Research Booklet

Ambiguous Lines

Architectures for/of Urban Interstitial Ecologies

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Part 1

Research Essay

London, Heterogeneous City, Urban Rhizome

London is one of the first urbanized cities in the world,[1] with the development of complex infrastructures that have brought the city's rapid growth and complexity. Consequently, it has led London to become a heterogeneous city.[2] The rapid urbanization was initiated by the Industrial Revolution in 18th Century when technology was based on fossil fuels, which on a grand scale has transformed the way of living, developing central cities. Later with the arrival of the automobile the cities have had a second rapid growth leading to the suburban sprawl. Yet, what is mostly overlooked (if not totally invisible) in this rapid transformation is the role of the infrastructures network (water, electricity, transport, communication systems, etc.) with mostly spatialized in linear formations that not only sustains the population of the city but also very much shapes it.[3]

> *"A third effect, and a consequence of the above two, involves a fundamental paradigm shift from viewing cities in formal terms to looking at them in dynamic ways. Hence, familiar urban typologies of square, park, district, and so on are of less use or significance than are the infrastructures, network flows, ambiguous spaces, and other polymorphous conditions that constitute the contemporary metropolis. Unlike the treelike, hierarchical structures of traditional cities, the contemporary metropolis functions more like a spreading rhizome, dispersed and diffuse, but at the same time infinitely enabling."* [4]

The importance of reading cities through infrastructure networks can be observed by American landscaper Alex Wall. On the one hand, in urban analysis or contemporary architectural discourse, we usually consider surfaces as a tool and planning device for reading urban space: a typical example, a grid forms a treelike hierarchical system with order and direction. On the other hand, Alex Wall argues that infrastructures, flows of materials, and networks have begun to be recognized as important issues in urban analysis, due to the rise of constant reproduction of the ambiguous sites in the urban areas. The increase in mobility and accessibility, the changing natures of contemporary metropolitan cities, necessitates a fundamental paradigm shift from perceiving the cities in its formal aspects to understanding them in more dynamic ways.

Although linear infrastructures account for a small percentage of urban land use, they are not static like built-up areas and open green spaces. The urban infrastructures overall form a dynamic space where the movement and exchange of material and immaterial flows not only pass through different urban fabrics and systems but they form urban spaces, programs, buildings and as much as interfaces, left-overs and interstices[5] [Fig.1]. These conditions render London most suitable for research into the different, undervalued but rich spatial implications of the urban infrastructures and network flows.

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[1] In London, the world's first urban railway for passengers was opened in 1836, and it was electrified and spread to suburbs in 1890, and the population reached 4.5 million by the end of the 1800s.

[2] In terms of economic functions, the city is constantly introducing new organic and inorganic components of the city scape altering, modifying and creating new habitats, new urban land surface biogeochemistry and living spaces for all kinds of organisms and non-organisms. This leads to greater heterogeneity in the urban space. Douglas, Ian., and David Goode, eds, ed. 2011. *The Routledge Handbook of Urban Ecology*, 20. Routledge

[3] Oke, T. R., G. Mills, A. Christen, and J. A. Voogt. 2017. *Urban Climates*, 13. Cambridge: Cambridge University Press. doi:10.1017/9781139016476.

[4] Wall, Alex. 1999. "Programming the Urban Surface." In *Recovering landscape: Essays in Contemporary Landscape Architecture*, edited by James Corner, 233–49. New York: Princeton Architectural Press.

[5] These linear infrastructures are named as green, blue, grey corridors in land use categories, such as railways, roads, footpaths, rivers, streams, and canals. For instance, material flows are such as, energy, water, foods and commodities, and immaterial flows of information and communications.
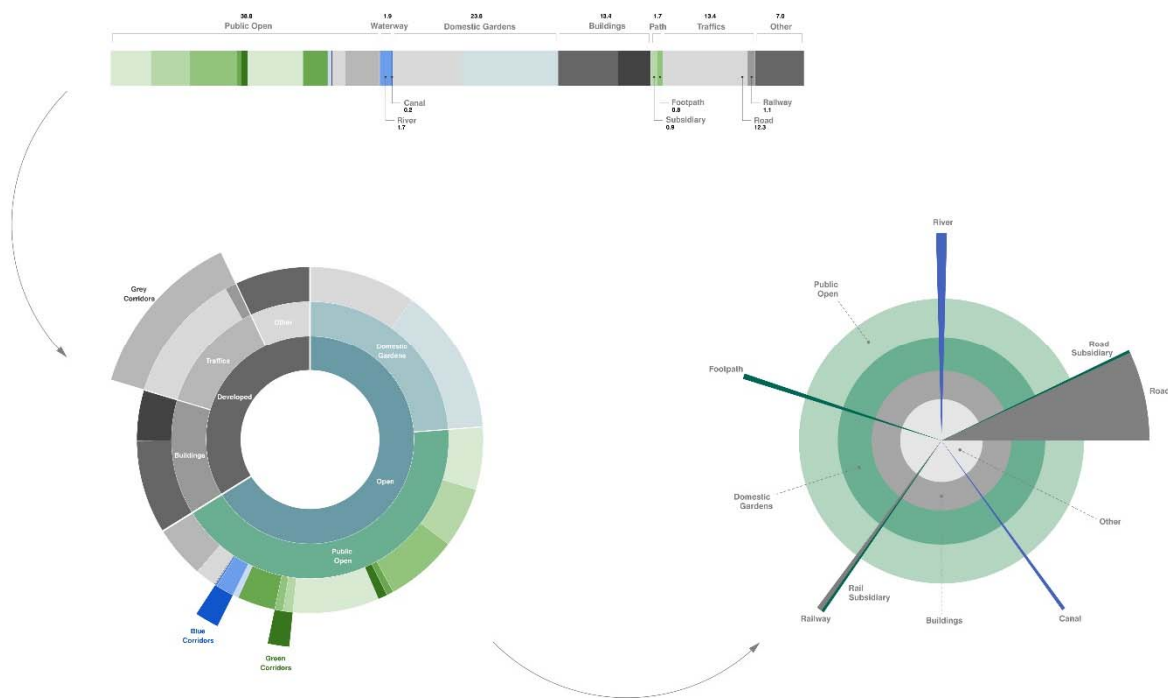
[Fig.1] Rethinking the anatomy of London land use and cover. Credit, Author.

Infrastructures and Interstitial Spaces

Traditionally, linear infrastructures have often been optimized by the technological, economic constraints, whereas in the contemporary cities, opposite trend is becoming more evident. While acknowledging that its mechanisms play a key role in the formation of urban scape, it always produces the urban interstitial spaces, perceived as negative and ambiguous, which undergoes transformations along with industry, developing, disappearing, or sometimes remained intact and neglected to form London's cityscapes.[6] Furthermore, we consider interstitial space in urban discourse mostly as open spaces or programs which constantly fluctuate.

However, interstitial spaces also coincide with the leftovers of the infrastructure and its former fabric, and form various hard-coded layers such as social, material, and green layers, which in London appears to be the result of the entangled infrastructure systems. Consequently, each of the developments of various infrastructures engraves their traces on the fabric of the city, and they piled up in layers to form the palimpsest in London. Thus, if the ambiguity of its hard-coded layers can be unlocked and requalification of them can be realized, we can reactivate the interstitial spaces for the development at various levels, from the neighborhood to the metropolitan scales.[7]

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[6] Each of the developments of various infrastructures engraves their traces on the fabric of the city, and they piled up in layers to form the palimpsest in London.

[7] The Spanish architect and urbanist, Ignasi de Solà-Morales earlier explained the notion of Terrain Vague (2014) with words such as, 'empty, unoccupied' yet also 'free, available, unengaged, ' and have interest in these interstitial spaces, often defined in the negative sense, 'empty,' 'unoccupied,' but can also be viewed as full of possibility, promise, and freedom.

Urban Rhizome

> *"Unlike trees or their roots, the rhizome connects any point to any other point. . . It has neither beginning nor end, but always a middle (milieu) from which it grows and overspills, [constituting] linear mulitiplicities."* [8]

London is composed of various types of many "lines" (highway, railway, metro line, pedestrian street, high street, back alley, for instance), which are rhizome-like, nonhierarchical structures in contrast to the grid system, and continually expanding across multiple terrains. In that sense, as a new lens for reading the city, the notion of line can be used both conceptually and analytically.

In order to use the notion of the lines for the representational mapping, it needs to identify and collect the information about the infrastructure, agents and actors involved in the network flow in London. Quantitative and geographical information on infrastructure was analyzed through the open data sources from London Datastore (Greater London Authority), and as a qualitative analysis, different modalities of mapping, survey or investigation was reflected through historic maps, illustrations, and photos of London [Fig.2]. Its aim is not only use as a cartographic and spatial instrument in producing the various scales of maps, but identifying the actors involved in London's network.
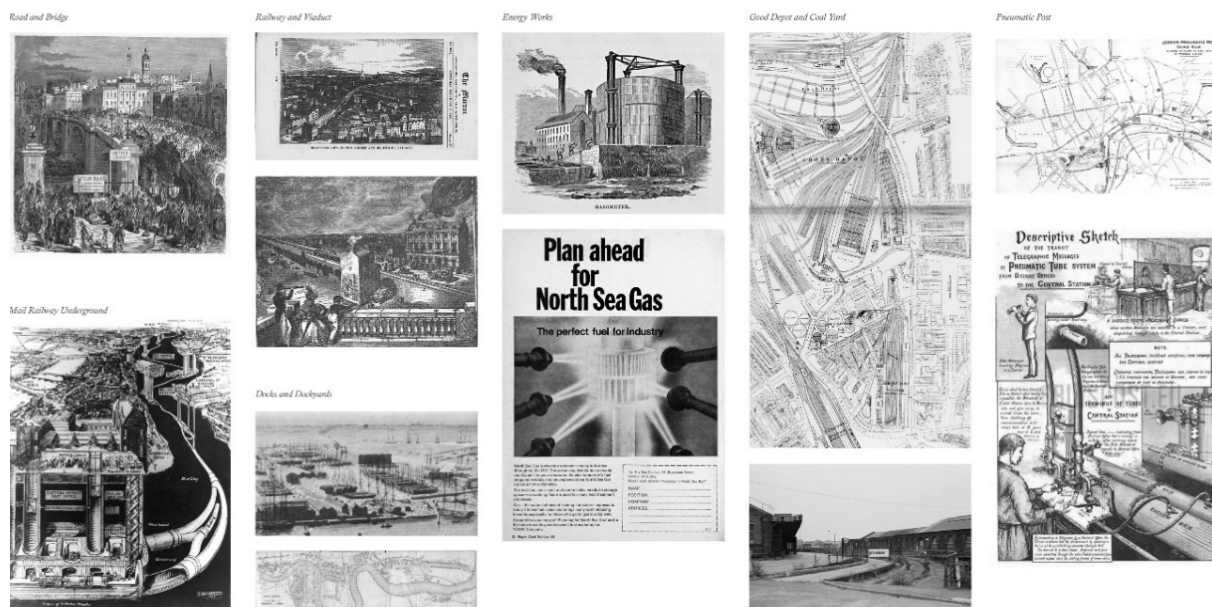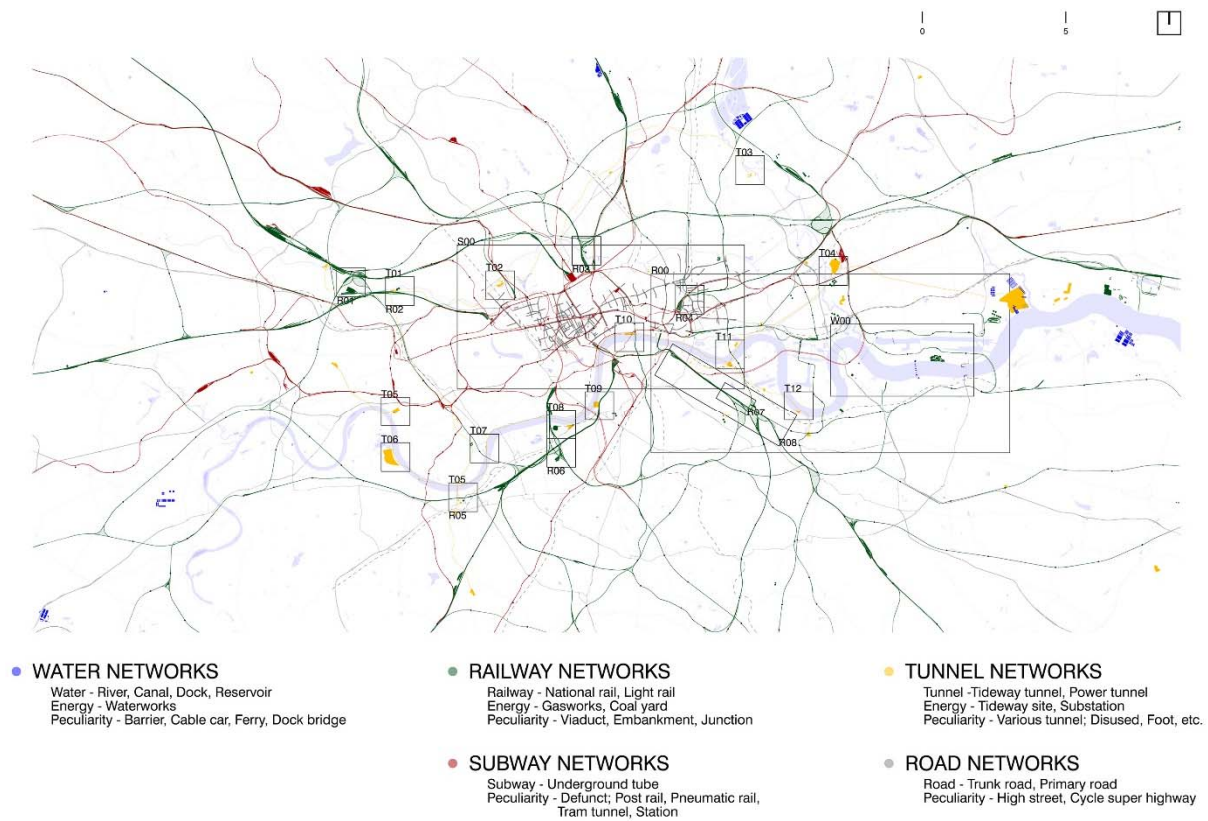
[Fig.2] Historical and cartographic data collected on various infrastructure systems in London.

Sampling and Survey

Since the information on the infrastructure by the previous analysis is still vast, it is necessary to limit the specific region to understand its complexity. In addition, in order to understand the underlying mechanisms of the city of London as a whole, I focused on sampling as a strategy by dissecting them into the collection of lines. For the sampling, first, I focused on the places with high intensity and peculiarity. These are mainly places of margins where they reach extreme conditions of certain material or social conditions. [Fig.3]

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[8] Corner, James, and Alison Bick Hirsch, eds. 2014. *The Landscape Imagination: Collected Essays of James Corner 1990-2010*, 227. New York: Princeton Architectural Press. Open-ended and indeterminate characteristics can be likened to the process-form of the rhizome.

- **WATER NETWORKS**
  Water - River, Canal, Dock, Reservoir
  Energy - Waterworks
  Peculiarity - Barrier, Cable car, Ferry, Dock bridge

- **RAILWAY NETWORKS**
  Railway - National rail, Light rail
  Energy - Gasworks, Coal yard
  Peculiarity - Viaduct, Embankment, Junction

- **TUNNEL NETWORKS**
  Tunnel -Tideway tunnel, Power tunnel
  Energy - Tideway site, Substation
  Peculiarity - Various tunnel; Disused, Foot, etc.

- **SUBWAY NETWORKS**
  Subway - Underground tube
  Peculiarity - Defunct; Post rail, Pneumatic rail,
  Tram tunnel, Station

- **ROAD NETWORKS**
  Road - Trunk road, Primary road
  Peculiarity - High street, Cycle super highway

[Fig.3] Mapping, Entanglement of System of Systems: Infrastructure networks in London.

After that, I produced what we call "fuzzy drawings" in the studio which single out the objects under investigation enmeshed with the most critical links and extensions in the forms of linear connections. The mechanism of fuzzy drawing first frames specific subjects and situations, and then extracts necessary information from them and articulates it as lines. It is the work for dissecting the hard coded layers which can be found by coupling with fuzzy drawings and historical data [Fig.4]
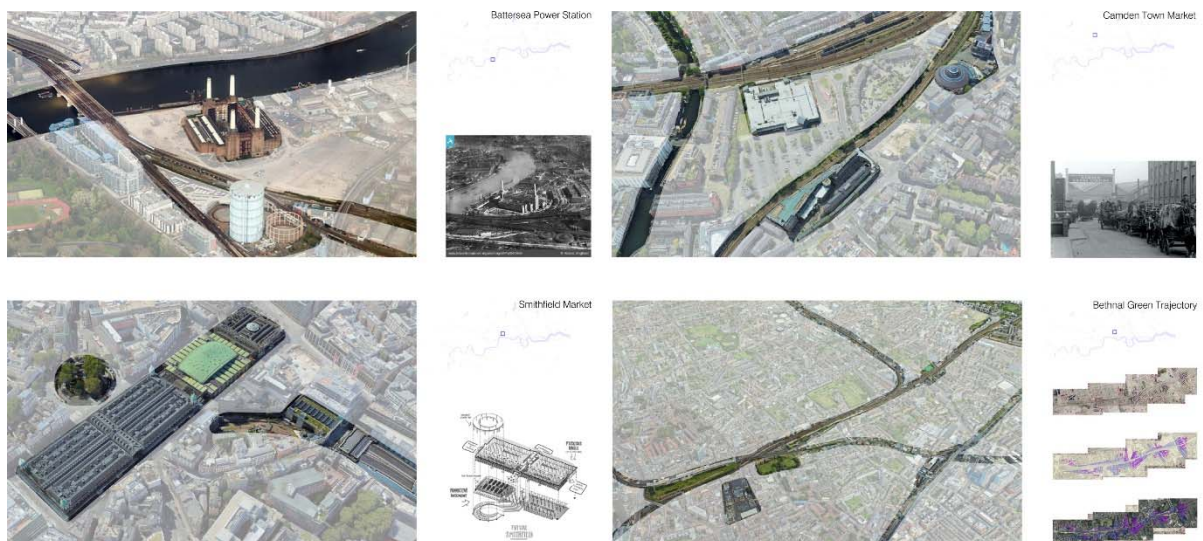
[Fig.4] Fuzzy drawings and its historical data in sampling places.

Urban Archipelago

What can be seen from the analysis of sampling places is that these places have been transit points for the exchange of goods and movement of people in the past, but in modern times, they have become new city centers that have been transformed by utilizing the infrastructures of the past. These city centers, as a result of infrastructures network with mostly spatialized in linear formations, form urban islands themselves, producing the urban patterns in London as an archipelago of 'the city in the city.' It can be recognized as the notion of the Green Archipelago in German architect, Ungers' arguments in *The City in the City*.[9]

On the other hand, what we need to know is that not all of these places become city centers in London, and city centers sometimes lose their potential and degenerate into simply urban islands because they fail to take into account the surrounding context. In addition, it was found that within these urban archipelago, interstitial spaces were formed and neglected. These interstitial spaces, mostly formed by the infrastructure as a byproduct, become leftover spaces. It is the result of not being reactivated because the hard-coded layer inherent in it and the coupling with other systems were not properly interpreted. Because we cannot qualify them on their own, as the French philosopher Gilles Deleuze claimed, a single line cannot survive as a system by itself, but can almost always exist only by entanglement with other systems.[10]

To avoid this kind of result, intersections of other systems is important from a large scope of urban scale, context and scenario with interscalar links and cluster effects. If the value of its ambiguity of entangled systems can be identified and unpacked, we can create new connective systems or tissues, which can reactivate these residual spaces for the development at various levels, from the neighborhood to the metropolitan scales.

Urban Ecology and Green Infrastructure

Contrary to perceptions, London is a truly green city compared to other major world cities. Open space constitutes 40 percent of London's area and Londoners enjoy around 27 square meters of open space per person.[11] Nevertheless, for many, the impression of London is that of a highly constructed urban area surrounded by less densely residential suburbs. Moreover, Londoners may regularly use local green spaces such as parks and commons, but they are not necessarily perceived as an integral part of London's character. Perhaps deeper is the fundamental assumption that architecture and urban development are in a profound sense as opposed to the natural environment.[12]

Green infrastructure has often been regarded as a counterpoint to the city, rather than an integral part of the urban environment in which their prosperity and viability depend. Because of this, the provision of green infrastructure was mainly determined by spatial considerations, such as the amount of green space required per person to provide for amenity and recreation, or to protect and conserve special landscapes and natural assets. As a result, the potential functions and services that green infrastructure can provide are greatly underestimated and unrealized.[13] This is a call for the future development of the green infrastructure needed to resolve the

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[9] Ungers, O.M et al. 2013. *The City in the City, Berlin: A Green Archipelago (1977)*, edited by Florian Hertweck, Sébastien Marot. Zürich: Lars Müller Publishers.

[10] Deleuze, Gilles, and Felix Guattari. 1987. "Introduction: Rhizome," In *A Thousand Plateaus: Capitalism and Schizophrenia*, translated by Brian Massumi, 4. Minneapolis: University of Minnesota Press.

[11] Bishop, Peter and Lesley Williams, ed. *Design for London, Experiments in urban thinking*, 155. London: UCL Press. 2020. https://doi: https://doi.org/10.14324/111.9781787358942

[12] Baxter, Alan. 2011. *London's Natural Signatures: The London Landscape Framework*. London: Natural England.

[13] Greater London Authority. *Investing in a Green Infrastructure for a Future London*. 2015. https://www.london.gov.uk/sites/default/files/gitaskforcereport.hyperlink.pdf.

pressing issues for not only for Londoners but also people around the world.

If we can embrace the transformation of the cities' form and function to make them more resilient and to allow for more efficient use of local resources, city can be reshaped in the process of urban development spontaneously. Besides, development of green infrastructure will help ensure London's resilience to climate change, and contribute to a significant improvement in the quality of London's environments. Thus the ecology of the city will be richer and Londoners will have better access to nature.[14]

East London and the Lea Valley

East London and the Lea Valley hold a fascinating place in London's history and until recently served as the backyard for living in central London, somewhere to put the essentials of city life, but that no one really wants to live with. They have been a place for receiving, making and transporting goods, first by canal ways from the River Lea to River Thames and later by rail and road [Fig.5]. It has been a convenient place to dump the detritus of the city, whether from wartime bombing or peacetime industry. It continues to be a home for industry with London's heavy industries and factories even until 1990's. The valley is a corridor favored by public utilities, from somewhere to generate and store and supply the huge volume of water, power and gas that Londoners consume, to somewhere to deal with the city's sewage.[15]

[Fig.5] East London and the Lea Valley. East London Green Grid. 2012.

Large industrial areas and infrastructure corridors in River Lea, which spans the Thames River from north to south, have led to numerous patches of neglected vegetation and informal suburbs landscape with brownfield sites, forming urban voids. These urban voids have worked as a barrier between East and Central London, resulting in numerous physical and political inequalities.

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[14] Ibid.

[15] Design for London. 2012. "East London Green Grid." Accessed Nov 27, 2021. https://issuu.com/designforlondon/docs/elggarea1/1.

Abbey Mill

Meanwhile, Abbey Mill, a site for the project, is at the center of these issues in East London and the Lea Valley. From the Channelsea River, the creek of River Lea on the west side of the site, the Light Railway and District underground line on the east are running across north to south, to the Northern Outfall Sewer for discharging large volumes of sewage on the north, and City Underground lines on the south traverse east to west, making the site served as an exchange and storage of goods and resources for London in the past [Fig.6].

[Fig.6] Fuzziness of surrounding infrastructure ruptures.

Besides, the site is now left as brownfields after the former heavy industry and related factories is cleared, but the soil from the ground and the water from the river are suffering from its contaminants. The rupture and fragmentation caused by the composite of the systems have come to clearly represent the notion of 'the city in the city,' [16] which is the urban pattern of London previously discussed in research part. These conditions and situations render the site as a most suitable place as a design project for my intervention.


Design Framework and Position

Although the ruptures by the infrastructures created an interstice in the city with negative conditions for the site, however, all of them also leave their different kinds of textures in the place. In this regard, the site can be read as both the layered and networked territory as Canadian architect, Lola Sheppard mentioned in her text. "The layered territory stratifies its environment into a series of individuated layers and systems. It enables an in-depth examination of the systems – physical and natural – at work within a site. Networked territory conceives of context as the subject and product of multiple intersecting networks of human and natural ecologies."[17] It is

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[16] Ungers, O.M et al. 2013. *The City in the City, Berlin: A Green Archipelago (1977)*, edited by Florian Hertweck, Sébastien Marot. Zürich: Lars Müller Publishers.

[17] Sheppard, Lola. "From Site to Territory." Goes Soft: Bracket, vol.2 (2013): 179-184. Accessed Nov 27, 2021.

necessary to dissect the layers of the site, to determine the elements in it, and to activate their possibilities. This is to restore the intrinsic and constructed quality of the site. As in the method of the previous research, it was interpreted through various historic maps, illustrations, and photos of the site [Fig.7]. Prior to human transformation of the physical landscape for agriculture with early industry, the intrinsic authenticity of the site was an ecological land with wetlands inhabited by diverse flora and fauna. In addition, constructed landform, surrounded by various infrastructures not only make the site severance and fragmentation, but also creates a condition that gives a quality of silent and serene quality.
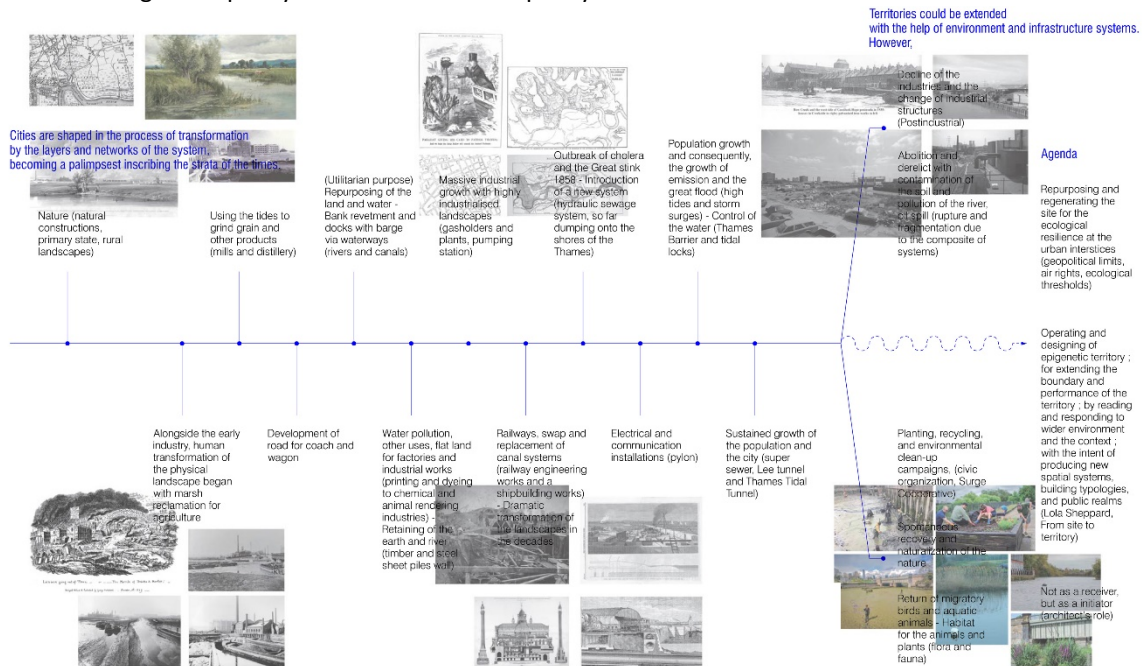
[Fig.7] Time line of the transformation of the site and its layers.

The main aim of the project is to transform this once industrialized territory with contaminated and neglected nature of interstices into a new public space for London, a revitalized space but also land recognized for its tradition of supplying the city of London. This required careful detection of the elements of artificially crafted land form, both evident and hidden, in order to weave continuity by the intervention of linear infrastructures as a new connective tissue between the contexts, and between its past and future for urban resilience. Namely, the infrastructure lines become the life lines of the city, and the ambiguous conditions produced by the intersections, overlaps, juxtaposition become lines of urban life.

Design Agenda

·   Repurposing and regenerating the site for the ecological resilience at the urban interstices (geopolitical limits, air rights, ecological thresholds)

·   Operating and designing of epigenetic territory; for extending the boundary and performance of the territory; by reading and responding to wider environment and the context; with the intent of producing new spatial systems, building typologies, and public realms[18]

·   Not as a receiver, but as an initiator (architect's role)

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http://new.lateraloffice.com.s24646.gridserver.com/POSITIONS/bracket2/Bracket_LS_essay.pdf

[18] Ibid.

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Part 2

Reflection

Process and Follow-up on the Research

London is composed of many different types and "lines" of infrastructures, which are rhizome-like, nonhierarchical structures, and continually expanding across multiple terrains. Those lines of networks not only sustain the population of the city but also very much shape it, resulting London to become a heterogeneity. In that sense, as a method of lens to read the city, the notion of line was used to read it.

Based on research, it turns out evident in London that the urban infrastructures with mostly spatialized in linear formations, overall form a dynamic space where the movement and exchange of material and immaterial flows not only pass through different urban fabrics and systems but they form urban spaces, programs, buildings and as much as interfaces, left-overs and interstices. And as a result of this action, several urban center islands within the city have been produced, as a London's urban pattern.

However, problems with this pattern have been identified, city centers of urban islands sometimes lose their potential and degenerate into simply urban islands because they fail to take into account the surrounding context. What we need to focus on within these spaces is the interscalar links and cluster effects of the intersection of other systems from a large scope of urban scale, context and scenario.

If the value of its ambiguity of entangled systems can be identified and unpacked, we can create new connective systems or tissues, which can reactivate these residual spaces for the development at various levels, from the neighborhood to the metropolitan scales. Moreover, if we can embrace the changes in the form and function of cities and use local resources more efficiently, it will lead to an architectural intervention strategy of resilient and sustainable development in response to new pressing issues.

In that sense, as a place where such phenomena or patterns are evident, Abbey Mills is a most suitable test-bed for design interventions. Abbey Mill is at the center of the issues with physical and political inequalities between East and Central London. It is ruptured and fragmented by the various infrastructures and former heavy industries, leaving the environments in a deteriorating state.

Translation into Design

The design project addresses various issues derived from research, and the site-specific characteristics and issues (from physical and natural to human and natural ecologies) required me in-depth examination. These, aspects of site-specificity have forced me to make some changes and adaptations in the design steps.

The first hurdle was faced from the inside of the site, which is the main stage of intervention. Several infrastructure lines surround the site and have their own textures and issues, but inside the site, the former infrastructure and facilities have been removed (as a cleared site) and now it is only a brownfield as an urban void. A new strategy was needed to find its own texture of the site. This issue led to an interscalar approach with the landscape domain. As a theme of the recovery of contaminated soil and rivers possessed in the site, topographic transformation and phytoremediation were introduced as a main site strategy.

In the scenario of the topographic transformation, first, the steel sheet piles facing the river are collected, and the contaminated soil along the river is excavated and backfilled on the back of the site, forming a barrier to block the noise of the railways. In that process, the inherent quality of the site naturally restores the original level and terrain of the past wetland. The environmental conditions with the connection of rivers to sites, and planting for phytoremediation rebalance the ecosystem, bringing significant ecological, biodiversity benefits.

The materials harvested in the process of changing the site are transformed into materials for architectural edifices, and the residues of the materials determine how we shape the site. From rammed earth to steel sheet piles, each material corresponds to the conditions of the site and this is also consistent with the project's main aim of sustainability and urban resilience by the materiality of reusable and reversible. Rammed earth is used in subterraneous conditions at the education centers, working with the soil and the water tables surrounded the architecture. And the steel sheet piles are also used in the subterraneous condition at the parking platform which does not need an insulation, and sometimes in places where they meet water to prevent penetration.

After the site's main strategy is established, subsequent interventions are followed according it. The work of dissecting the layers of the infrastructure lines surrounding the site was carried out through the past material sets, and the architecture intervention method was decided as a catalyst, rather than just resolving their problems.

For example, as a response to the Northern outfall sewer located on the north of the site, the bridge is not just for overcoming the five meter level difference at the edge of the site, but also overlaps with various programs while passing through the site. It leads to reactivation of the productive activities for leisure such as swimming and playing field. Furthermore, it becomes not only a connection within the site, but also a pedestrian link that connects the city to the city from a larger scale perspective, extending the Greenway from the east to the west, and the Lee way from the Lea River in the north to the Thames River in the south, serving as a catalyst for another urban archipelago.

And just as topographic transformation is the site's main strategy, the roof of the underground parking platform located on the south of the site forms a mound as a landscape gesture to block the noise of the lifted railway, and the constructed landform extends to the riverside to blur its demarcation boundary.

Reflection

The initial goal of my project as indicated in Graduation plan, is to realize a multi-scalar architectural intervention that can incorporate various forces and qualities of different linear systems which produce new nodes of exchange, overlaps, edges or thresholds where new urban programs can be generated.

To achieve this for the final part of the graduation period, the project should be defined at the intersection of urban landscape, architecture and infrastructure as a resolution of not only social flows but also the systems and elements of the material flows. It aims to formulate new social urban programs where the distinction between the site, the architectural edifice or the urban space blurs. In doing so, thus, it will lead spontaneously to formulate new formal and material language addressing the pressing issues such as sustainability and resilience.

For the rest of the period, it is important to produce materials for the final presentation of the project, but I want to focus more on imagining and experiencing the space of the project from the standpoint of the actors who will use it, and on how Abbey Mills as an urban island can actually become an active agent for London as a whole.

Namely, the infrastructure lines become the life lines of the city, and the ambiguous conditions produced by the intersections, overlaps, juxtaposition become lines of urban life. Ultimately, I want architecture as a discipline and as my profession to be a means of communicating with the world. I hope that my project will eventually serve as a stepping stone for me to redefine my professional trajectory.