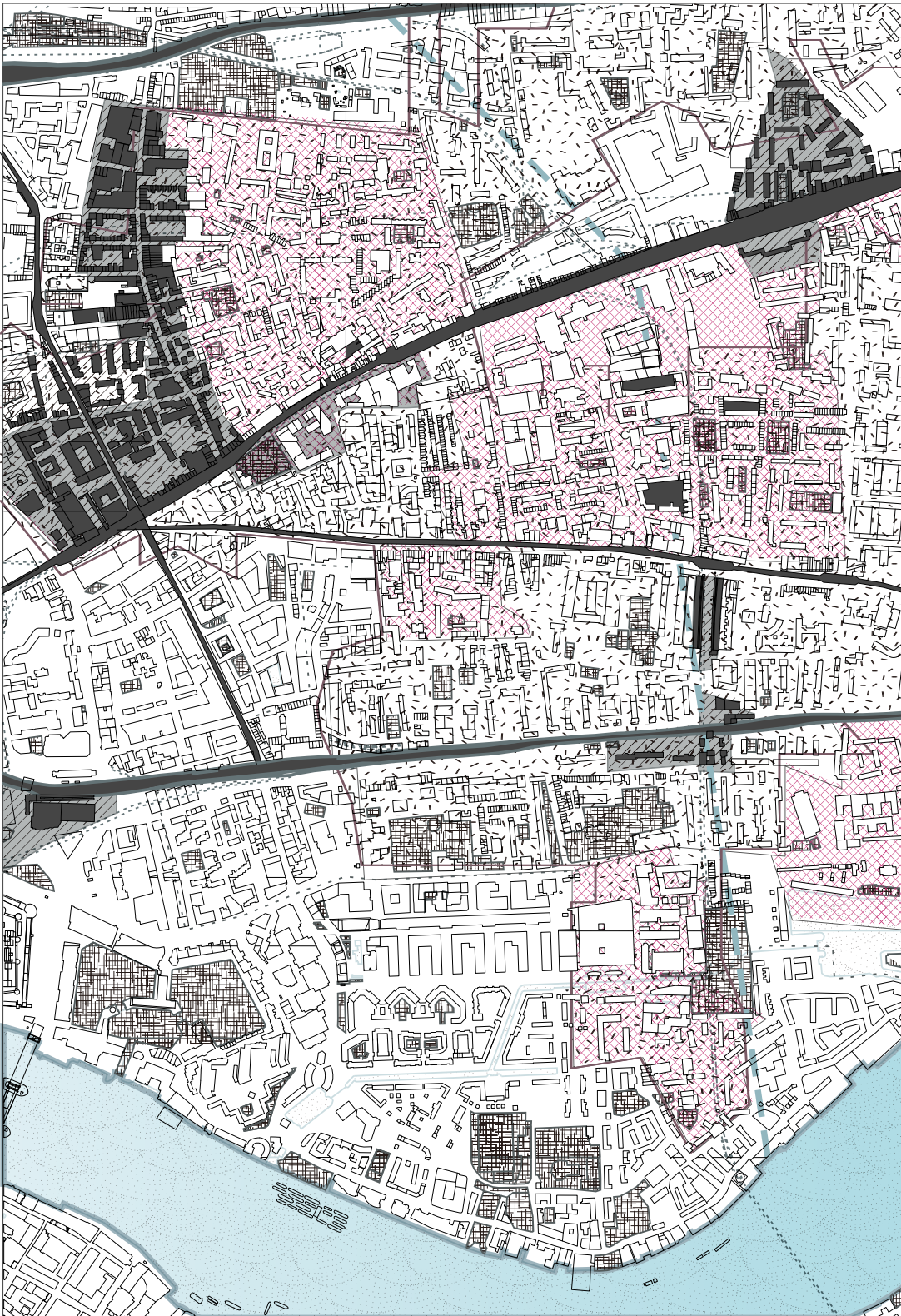
Physical Infrastructural Edge (overground)

Figure 4.2 - Mapping collection of edges

25,000 pounds per year, even lower than median household income of the whole Britain.[15] It is apparent from the socio-economic edges drawn that connectivity and location is highly relevant to households income. Higher income households tend to reside within a close proximity to waterfront, mainroad and public transport hubs which is driven by opportunities, policies and living quality.

The socio-economic edge not only highlights the income inequality among residents of Tower hamlets, but also brings tensions and protests towards both sides of the community. The living costs were driven up in these edges that led to local residents' protests against new private developments. Residents of brick lane have protested over the years against redevelopment programs pushed by the borough, a resident says " The challenge before is a class issue and therefore necessarily a race issue as well. Tower Hamlets has one of the longest housing waiting lists in the country. This proposal that the council is gearing up to approve will only push up rents, push out the local community and deepen the housing crisis."[16]

3.3. Historic edge

When talking about porous space, urban searcher Sophie Wolfrum states that cities historically operated as closed cells which strictly controlled access and restricted it to a few locations. The open city, on the other hand, is one that has, militarily speaking, given up the idea of resistance since it allows access to the adversary in an effort to prevent additional disturbance. Historically, London was

fortified during the English Civil War between 1642 and 1647. The fortification works, which was a series of earth bank and trenches, went from Thames northward towards Whitechapel Road, connecting the Windmill to Gravel Lane and Brick Lane, dividing the whitechapel area into inner and outer London.[17]

On the current urban fabric, the historic edge of Whitechapel currently sits between the Royal London Hospital and Shadwell Basin, crossing Shedwell station and Watney Market. The Whitechapel Mount was a prominent landmark in 18th century London that was situated next to the London Hospital, acting as a fort for the London civil war fortification.[18] However, none of these historic edges are prominent in the street scenes of the area nowadays, instead they became bustling commercial streets and memories preserved in archives.

3.4. Demographic edge

Tower Hamlets is one of London's most diverse boroughs, with more than one third of residents having Bangladeshi origin.[19] Historically, areas around Brick Lane were the culture center of the Jewish communities in London. Due to the civil war between east Bengal and Pakistan, Bengladishi refugees began to arrive in London during the 1960s. By the 1970s, Brick Lane had become predominantly Bengali, the Jewish synagogue was then sold off and converted into 'Great London Mosque'.[20]

Nowadays, when looking at the minority maps of western Tower Hamlets, it can be concluded that Shedwell has the highest concentration of

16. "The Save Brick Lane Protest." Spitalfields Life, https://spitalfieldslife.com/2021/06/14/the-save-brick-lane-march/. Accessed 18 Jan. 2023.

17. http://www.fortified-places.com/london/. Accessed 22 Jan. 2023.

18. Whitechapel Mount and the London Hospital (1999). http://www.mernick.org.uk/thhol/whimount.html. Accessed 23 Jan. 2023.

19. Kinder/, Aisha Majid/Harrison Ashman/ Chloe Hirst/ Eve Watling/ Tabby. Tower Hamlets: Growing up Poor in the Borough with a Missing 'Middle' – Eastlondonlines. https://www.eastlondonlines.co.uk/2017/03/tower-hamlets-growing-up-poor-in-the-borough-with-a-missing-middle/. Accessed 23 Jan. 2023.

20. "Bangladeshi London." Exploring 20th Century London, https://web.archive.org/web/20071024232417/http://www.20thcenturylondon.org.uk/server.php?show=conInformationRecord.294. Accessed 24 Jan. 2023.

21. Sim, David. Soft City: Building Density for Everyday Life. Island Press, 2019.

Bangladeshi residents, mostly at the north side of DRL railway, and along commercial Road. In comparison, the demographic edges of western Tower Hamlets coincide with socio-economic edges and physical infrastructural edges. Community actors, together with Public and Private actors, consis the multi-background characteristic of the demographic analysis of the area. The demographic analysis also showcases the conflicts and collaborations of these actors. (Figure 5. Demographic analysis)

Figure 5 - Demographic Analysis
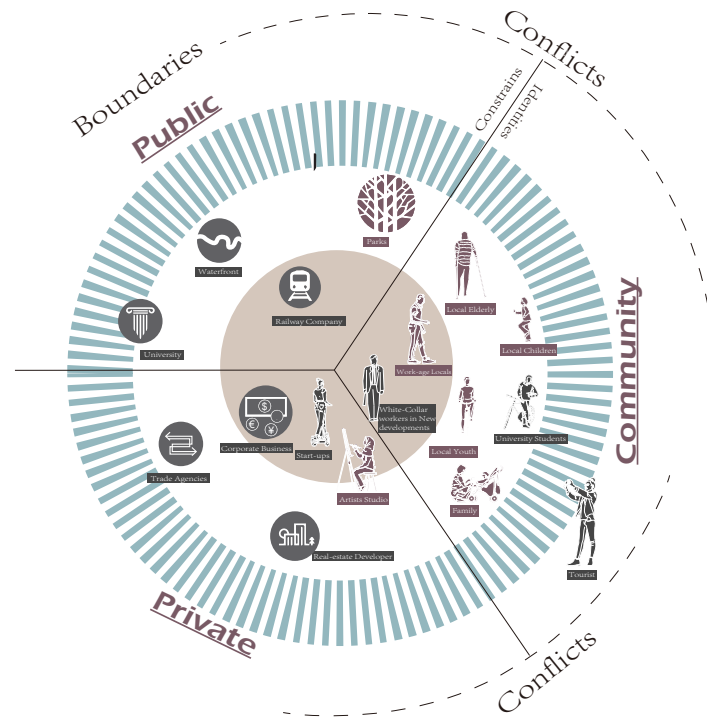
	Programs	Problems	Potentials	Demography
Gentrified Area	New residential development Retail Area Commercial Area Hospital School and University Significant Building	High cost of living Lack of human Scale Exclusiveness Lack of Identity Coperate Business	Financing the surrounding Attract high imcome group	
Area of ongoing gentrification	Retail Area Commercial Area Brownfield Site Railway Station Industrial Area Art District Tourist Attractions Sports Center	Drive up the cost of living Lack of connection to neighbourhood	Reletively low cost living Provide job Inspire Creativity Intimite Street Scale Openess of Public space Improve Sanitization Attract Tourists	
Pre-gentrified Area	Retail Area Commercial Area Railway Station Industrial Area Social Housing Garden Farm Cemetery	Poverty Lack of job opportunity Low Sanitization Exclusiveness Crime	Affordable housing Ethinic Identities Sense of community Diversity	

22. Ibid.

23. Klinenberg, Eric. Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life. Crown, 2018.

24. What Are the Regional Differences in Income and Productivity? https://www.ons.gov.uk/visualisations/dvc1370/. Accessed 19 Jan. 2023.

25. Russo, Giovanni, et al. "Commuter Effects on Local Labour Markets: A German Modelling Study." SSRN Electronic Journal, 2011, https://doi.org/10.2139/ssrn.1908100.

The process of social integration consists of integrating minorities into the social structure of the host society, hence crossing the demographic edges. David Sam and Jan Gehl talked about social integration from an urban design point of view in their book 'Soft City' by showcasing a case from Vauban, Germany.[21] The Vauban case is a master plan developed by the city of Freiburg on the former French military base at the suburbs of the city, which aims to create a new neighborhood that is socially and economically diverse. The spatial principles adapted in order to achieve social integration includes active ground floors with small business and front gardens, a variety of outdoor space- both common and private, almost car-free living with excellent public transport and bike infrastructure, which helps the street to become a place for playing and meeting.[22] This successful case of a sustainable and diverse community provides references for design principles in order to achieve an integrated and coherent society.

3.5. Social infrastructural edge

Eric Klinenberg defines social infrastructure by capaciousness in his book 'Palaces for the people'. He listed programs such as public institutions, green spaces, community organizations and commercial establishments that invite people into the public realm. Especially, he mentioned the "third places" as defined by sociologist Rayoldenburg, which includes cafes, diner, barber shops and bookstores where people are welcomed to gather and interact with little to none purchases.[23]

By mapping specific programs within western Tower Hamlets area, I try to discover areas where multiple cultural infrastructure and commercial functions are concentrated. The specific functions include barber shop, mosque, museum, textile shop, co-working space and parks. It is prominent in the map that they are concentrated along Brick Lane and transport connections, which indicates the cultural edges between cultural hubs and residential areas.

3.6. Physical infrastructural edge

'Commuter effect' is a phenomenon mentioned in the economic inequality maps produced by the Office of National Statistics, when they ask the question of what the regional differences in income and productivity are. According to the office, areas with "commuter effect" means they have higher productivity but low incomes, which is a phenomenon due to people who worked in the city and had high salaries did not reside there.[24] Among all the boroughs in the UK, Tower Hamlets has the highest productivity, while its income level is just slightly above average, which indicates it is experiencing the most severe 'commuter effect' in the country.

The reasons for a large number of workers commuting to Tower Hamlets regularly to work but not living inside the borough are the commercial hot spots and deprived communities within the area. The lack of sharing resources between the two including knowledge, job opportunities has led to workers who reside in suburban towns commute across the city relying

on public transport infrastructures. Potentially, the 'commuters effet' could bring positive influence to local employment. According to a German modeling study, the commuters shop and provide higher consumption levels to the local market, also driving up the demand for public services.[25] Therefore by planning commercial and social infrastructure together with hard infrastructure such as railway stations, it is possible to maximize the commuter's contribution to the local economy and labor market.

Western Tower Hamlets is very well connected with public transport from underground, overground, train and DRL lines. The elevated DRL line and overground train line constructed physical barriers within the urban fabric, together with leftover spaces and brownfields along the tracks. Potentially the renewed infrastructure network could make use of the edge space and turn it into transitional areas with good crossing connections

and vibrant interactions.

The social infrastructure attached with railway infrastructure usually includes retails, public facilities and more. In fact, some shops in the UK have shifted their focus from high-street to transport hubs because of the high level of foot traffic.[26] At Liverpool Street station, a redevelopment scheme was proposed by Herzog & de Meuron to extend the station in order to accommodate not only retail but public greet space, hotels and office spaces.[27] Since western Tower Hamlets is very well connected by all types of railway systems, this trend of building multi-purpose infrastructure attached with transport systems has the potential of transforming hard infrastructure from a 'wall' to a porous transition zone. (Figure 4. Thick Description)

26. Berti, Adele. "Train Stations: The New Shopping Meccas?" Railway Technology, 30 Aug. 2018, https://www.railway-technology.com/features/train-stations-new-shopping-meccas/. Accessed 19 Jan. 2023.

27. Parkes, James. "Herzog & de Meuron Unveils Plans to Add Two Towers to Liverpool Street Station." Dezeen, 25 Nov. 2022, https://www.dezeen.com/2022/11/25/herzog-de-meuron-liverpool-street-station-redevelopment/. Accessed 19 Jan. 2023.
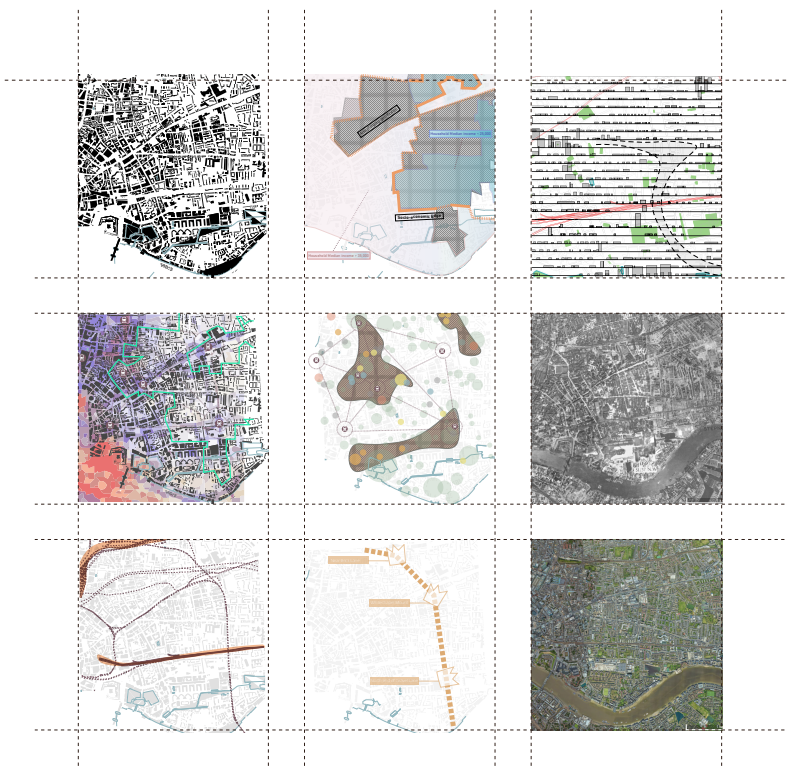
1 2 3
4 5 6
7 5 9

1 Urban fabric

2 Socio-economic edge

3 Morphological edge

4 Demographic edge

5 Social infrastructural edge

6 Historic satellite

7 Physical infrastructural edge
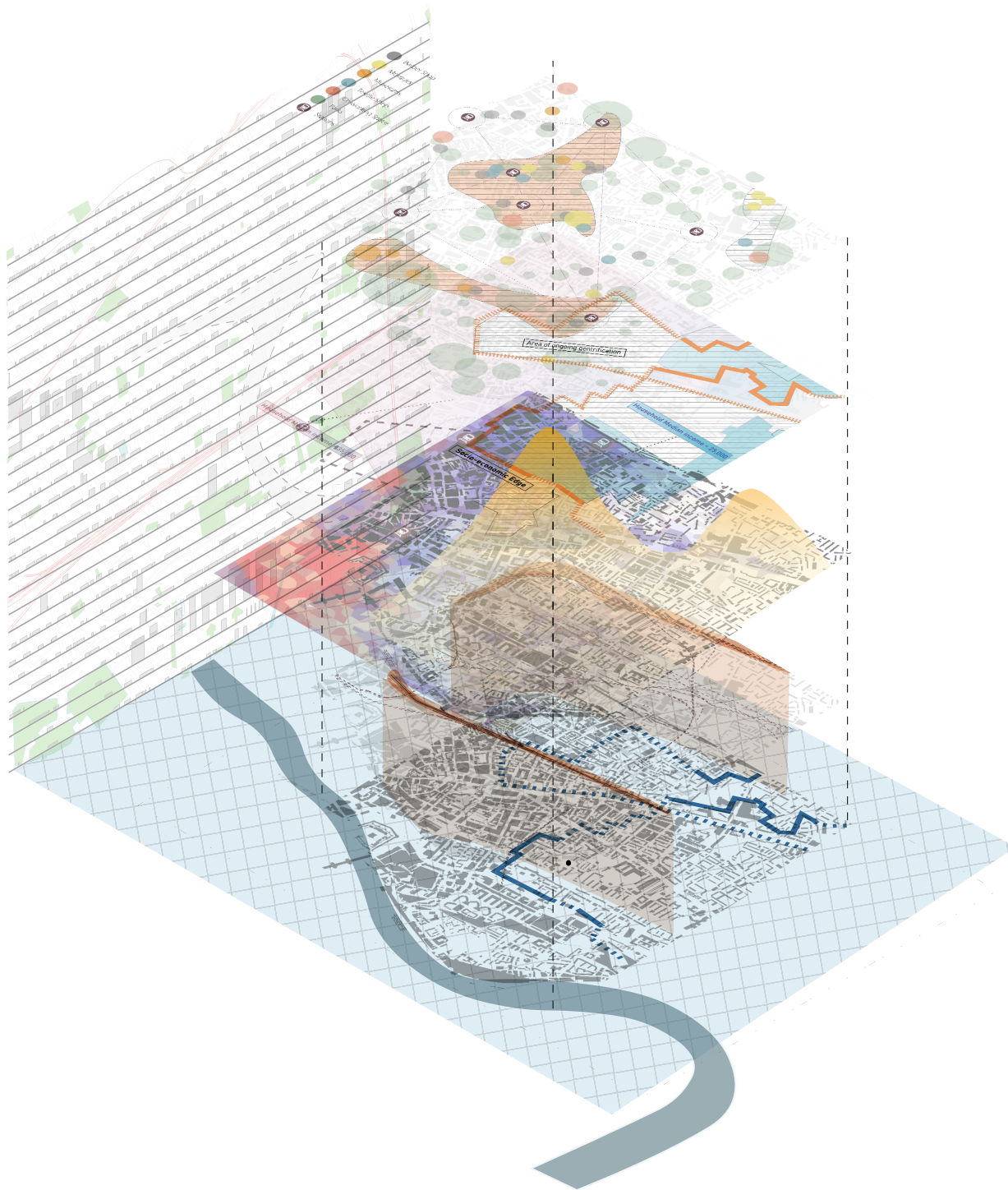
8 Historic edge

9 Current satellite

Figure 4 - Thick Description

4. A porous city and social integration

The idea of edge crossing is both an urban morphological term and a social one. Richard Sennet made a connection between a porous city and social integration. He first elaborated on the meaning of an open system, which indicates the acceptance of conflict and dissonance. Instead of a rigid structure, cities with an open system experience growth in a natural way. He also stated that it is essential that cities operate as an open system to become more democratic as a tactile experience. [28] The principles for an open system according to Sennet, is "porosity of territory, incomplete form, and nonlinear development"[29]. In order to achieve the goal of porosity, David Newman explored the concepts of 'removal of the wall'. He thinks the changes occur by the process of "from a barrier to an interface, and from a no-man's land to a transition zone". In the process, people's perception of others turns from 'them' gradually towards 'us'. In this second half of the paper, I am investigating the idea of removing the barrier, turning edges into a porous transitional zone, and other methods of promoting social integration including domesticity of architecture and social infrastructure such as the third places.

4.1. Urban openness

According to Xavier Van Rooyen, a city with an 'Open Structure' follows the principles of 'growing form' and 'aesthetic of change'.[30] While an architecture with open structure acts like the "endless architecture" proposed by Llewelyn Davies and Weeks, whose principles are applied to the Northwick Park Hospital project, an architecture incorporating the "open structure" principle can also be designed in such a way that it expands over time, extending the principles of configuration from which it was organized in the first place. Architects need to first define the minimal ecological requirements and design with an intention and configuration that allow for the architecture to develop overtime.

How do we determine whether a designated site fits in the requirements of 'open structure' or not? As a framework for various tasks within an interdisciplinary network project, an "urban structure type" concept was created and used as a workable and appropriate way to organize the urban spatial order.[31] The framework is presented as a monitoring system of land use information by Ellen Banzhaf and Rene Hofer, in which information is constructed to analyze the urban structure types and their characteristics. The urban structure types presented include public buildings,

28. Sennett, Richard, and Pablo Sendra. Designing Disorder: Experiments and Disruptions in the City. Verso Books, 2022.

29. Sennett, Richard, and Pablo Sendra. Designing Disorder: Experiments and Disruptions in the City. Verso Books, 2022.

30. Van Rooyen, X. "Megaform Versus Open Structure or the Legacy of Megastructure". Histories of Postwar Architecture, vol. 1, no. 3, Jan. 2018, pp. 30-49, doi:10.6092/issn.2611-0075/8515.

31. Banzhaf, Ellen, and Rene Hofer. "Monitoring urban structure types as spatial indicators with CIR aerial photographs for a more effective urban environmental management." IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 1.2 (2008): 129-138.

32. Banzhaf, Ellen, and Rene Hofer. "Monitoring urban structure types as spatial indicators with CIR aerial photographs for a more effective urban environmental management." IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 1.2 (2008): 129-138.

33. Wolfrum, Sophie. Porous City: From Metaphor to Urban Agenda. Birkhäuser, 2018.

34. Vigano, P. (2009). The Metropolis of the Twenty-First Century. The Project of a Porous City. On Territories, OASE, (80), 91–107. Retrieved from https://oasejournal.nl/en/Issues/80/TheMetropolisOfTheTwenty-FirstCentury

35. Vigano, P. (2009). The Metropolis of the Twenty-First Century. The Project of a Porous City. On Territories, OASE, (80), 91–107. Retrieved from https://oasejournal.nl/en/Issues/80/TheMetropolisOfTheTwenty-FirstCentury

36. Ibid

37. Wolfrum, Sophie. "Porous City-From Metaphor to Urban Agenda." Porous City, De Gruyter, 2018, pp. 9–14, http://dx.doi.org/10.1515/9783035615784-001. Accessed 19 Jan. 2023.

gardens, parks, residential areas and so on, with description of characteristics about building density, building scale, level of imperviousness.[32]

In order to further develop the edge condition analysis presented in the first half of this paper, as well as exemplify the urban openness at western Tower Hamlets, I extracted 3 sites within the area to further investigate. The sites all sit on top of certain edge conditions. I classified the urban structure types within the sites, together with analysis of their dedicated flow areas, density, porosity and imperviousness. In the end I come to the conclusion of typical urban openness on the edge spaces within western Tower Hamlets. (Figure 5. Urban openness analysis)

4.2. Porosity

Urban porosity is one of the more important components of an open system according to Richard Sennet. Sophie Wolfrum considers porosity's program approaches both social and physical space. It is one of the few phrases that explicitly refers to both forms of urban space without pigeonhole thinking.[33] Paola Vigano defines urban porosity by stating "porosity is the ratio between the volume devoted to flows and the total area."[34] She writes about 'the Metropolis of the Twenty First Century', which is a research project on 'Gran Paris', investigating the conditions of Paris. Her team's project focuses on the concept of the porous city. Her argument for the need for a porous city is that the social segregation caused by the inequality of infrastructure is so severe

that elitist solutions for a better living environment are pointless for both the poor and the rich. What is important is to take a general approach in a broad perspective, to turn the ecological problem of social inequality towards a democratic way of urban development.

In order to create a porous city, Vigano believes it is crucial to concentrate on renewing infrastructure such as public transport, since these developments will generate new crossings and intersections that will be significant places for connecting and accessibility for all groups. Apart from transport connectivity, Vigano also measures the porosity by the percentage of open spaces in relation to constructed space, especially the ecological connections such as forests, parks and gardens. Her investigation shows that "the public space at times separates rather than unites".[35] Since in some cases green areas form buffers around enclaves within a city, she proposes an edge of 'anti-park' that facilitates crossing and habitating. She argues in this way the porous city project redesigns the relationship between built-up space and open space.[36]

On an architectural level, Stavro Stavrides points out that "in-between spaces are spaces to be crossed"[37]. He goes on to describe the practical ways of lower thresholds which could possibly create unique quality for in-betweenness spaces. He explains that architecture has performative power, therefore some buildings are "deliberately designed to minimize feelings of uneasiness" in order to not intimidate people from crossing boundaries. For example, glass is used instead of walls, maximum accessibility on visual,

Figure 5 - Urban Openess Analysis

Parking / Leftover Space
Consule Estates
Plaza
Community Garden
City Park
Flow space
Sports field/ Playground

Shadwell Station Area:
Low rise housing estates (prefabricated house 3-4 stories high) mixed with new development of high rise private apartments, Regular alignment, Big infrastructure presence, low to intermediate impreviousness.

Primary School
Private Apartments
Sports field/ Playground
Parking / Leftover Space
City of London College
Flow space
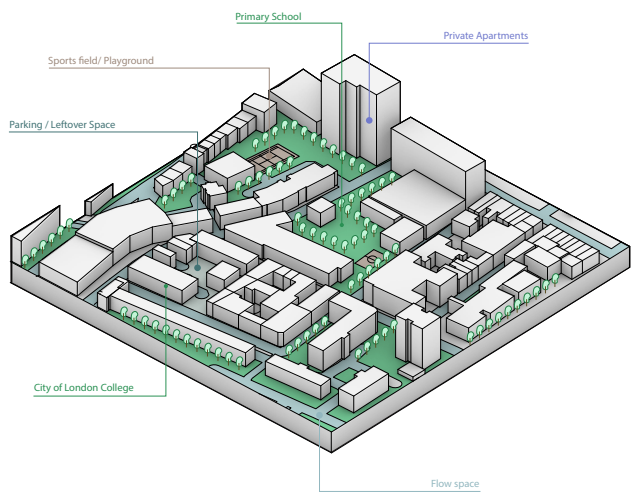
Back Church Lane Area:
Low rise housing estates (prefabricated house 3-4 stories high) mixed with low rise commercial and acedemic buildings, High building density, Low to intermediate impreviousness.

Primary School
Row Housses
Parking / Leftover Space
Sports field/ Playground
Commercial Area
Flow space
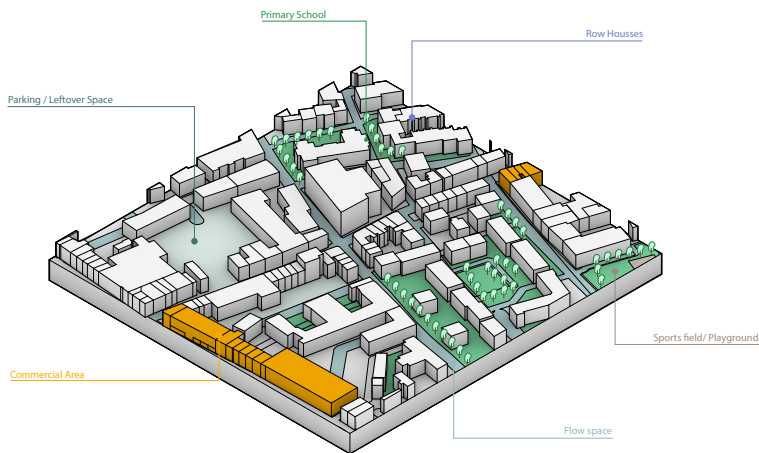
South Brick Lane Area:
Continuous row houses with built up back yard, mixed with high rise commercial and acedemic buildings, High building density, Historic urban fabric, High impreviousness.

strips of hot air are featured instead of doors. These spaces with low thresholds are privileged in a sense that they enhance the spatial quality of cities, unexpected encounters take place in street cafes, entrance halls of stations, plazas and squares. Stavrides elaborates that the architecture of the city could in fact be conceived as the art of thresholds.[38]

4.3. Adaptability

Ungers is considered to be one of the first advocates for autonomous architecture. He proposed the idea of adaptable architecture, and considered the adaptability in architectural design as a transformation from "an authoritarian act to an act of participation."[39] However the idea of building for the imaginary future is too vague for architecture which is more often considered to be an ecological and sociological function, instead Ungers argues that architecture should not exist only to satisfy the current needs and requirements in the most rational way, but to exist as a form of art, a form that is higher than reality, a form that "can transcend the constraint of material necessity."[40] Essentially, adaptability allows for further adaptations in the future in terms of functions or spatial needs, which also enables temporary extensions for all purposes.

4.4. the third places

The phenomenon of social segregation started with the reign of gentrification which has largely shaped the modern city. Richard Sennet stated in his book 'Designing Disorder - Experiment and Disruptions in the City' that, developers came to dominate the financing

and construction of housing projects, and they preferred the commercial benefits of homogeneous living then mixed user ones.[41] This book also pointed out that social segregation implies the missing of the middle and lower-middle classes in the city center, because they are more spread out in the outer city. The " missing middle" phenomenon is interesting to investigate further, in order to explore the possibility of bridging the social gaps by bringing the middle class back into the city.

The 'third places' was initially used by sociologist Ray Oldenburg to describe the locations where individuals go between home(first place) and work (second place). They serve as meeting places where we discuss issues, have fun, and form bonds. One theoretical support for social integration through ' third places' comes from Eric Klinenberg, who stated the power of social infrastructure in bringing people to look after each other, and therefore improving the urban living quality.[42]

38. Wolfrum, Sophie. "Porous City-From Metaphor to Urban Agenda." Porous City, De Gruyter, 2018, pp. 9–14, http://dx.doi.org/10.1515/9783035615784-001. Accessed 19 Jan. 2023.

39. Ibid

40. Oswald Mathias Ungers, "Architecture's Right to an Autonomous Language, 1979 ," in The Presence of the Past: First International Exhibition of Ar chitecture La Biennale di Venezia 1980 (Venice: Edizione La Biennale di Venezia, 1980), 319 and 324 .

41. Sennett, Pablo Sendra, Richard, and Richard Sennett. Designing Disorder: Experiments and Disruptions in the City. Verso Books, 2022.

42. Klinenberg, Eric. Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life. Crown, 2018.

5. Conclusion

In the beginning of this research paper, I state my fascination for the urban edge conditions of London, with its connection to social integration and gentrification. The topic is relevant because of the diverse urban and demographic conditions of London. Therefore I raise the main research question of how to design with openness within the 'edge' area to both promote social integration and innovative collaboration in the process of gentrification.

In the introduction, I identify the different definitions of urban edges. The various theories come from a few social academics such as Thomas Nail and Richard Sennett, who both use the words 'boundaries' and 'borders'. Yet Thomas Nail further raises the conversation of 'frontier' situation, which is more fitting in relation to my research context of urban edges in London.

Approaching the more detailed study of urban edges, I choose to apply the analytical method of "thick description" to analyze different edges. By overlaying information, it is apparent that different edges including socio-economic edges, demographic edges, infrastructural edges and morphological edges are interconnected. The intersection system of edges creates interesting urban conditions, with leftover spaces in close proximity of opportunity areas and neighborhood centers, which is a potential reference when choosing the site of

interest for further design.

When the term 'porosity' was first brought up by Walter Benjamin, it was criticized of being imprecise, too conceptual and vague. However, as pointed out by Sophie Wolfrum, it has been repeatedly used in urban design agendas afterwards. According to Wolfrum, the design agendas that are connected to porosity are:

I.   interpenetration, superimposition and multilayering of spaces
II. integration, overlapping and communication of spatial elements
III. ambiguous zone, in between space, and threshold
IV. permeability, spaciousness, and ambiguity of borders
V.   coexistence, polyvalence, and sharing
      ...[43]

These spatial agendas are very beneficial to my designing process in terms of referencing in the context of practical design and further developing the design strategies and spatial arrangements.

In conclusion, this research paper utilize the theory of urban openness and porosity to promote social integration by design to cross urban'edges' in London. This will help in bringing social integration and bridge disparities between various communities.

43. Wolfrum, Sophie. "Porous City-From Metaphor to Urban Agenda.".

Urban analysis

The Truman Brewery

Second Home Spitalfields

1. Morphological Edge

2. So

Tower Hamlets Library

The Royal London Hospital

3. Historic Edge

10 mins walking

Queen Mary University

15 mins walking

6. Infrastructural Edge

cio-economic Edge

Princes Court

Tobacco Dock
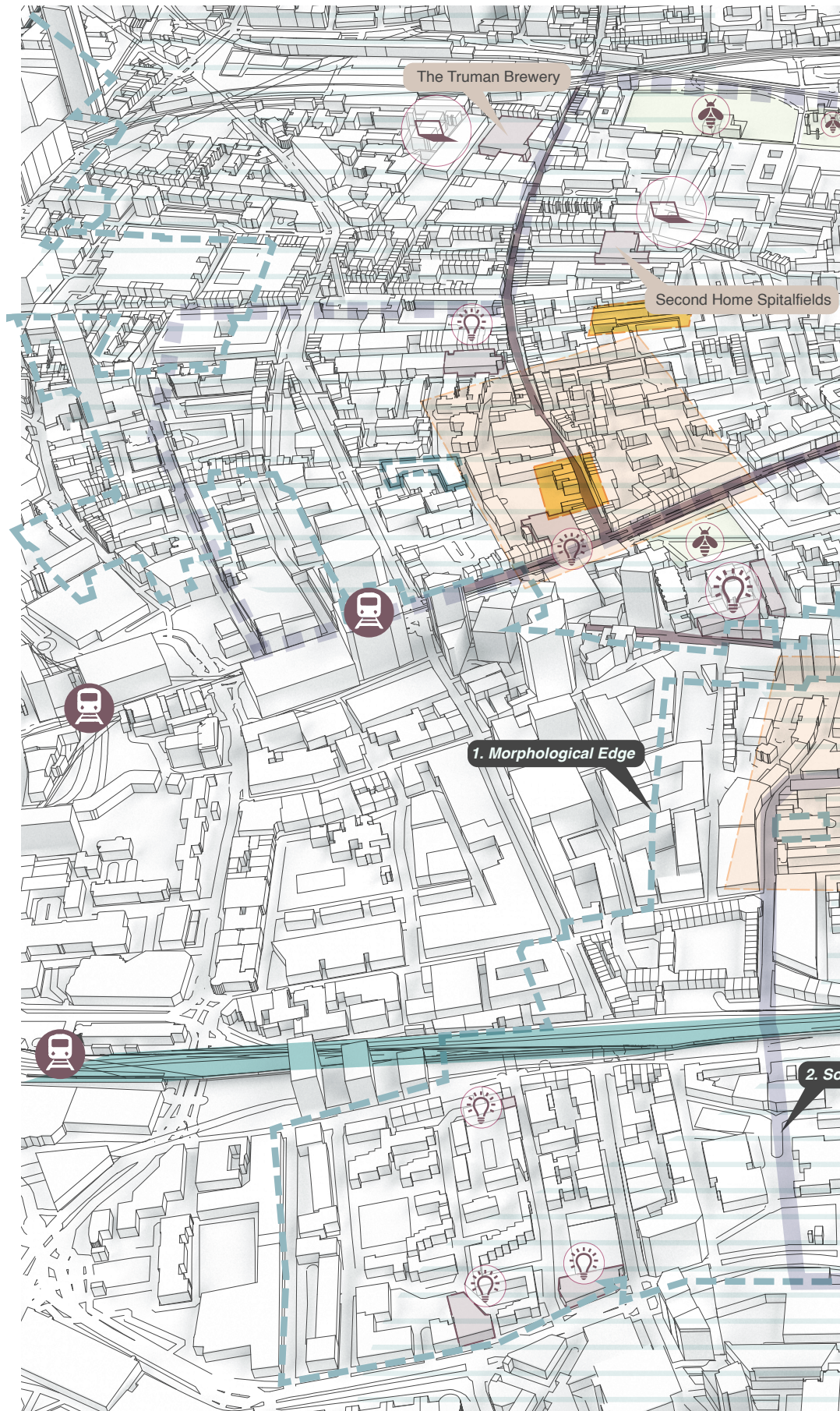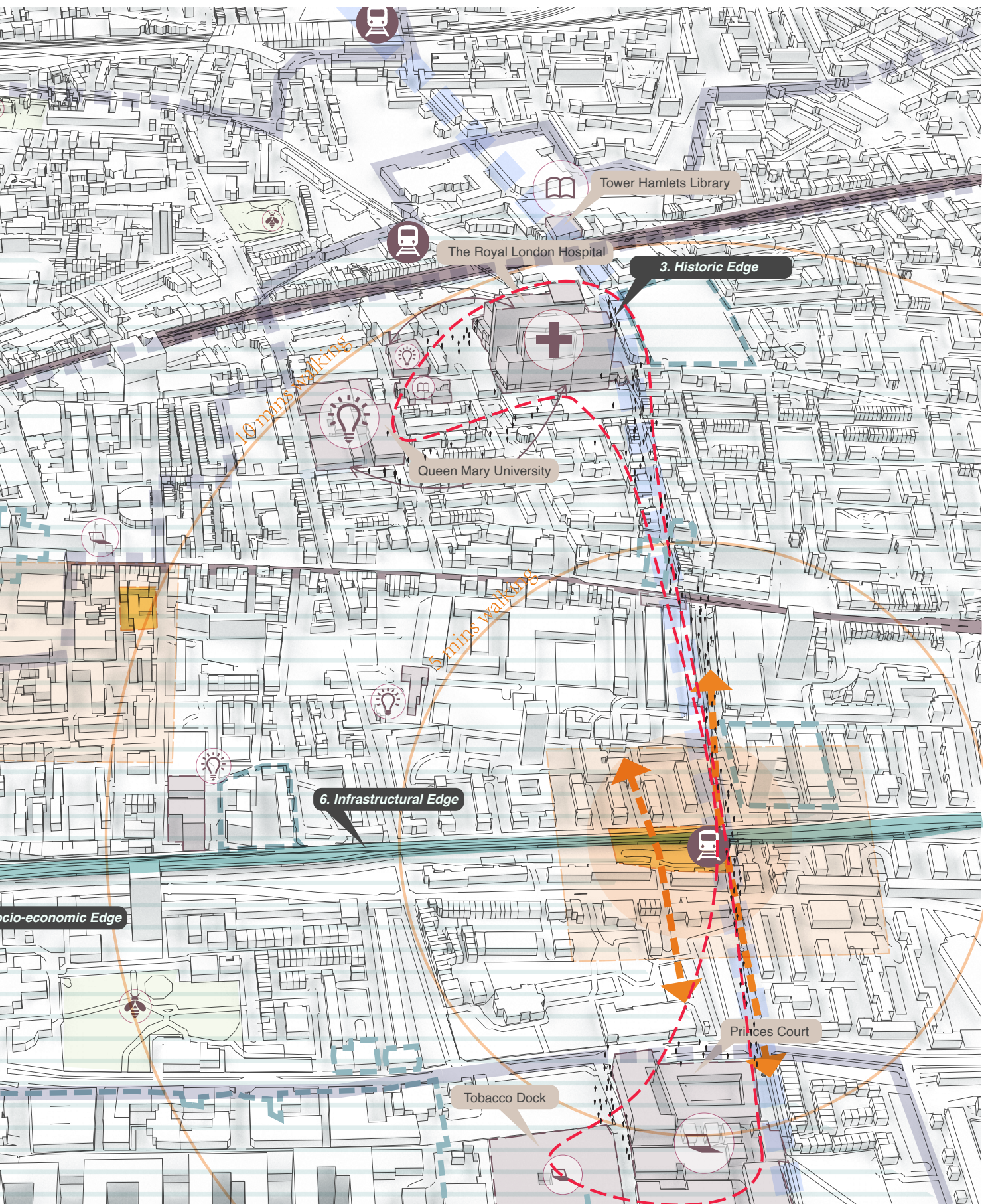
Reflection

Design approach in relation to research process

In my research process I was fascinated by the heterogeneous characteristics of London, especially the community that I based my research on, western Tower Hamlet. The process of researching on the edge conditions allowed me to study urban conditions under the lens of contrast. The wide range of topics and the heterogeneous backgrounds of the actors enabled me to perceive urban analysis with depth and at the same time seek methods and methodologies fitting to this wide range of research topics.

The multi layered research approach I utilized provides a coherent understanding of edge conditions as well as a solid foundation towards the design process. In contrast to the traditional methods that are used in urban analysis such as geographical mappings, the method of ''Thick Description'' that I used, helps not only with describing different edges with completely different variants but also helps with the natural transition into the earlier design process of identifying demographic targets and socioeconomic backgrounds.

My graduation project is relevant to current architectural and urban analysis because many of the current architectural academics at TU Delft focus on the study of people, the cultural and economic aspects. These aspects are becoming more and more influential in the design approaches and concepts. For example, the topic of gentrification and design for social integration has been a popular debate among current architects, and the study of edge conditions or crossing edges is an essential research base for such a type of design.

In order to design for crossing edges and social integration, I chose the approach to design space for economic, educational or leisure activities in order to bridge the contrast of socio-economic and infrastructural edges. The cross domain design requirements fit with the studio topic of heterogeneous London, which encourage the design for a diverse and multicultural city. On a bigger scale, the scientific way of studying the edge conditions as part of the urban structure is relevant to Msc AUBS program and Architectrue track for its applicability of overall research on urban space and architecture design. This demonstrates the relevance of my graduation project to my master track and programme.

In my process of developing the

design, I first continued with the research question from my research process, which focused on the question of what typologies, spatial configurations and functionalities are most fitting for such a project. In search of these answers, I looked into the urban theoretical studies of urban openness and porosity as these topics are often linked to social integration and urban equality. In terms of porosity, I concluded that there are three different scales of porosity I aim to achieve in my design, which are urban, spatial and material.

Urban porosity is highly relevant to the urban context and site selection. With the help of edge condition analysis on a 3D level, I establish a system of edges within the research area then proceed to choose my site based on the edges that should be crossed with architectural design. Therefore my urban research is connected directly to my site selection context because of its scientific and efficient approach to locate areas with conflict and potential.

Porosity on the building levels helps me with making radical design choices based on the design agendas that focus on making connections spatially and demographically. In my design process, I constantly remind myself to consider the spatial configuration that promotes visual and physical connections, and create low threshold space for promoting social interactions. Hence, this showcases that this idea of openness evolves from an urban theory to tangible design approaches.

Last but not least, porosity on the material level is highly connected to building technology and climate control, including temperature, ventilation and acoustic qualities. I emphasized on the indoor acoustic qualities of my design, both because of the context and the programs within the building. Utilizing porous material, I designed to reflect and absorb the noise from the surrounding environment and which then improves the living quality. This further reiterates how my research process has naturally led to my design goal, and the research methods have inspired my design approach.

Feedback and progression of my work

My mentors and I approached the project with the ideology of solving social problems, but the design process was completed with a realistic attitude. Because I am designing a complex building with an overlay of multiple programs, it is essential to make a solid study of the vertical organization and program components as well as the overall compositions of my design. These three basic elements in my design are highly connected and interactive with each other.

Working on the overall composition of the building, I initially approached it with the concept of collaging and contradicting, which led to extremely complicated volumes that lacked creativity and organization. My approach to finding form took a turn after the feedback given by my mentors, which suggested I need to design with both more coherence and logical organizations. With the feedback I tried to find form by comparing physical models and different variants of organization logics, especially vertical connection

that is important for linking overlapping components. The logistics and pairing of multiple compositions led to finding a coherent form in the end for me.

After the program components and their overall positions were settled, I came to realize through the feedback that small adjustments need to be made including structural and material choices, levels of residential units and circulation design regarding fire safety regulations. All these progress and detailed changes would not have happened if not for the weekly feedback given by my mentors and our countless consistent work towards perfection and creativity.

My assessment towards my project

To conclude, my graduation design has its value towards academic architecture studies and society because the topic of gentrification/inequality is highly relevant in not only London but many other metropolitan areas in the world. The gentrification in London specifically has led to enclaves of new development surrounded by working class neighborhoods, therefore creating an 'edge' area between these two. The gentrification process of London was caused by the growth of business opportunities and population. On one hand, Gentrification has led to the increase of hygiene and quality of life, but has led to the loss of identities of certain communities. Such phenomenon is common in big metropolitan areas all over the world, therefore the study of social integration in urban transitional zones is relevant in a bigger social framework.

The value of my research methods could be reflected by the result of 'thick descriptions' of edge conditions, which not only provide a thorough urban analysis of edge conditions of western Tower Hamlets, but also offer a well organized theoretical framework for future studies on urban edge conditions.

I learned from working on my graduation projects that in order to design with the function of surrounding context, architects should start with urban studies of the surrounding areas to discover the urban characteristics and potentials. Design agendas could be naturally generated from urban analysis and be implemented in the process with different layers of scales.

Because of the complexity of my project, I came to realize that when dealing with a complex context, even if the design project starts with ideology or higher theoretical ambitions, the approach should still be ultra realistic in terms of practicality. But creativity and playfulness should not be neglected in the process as well. In the end, the questions I have towards my project and its fascinating settings motivated me to keep an open mind towards this complexity that sits inside a bigger heterogeneous system.
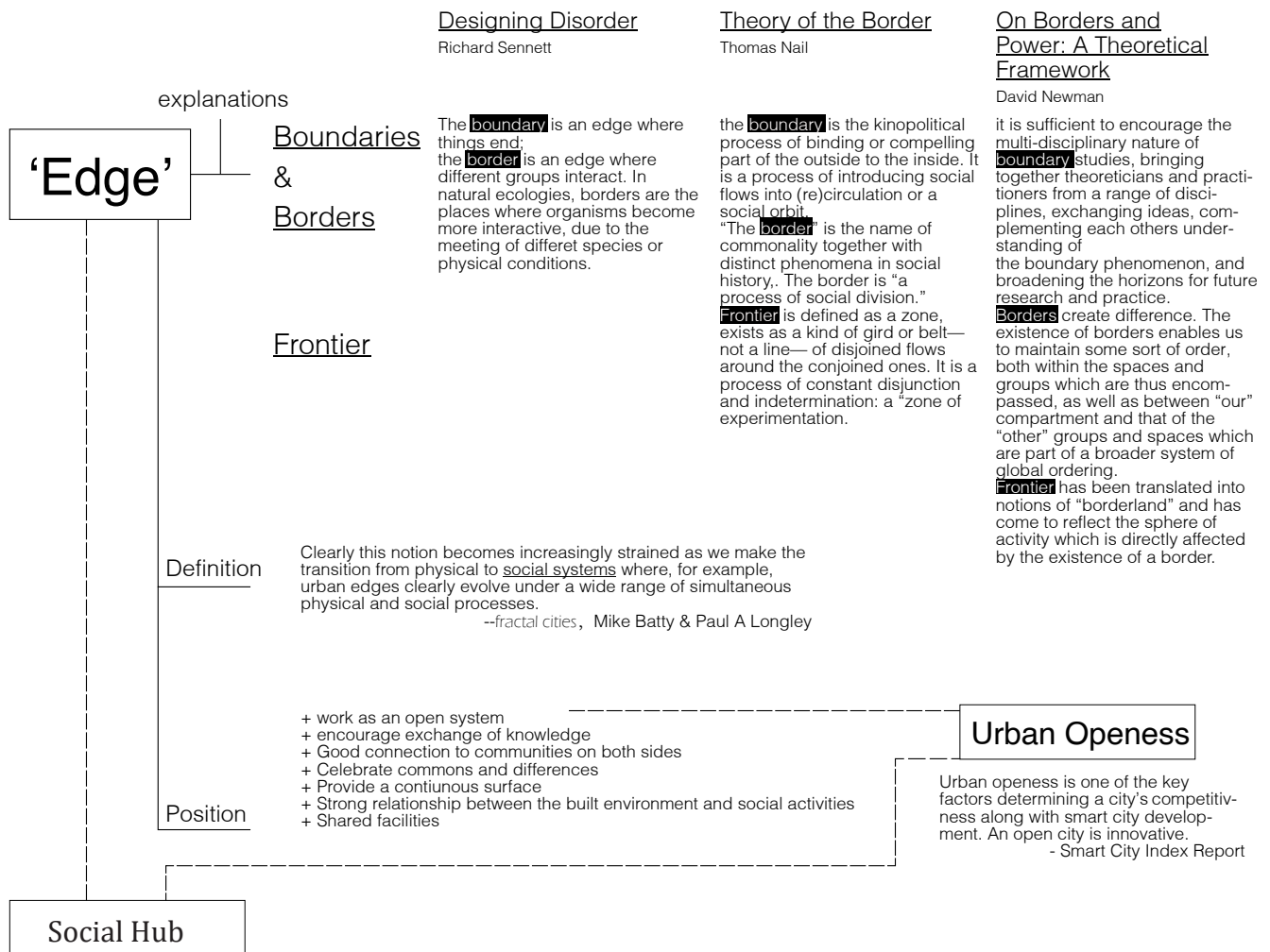
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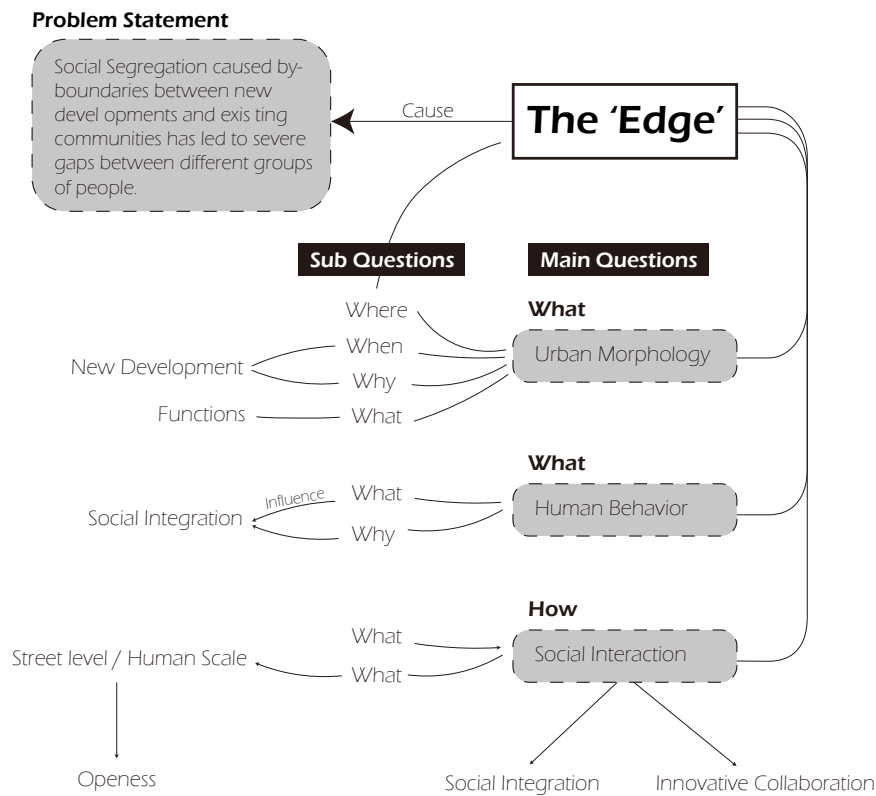Wolfrum, Sophie. "Porous City-From Metaphor to Urban Agenda." Porous City, De Gruyter, 2018, pp. 9–14, http://dx.doi.org/10.1515/9783035615784-001. Accessed 19 Jan. 2023.

Appendix
Other Research Findings

Theory - Definition of edges

‘Edge’

explanations

Boundaries
&
Borders

Frontier

Designing Disorder
Richard Sennett

The boundary is an edge where things end;
the border is an edge where different groups interact. In natural ecologies, borders are the places where organisms become more interactive, due to the meeting of differet species or physical conditions.

Theory of the Border
Thomas Nail

the boundary is the kinopolitical process of binding or compelling part of the outside to the inside. It is a process of introducing social flows into (re)circulation or a social orbit.
"The border" is the name of commonality together with distinct phenomena in social history,. The border is "a process of social division."
Frontier is defined as a zone, exists as a kind of gird or belt— not a line— of disjoined flows around the conjoined ones. It is a process of constant disjunction and indetermination: a "zone of experimentation.

On Borders and Power: A Theoretical Framework
David Newman

it is sufficient to encourage the multi-disciplinary nature of boundary studies, bringing together theoreticians and practitioners from a range of disciplines, exchanging ideas, complementing each others understanding of
the boundary phenomenon, and broadening the horizons for future research and practice.
Borders create difference. The existence of borders enables us to maintain some sort of order, both within the spaces and groups which are thus encompassed, as well as between "our" compartment and that of the "other" groups and spaces which are part of a broader system of global ordering.
Frontier has been translated into notions of "borderland" and has come to reflect the sphere of activity which is directly affected by the existence of a border.

Definition

Clearly this notion becomes increasingly strained as we make the transition from physical to <u>social systems</u> where, for example, urban edges clearly evolve under a wide range of simultaneous physical and social processes.
--*fractal cities*, Mike Batty & Paul A Longley

Position

+ work as an open system
+ encourage exchange of knowledge
+ Good connection to communities on both sides
+ Celebrate commons and differences
+ Provide a contiuous surface
+ Strong relationship between the built environment and social activities
+ Shared facilities

Urban Openess

Urban openess is one of the key factors determining a city's competitiveness along with smart city development. An open city is innovative.
- Smart City Index Report

Social Hub

Research sub-questions & research diagram

Problem Statement

Social Segregation caused by-boundaries between new devel opments and exis ting communities has led to severe gaps between different groups of people.

Cause

The 'Edge'

Sub Questions   **Main Questions**

Where   **What**
When
New Development   Urban Morphology
Why
Functions   What

What
Influence   What
Social Integration   Human Behavior
Why

How
What
Street level / Human Scale   Social Interaction
What

Openess   Social Integration   Innovative Collaboration

What are the urban **morphologies** of these spatial boundaries?

1. Where are these spatial boundaries located?
2. What are the functions located on the spatial boundaries between new developments and existing communities?
3. When and why did the new developments occur?

What's the **psychological** impact on people due to the big contrast of urban fabric between different communities?

1. What's the element that influences the urban fabric's relevance to social segregation or any other human behavior?
2. Why is it important to link people from different communities together?

How does a space promote spontaneous **interaction** at the edge of communities?

1. What's the current social interactions between locals and people who commute to work in those new developments?
2. What are the forms of spatial boundaries in human scale? Are they indoors or outdoors? Are they considered pleasing or unpleasant?

Historic time line - Whitechapel

Charles Dickens and his portray of East end poverty

August 1927: Sunday crowds at Whitechapel market

British Jewish refugee immigrant in whitechapel

Princess Alexandra School of Nursing

The redevelopment of 'Banglatown'on Bricklane
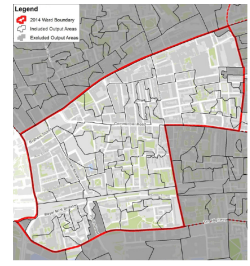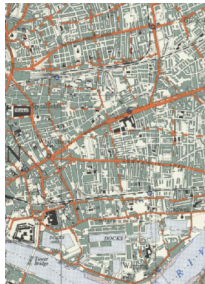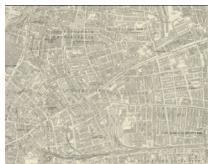
Whitechapel Sunday Market

1880s   **1920s**   **1930s**   **1960s**   **1990s**   **2020s**

Onsite / Online Survey Result

Which borough of London do/did you live in?
Answered: 38   Skipped: 0

What is your ethnicity?
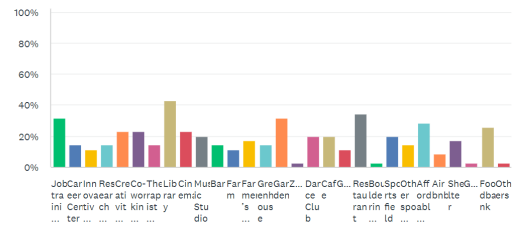Answered: 38   Skipped: 0
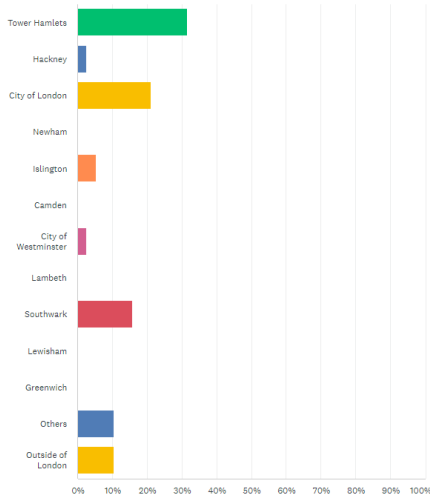
Do you think there's social segregation in London?
Answered: 35   Skipped: 3
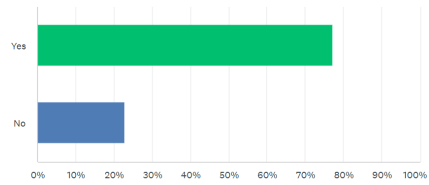
What space do you want more in your community?(multi-choice)
Answered: 35   Skipped: 3
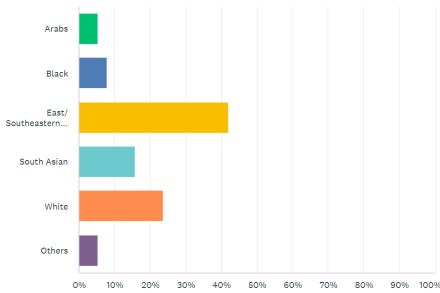
ANSWER CHOICES	RESPONSES	
Job training School	31.43%	11
Career Center	14.29%	5
Innovative Incubators	11.43%	4

Where do you like to go between work and home?