

Living With Infrastructure:

**A study on the management and adaptation of social practices around
transportation infrastructure residual spaces**

**インフラと共に生きる：交通インフラの余白空間利用における管理
と適応に関する研究**

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Graduate School of Global Environmental Studies

Kyoto University

Doctoral Program in Global Environmental Management

Srijon Barua

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LIST OF ABBREVIATIONS:

IRS: Infra-Residual Spaces
 PAR: Participatory Action Research
 BRAC: Bangladesh Rural Advancement Committee (BRAC University)
 Ci+AU: Center for Inclusive Architecture and Urbanism
 UNDP: United Nations Development Program
 SBB: Swiss Federal Railways (Schweizerische Bundesbahnen)
 NPO: Non-Profit Organization
 RER: Réseau Express Régional (French rapid transit system)
 SNCF: Société Nationale des Chemins de fer Français (French National Railway Company)
 MAU : Multi Attribute Utility
 TAM : Transportation Asset Management
 TSMO: Transportation Systems Management and Operations
 IIMS: Integrated Infrastructure Management System
 IBS: Infrastructure balance sheet

Executive summary

Background: This research explores the management strategies for urban leftover spaces created by transportation infrastructure. In global south urban mega cities are already faced with the challenges of migration, overpopulation and informal economies. Transportation infrastructures generate urban negative spaces which influence these issues in an active way. It changes the nature of informal or formal activities in leftover infrastructure spaces and communities adapt with the changing situations over time. This phenomenon asks few fundamental question-

How social practice adapt with the infrastructural residual spaces (IRS)?

What factors influence such adaptation?

How can we facilitate sustainable adaptation in infra-residual-spaces?

The research has six chapters. Each chapter flows to the next chapter objectively.

Methodology: Introduction chapter of the research explains how in global south infrastructure is increasing every year and with that the amount of leftover space is also on the rise. With the introduction of the Bangladesh sites two of the main problems (Problem Statement) are identified as

1.Undetermined rent structure in leftover spaces

2.Evictions and exploitation due to lack of the guidelines to manage such spaces.

The next chapter, Theories and background studies analyses practical case studies and literature reviews to address these problems. From the analysis of a Bangladesh site participatory action research and existing theories on management of infrastructure, we determine that there are two Research Gaps that can be identified

Gap 01: Multi-Stakeholder Perspective on Infra-Residual Space Management

Gap 02: Value-Based Comparative Analysis of Infra-Residual Space among tenant and owner

These two Gaps points toward the lack of specific guidelines or policies tailored towards the management of infra-residual-spaces.

From this point onward, the next chapter tries to address the gap 01 by organizing public events like symposium and google form public survey to reflect both expert and general peoples perspective on the the adaptation in IRS. To address the gap 02, field survey is organized spanning 7 different cases according to timeline of their existence. To design a questionnaire to evaluate these 7 cases , we need some common factors that can be same for the cases. Chapter 04 will address gap 02 but the summary of chapter 03 provides us with the 5 common factors founds from the 18 expert discussion and 115 survey participants. These same 5 common factors , which will be used to evaluate the 7 cases are the conclusion of chapter 3 and chapter 3 provides us with a set of questionnaire that can be used to collect data during

field survey. These factors are- Land Use Management, Functionality of Infrastructure, Accessibility of User Group, Tenant/User Profitability, Infrastructural Liability.

Chapter 04, Field survey and case study analysis, tries to address gap 02. It introduces the seven case studies and respective management activities that were used to collect the data on five factors of each cases. With the interviews and collected data each of the 7 cases are presented with three types of original Datasets-

- 1.Stakeholder dynamics of each case
- 2.Land use history and evolution of residual spaces in each case (infra-landuse-timeline)
- 3.Eviction process/ displacement history in each cases

These datasets are analyzed from the standpoint of five factors and evaluated side by side in radar charts. Which is used to show a relationship of these five factors in a graph . This hypothetical graph is termed as “Factor inter relationship graph”. This graph establishes a hypothetical relationship of the previously mentioned 5 factors that commonly explains all the case studies. This graph also shows the state of sustainable adaptation , eviction and subsidization to avoid displacement.

Findings: Chapter 5 provides insights for three core findings which is the key lessons of this research from chapter 04 and explains overall process of IRS adaptation. These three findings focuses on transparency of the system and management as a core concept to follow for sustainable adaptation of social practice with infra-residual-spaces. Following the three hypothesis this chapter shows a model solution in Bangladesh context which has been partially executed. For the specific site mentioned in chapter 01 , this adaptation strategy is titled as “Co-operative surface lease system”

The thesis concludes as a discussion essay on the future of the urban leftover spaces. This chapter provides a narrative on the importance of the policies of IRS. As seen from the case studies , where global south faces emerging issues of eviction and unfair rent in leftover spaces, global north also faces the same in the context of aging transportation infrastructure. With transportation infrastructures aging decade by decade increases its management cost , global north cases are also posed with the same question on the determination of Value-Based pricing of IRS. This research provides information to approach an infra-residual-space context strategically and address the policy requirements through its original diagram and methods.

Impact Keywords :

The context keyword: infra-residual-spaces (urban leftover space from transportation infrastructure)

The problem keyword: Eviction and exploitation (coming from undetermined value of IRS)

The solution keyword: Transparency of management practise (publicly disclosed value of IRS, can be cultural, commercial , social etc type of value)

Infrastructural management, Post infrastructural adaptation, urban leftover space , infrastructure planning and design

Chapter 1: Introduction

The "Introduction Chapter" lays the foundation for the research, beginning with a background essay (1.1) that delves into the production of infra-residual spaces due to urbanization and infrastructure development. It emphasizes why this research is necessary, particularly in the Global South. The next essay (1.2) addresses the adaptation processes of these spaces and whether they improve or degrade urban living conditions, identifying the core research problem. The following essay (1.3) formulates a case for infrastructural adaptation, guiding the investigation's focus. Finally, the research framework (1.4) provides an overview of the methodologies and methods employed in the study

1.1 Research Background: Production of Space as Infra-Residual

Modern infrastructure imposes a controlled and static colonization over the organic dynamism of nature, often disrupting landscapes and erasing cultural values. While infrastructure projects are pivotal in global policy and urbanization, their single-purpose design frequently overlooks the potential for various use. Historically, structures like Roman aqueducts and medieval bridges have evolved to support diverse social, commercial, and residential functions. These days, the enormous scope of contemporary infrastructure makes it difficult for the public to distinguish between landscape architecture, urban design, civil engineering, and architecture. In order to better understand the underutilized areas beneath viaducts and other effects on social practice from a management perspective, this thesis, "Living Within Infrastructure: A study on the management and adaptation of social practices around transportation infrastructure residual spaces," was written. The spaces left behind after transportation infrastructure is built and arranged are known as infra-residual spaces. These areas are usually found underneath elevated constructions such as overpasses, railway lines, and viaducts, as well as beneath highways and bridges. These spaces are characterized by their frequently accidental and unplanned nature. Depending on the particular infrastructure type and its urban setting, these spaces might vary in size, shape, and utility. **This large-scale production of residual space requires effective management strategies and land use planning.** By investigating these sites, the project hopes to discover how they might be converted into lively, multipurpose urban spaces that fulfill the community's socioeconomic and cultural requirements. This research is critical for designing integrated urban policies to improve the livability and sustainability of modern cities.

The United Nations Development Program (UNDP) recently funded a study by the Center for Inclusive Architecture and Urbanism (Ci+AU) at BRAC University. The study found that the 207 acres of residual space under Dhaka's elevated structures—such as flyovers and expressways—remain largely underutilized. These regions have potential, but they are hampered by encroachment and abuse, which results in an estimated USD 2 billion in socioeconomic losses each year. (Centre for Inclusive Architecture and Urbanism (Ci+AU), 2023)

The Tejgaon-Nabisco flyover in Dhaka's industrial region is used as a case study to investigate post-infrastructure adaption in urban areas (figure 01). The goal is to study how the flyover infrastructure affects the lives and livelihoods of squatter communities beneath it, in order to establish management solutions that make use of local resources. Unplanned zoning and the spread of informal slums and squatters have complicated Dhaka's urban landscape even more. With approximately 400,000 people

relocating to Dhaka each year, many of whom are fleeing natural disasters, the city's population of 21.7 million grows at a 3.50% yearly rate. Currently, 1.06 million people live in slums in the Dhaka division, a figure that has increased alongside unregistered informal settlements (The Guardian, 2015).



Figure 01: Top: Post construction infrastructural residual spaces in Dhaka. Tejgaon Nabisco Flyover and Mayor Hanif flyover exhibits adaptation of socio-economic practice in existing urban context. Bottom left to right: various land uses in Dhaka under flyover spaces [Photo credit: Srijon, 2020-2023]

The core Dhaka metropolitan region is largely residential, with 41.45% of the land used for housing. However, mixed-use development is increasing, complicating transportation planning as commercial, residential, and industrial zones deviate from their original master plan. Effective public transportation necessitates interconnected metropolitan areas and a lifestyle transition that cannot be accomplished just by implementing mass transit systems. Despite the fact that railways and road links are critical components of a regional network, they barely account for 6.06% of Dhaka's area (RAJUK 2015). Furthermore, the city's geographical location, which is encircled by rivers on three sides, is underutilized due to a lack of efficient water transportation networks. While the existing railway network connects important intra-city stations, there is no intra-city train service, aggravating congestion.

Several megaprojects are currently changing Dhaka's skyline, including the Dhaka Elevated Expressway and the Dhaka Mass Rapid Transit system. As shown in figure 01, these 68 km of elevated infrastructure projects, spearheaded by the Bangladesh Bridge Authority, aim to ease traffic congestion, a long-standing problem in the metropolis. Despite the construction of seven flyovers from 2004 to 2019, which were designed to reduce traffic congestion, the situation has remained essentially unchanged. According to the World Bank, the average traffic speed in Dhaka has decreased from 21 km/h to 7 km/h, which is equivalent to the average human walking speed. This raises concerns regarding the efficacy of such expensive infrastructure solutions.

Infrastructure is a broad term that is used differently in academic literature depending on its application. Its traditional meaning and usage apply to critical utilities and services such as roadways,

water systems, telecommunications, electricity, and drainage systems that, when interconnected, produce an efficient and functional metropolitan environment (Goodman, 2015). This study looks primarily at transportation infrastructure in the form of flyover viaducts and their physical influence on metropolitan areas. When positioned in a densely populated and complicated megacity, flyovers can work as a vital factor in controlling the natural dynamics of the setting, potentially influencing the current situation. Such transportation infrastructure works as a type of colonization by imposing new systems on established urban fabrics. This phenomenon illustrates the adaptation of ambient social practices in response to the existence of flyover infrastructure.

Transportation infrastructure has typically been developed with a single goal in mind: to serve geopolitical and economic purposes. This method has frequently resulted in negative effects, such as damaged landscapes, defacement of retrofitted structures, and loss of cultural and natural assets (Nijhuis, 2015). Infrastructure projects are now fundamental to global policy, acknowledged as the principal domain for public investment (EU Decision, 2011), and critical in shaping privately financed urbanization (Shannon, 2010). The intricacy of modern infrastructure blurs the lines between landscape architecture, urban design, civil engineering, and architecture, defying traditional planning and design conventions. The importance of strategic planning, effective decision-making, and data availability are highlighted as critical for reducing traffic congestion and allowing sustainable infrastructure development. It successfully affects many aspects of our modern life (Short, 2005; Emberger, 2017).



Figure 02: Left: Ponte Vecchio in Florence, one of the oldest examples of utilization of infra-residual spaces for formalized commercial use. Right side image shows Osaka Circle Line under railway shopping area, managed and organized by JR leased to small commercial shops and restaurant chains. [Photo credit: Srijon, Snapir Arnon]

Throughout history, infrastructural developments such as Roman aqueducts, castle walls, and medieval bridges have not only served their primary functions but have also been integral to social, commercial, and residential life. A MacDonald outlet under Osaka circle line in figure 02 shows how seamlessly common business are integrated in urban fabric along with under railway leftover spaces. Examples like the Berlin Hochbahn, Água de Prata Aqueduct, Ponte Di Rialto, Ponte Vecchio (figure 02), Pont Notre Dame, Viaduct des arts, etc. illustrate this multifaceted utility. In the Global South, similar adaptability is observed with the Flyover Pelangi in Antapani, Indonesia, the Matunga flyover in Mumbai, India, and many more. Prasetyo (Prasetyo, 2015) highlights the reclamation of under-flyover spaces in Bandung, Indonesia, for community activities, paralleled by (Wang, 2023) the account of vegetable markets under flyovers in Changchun, China. The management of urban infrastructure is a complex issue impacted by social, economic, and environmental variables. A comprehensive and sustainable approach is necessary due to the complexity of managing

interconnected systems like water, energy, transportation, and land use (Ferrer, 2018). (Pandit, 2011) Urban quality of life can only be improved by integrating green infrastructure (Breuste, 2015), and community management in developing countries fills in the gaps in service delivery for the urban poor (Cotton, 1994). These examples of social practice's "infrastructural adaptation" point to a recurrent theme of spatial repurposing, but little research has been done on the systematic administration of these spaces in unofficial megacities. The idea of infra-urban hybridization redefines infrastructure beyond its practical use, fusing it with urban life as a result of homeless people using these buildings as shelter. More than at any other point in history, infra-residual areas are becoming more prevalent in society. Infrastructure management must adopt a balanced strategy that takes into account both wider societal effects and technical efficiency in light of this progress. **As Dhaka continues to develop its mega transportation projects, it must address the complex interplay of planned infrastructure and organic urban growth to create a sustainable and livable city.**

1.2 Research Significance & Problem Statement: An Inevitable Adaptation, For Better or Worse?

Historically urban planners, architects, sociologists, and urban thinkers have tried to explain the post-construction infrastructural usage phenomenon and its after-effects in many different forms and illustrations. Rem Koolhaas, in his famous 2002 article entitled "Junk space" stated the aforementioned phenomenon in one of the most useful metaphoric ways possible. To quote him – "The product of modernization is not modern architecture but junk space. Junk space is what remains after modernism has run its course. If space junk is the human debris that litters the universe, Junk-space is the residue that humans leave on the planet". Rem Koolhaas further elaborates by asserting that modern architects and engineers have created more architecture than all the history together. Hence the junk space or such post-construction infrastructural residue spaces are the total of our current tangible infrastructural mass (Koolhaas, 2002).

Highway and road development has been a fundamental engine of economic and social change, with a focus on user and community benefits (Hennes, 1960). However, this viewpoint has been challenged for its narrow scope, with requests for a more comprehensive approach that takes into account local innovations and discussions. This is especially important in modern urbanism, as road infrastructure must be integrated into the city (Moraes, 2021). Road and highway development provides excellent insights into state formation and expertise (Harvey, 2018). Another example of these theories can be seen in the 1968 renowned Jane Jacobs vs. Robert Moses fight over the Lower Manhattan Expressway project. Which attempted to combine expressway designs with lodging facilities. Jane Jacobs spearheaded a quickly growing movement that brought people from all over the city together and eventually put an end to Paul Rudolph's famous Lower Manhattan concept of constructing usable space amid traffic infrastructure, which was proposed in 1965. Jane Jacobs believes that planners and designers concentrate on understanding the complexity and distinct qualities of space that affect how places function and enrich them (Jacobs, 1961). Rem on the other hand in the 1990s, provides an alternative perspective which states that this phenomenon is neither negative nor positive, it is just an **inevitable byproduct of urbanization that necessitates coexistence.**

There are examples of successful land use in residual spaces. However, the nature of land use and management, in terms of tenant and owner relationships, as well as the profitability of space usage,

must be understood in order to properly replicate these success stories. This situation is becoming more common in the Global South as urbanization and transportation infrastructure expand together. **Inability to learn from past successful cases who were able to reach sustainable adaptation, will result in a loss of our ability to adapt in a timely manner. Achieving a stage of coexistence between social practices and infrastructural residual space will take much more time and resources.**

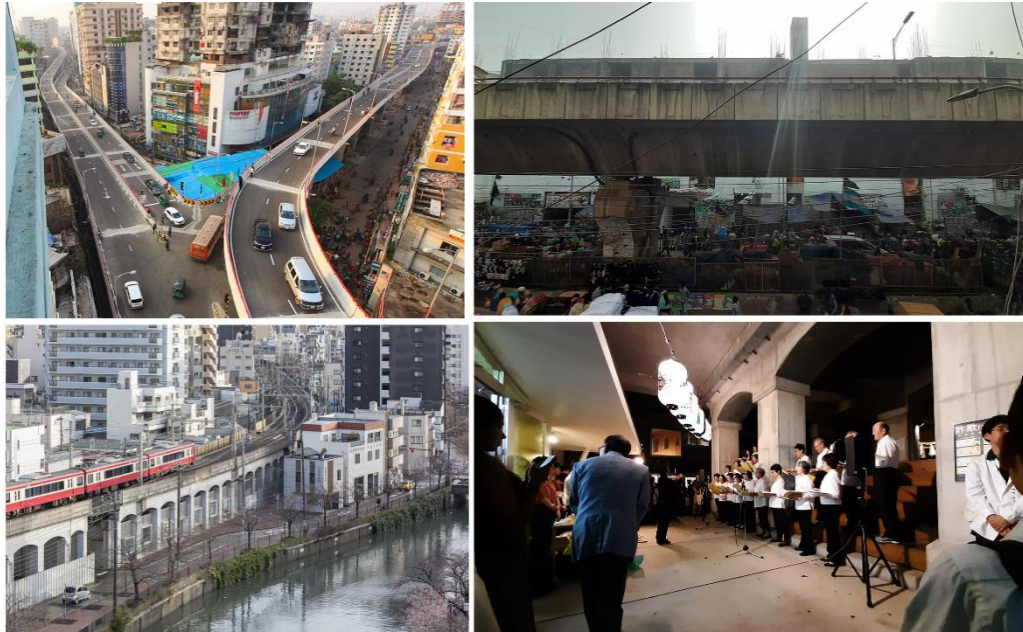


Figure 03: Top: Adaptation of infra spaces in Dhaka vs Adaptation process in Yokohama [Photo credit: Srijon, Daily Asian Age, Archdaily]

The World Bank has funded the rapid growth of urban transportation infrastructure in Global South megacities during the last decade. Since 2012, twelve metro and bus rapid transport (BRT) projects have been constructed, affecting approximately 20 million people. These projects are part of a larger effort to improve urban transportation in 18 countries, including Bogotá, Colombia, Dakar, Senegal, São Paulo, Brazil, and cities in China and India. The São Paulo Metro Line 5 lowered average travel times by 50% for 500,000 daily passengers, while the Lagos BRT in Nigeria reduced public transportation expenses by 30% for 200,000 daily users. In Peru, the Metropolitano BRT system presently transports over 700,000 people every day, cutting travel time by 34% on average. In Tanzania, the initial phase of the Dar es Salaam BRT has reduced travel time by half along its line. These projects not only improve accessibility and reduce congestion, but they also increase social inclusion and reduce greenhouse gas emissions, paving the way for sustainable urban growth in the Global South.(World Bank Report, 2024)

According to Arefin, flyover projects in Dhaka City primarily benefit the capitalist elite through neoliberal programs. Stephen Graham's 2018 paper "Elite Avenues" offers an alternative perspective on flyover-induced land usage. He argues how development and planning elites in the Global South fetishize elevated roadways or flyovers. The article also adds that flyovers have been presented as revolutionary icons delivering the appeal of free and uninterrupted circulation, although they are frequently more electorally compelling than cost-effective traffic management plans for cities

(Graham, 2018). Orski emphasizes the necessity for a methodology that is sensitive to social and economic goals, as well as the importance of new institutions to assist in goal formulation (Orski, 1970). Cascetta (2015) provides a decision-making paradigm for transportation systems that combines cognitive rationality, stakeholder participation, and quantitative approaches. Wachs advises expanding research programs to include different viewpoints, such as organizational and human perspectives, in order to improve our understanding of transportation systems (Wachs, 1985). To sum up, **an adaptive co-existence of infrastructure and urban life is inevitable** as we enter to the age of infrastructural transformations. The research narrative emphasizes the **process of adaptive approaches to co-existence** that balances infrastructure's economic, and socio-cultural contributions, community life, and local environments.

1.2.1 Realities of Infra-Adaptation in Dhaka: Traffic Jam and Flyovers as Urbanization Byproduct in the Context of Global South

The UNB news report emphasizes how Dhaka's traffic congestion persists even after seven flyovers worth more than Tk 40 billion have been built in the last 15 years. Experts contend that rather than improving the city's traffic problems, these expensive infrastructure projects have made them worse. Professor of civil engineering at BUET Shamsul Haque blames the flyovers for creating additional traffic strain at their ends and hence more congestion. Instead, he is an advocate for improving the public transportation system. This is supported by Robert Gallagher's analysis, which demonstrates how an excessive reliance on vehicles and an inadequate bus infrastructure could cause Dhaka's traffic speed to further decline. Jahangirnagar University's Adil Mohammed Khan highlights the importance of comprehensive planning and greater investment in public transportation, arguing that money spent on flyovers would have been better used to purchase additional buses and introduce alternate modes of transportation. To effectively handle the traffic crisis, both experts emphasize the significance of good infrastructure design, efficient traffic management, and a reduction in the use of private vehicles, in addition to rapid decentralization (UNB, 2019). In the news report, experts discuss how flyovers in Dhaka are "irreparable damage" to the city and how inefficient they are at reducing traffic congestion. The installation of multiple flyovers has not resulted in a notable improvement in traffic problems as shown in figure 04. Flyover-centric solutions, according to experts like Professor Dr. Md Shamsul Hoque of BUET, are useless for metropolitan areas and have made congestion at their exit points worse. To improve traffic management and road usage, they advise expanding public transportation, especially buses, and switching out smaller cars with double-decker buses.



Figure 04: Left: Proposed Strategic transport plan (STP) Dhaka 2035, Bangladesh (source : JICA study team) , Middle : Pre Infrastructure Construction condition in Dhaka , (Source daily star) , Right : Post construction adaptive use of a Flyover in Dhaka with traffic congestions (Source : Srijon)

Additionally, the anticipated completion of the Metro Rail and Bus Rapid Transit (BRT) projects may offer only minimal improvements unless accompanied by a substantial increase in public transport and comprehensive traffic management strategies. Experts emphasize the need for holistic and strategic planning, as outlined in the Strategic Transport Plan (STP) for Dhaka, to address the city's traffic woes effectively (UNB, 2019).

Table 01: List of flyovers constructed in Dhaka since 2000

Flyover	Year Opened	Length (km)	Width (m)	Key Features	Areas Connected in Dhaka
Mohakhali Flyover	2004	1.12	7.5	19 pre-stressed box girder spans, 0.6m footpath on both sides	International Airport, Gulshan, Banani
Khilgaon Flyover	2005	1.899	14	Sections: Rajarbagh (222m), Malibagh (202m), Sayedabad (220m)	Sabujbagh, Madartek, Kadamtali, Basabo, Rajarbagh, Sipahibagh, Meradia, Goran
Kuril Flyover	2013	3.1	14.6	4 loops (2 'Y' and 2 'U'), 12.7 acres of land	Uttara, Pragati Sarani, Purbachal, Nikunja, Banani
Mirpur Airport-Road Flyover	2013	1.8	N/A	Connects Matikata to Airport Road at Zia Colony	Mirpur, Shahjalal International Airport, Uttara, Banani, Gulshan, Mohakhali
Mayor Hanif Flyover	2013	10	N/A	5.5 km main flyover	Dhaka-Chittagong highway, Nimtoli, Jatrabari, Sayedabad, Kaptanbazar, Gulistan
Moghbazar-Mouchak Flyover	2017	8.7	N/A	Loops and onramps connecting multiple areas	Tejgaon Satrasta, Sonargaon Hotel, Moghbazar, Ramna, Bangla Motor, Malibagh, Rajarbagh Police Lines, Shantinagar
Bijoy Sarani-Tejgaon Link Road Flyover	2010	1.114	18.3	Connects Bijoy Sarani to Tejgaon	Bijoy Sarani, Tejgaon

Adaptability studies on transit-oriented development (TOD) influence areas are crucial for successful implementation in developing countries like India, as mobility patterns differ significantly from developed countries. (Ann et al., 2019). For this research we closely focus on two flyovers of Dhaka.

(1) Nabisco-Tejgaon Flyover, Dhaka (A case study site)

Since its opening in 2010, the urban lower-class population of floating people has taken refuge under the Nabisco Flyover. In an industrial zone, it has been transformed into an underpass squatter settlement. The people living beneath railroad spaces use the flyover's pathways, terminal wall, roads, and median—an elevated structure in the middle that connects columns—for both their daily living and income-generating activities. As an illustration of self-management in a transportation infrastructure setting, this flyover has been examined. The stakeholder and land use dynamics resulting from the interplay between urban informality and residual infrastructure around this site are examined in Chapter 2.

(2) Mayor Hanif Flyover, Dhaka (A case study site)

The longest flyover in Dhaka, the Mayor Mohammad Hanif Flyover, opened by Prime Minister Sheikh Hasina and runs 11.8 kilometers from Jatrabari to Gulistan. The flyover, which bears the name of the late mayor of Dhaka, Muhammad Hanif, is intended to improve communication and reduce traffic between the capital and 32 districts in the southeast. The project, which was developed by Orion Infrastructure Limited under the nation's first Public-Private Partnership (PPP) initiative, was finished in spite of a number of difficulties, one of which was protecting subterranean utility lines. It is anticipated that the flyover, which levies different tolls for various car kinds, will greatly enhance regional access and urban mobility. 2,000 personnel and a large amount of materials were used in its construction to ensure its longevity and earthquake resilience. Starting in 2010, the project represents a major infrastructural development in Dhaka, offering a crucial connection to the Dhaka-Chittagong expressway and reducing traffic in strategic parts of the city. A Request for Expression of Interest (EOI), ref no. 46.207.000.09.27.178.2021-209, was released by the Dhaka South City Corporation on March 15, 2023. The project's goal is to offer advisory services for Tejgaon Nabisco Flyover's urban design and beautification. The scope entails assessing the existing state of affairs, creating both basic and comprehensive plans, and supervising construction in order to convert the region into useful public areas.

The author worked on this project in 2022–2023 in collaboration with Next Door Consultants Dhaka as a part of the completion of the practical management project for the GSGES Global Environmental Management PhD program. In collaboration with the consultants, author produced information and reports that were utilized in Bangladesh as a site introduction, showcasing creative approaches to repurposing and enhancing leftover areas brought about by transportation infrastructure. The inception report, which breaks down the Dhaka site into eight sections and introduces the under-flyover setting through photographic and map evidence, includes the following table and photos. **In Chapter 5, the application of the thesis hypothesis and findings will be covered in more detail, along with the project implementation and design methodologies.**

Table 02: Scope of Project divided into 8 areas under the Mayor Hanif flyover. Please kindly see the appendix 6 as the inception report submitted for the project to Dhaka South City Corporation in January 2023.

Area	Name of the Area	Under Flyover Land Use	Problems	EP
01	Chankharpul to Bongo Bazar	Horse keeping, carriage parking, poultry farms, garbage dumps	Narrow roads, illegal possession, unsanitary conditions	EPA06 - EP03
02	Bongo Bazar to BRTC Bus Counter	Parking for buses and vans, food court, median hotels, vendors	Congestion, vendor encroachments	EP03 - EP17
03	BRTC Bus Counter to Jaikali Mandir	Vendor shops, unused space, police box, temporary settlements	Heavy traffic, illegal possession, clutter	EP17 - P01
04	Jaikali Mandir to Rajdhani Supermarket	Empty spaces, garbage dumps, plantation nursery	Unused spaces, garbage issues	P01 - P21
05	Rajdhani Supermarket to Swamibag	Empty spaces, public toilet, car and bike parking, vendor shops	Underutilization, sanitation issues	P21 - P30
06	Swamibag to Saydabad	Bus depot, empty spaces, banana plantation	Encroachment, improper use, garbage stacks	P30 - P40
07	Saydabad to Janapath Mor	Large open spaces, medians	Unused spaces, encroachments, garbage dumps	P40 - P50
08	Jatrabari to Kutubkhali	Kitchen market, nursery, auto parking, small shops	Congestion, lack of organization, encroachments	P64 - P85

Based on a survey carried out in 2022 for the Mayor Hanif Beautification Project, the following pictures depict the Land Use and Issues Under the Mayor Hanif Flyover: a segmented analysis from Chankharpul to Kutubkhali. A thorough understanding of the under-flyover spaces is provided by the author's photos and the surveyor's AutoCAD drawings for the project team. The author received these sketches as part of the documentation for the design consultation. The images mainly highlight the state of these Dhaka under-flyover locations at the moment.

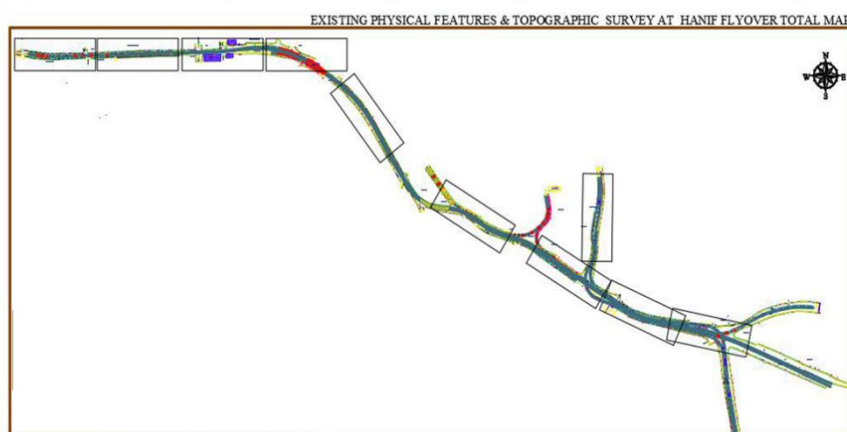
Area 01 - 08 (Full Hanif Flyover Length of 11 Kilometers) figure 5 (A) This image shows the full map of the Hanif Flyover, highlighting key physical features and topography along the 11-kilometer stretch. The layout provides an overview of how different sections of the flyover interact with the surrounding urban landscape, indicating areas of interest for land use beneath the flyover. Detail drawing for each segment is provided in the appendix 2.

Area 01, Chankharpul to Bongo Bazar (EPA06 - EP03) in figure 5(B); The under-flyover area in this section is utilized for various informal and low-income activities. The images show the presence of livestock (such as horses and cows), horse-drawn carriages parked along the road, and small-scale commercial activities like poultry farms. These spaces appear to serve a combination of agricultural, storage, and local transportation needs. Additionally, there is some informal housing and small stalls selling goods. Area 02, Chankharpul to Bongo Bazar (EPA03 - EP17) in figure 5 (C); In this area, the land under the flyover is more commercialized. It features informal markets with vendors selling a

variety of goods, such as fruits and other items. The area appears to be densely populated with pedestrians and vendors, and the flyover structure itself is used as a shelter for these activities. Buses and informal stalls are visible, indicating that this space serves both transportation and economic purposes.

Area 03, BRTC Bus Counter to Jaikali Mandir (EP17 - P01); The figure 6 (A) in this section primarily depict transportation-related land use under the flyover. Several buses are parked under the structure, using the space for both long-term parking and operational stops which creates traffic congestion all day long. There are also informal businesses and vendors occupying the sides of the area, as well as rickshaws parked near the buses. The space is somewhat chaotic, with minimal formal planning, used for both transportation and small-scale commercial activities.

(A) Area 01 -08 (full hanif flyover length of 11 kilometers)



(B) Area 01 : Chankharpul to Bongo Bazar (EPA06 - EP03)



(C) Area 01 : Chankharpul to Bongo Bazar (EPA03 - EP17)



Figure 05: (A) Full layout and Mayor hanif under flyover beautification project area 01-08 (Source: DSCC,Next Door Consultant,Srijon, over view picture courtesy seven rings cement), (B) Area 01 landuses , (C) Area 02 Landuses

(A) Area 03 : BRTC Bus Counter to Jaikali Mandir (EP17- P01)



(B) Area 04 : Jaikali Mandir to Rajdhani Super market (P01-P21)



Figure 06: Mayor hanif under flyover beautification project area 01-08 (Source: DSCC,Next Door Consultant, Srijon)

Area 04, Jaikali Mandir to Rajdhani Supermarket (P01 - P21), figure 06 section (B) shows informal land use. The images feature open spaces beneath the flyover, some of which are used for makeshift storage of garbage, while others appear abandoned or vacant. There are informal structures visible, possibly used for storage or temporary shelter. The space also shows signs of neglect, with little formalized use beyond random storage, some waste dumping, and occasional pedestrian use. There is a colony of sweepers who were living under the flyover as they were allowed to stay there by the Dhaka City Corporation.

(A) Area 05 : Rajdhani Super market to Swamibag (P21-P30)



(B) Area 06 : Swamibag to Saydabad (P30-P40)



Figure 07: Mayor hanif under flyover beautification project area 01-08 (Source: DSCC,Next Door Consultant,Srijon)

Area 05, Rajdhani Supermarket to Swamibag (P21-P30) in figure 07(A); The under-flyover area in this section is primarily being used for rickshaw parking and informal stalls. The space is dominated by pedestrian and light vehicular traffic, with local businesses and informal vendors utilizing the shaded areas under the flyover. Construction materials, like piles of sand, are also stored here, temporary or ongoing infrastructure work is going on in a nearby area. Overall, this section shows a mix of transportation-related activities and commercial uses. Area 06, Swamibag to Saydabad (P30-P40) in figure 07 (B); This section highlights the use of under-flyover spaces for bus parking and informal markets. Buses are seen occupying large sections, with roadside vendors selling various goods. There is significant pedestrian and vehicular congestion in this area, indicating a high-traffic zone. Parts of the space under the flyover are also used for waste dumping and informal greenery, which shows the mixed-use nature of these spaces, combining both economic activities and neglected land use.

(A) Area 07 : Saydabad to Janapath Mor (P40-P50)



(B) Area 08 : Jatrabari to Kutubkhali (P64-P85)

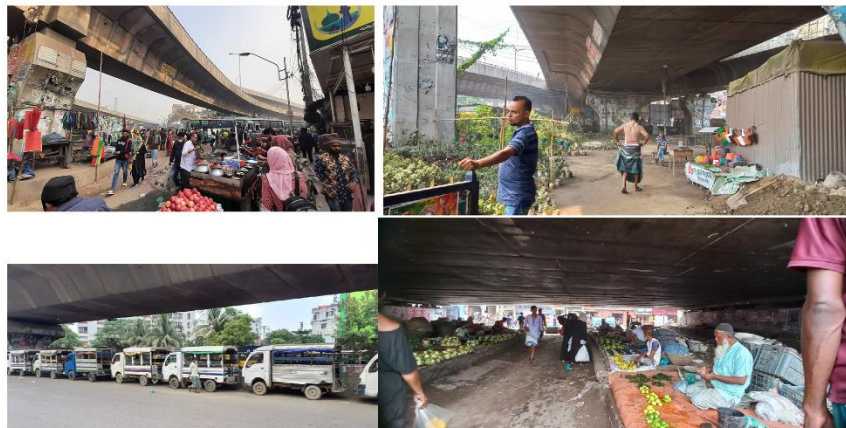


Figure 08: Mayor hanif under flyover beautification project area 01-08 (Source: DSCC,Next Door Consultant,Srijon)

Area 07, Saydabad to Janapath Mor (P40-P50), in figure 08(A) ; The images in this section show informal commercial activities, with market vendors occupying spaces under the flyover. There are also pedestrians moving through the area, and public buses parked nearby. This part of the flyover acts as a shelter for vendors, though the space appears dusty and underutilized in terms of formal infrastructure. It highlights the informal market-driven use of space , with minimal organization or management visible.

Area 08: Jatrabari to Kutubkhali (P64-P85) in figure 08 (B); This area is heavily dominated by market activities, with vendors selling produce under the flyover. The flyover shelters an informal marketplace where fruits, vegetables, and other goods are sold. Additionally, the space is utilized for truck parking, indicating a dual-purpose area for both transport and commerce, as this area connects Dhaka with outside districts with highway. The vibrant marketplace under the flyover suggests high community engagement, despite a lack of formal infrastructure or facilities.

1.2.2 Eviction Rates in Public Spaces & Informal Housing Cases in the Context of Dhaka, Bangladesh

However, we ignore an important component in the larger narrative: evictions of existing land usage owing to transit-oriented development. To understand this phenomenon, we must first examine the process and evolution of infrastructure adaptability. The urban poor in Dhaka, Bangladesh, fear eviction due to a lack of tenure security, and both the state and the market deny them housing rights, despite international agreements and national legislation. (Lata, 2020) Evictions from Dhaka's slums and squatter settlements breach housing rights, and changing unfavorable views about the poor and their lack of land ownership can contribute to advances in housing rights. (M Rahman, 2001)

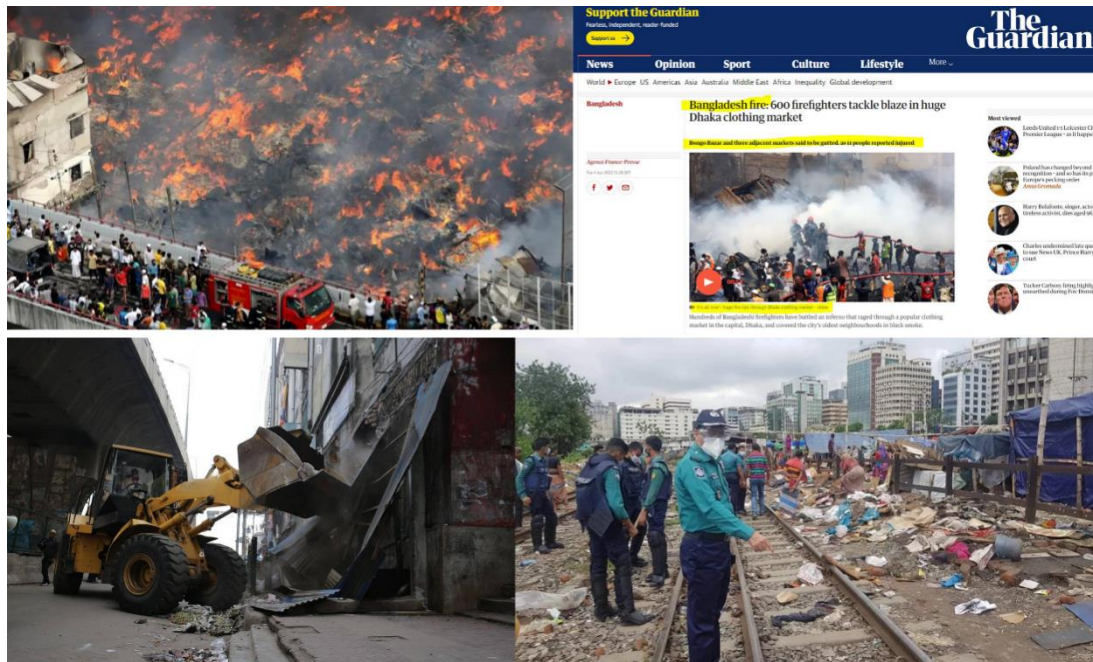


Figure 09: A view of Gulistan fire from mayor hanif flyover and Cases of eviction and Hazard around infra residual spaces in recent times, Dhaka (Top: Source: The Guardians, April 2023, Bottom: Alamy , Dhaka Tribune 2020)

The construction of flyovers and elevated roads often leads to forced evictions and displacement of informal settlements and slum dwellers living in the areas underneath. These evictions disrupt homes, livelihoods, social ties, and access to basic services, causing immense hardship for the urban poor. As seen in the figure 09 , the fire hazard in 2023 April has caused removal of the under flyover informal business soon after the inception report submission . In Mumbai, India, the Sahar Elevated Access Road (SEAR) flyover connecting the airport to highways has narratives of displaced homes, forced evictions, and homelessness hidden beneath its eight-lane expanse. The SEAR exemplifies how infrastructure projects create "urban archipelagos" that connect affluent areas while invisibilizing and displacing marginalized communities. A study in Nigeria between 2010-2016 identified 370 reported cases of infrastructure-related displacement, affecting over 3 million people across the country (Onyebueke et al., 2020). Certain regions faced disproportionate impacts, highlighting spatial and temporal variations in such displacements (Onyebueke et al., 2020). These evictions constitute gross violations of internationally recognized human rights, including the rights to adequate housing, food, water, health, education, work, and freedom of movement. They intensify inequality, social conflict,

segregation, and marginalization, particularly for women, children, minorities, and indigenous peoples. International guidelines stipulate that evictions must only occur in exceptional circumstances, with full adherence to human rights laws, and after exploring all feasible alternatives to minimize displacement. However, there is often a lack of transparency, accountability, and due process, with evictions frequently carried out with violence (Sheppard, 2023)(Evictions, 2002). Evictions create ruptures in people's lived realities, senses of belonging, and are deeply intertwined with issues of race, gender, home, security, and law (Strauss, 2023). They are not just outputs of infrastructure policy but complex socio-spatial phenomena with far-reaching psychological and social impacts.

The U.S. Department of Housing and Urban Development (HUD), which oversees public housing, does not systematically collect or publish data on how many eviction cases are filed by public housing authorities (PHAs) or what share of public housing households face eviction threats annually (Gromis et al., 2022). This lack of clear eviction policy and data at the federal (HUD) and local (PHA) levels raises critical questions about the management and protection of public housing tenants from displacement threats, particularly those related to inability to pay rent. The opacity around eviction practices in the public housing system raises concerns over potential violations of housing rights, lack of accountability, and disproportionate impacts on vulnerable groups like minorities and the urban poor. Greater transparency through systematic data collection and clear policies is needed to protect tenants' rights and residential stability (Gromis et al., 2022), (Phillips, 2021) (Kenna et al. 2018)

Weinstein (2020) and Maharaj (2013) both highlight the collective and political nature of evictions in the Global South, particularly in India and South Africa. These evictions are often carried out by governments to make way for large-scale infrastructure projects, such as transportation. The forced removal of established communities, as seen in the cases of the Warwick Market and the Durban south area, can have significant social and economic impacts. Brickell (2017) further emphasizes the use of violence and coercion in these evictions, while Megebhula (1994) provides a narrative report on the ongoing suffering of homeless people in Durban, South Africa, as a result of these evictions. These studies collectively underscore the complex and often unjust dynamics of transportation infrastructure development in the Global South, and the need for more equitable and inclusive urban planning processes. In Kolkata, forceful evictions take place on informally occupied land both at the fringe and the central part of the city with vague statutory laws. (Mishra, 2018) The utilization of under flyover spaces, or negative infrastructure spaces, has been a topic of interest in urban planning. Jamila (2022) and 김미선 (2014) both highlight the potential for these spaces to be repurposed as open public areas, contributing to the city's amenity. Pardee (1969) and Airis (1969) further explore the concept of air rights, suggesting that these spaces could be used for a variety of purposes, including parks, parking, housing, and office buildings. These studies collectively underscore the need for thoughtful policies and regulations to guide the use of under flyover spaces, ensuring that they contribute positively to the urban environment.

Residents moving from gentrifying neighborhoods find little difference in socioeconomic status or access to the urban core compared to those moving from non-gentrifying neighborhoods. (Freeman et al., 2023) making us ask a question, **is this adaptation geared toward better or worse?**

1.3 A Case for Infrastructural Adaptation

Transportation infrastructure management faces challenges such as strategic planning, cost management, climate change resilience, globalization, urbanization, and modernization, necessitating a comprehensive approach to ensure sustainable and efficient systems. However, when the issue of infra-residual space is involved, one key factor is the tenant-landlord relationship, as it determines the rate of eviction, displacement, and gentrification. **Therefore, the process of this adaptation is significant in any global context, as infrastructure itself is a formal entity, and the land use of the spaces generated due to infrastructure also fosters a risk of displacement due to complex ownership-tenant dynamics.**

1.3.1 Significance of the Issue

The construction of modern transportation infrastructure frequently results in the production of unused **infra-residual spaces (IRS)**. These spaces, left over after large-scale developments like as flyovers and elevated roadways, offer substantial prospects for urban growth if properly managed. However, the existing approach to infrastructure development frequently overlooks these areas, resulting in detrimental socioeconomic and environmental outcomes. The relocation and forceful eviction of underprivileged groups from these locations worsens inequality and social unrest. Addressing the management and reuse of infra-residual spaces is critical for developing long-term urban environments that combine physical infrastructure requirements with social practices. This study intends to emphasize the potential of these areas to improve urban livability and sustainability, while also serving as a model for integrated urban solutions that can be implemented globally.

1.3.2 Problem Statement

The rapid urbanization and development of transportation infrastructure in cities often lead to the displacement of informal settlements and the creation of non-regularized infra-residual spaces. **Forced evictions from these areas disrupt the lives of the urban poor, displacing them from their homes and severing their social ties. Additionally, infra-residual space users or tenants often face undetermined and unfair payment issues, which can lead to displacement and eviction if property and land values are not properly adjusted.** The lack of strategic planning and comprehensive policies to manage these spaces results in missed opportunities for creating vibrant, multifunctional urban areas. This problem is particularly acute in cities like Dhaka, where the rapid construction of elevated transportation infrastructure has left significant portions of urban space underutilized and poorly managed. Addressing these issues requires a thorough understanding of tenant-landlord relationships and the implementation of equitable policies to ensure that infra-residual spaces are effectively integrated into the urban fabric, benefiting the entire community and economy.

1.3.3 Research Question

Question: How do social practices adapt to infra-residual spaces created by transportation infrastructure projects?

Sub-questions:

1. What are the factors that influence the adaptation of social practices in infra-residual spaces?
2. What is the relationship among these factors in shaping the adaptation processes?

This research question seeks to explore the dynamics between urban infrastructure and the communities that inhabit the spaces left over from infrastructure projects. By understanding how social practices adapt to these physical environments, (figure 10) the research aims to develop strategies for repurposing infra-residual spaces to meet the socioeconomic and cultural needs of urban populations. This research is crucial for promoting sustainable urban development and ensuring that infrastructure improvements do not worsen socioeconomic inequities, but rather contribute to the construction of inclusive and dynamic urban places, **assuring equitable tenant rights, and preventing unnecessary evictions.**

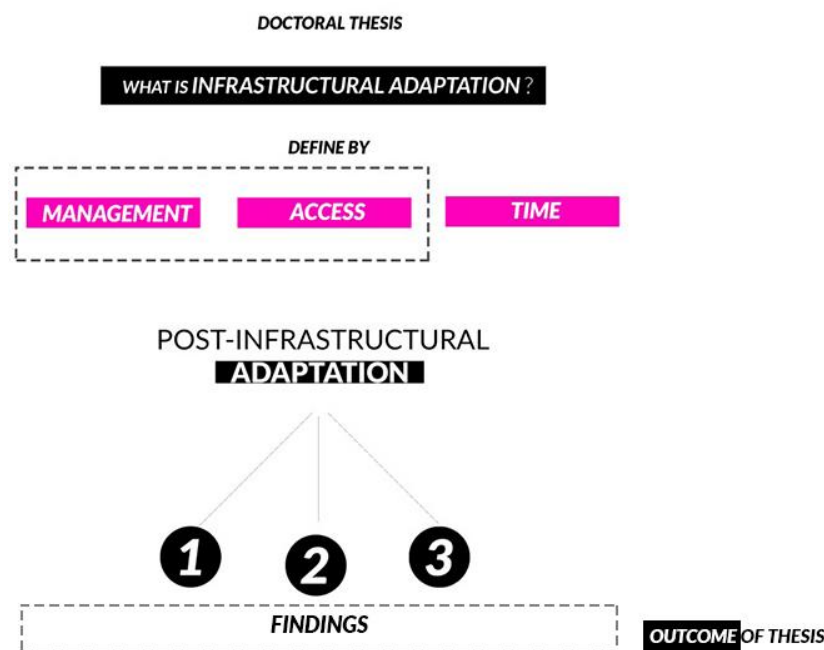


Figure 10: A diagram showing the research question and three key findings as the outcome of the thesis

1.4 Chapter Arrangements of the Research

The doctoral thesis uses a structured framework to investigate the adaptation of urban environments beneath and around elevated transportation infrastructures. The study is structured into six chapters, with each one building on the preceding one to provide a thorough knowledge of the phenomenon. Figure 11 below describes the chapter flow and dissertation narrative.

The "Introduction Chapter" establishes the research framework, beginning with a background essay on the creation of infra-residual spaces as a result of urbanization and infrastructural development. It stresses why this research is important, especially in the Global South. The following essay discusses the adaptation processes of these places and whether they improve or deteriorate urban living circumstances, highlighting the central research question. The following essay makes a case for infrastructural adaptation and directs the investigation's focus. Finally, the research framework

summarizes the methodology and methods used in the study, closing with references to back up the opening insights.

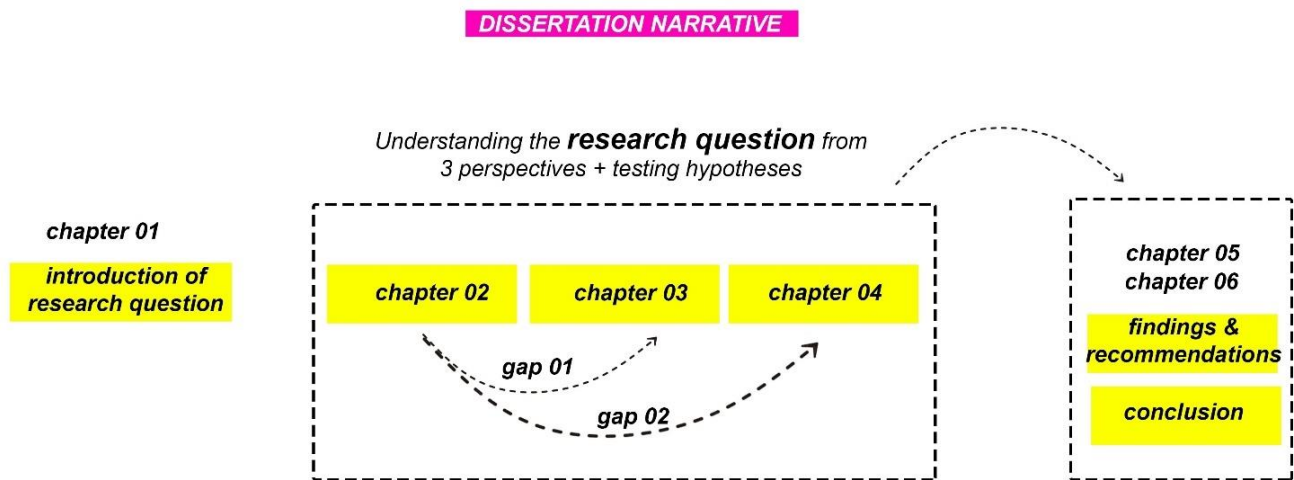


Figure 11: A diagram showing the chapter flow and dissertation narrative

"Chapter 2: Theories and Background Studies" investigates "Infrastructural Realities" and how they manifest in the Global South, contextualizing infra-residual spaces with a case study in Dhaka and its conclusions. Following this case study, and using keywords from the research case, the following subsection examines "Infrastructural Theories" related to socioeconomic land use, public spaces, and stakeholder roles, such as transit-oriented development and infrastructure management of spaces and built forms. This theoretical basis helps identify the "gaps" in current knowledge and understanding of infra-residual space management, collecting everything into a literature review with extensive references.

"Chapter 3: Public and Stakeholder Perspective on Infrastructural Adaptation" addresses the first gap: stakeholder perceptions, using a detailed "Expert Perspective" gleaned via symposiums and expert presentations hosted by the author. It also includes a "Common User Perspective" derived from a global survey of 115 samples, which summarizes major findings. The lessons learned from these interactions highlight critical variables for the study question, focusing on stakeholder insights and gaps in understanding among stakeholders.

"Chapter 4: Field Survey" begins by identifying the second gap and then delves into the "Evolution of Infra-Adaptation" using case studies and timeline narratives from seven infra-land use situations through a comparative study. The "Lessons from Comparison" section compares factors between various situations, integrating values and showing them using radar plots. This analysis reveals crucial ideas such as management systems, rent structures, and the public-private space dynamic, resulting in valuable "Lessons" for practical application.

"Chapter 5: Findings and Recommendations" contains a thorough "Analysis" of components from the case studies, correlations between these factors, and hypotheses expressed by diagrams. It assesses the significance of these findings and gives "Recommendations and Application of the Hypothesis" customized to the context of Dhaka, Bangladesh, outlining solutions for better management and exploitation of infra-residual areas.

"Chapter 6: Conclusion" describes the "Future Scope of Work," identifying opportunities for more research and development based on the study's findings. It also examines the "Limitations of the Study," which offer a critical assessment of the research's breadth and restrictions. In conclusion, the author asks a question - are infra-residual-spaces a product or feature? The answer can fundamentally determine how we evaluate infrastructure and its social and commercial value. The doctoral thesis appendices contain "Transcripts of 23 Interviews", a "Global Survey Form", chosen "Symposium Transcripts and Posters", a copy of the "Nature Springer Paper", and information on the "Dhaka Under Flyover Beautification Project". These supplemental materials give context and support for the research findings.

CHAPTER 2: THEORIES AND BACKGROUND STUDIES

"Chapter 2: Theories and Background Studies" explores the "Infrastructural Realities" (2.1) and how they manifest in the Global South, providing context for the infra-residual spaces through a case study in Dhaka and its findings. Following this case study, and taking keywords from the research case, the next subsection reviews "Infrastructural Theories" (2.2 and 2.3) related to socio-economic land use, public spaces, and stakeholder roles, including transit-oriented development and infrastructure management of spaces and built infra-forms. This theoretical foundation helps identify the "Gaps" (2.4) in current knowledge and understanding of infra-residual space management, compiling everything into a literature review with comprehensive references

2.1 Infrastructural Realities: Infra-adaptation of Social Practices in Infra- Residual Spaces in Global South: A case of Tejgaon-Nabisco Flyover Dhaka

By 2035, Dhaka's population is expected to have grown from 17 million in 2018 to 35 million, causing serious problems with pollution and traffic in the city's urban transportation system (UTS). Encompassing Dhaka and its neighboring districts, Greater Dhaka covers an area of more than 1,528 square kilometers and makes up around 40% of Bangladesh's GDP. The main mode of transportation used by Dhaka's UTS is inefficient road-based transportation; buses handle 47% of daily journeys, and during peak hours, traffic volume surpasses road capacity by 100%. The first mass rapid transit (MRT) network in the city is among the public transportation projects that are currently being built. In order to tackle these obstacles, the government authorized the 2016 Revised Strategic Transport Plan (RSTP), which suggested the construction of two BRT lines and five MRT lines by 2035. The current 20.5-kilometer corridor from the airport to Gazipur is to be improved with a dedicated BRT lane, flyovers, and stations as part of the BRT-3 project, which is co-financed by the Global Environment Facility (GEF), Agence Française de Développement (AFD), and the Asian Development Bank (ADB). The project, which has witnessed a 30.2% increase in civil works cost, is anticipated to improve Dhaka's UTS and contribute to a more sustainable and livable city despite delays and cost overruns (Asian Development Bank, 2022). In Dhaka, Bangladesh, utility infrastructure can be provided through incremental development and service upgrades, but new urban strategies that provide infrastructure before development are more successful. The environment in Dhaka, Bangladesh, is better off when urban development strategies prioritize the installation of utility infrastructure before development. (2018, Nahrin). Enhancing public transportation in Dhaka can be achieved through the establishment of a public-private partnership framework that unifies service providers, creates an umbrella organization, and guarantees smooth transit service across jurisdictions. (Chowdhury, 2014)

2.1.1 Research Site and Stakeholder Dynamics:

The Tejgaon-Nabisco Flyover, a 1.114-kilometer construction that opened in 2010, connects Dhaka's industrial zone to the main Mirpur arterial route, affecting a large urban poor population. This area has been a slum since the 1970s, with residents adjusting to the under-viaduct spaces after construction (as shown in figure 12). Tejgaon's industrial activities provide substantial environmental issues due to inadequate waste management and regulatory implementation deficiencies. Despite attempts by the Dhaka City Corporation, the city's waste management crisis continues, with garbage generation expected to exceed 47,064 tons per day by 2025.

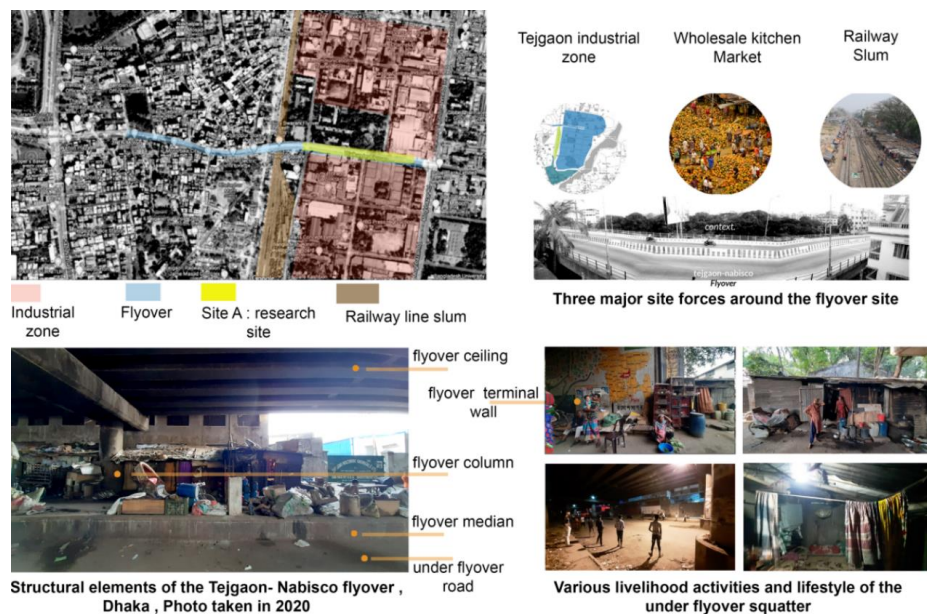


Figure 12: Top: The image at the top depicts the site's condition and surrounding contextual forces. The flyover is strategically located near an industrial zone, the largest kitchen market, and railway lines. Bottom: The images at the bottom showcase the living conditions within the squatter settlement situated under the flyover and highlight how the flyover's structural elements support the livelihood activities of the squatter community. Image credit: Author

This study, conducted by the author in 2021, focuses on the squatter zone beneath the overpass, which contains 33 squatter housing units and acts as an active living space. In assessing this residential zone, we identified several stakeholders based on their roles and proximity to the site. Primary stakeholders, denoted as P(A), include the squatter community that lives and operates in close proximity to the region. Industries, households, and pollutants in the region are classified as P(B). In addition, businessmen who profit from acquiring squatters' garbage and byproducts are classed as P(C) in Chart 1 below.

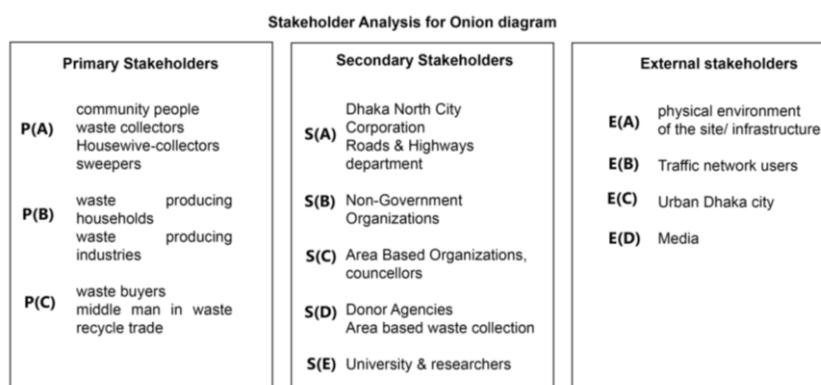


Figure 13: Stakeholder dynamics of the site

2.1.2 Participatory Action Research Workshop (PAR) Organization

The participatory action research (PAR) workshops in this study focus on the Tejgaon Nabisco under-flyover squatter community, aiming to understand the interaction between the community and

physical infrastructure. Two workshops facilitated data collection through visual representations and demographic surveys, providing insights into spatial and social relationships. Participants, selected from 33 households under the flyover, engaged in activities to articulate their experiences and interactions with the spaces. The workshops aimed to gather demographic information, identify stakeholder composition, investigate infrastructure utilization, create zoning diagrams, and explore site forces, all contributing to understanding community adaptation and spatial governance patterns as shown in figure 14. The design of the workshop questionnaire included sections on demographic and living conditions, and spatial utilization and zoning mapping, facilitating a hands-on approach for participants to draw their living and working zones. Figure 15 shows the PAR sample from the occupants in the squatters shown in figure 14.



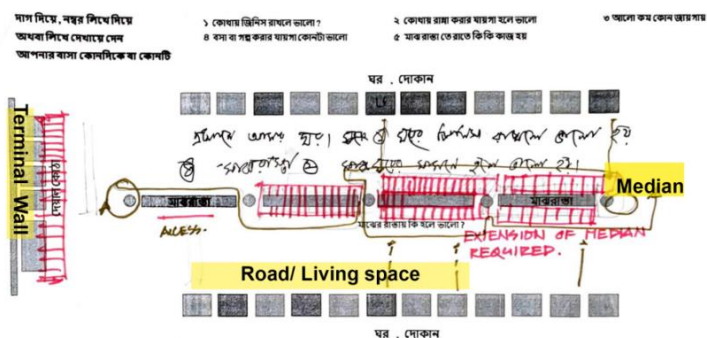
Figure 14 : This figure showcases the squatter community's utilization of the space beneath the flyover, including columns, terminal walls, and roads. It also includes photographs from participatory action research workshop conducted with the inhabitants of the squatter community. Image credit: Author,2020

Workshop 02 sample 03 (27 samples)

Median	Service zone	cooking space , cart parking , storage space. Extension of median required	2.75m-5.5m per household
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Terminal Wall	Service zone	storage space, community space	1.2 m- 1.5m
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Road/ Living space	Living Zone	lack of water facilities, expensive electricity and lights	3-5m
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হুবি একে নকশা করে দিতে পারেন কই কিং কি রাখা যায়

SAMPLE 03 BACCHU MIAH, MALE 60, CART PULLER

Question (current use) : Draw or Identify the current use of median , terminal wall and road under the flyover

Question (problems) : What are some of the problems and improvement suggestions ?

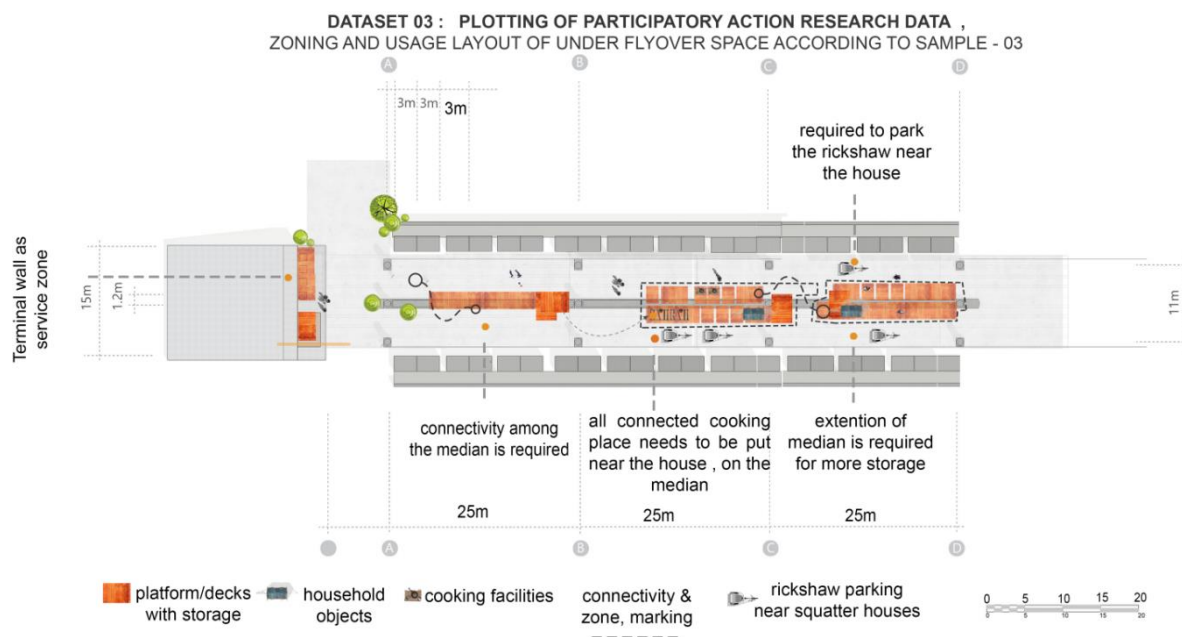


Figure 15: This figure showcases the squatter community's utilization of the space beneath the flyover, including columns, terminal walls, and roads. It also includes photographs from participatory action research workshop conducted with the inhabitants of the squatter community. Image credit: Author,2020

2.1.3 Findings From the Research

Finding 01: Infrastructural elements (flyover column, terminal wall, under-viaduct road, etc.) influence a microcosm of socio-economic practice endemic and adaptive to the local informality, thereby making its nurturing a potential asset for the city (Table 03)

Median Utilization: The majority (70%) of inhabitants prefer maintaining the current use of the median for sorting, reselling, and storing waste and household objects, predominantly as a service zone and, secondarily, as a community gathering space

Road Usage: The road beneath the flyover serves dual purposes; one lane facilitates vehicle movement, while the other is adapted for cooking, socializing, and other household activities. Approximately 51.8% express a need for housing services, and 63% indicate a demand for housing extensions, highlighting a significant need for shelter facilities.

Table 03: This chart displays the usage and zoning ratios of the median, terminal wall, and road, based on 27 samples gathered from the participatory action research workshop. Dataset 02 and Dataset 03 zoning type information is taken as a basis for the statistics. These ratios are only reflective of the opinions of the 33 squatter households directly living under the flyover

TERMINAL-WALL		MEDIAN SPACE		ROAD	
Zonning type	Functions	Zonning type	Functions	Zonning type	Functions
Service zone 59.25%	waste storage, bright light , water collection, flower garden, open space for traffic, toilet and shower, clock on the wall	Service zone 70.37%	Storage space, cooking space , waste collection space waste sorting spcae, household storage water storage	Service zone 51.85%	Toilet water electricity gas connection
Education zone 40.7%	Art wall colorful space	traffic and parking 37.03%	cart parking circulationcars trucks	House / extention of house/ living zone	Shelter/ living zone work place
Community zone 66.66%	seating space school, workshop place,	community space 59.25%	business space, open space clean space art, plantation	62.96%	Storage for household objects
ratio out of 27 samples		ratio out of 27 samples			

* participants can suggest / design multiple usages for a given under viaduct zone

Terminal Wall Function: Previously hosting an informal school managed by the NGO Light of Hope, the terminal wall is favored by 66% of participants as a community space, with 59% advocating for the integration of service facilities alongside educational activities.

It is observed that the squatter community provides an environmental service by cleaning up waste discarded in the area by local industries, markets, and households. They collect and resell the waste and byproducts, creating an informal economy rooted in the local urban context. However, since the polluters do not take responsibility for waste management, the squatter collectors essentially perform the task of cleaning the vicinity and transforming it into an informally operated economic subsystem. This microcosm of informality is crucial to the people, place, and infrastructure, and it relies heavily on the waste management of the Tejgaon industrial area. The colonization of the flyover entity has acted as a catalyst, facilitating newer forms of socio-economic practices through its infrastructural containment. This leads us to consider the fact that the squatter community and the under-flyover setup should not be seen as entities to be evicted but rather as assets to be nurtured with specific frameworks.

Finding 02: In the absence of state-sanctioned or privatized management frameworks, communities autonomously develop self-governed processes to manage infrastructural residual spaces.

The participatory action research data reveals that the current management of these under-viaduct spaces predominantly rests within the realm of self-governance by the inhabitants themselves. This grassroots-led approach entails the inhabitants assuming responsibility for the maintenance, upkeep, and adaptive evolution of the space. Periodically, this self-driven management is complemented by the intermittent support of Non-Governmental Organizations (NGOs). However, it is noteworthy that the onset of the COVID-19 pandemic witnessed a significant reduction in external aid, rendering the inhabitants more reliant on their self-initiated management strategies. The Stakeholder Onion Diagram is a strategic tool designed to visualize the importance and roles of stakeholders in relation to a system. It typically consists of three or four concentric layers, each representing different groups of stakeholders based on their proximity and relationship to the central issue. As Ian F. Alexander noted, primary stakeholders are those who will actually operate the system and thus remain close to it. Secondary stakeholders are users who will not operate the system but will consume its output. They are managers who rarely consume the system's output directly but utilize the information for planning and strategic control (Alexander, 2005)

Examining the onion diagram in above, we observe that organizations of policymakers S(A), categorized at the secondary onion level or as secondary stakeholders, are largely disconnected from the systems operating within the under-flyover squatter community and its closest actors, P(A) the squatter community, and P(B) the local industries. Services such as electricity are provided at a higher cost by local area-based political organizations S(C), yet the locals (P(A)) are far from being the primary beneficiaries. A significant connection impacting the economic dimensions of the system exists between P(A) and P(B).

The reciprocal nature of this system highlights that community squatters offer a rudimentary waste management service to local polluters free of charge (illustrated on the right side of Figure 16). This system, autonomously developed among the squatter inhabitants, ensures the continuity of sustainable management, environmental cleanup and survival of the locals. This important cycle has persisted for several years. The presence of flyover infrastructure enhances the setup, intertwining people and places, and offers a foundation with its infrastructural elements to host multitude of socio-

economic practice. This evidences that, in the absence of formal policies governing spaces under flyovers or infrastructural residual areas, unique socio-economic systems emerge, adapted by the communities themselves. If nurtured, this system has the potential to evolve into a more efficient operational dynamic.

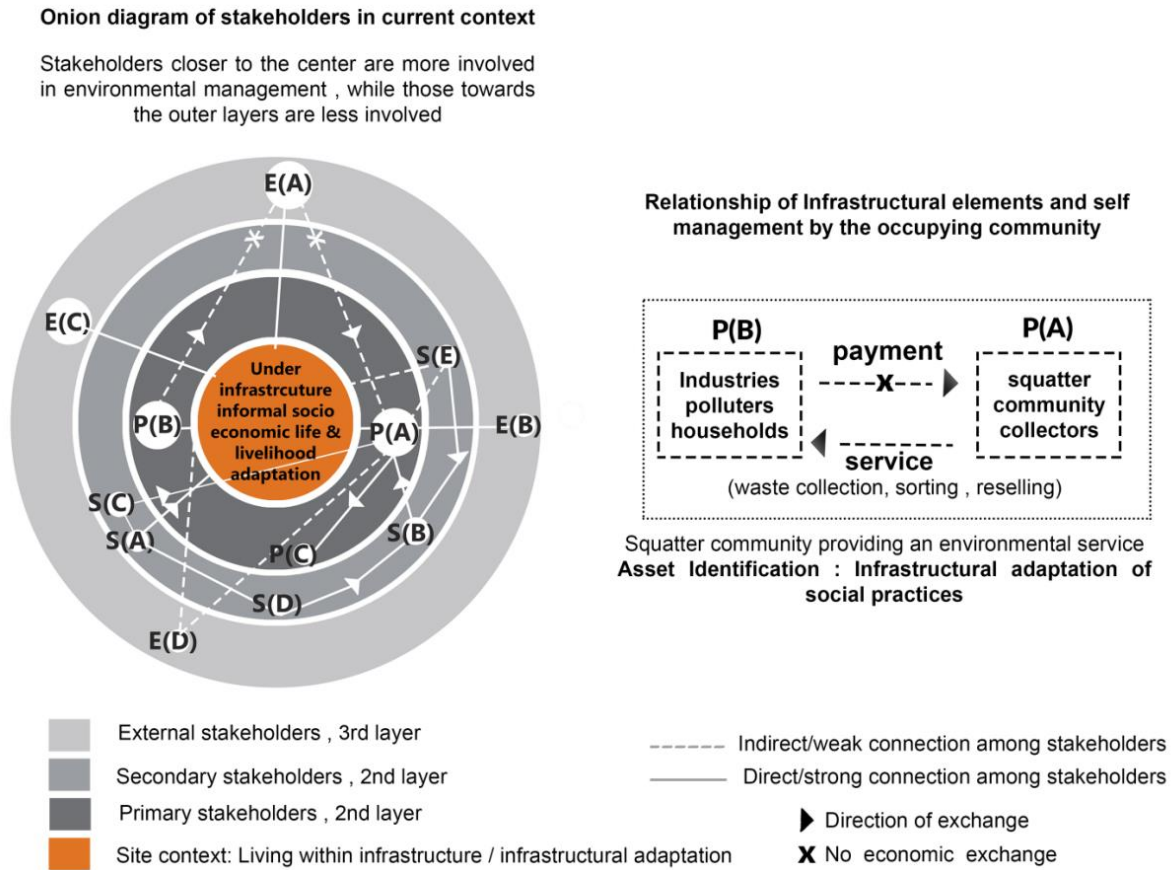


Figure 16: The left side of this figure shows the relative positions and connections of stakeholders (as identified in figure 13) in relation to the adaptation of the under-flyover squatter community. The right side of the figure illustrates the relationships between the squatter community and the site forces outlined in Figure 01.

2.2 Infrastructure Theories: Theories on Transport Infrastructure, Socioeconomic Activities and Public Spaces

The literature review for this research has been structured around key insights from the Bangladesh case study and its lessons. The review focuses on the following keywords and groupings of factors related to transportation infrastructure and their residual spaces. This method ensures a comprehensive understanding of the subject by organizing relevant literature based on core themes and factors.

2.2.1 Importance of Social, Economic and Political Influences on Viaduct Spaces Around Transit Stations

(1) Production of Space Around Transit Economy:

Henri Lefebvre in his seminal work "The Production of Space," argues that space is not merely a physical or static entity but a dynamic social construct shaped by human relations and activities. Lefebvre introduces a tripartite model to analyze how space is produced. **Spatial Practice (Perceived Space):** This dimension involves the physical and material aspects of space as influenced by daily routines and practices. **Representations of Space (Conceived Space):** Envisioned by planners, architects, and administrators, this aspect of space reflects the abstract and often idealized visions that guide the construction and organization of spaces. **Representational Space (Lived Space):** Focused on the lived experiences of individuals, this dimension recognizes space as shaped by the symbols, emotions, and meanings attributed to it by those who inhabit and interact with it. Lefebvre's theory posits that **space is a product of social processes that both reflect and influence societal relations.** This interplay underscores the political and ideological functions of space, suggesting that it serves not only as a site of social reproduction but also as a tool of control and domination. (Lefebvre, 1992)

The development of transportation infrastructure has a substantial impact on socioeconomic development, urban planning, and regional growth. Investments in transportation infrastructure are favorably associated to socioeconomic gains, yet uncertainty in technical and socioeconomic assessments frequently undermine decision-makers' confidence (Raicu et al., 2021). In Madrid, the construction of a new metro line has changed business site patterns, stressing the importance of urban accessibility and agglomeration in economic activity. Similarly, balanced high-speed rail stations in Korea's urban centers have shown to be more effective in attracting passengers and economic activity than periphery stops (Kim et al. 2018). The economic aspect is critical in designing national road networks, boosting economic growth, and lowering manufacturing costs (Tzonevska, 2023). Railway stations, which serve as major business centers, attract a variety of businesses, resulting in localized economies of scale (Graaff & Rodenburg, 2007). Transit construction in metropolitan areas boosts employment, property values, and tax revenues, albeit the effects vary by context (Ayer & Hocking, 1986). Anticipated transportation improvements, such as Chicago's elevated transit line, have been found to dramatically enhance residential land values. However, neoliberal urbanization in Chicago has turned public transit into an economic tool, benefiting wealthy residents and visitors while ignoring other regions (Farmer, 2011). The evolution of public transportation economics over the last 50 years has revealed critical insights on optimal capacity provision, pricing, cost recovery, subsidies, and regulation (Hörcher & Tirachini, 2020). Collectively, these studies highlight the diverse effects of transportation infrastructure on socioeconomic growth, underlining the importance of comprehensive planning and policymaking to realize its full potential.

Figure 17, (Limani, 2018) categorizes the relationship between transport infrastructure and economic development into four quadrants. In open dynamic systems, transparent infrastructure investments maximize the positive impact on sustainable economies, while in growing markets, transport supports but is not essential for development. In closed dynamic systems, access is limited; good infrastructure may exist, but a lack of investment leads to instability and inequality. Isolated areas with poor infrastructure face economic decline, as transport alone cannot reverse their negative trajectory. The matrix emphasizes the critical role of infrastructure investment to achieve balanced economic growth.

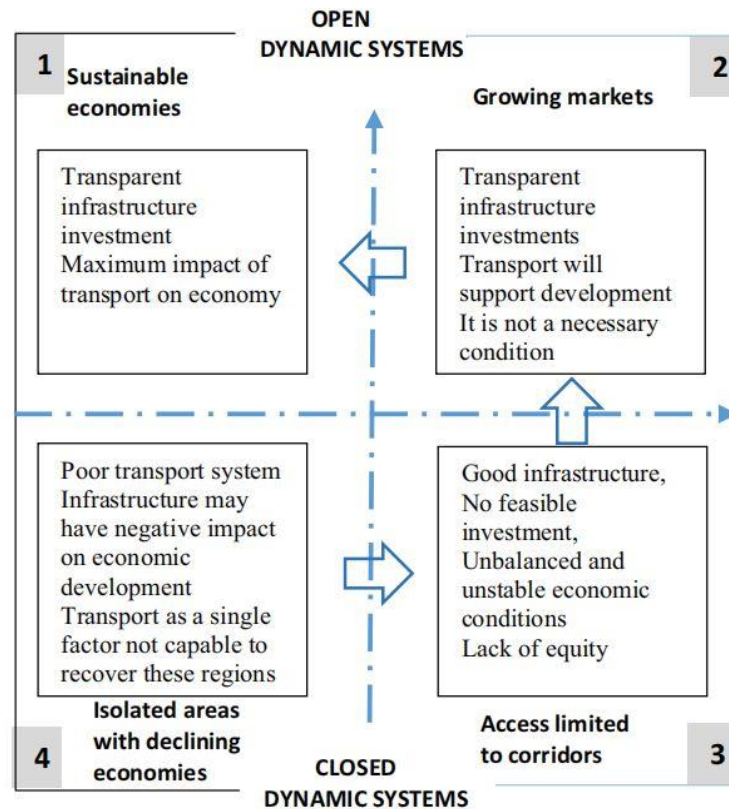


Figure 17: Transport infrastructure impact on regional economy. (Limani, 2018)

Transparency in infrastructure investment is crucial for several reasons, as highlighted in the Limani (2018) article. Firstly, transparent investments facilitate better cost and benefit analyses, which are essential for determining the net present value (NPV) and net future value (NFV) of projects. In the case of Kosovo, the lack of transparency in investment projects has led to a failure in confirming these values, placing the country in a closed dynamic system with significant economic instability (Limani, 2018, p. 4). Additionally, **transparency ensures that strategic planning and management can be more effective**. Transparent investments allow for equitable distribution of resources, ensuring that all regions and communities benefit, not just select areas. This is particularly important in developing countries where infrastructure investments must address both economic and social impacts comprehensively (Limani, 2018, p. 8). Moreover, **transparent investments enhance the credibility and accountability** of policymakers and planners. This is critical for gaining public trust and for the sustainable development of transport systems that can support broader economic growth and development (Limani, 2018, p. 9).

In Colombo, Sri Lanka, Weththasinghe and Wijesundara (2017) identify traffic-influenced urban residual spaces as potential public assets. They call for recovering these places through strategic design and planning, emphasizing the importance of public-private collaborations in overcoming the obstacles of such urban transitions (Weththasinghe & Wijesundara, 2017). Akaydin (2021) addresses the setting of highly developed metropolitan surroundings by focusing on leftover areas in upper-modern cities such as London. The study cites the London Low-Line Railway as an example of how residual areas might be regenerated to promote social interaction and biodiversity, as long as designs take a human-scale approach to accept and adapt to rapid urban changes (Akaydin, 2021).

Yang et al. (2020) present a coupled simulation method for evaluating the integration of transportation infrastructure and public areas. Their strategy seeks to reduce traffic pollution and promote microclimates in metropolitan areas, ultimately improving human comfort and environmental quality. (Yang et al. 2020). Gössling criticizes the distribution of urban transportation space, pointing out a bias toward motorized transport that disadvantages sustainable options such as cycling. Their findings advocate for a rethinking of space distribution to enable more sustainable urban transportation practices (Gössling et al., 2016). Yang Tian (2024) conducts a detailed literature analysis on the use of spaces beneath elevated roadways, an often-overlooked facet of urban design. **The study methodically examines 112 scholarly papers** to see how they address various sorts of residual spaces created by urban infrastructure, notably elevated roadways. Tian's analysis notes a key vacuum in the existing literature: while many research address the physical elements of these spaces, few investigate the synergistic and trade-off potentials of incorporating these regions into larger urban environmental and social frameworks (Yang, 2024). Research on the impact of **transport stations on local economic activity** yields mixed results. Cooper (2014) discovered that, while transit availability does not guarantee economic growth, it is an important determinant in the development of a community. Guteris (2016) stressed the economic advantages of bus stations, such as compensation, rental income, and advertising services. Graaff (2007) emphasized the importance of train stations as hubs for a variety of activities, including shopping and working, which contribute to the growth of local economies. Dorantes (2010) provided more evidence, demonstrating that the construction of a new metro line in Madrid had a favorable impact on the positioning of companies near the stations.

Rodrigue (2024) highlights five important aspects that influence transportation project development: environmental, historical, technological, political, and economic.

Table 04: Factors that influence development projects around infrastructure hub

Factor	Description
Environmental	Local hydrographical and geomorphological characteristics pose technical challenges for construction and maintenance. Regional climate conditions affect operations. Nationally, geographical distance influences infrastructure development, while globally, oceanic contours and choke points shape the structure and orientation of transport systems.
Historical	Settlement patterns influenced by cultural attributes impact local transport development. Regional urban systems shaped by historical accumulation coordinate transport systems. Nationally, colonialism and imperialism have influenced transport developments, and globalization has significantly shaped global transport systems in recent decades.
Technological	Different transportation technologies match various scales of development. Roads are associated with local mobility, railways and air transportation with regional mobility, and long-distance rail and highway networks with national or continental connectivity. Air transportation and telecommunications primarily drive global transport development, despite predominant use at regional and local levels.
Political	Transportation development is regulated through zoning at the local level, taxation and regulations at regional and national levels, and trade agreements at the transnational level.

Factor	Description
	Multilateral trade agreements influence transportation systems by favoring specific transnational connectivity.
Economic	Economic processes shape transportation development to support economic activities and interactions. Advanced economies demand intensive and efficient transportation systems. Local employment and distribution drive transit systems and freight distribution, while regional competition between transportation modes determines modal preferences and usage levels. At the global level, competition between major economic actors, driven by comparative advantages, influences major freight flows and the supporting transport systems.

Beyond the industry itself, transportation has positive socioeconomic effects since it creates jobs and local purchases that have direct, indirect, and induced effects. Maintaining the advantages of transportation networks requires efficient logistics and infrastructure management. These factors are also critical in fostering economic prospects through increased competitiveness, land value enhancement, scale and scope of production, and geographic specialization. Transportation networks impact many different economic activities and the results of regional development, making them essential to economic growth and development overall (Rodrigue & Notteboom, 2024).

(2) Geopolitical Role of Infrastructure:

In the realm of **global infrastructure development**, the interplay between geopolitical interests and economic imperatives is a crucial area of study, particularly concerning transportation infrastructure in the Global South. Melecký (2018) presents transport policies as potent tools for poverty alleviation in the Global South, emphasizing their role in breaking the cycle of intergenerational poverty. This aligns with Davtyan's (2014) exploration of infrastructure's pivotal role in the geopolitical and economic dynamics of regions like the South Caucasus, where infrastructure acts as a cornerstone for regional stability and economic growth (Davtyan, 2014). Gilbert (2012) offers a broader perspective by advocating for Asian connectivity through regional infrastructure cooperation, suggesting that such collaborative efforts can foster regional integration and spur economic growth across Asia (Gilbert, 2012). This theme of regional benefits extends to the work of Benevenuto and Caulfield (2019), who argue that effective transport policies are essential for eradicating poverty through enhanced accessibility and economic opportunities, thereby promoting social mobility and reducing poverty in the Global South (Benevenuto & Caulfield, 2019).

In the context of South Asia, Gilbert and Banik (2010) demonstrate how cross-border transport infrastructure development not only benefits the larger economies like India but also offers significant relative gains to smaller nations such as Nepal, Bangladesh, and Sri Lanka. This development is seen as a facilitator of economic welfare and a reducer of intra-regional economic disparities (Gilbert & Banik, 2010). Nicolas (2015) shifts the narrative to the motivations behind China's robust infrastructure program in South Asia, positing that these initiatives are more likely to foster multilateral growth and regional economic integration than to disrupt the regional order. This liberal perspective contrasts with the realist view, which perceives such geopolitical strategies as potentially hegemonic (Nicolas, 2015). Transport, energy, and water management infrastructures play a key role in shaping international relations in the South Caucasus, influencing relations between Armenia,

Georgia, and Azerbaijan and neighboring states (Davtyan & Khachikyan, 2023). Lastly, Revoltella et al. (2016) highlight the critical role of well-developed transport infrastructure in linking local businesses with global markets, especially during economic recoveries. Their findings suggest that improved transport networks are indispensable for fostering regional economic growth and enhancing the global competitiveness of local businesses (Revoltella et al., 2016).

Collectively, these studies provide a comprehensive understanding of the various impacts of transportation infrastructure on geopolitical dynamics, economic development, and poverty reduction, underscoring the necessity of integrating infrastructure policy with broader economic and social policies to achieve sustainable development. **Therefore, the type of land use adopted for a specific infra-residual space is often a political decision both in global south and north context.** Together, these studies propose various views of how transportation infrastructure can shape public spaces. They argue for a proactive approach to urban design that embraces the complex interplay between physical space, social dynamics, and environmental considerations, **aiming to transform residual spaces into vibrant, functional, and inclusive urban areas.** These insights are crucial for policymakers and urban planners seeking to enhance the livability and sustainability of rapidly growing urban landscapes.

2.2.2 Role of Stakeholders in Transport Hub Development

The role of stakeholders in the development and operation of transport stations is crucial, as they **determine private investments and public values** (Priemus, 2006). Factors such as transit network design, citizen input, and individual station design also play a significant role in facilitating or precluding potential area development (Srifer, 1995). The selection and suitability of rail transit station design, particularly in terms of public safety, is important for user satisfaction and the success of the national rail network (Akabal, 2017). The involvement of diverse stakeholders in transport planning decisions is essential for finding shared solutions and making the process effective and efficient (Garofalo, 2013).

The paper by Lunardon, Vladimirova, and Boucsein (2023) highlights the potential of European railway stations to improve urban transportation, optimize city resources, and enhance citizens' daily lives by transforming stations into mobility hubs. To achieve this, it is crucial to investigate the role of stations as public spaces, upgrade their energy infrastructure, and implement circular resource management. The study emphasizes the need for cooperation among stakeholders, adaptable urban policies, and the urban planner's role as a change agent. It calls for data-driven research and experimental approaches to develop energy-efficient and sustainable models for stations. The ongoing research, involving projects in Milan, Toulouse, and Madrid, will test new services and gather community feedback to create scalable models for other cities, underscoring the necessity of collective stakeholder effort for successful transformation. (Lunardon et al., 2023)



Figure 17: Example of successful stakeholder integration in community development through transit infrastructure residual land-use at Project Deyalkotha, Dhaka (left image) and KAMC, Yokohama (right image) [Image source: Srijon and KAMC website]

Project Deyalkotha, situated at the Tejgaon-Nabisco Flyover in Bangladesh, and the Yokohama Koganecho Art Bazaar have both demonstrated successful integration of social activities, economic generation, and the use of residual spaces for community public spaces and social transformations (figure 17). These projects effectively involve policymakers, local communities, architects, planners, artists, and local management bodies. Both initiatives are facilitated by local non-profit organizations, which act as connectors among the various stakeholders involved in area management.

The two images highlight how NGO management can be successfully used to support community development in different contexts. In Dhaka's Project Deyalkotha (left of figure 17), a vibrant community space has been created under a flyover, where locals—particularly women and children—gather for cultural and educational activities. The space feels grassroots-driven, with a focus on local identity and needs. Meanwhile, in Yokohama's KAMC (right), the area under railway arches has been transformed into a more formal public space, designed for social gatherings and community events through the active participation of NPO kogane cho management center . While both projects make excellent use of leftover infrastructure, Dhaka's is more informal and community-led, whereas Yokohama's reflects a more organized, urban approach both aided by Local NPO efforts.

Table 05: Summary on the Role and types of stakeholders based on the above studied theories & projects

Stakeholder	Role in Transport Station Development	Contribution to Socio-Economic Development
Urban Planners	Act as change agents to integrate stations into urban planning and transform them into mobility hubs.	Promote sustainable urban mobility, enhance public spaces, and improve citizens' daily life.
Policy Makers	Adapt urban policies and regulations to support station transformation and sustainable development.	Facilitate effective governance, align public and private sector efforts, and enable innovation.
Private Sector (Businesses)	Provide local and global services to meet residents' demands and promote effective travel.	Create economic opportunities, stimulate local economies, and enhance service provision.
Energy Experts	Upgrade and optimize the stations' energy infrastructure through experiments and data-driven strategies.	Address urban energy challenges, improve energy efficiency, and support sustainable growth.
Logistics and Material Management Experts	Test novel models for material and logistics management to enhance resource circularity.	Promote sustainable urban logistics, reduce waste, and support environmental goals.
Local Communities and Users	Participate in placemaking activities, provide feedback, and engage in community involvement.	Enhance social value, foster community engagement, and ensure the station meets local needs.
Researchers and Academics	Conduct experiments and studies to generate new knowledge and industry achievements.	Provide evidence-based insights, evaluate impacts, and develop scalable models for station transformation.
Urban Mobility organizations (local/National)	Lead projects and initiatives to test new services and intermodal developments at railway stations.	Drive innovation, support urban mobility solutions, and facilitate the sharing of best practices.

The table summarizes the critical roles played by different stakeholders in the transformation of railway stations and their contributions to socio-economic development. Urban planners, policy makers, and the private sector work together to integrate stations into urban planning, adapt regulations, and provide essential services. Energy experts and logistics professionals focus on optimizing infrastructure and resource management, addressing environmental challenges. Local communities and users participate actively, ensuring that the stations meet their needs and foster community engagement. Researchers and academics support these efforts through studies and experiments, while organizations like local or regional Urban Mobility cell, lead and coordinate projects to innovate and improve urban mobility and sustainability. These combined efforts contribute to sustainable urban development, economic growth, and enhanced quality of life for citizens.

2.2.3 Urban Governance and Commons Management

Urban open space management is increasingly influenced by varying governance arrangements, resulting in various approaches that can enhance sustainable long-term development of urban open spaces. (Jansson et al., 2018) Key factors influencing the governance of landscape management in urban open space development include internal municipal strategies, regulations, power dynamics, and co-governance arrangements, which collectively shape governance structures and decision-making processes (Jansson, 2018)

The studies by Min (2008) and Levent (2015) both highlight the dynamic nature of urban spaces, with Min focusing on the patterns of change in site use and Levent discussing the need for **real estate valuation in urban transformation projects**. Kleszcz (2018) and Becker (2011) both emphasize the potential for innovative approaches to urban space, with Kleszcz discussing the emergence of new forms of housing that combine urban features with food production, and Becker advocating for the transformation of existing structures into sustainable environments. Real estate valuation studies are crucial for urban transformation projects, as they help determine property contribution values and optimize land use for sustainable urban development. (Levent et al., 2015)

Critical perspectives on the "City as Commons" suggest that while the concept offers a framework for rethinking urban governance, it may not be sufficient to overcome existing political and economic challenges, indicating a need for more radical and inclusive approaches. (Zielke et al., 2021). The concept of urban commons and commoning is explored in various contexts, with a focus on the challenges and potential of these practices. Zielke (2021) critically evaluates the City as Commons approach, highlighting its limitations in disintegrating urban neighborhoods. Palmer (2016) presents urban commoning as a counteraction to neoliberal urbanism, emphasizing its potential to transform the urban landscape. Kalb (2017) further complicates the discussion by highlighting the potential for exclusivity and hierarchy within urban commons, cautioning against assumptions of their inherently progressive nature. These studies collectively underscore the complex and various nature of urban commons and commoning, and the need for further research and critical reflection in this area on how urban public spaces should be governed for infra-residual spaces. These studies collectively present the importance of understanding and adapting to the changing nature of urban spaces, and the potential for creative and sustainable solutions in urban design and development.

2.3 Theories on Infrastructural Management Systems

Management of infrastructure should not be confused with management of infra-residual spaces. In many contexts, these two different systems are not identified characteristically. In this instance, author tries to look into transit infrastructure management theories and infrastructure residual space management separately.

In exploring the dynamics of **urban spaces created by transportation infrastructure**, several scholars have contributed theories and findings that present the transformational potential of residual spaces. These areas, often underutilized or overlooked, emerge around infrastructures such as pedestrian bridges, railways, and highways. Their management and adaptation carry significant implications for urban planning and community engagement. Putri and Ellisa (2020) delve into the **"terrain vague"** concept, illustrating how residual spaces beneath pedestrian bridges in Jakarta

become arenas for informal and unexpected social events. This transformation imbues these spaces with a sense of freedom and utility, fostering vibrant community interactions that enhance urban life (Putri & Ellisa, 2020). Sheller (2023) expands the discourse to consider public transport systems as dynamic arenas of socio-political interaction. Labeling these spaces as both mobile public spheres and atmospheric publics, Sheller argues that they are not just physical locales but contested realms where micro-political struggles unfold, influencing the broader urban public sphere (Sheller, 2023). In other literatures similar concepts are mentioned from a more architectural perspective as “Junk space” by Rem Koolhaas.

2.3.1 Transport Infrastructure Management Theories

Theories and practices in transportation infrastructure management encompass strategies for optimizing the **planning, funding, delivery, and maintenance of transportation systems**. Key concepts include a comprehensive, cooperative, and performance-driven planning process that engages the public, monitors conditions, forecasts growth, and develops investments to meet future demands (United Nations, 2021). Transportation Systems Management and Operations (**TSMO**) aims to maintain and restore system performance through traffic incident management, integrated corridor management, road weather management, and real-time traveler information (FHWA 2022). Transportation Asset Management (**TAM**) focuses on cost-effective maintenance, upgrading, and operation of assets, emphasizing service planning, life cycle management, and data utilization (U.S. Department of Transportation, Office of the Secretary, 2022). Effective governance structures require clear organizational frameworks, funding mechanisms, and oversight, considering the roles of transportation agencies and their relationship with government and non-government actors. Robust financial planning, including public-private partnerships, is essential for securing funding and ensuring ongoing maintenance and operation. Integrating these theories and practices enhances the performance, safety, and sustainability of transportation systems.

Cristina Purcar's research investigates the evolution of **railway planning theory** from the 19th to the early 20th century, focusing on how early railway construction posed novel regional and urban planning challenges. The study highlights the transition from viewing railways purely as transportation systems to recognizing their broader spatial impacts on urban and regional landscapes. Through analysis of various treatises from Britain, France, Germany, Belgium, and the USA, the research underscores the emergence of interdisciplinary planning approaches that integrated architectural, urban, and regional planning concerns. It also examines how railway stations became central to urban planning and architectural design, influencing urban connectivity and aesthetics. The findings reveal that railways played a pivotal role in the development of urban and regional planning disciplines, emphasizing the need for a balanced approach to railway infrastructure that considers both technical efficiency and broader spatial impacts (Purcar, 2007). The research by Gharaibeh, Chiu, and Gurian (2006) introduces several theories on transportation infrastructure management, primarily focusing on the application of Multi Attribute Utility (**MAU**) theory. This theory provides a structured approach to decision-making in the allocation of funds across various transportation infrastructure assets, such as pavements, bridges, culverts, signs, and intersections. The methodology involves four key steps: measuring the performance of infrastructure assets, establishing the relationship between investment levels and asset performance, calculating the MAU for each funding allocation alternative, and selecting the alternative that maximizes expected utility. The MAU theory allows for a

comprehensive analysis of trade-offs between different asset classes, considering both the technical performance and the decision maker's risk preferences. By applying this theory, the research highlights the importance of a systematic and quantitative approach to infrastructure management, ensuring optimal resource allocation and minimizing the risk of infrastructure failure. The case study in Champaign County, Illinois, demonstrates the practical application of these concepts, revealing that decision makers often prioritize safety-critical assets and exhibit varying degrees of risk aversion based on the asset class being managed (Gharaibeh, Chiu, & Gurian, 2006).

Based on the theories discussed in **Hasselgren's research**, the management of transportation infrastructure is influenced by both neoclassical and institutional economic paradigms. The neoclassical theory emphasizes optimization and efficiency through formal mathematical models, often justifying government intervention to correct market failures and improve resource allocation. Key concepts include **natural monopoly theory, where transport infrastructure is seen as a decreasing-cost industry best managed by the public sector to avoid inefficiencies**, and welfare economics, which supports interventions like congestion pricing and Pigovian taxes to achieve optimal resource use. On the other hand, institutional theory focuses on the organizational and governance aspects of infrastructure management, considering transaction costs, property rights, and the broader societal context. This approach highlights the dynamic and evolutionary nature of economic processes, emphasizing the role of organizations, learning, and emergent processes in shaping infrastructure systems. Concepts like transaction cost economics explain the boundaries and efficiency of different organizational models, advocating for a balance between market mechanisms and hierarchical governance. Hasselgren also introduces a coevolutionary development approach, integrating technology, economics, and politics to understand the long-term evolution of transport infrastructure. This perspective shows the interplay between public and private sectors, suggesting that hybrid organizational forms, such as public-private partnerships, can effectively address the complex challenges of infrastructure management by leveraging the strengths of both paradigms (Hasselgren, 2018).

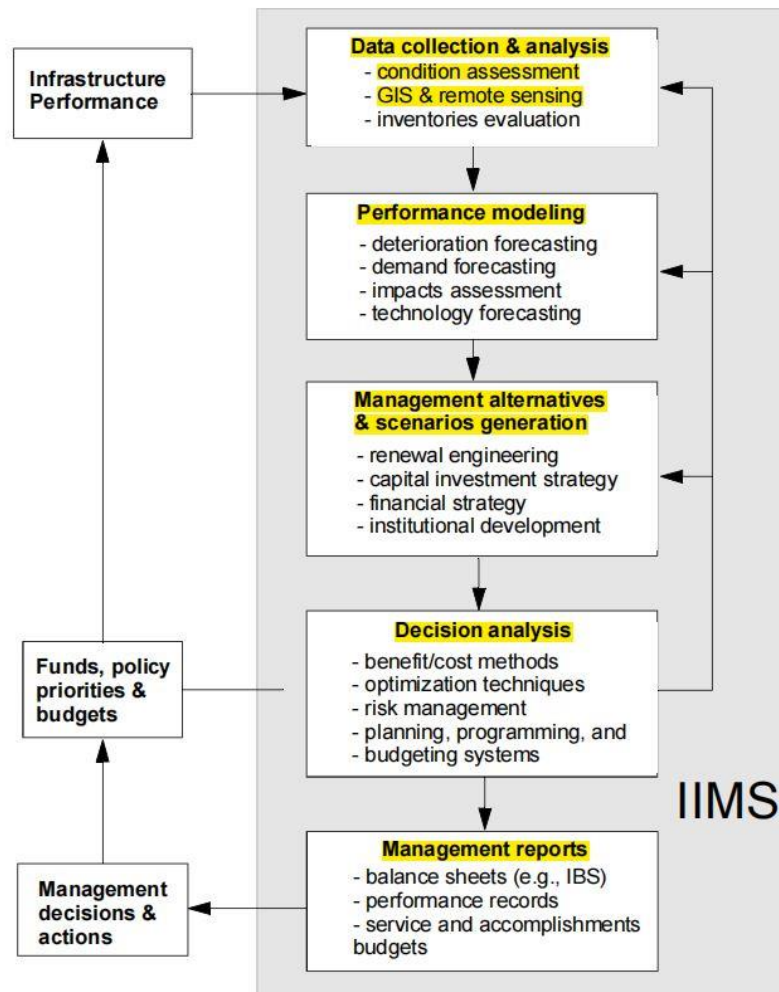


Figure 18: IIMS (=integrated infrastructure management system), Conceptual structure of the IIMS professionals (Lemer,2000)

The Integrated Infrastructure Management System (**IIMS**) in figure 18 is a comprehensive tool designed to enhance urban and regional infrastructure management by providing tailored, accurate information to various stakeholders. It offers **user-specific reporting**, ranging from concise summaries for high-level officials to detailed analyses for project managers, ensuring that each user receives relevant data for decision-making. The system integrates extensive data collection technologies, promoting efficiency, transparency, and accountability. By supporting planning, programming, and budgeting activities, IIMS helps develop realistic infrastructure projects and programs. Its adaptability and flexibility, with both on-demand and recurring reports, ensure the system remains relevant and useful over time. (Lemer & Wright, 1995).

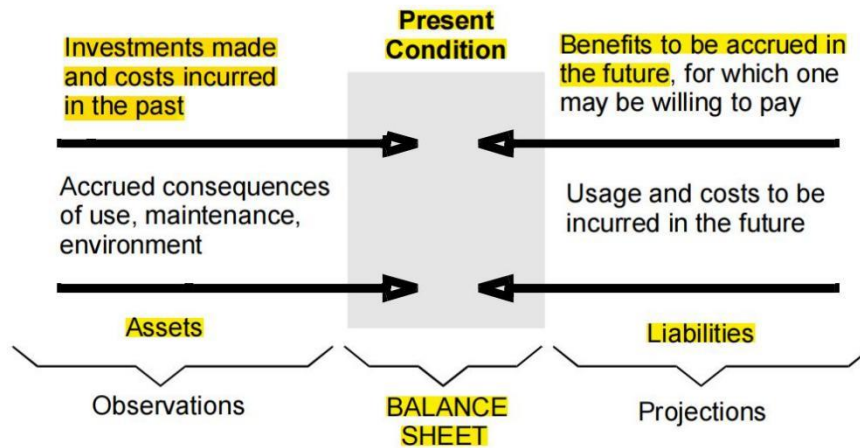


Figure 19: Infrastructure as assets and liabilities (Lemer,2000)

Infrastructure balance sheet (IBS): Figure 19 summarizes four approaches to establishing the financial and economic value of infrastructure assets, each with specific uses, advantages, and limitations. The **"historic expenditures at cost"** approach considers the original procurement and related costs, offering a straightforward comparison with contemporary data but failing to account for changes in prices or asset wear and tear. The **"current replacement cost"** approach estimates the cost to replace an asset at current prices, useful for comparing with other assets and budgeting, though it relies on sometimes conjectural data. The **"equivalent present value in place"** approach adjusts historic costs for inflation and depreciation, providing a more realistic current valuation that incorporates changes in technology and service expectations, useful for policy comparisons and financial analysis. Lastly, the **"productivity-realized value in use"** approach bases value on potential net returns, reflecting the realistic importance of an asset but relying heavily on assumptions and projections. Each method serves different valuation needs, from direct cost comparison to comprehensive financial planning and policy evaluation.(Lemer & Wright, 1995). Figure 19 illustrates a summarized version of the Infrastructure Balance Sheet concept which has been explained here.

The essence of this system is to ensure that infrastructure performs well by providing support and service to various social and economic activities. Effective maintenance and economic generation for maintenance are highlighted as critical for the sustainable lifespan of urban infrastructure, reflecting the importance of continuous evaluation and adjustment of management strategies to meet long-term goals. Theories collectively are as follows-

Table 06: List of infrastructure management theories and infra-residual space theories

Theory	Core Concepts	Source
Railway Planning Theory	Railway construction posed planning challenges; interdisciplinary approaches; railway stations central to urban planning	Purcar (2007)
Multi-Attribute Utility (MAU) Theory	Structured decision-making for fund allocation; performance measurement; risk preferences; optimal resource allocation	Gharaibeh, Chiu, & Gurian (2006)
Neoclassical Economic Theory	Optimization and efficiency; government intervention; natural monopoly theory; welfare economics	Hasselgren (2018)
Institutional Economic Theory	Organizational and governance aspects; transaction costs; property rights; hybrid organizational forms	Hasselgren (2018)
Coevolutionary Development Approach	Integration of technology, economics, and politics; public-private sector interplay; hybrid organizational forms	Hasselgren (2018)
Infrastructure Management System (IIMS)	Comprehensive, computer-based tool; inventory management; condition assessment; predictive modeling; scenario development; user-friendly access	Lemer & Wright (1995)
Integrated Infrastructure Management System (IIMS)	Inventory management; condition assessment; predictive modeling; scenario development; information access; decision support; stakeholder engagement; risk management; performance measurement	Lemer & Wright (1995)
Comprehensive Planning Process	Cooperative, performance-driven planning; public and stakeholder engagement; forecasting growth; developing investments	United Nations (2021)
Transportation Systems Management and Operations (TSMO)	Traffic incident management; integrated corridor management; road weather management; real-time traveler information	FHWA (2022)
Transportation Asset Management (TAM)	Cost-effective maintenance; upgrading and operation of assets; service planning; life cycle management; data utilization	U.S. Department of Transportation, Office of the Secretary (2022)
Effective Governance Structures	Clear organizational frameworks; funding mechanisms; oversight; roles of transportation agencies	U.S. Department of Transportation, Office of the Secretary (2022)
Junk Space (infra-residual space)	Byproduct of built projects	(Rem Koolhaas 2001)
Terrain Vague (infra-residual space)	"terrain vague" is about recognizing and valuing the indeterminate, marginal, and vacant urban spaces as essential parts of the city that offer unique possibilities for social and spatial engagement. This concept challenges the traditional roles of architecture and urban design, proposing a more sensitive and respectful approach to urban interventions.	(de Sola-Morales, 1995)

Based on the collective outputs, it is evident that there has been limited effort to develop theories on the management of infrastructure residual spaces from a multi-stakeholder perspective. Specifically,

there is a lack of focus on how such urban voids should be governed or maintained. This gap highlights the need for more comprehensive research and theoretical frameworks that address the governance and maintenance of these spaces, incorporating the perspectives of multiple stakeholders (tenants and owners inclusive) involved in urban development process. Based on these research next segment will identify the gaps in literature and scope of research methodology next.

2.4 Gap in Literature and Scope of Research:

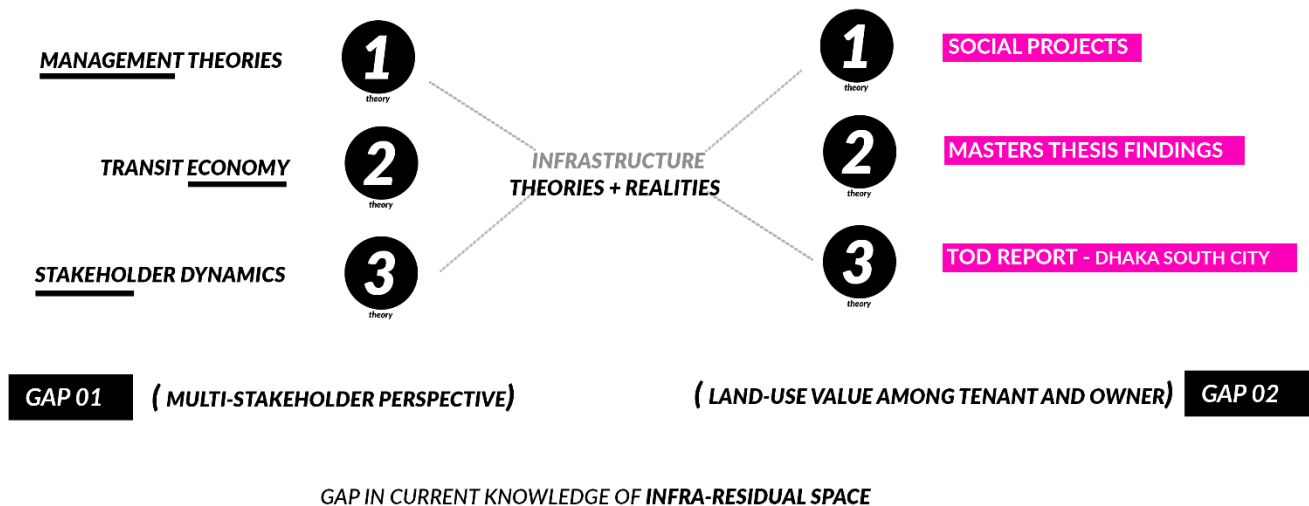


Figure 20: Chapter summary leading to gaps in current knowledge based on the studies thus far

Gap 01: Multi-Stakeholder Perspective on Infra-Residual Space Management

The first research gap highlights the need for a multi-stakeholder perspective on infra-residual space management, as existing studies primarily address the physical infrastructure itself. It is crucial to study the views of policymakers, researchers, architects, and other diverse stakeholders to understand infra-residual space management comprehensively. This approach should encompass diverse strategies, theoretical frameworks, design approaches, and the general public's preferences to facilitate effective utilization and management of these spaces. Existing cases of formal and informal cases should be integrated to understand its worldwide generalization.

Gap 02: Value-Based Comparative Analysis of Infra-Residual Space among tenant and owner

The second research gap emphasizes the need for a value-based analysis of infra-residual space utilization, focusing on both landowners' motivations and tenants' benefits. Current studies largely ignore the economic and social value derived from these spaces, which were not initially part of infrastructure planning. This oversight can lead to confusion and promote unfair rent practices or eviction of tenants. A thorough understanding of the economic and social dynamics relationship is essential for equitable and effective utilization of infra-residual spaces. Figure 20 depicts the gaps , coming from the summary of the literature review and practical projects thus far.

2.4.1 Working Hypothesis to Begin the Investigation:

Infrastructural adaptation is a **global phenomenon**. There are successful cases of **under viaduct space** utilization where the adaptation of infra-residual spaces and land use has prevented the displacement of tenants. Preserving tenants' rights while maintaining owners' interests in managing infra-residual spaces as valuable assets is a delicate balance that requires thorough study. This research begins with the hypothesis that eviction and displacement are primarily management issues within formal infrastructure entities. Lessons from case studies in developed countries can address these challenges effectively, assuming that the evolution of land use, eviction, and adaptation are global phenomena common to both **the Global South and Global North**. By analyzing timelines and tenant-landlord relationships, we can understand how these areas have achieved sustainable coexistence or identify past and current displacement mistakes.

2.4.2 Defining the Research Scope: Definition of Viaducts

Viaducts are elevated structures that serve as a means of crossing obstacles such as water, roads, or valleys (Haripriya 2018). They are characterized by their large physical artifacts and altered atmospheric conditions and play a crucial role in urban infrastructure (Adams 2017). The construction and design of viaducts are influenced by factors such as location, materials, and intended use (Haripriya 2018). Yoshikawa (2000) highlights the importance of innovative design and construction techniques, such as seismic isolation, in enhancing the resilience of viaducts to natural disasters. A viaduct is a specialized type of bridge designed as a series of multiple spans or arches, typically constructed to carry roads or railways across valleys, gorges, or other low-lying areas. Unlike a regular bridge, which is usually a single structure, a viaduct is a continuous structure made up of multiple smaller bridges or spans connected together. The supporting arches or spans of a viaduct are usually of equal length, giving it a uniform appearance. Viaducts are primarily used to traverse depressions in the terrain and are commonly constructed using stone, concrete, or brick. This construction allows for the space underneath the arches to be utilized for various purposes such as parking, commercial activities, or even limited water traffic. In essence, a viaduct maximizes the use of space below while providing a durable and efficient means of transportation over challenging landscapes.

Viaducts can navigate different environmental contexts, including canals, rivers, valleys, highways, and roads (figure 21). Each of these terrains presents unique challenges that viaducts are designed to address. Whether constructed from stone, concrete, or brick arches, viaducts maintain their core characteristics of uniform spans and elevated pathways, making them suitable for diverse applications. In addition to their structural and functional roles, viaducts create unique opportunities for the utilization of space beneath their arches and spans. These infrastructural residual spaces, often referred to as "under viaduct" spaces, can be transformed for various human activities and community uses. For example, these areas can be developed into parking lots, commercial spaces, public parks, recreational areas, or even markets. Such uses not only optimize the space under the viaduct but also contribute to urban revitalization and community engagement. In many cities, the spaces beneath viaducts are creatively repurposed to enhance urban life, providing venues for social interactions, cultural events, and green spaces that improve the overall quality of the urban environment. This makes viaducts a crucial element in modern transport infrastructure and urban matrix of a city.

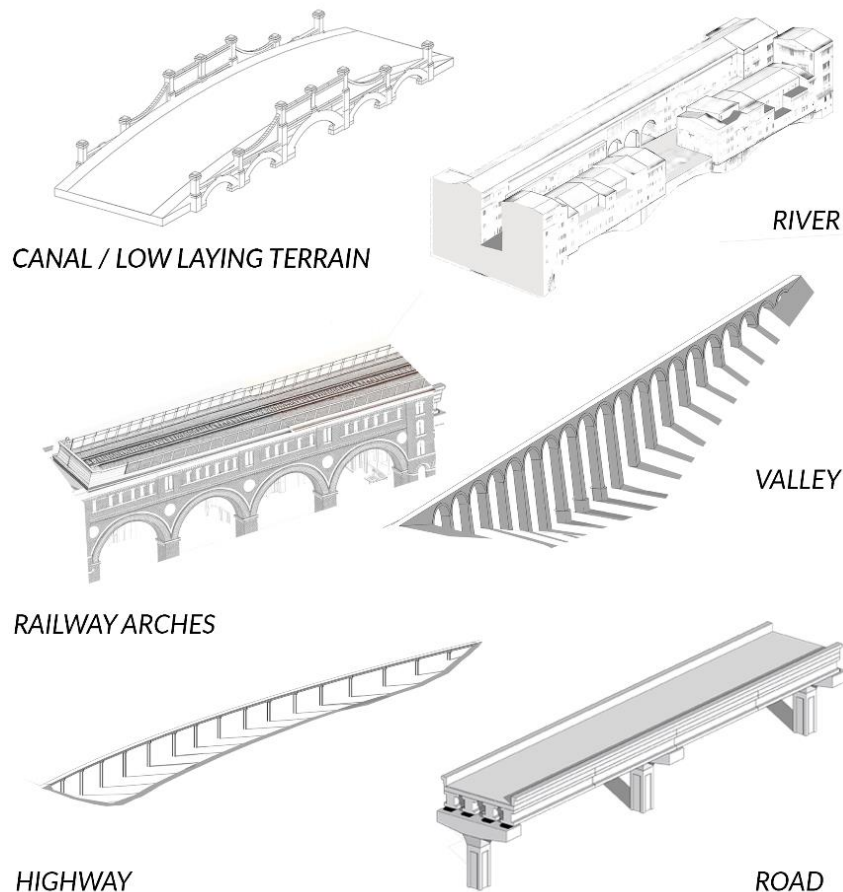


Figure 21: This diagram illustrates the versatility and adaptability of viaducts in various geographical conditions and terrains. A viaduct, characterized by a series of connected spans or arches with roughly equal distance and elevation between its supporting columns, serves as a bridge-like structure designed to traverse low-lying areas such as valleys, rivers, and highways.

(1) Defining Infra-Residual Spaces and Their Socio-Economic Dynamics

Transportation infrastructures, such as viaducts, bridges, and highways, often create residual spaces—voids or by-products of construction that occupy urban areas and influence social practices. These infra-residual spaces, as they can be termed, represent an unintended but integral aspect of urban development, shaping the environment and the community in various ways. Infra-residual spaces are the leftover areas generated by the construction and layout of transportation infrastructures. These spaces typically exist under elevated structures like viaducts, bridges, and highways, and can also be found alongside or beneath railway lines and overpasses. Characterized by their often unintended and unplanned nature, these spaces vary in size, shape, and utility, depending on the specific type of infrastructure and its urban context.

In many cities, these spaces are repurposed for commercial activities, as seen in Dhaka, where local vendors set up stalls under a flyover, creating a bustling marketplace. This adaptation supports the local economy and provides residents with accessible goods and services. Recreational and cultural uses are also prominent, with examples from Zurich showing viaducts transformed into vibrant public

spaces, housing markets, shops, and recreational areas. These adaptations turn otherwise neglected areas into cultural hubs, promoting community interaction and cultural exchange. The use of these spaces for graffiti and skate parks, as depicted in one of the images, reflects their role in supporting youth culture and creative expression.

In some cases, infra-residual spaces serve as makeshift shelters for the homeless or as informal housing. This use is particularly prevalent in densely populated urban areas with significant housing shortages. The images from Osaka show how these spaces are adapted for various urban functions, including residential use, indicating their critical role in providing temporary solutions to urban housing challenges. Additionally, the structural supports of viaducts and bridges can create sheltered areas that are ideal for storage or logistical purposes. These spaces are often utilized by local businesses for warehouses or storage facilities, contributing to the urban logistics network. Some infra-residual spaces are converted into green areas, contributing to urban sustainability efforts. These adaptations include small parks or green belts that help mitigate urban heat islands and provide recreational areas for residents. Infra-residual spaces are a by-product of urban infrastructure development that, when thoughtfully integrated into the urban fabric, can significantly enhance the livability and functionality of a city. These spaces exemplify the dynamic interplay between built environments and social practices. Their successful adaptation often involves creative urban planning and policy support to maximize their potential. Infra-residual spaces are versatile and multifunctional areas that emerge from the construction of transportation infrastructures. They offer a unique opportunity for urban renewal and community engagement, transforming otherwise unused spaces into valuable urban assets. By recognizing and harnessing the potential of these spaces, cities can foster more inclusive, vibrant, and sustainable urban environments.

(2) Viaduct Impact on Micro and Macro Scale

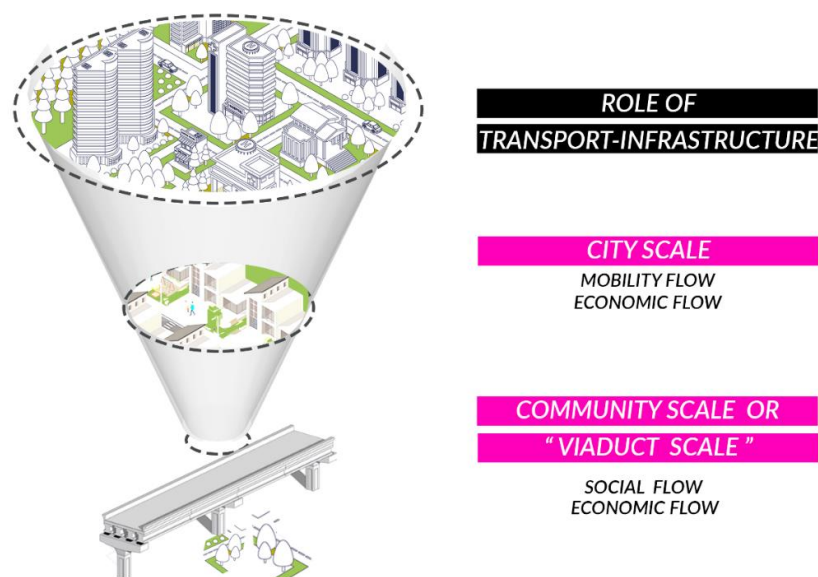


Figure 22: Transport infrastructure impact on city scale and viaduct scale.

Transportation infrastructure exerts a profound influence on urban environments, manifesting at both macro and micro scales. At the city scale, infrastructure such as roads, railways, and viaducts facilitate the flow of mobility and economic activities, acting as the arteries that support the city's overall functionality. This infrastructure enables the efficient movement of people and goods, which is crucial for economic growth, reducing travel time, and enhancing accessibility to different urban zones. The smooth operation of these systems fosters a dynamic economic flow, essential for maintaining the vitality and competitiveness of urban areas. Simultaneously, transportation infrastructure impacts the community or neighborhood scale, particularly through what can be termed the "viaduct scale." At this micro level, infrastructure shapes social interactions and community dynamics as shown in figure 22. Viaducts and other forms of elevated infrastructure create unique spatial conditions underneath and around them, often referred to as infra-residual spaces. These spaces can be adapted for various social activities, markets, recreational areas, and even commercial enterprises, as seen in many urban settings worldwide.

In essence, the impact of transport infrastructure is twofold: it supports the mobility and economic flow at the city scale, ensuring the efficient functioning of urban areas, while also fostering social flow at the community scale by creating adaptable spaces that can serve diverse community needs. A thoughtful planning and design in transportation infrastructure projects to maximize their benefits at both macro and micro levels.

(3) Viaducts Evolution

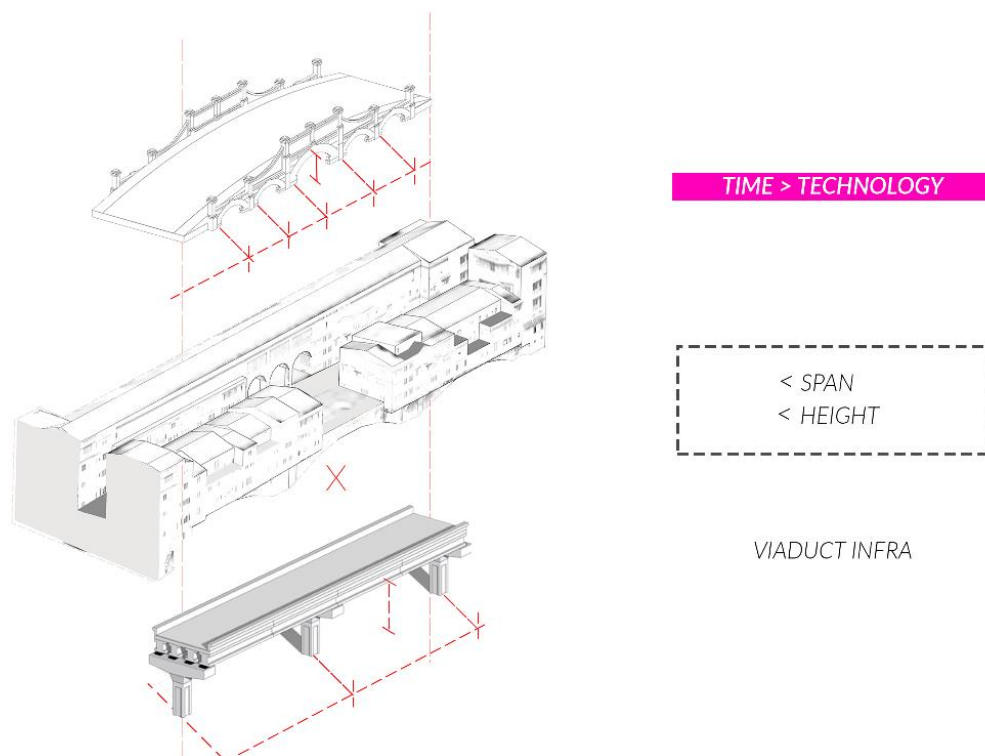


Figure 23: This diagram illustrates the evolution of viaduct construction technology over time, highlighting how advancements in engineering and materials have enabled the development of larger spans and increased heights.

Initially, viaducts were constructed using rudimentary methods, limiting their span and height capabilities. However, as technology progressed, so did the structural and construction techniques, allowing for more ambitious and resilient designs. The image showcases three types of viaduct structures as a conceptual image of evolution. An early form with shorter spans and lower heights, a 16th century bridge or Ponte Vecchio in Florence with moderate improvements, and a modern flyover viaduct with significantly larger spans and heights. This progression demonstrates that contemporary viaducts, thanks to advancements in materials such as high-strength concrete and steel, as well as innovations in construction techniques, can cover greater distances and rise to impressive heights. These modern viaducts not only enhance transportation efficiency but also create expansive infra-residual spaces beneath them. These spaces, due to their increased dimensions, offer greater potential for diverse social activities and community uses.

Figure 23 tries to demonstrate the correlation between technological advancements and the structural evolution of viaducts. As viaducts continue to evolve, they provide increasingly larger infra-residual spaces, which can be creatively adapted to serve various social and economic functions, thereby enhancing the urban environment and contributing to sustainable urban development.

(4) Post Infrastructural Adaptation:

Post-construction infrastructural adaptation refers to adaptive ways of repurposing residual spaces created by transportation infrastructures like viaducts and flyovers. This involves understanding these leftover areas into functional spaces that support new social practices and land uses, thereby enhancing the urban environment's social and economic fabric. This concept forms the core methodology and process of this research, focusing on how these byproduct spaces can accommodate everyday urbanism and contribute to urban revitalization in a sustainable manner.

CHAPTER 3: EXPERT AND COMMON USERS PERSPECTIVE ON INFRASTRUCTURAL ADAPTATION

Chapter 3: Expert and Common Users Perspective on Infrastructural Adaptation" discusses the first gap; stakeholder perspectives through a detailed "Expert Perspective" (3.2) gathered from symposiums & expert talks organized by the author. It also incorporates the "Common User Perspective" (3.3) obtained from a global survey of 115 samples, summarizing key findings. The Lessons (3.4) derived from these discussions highlight crucial factors for the research question, emphasizing stakeholder insights and gaps in understanding among the stakeholders themselves. These lessons lead to the questionnaire formulation for chapter 04 field survey.

3.1 Overview and Methodology:

This chapter aims to address the first gap identified in Chapter 2, focusing on the adaptation of infrastructure from the perspective of multiple stakeholders. The **classification of stakeholders** is divided into two key segments:

1. **Expert Opinions:** This segment gathers insights from individuals directly involved in the contextual policymaking, design, planning, and management of several specific infra-residual projects. These experts include 16 of policymakers, architects, urban planners, and researchers who contribute to the theoretical and practical aspects of infrastructural adaptation.
2. **Common User Opinions:** This segment considers the perspectives of everyday users of transit-oriented developments, transportation infrastructure, and urban spaces. It includes insights from 115 common urban users from 37 countries and various global contexts, capturing a broad spectrum of user experiences and preferences.

3.1.1 Methodology

To understand this multi-stakeholder perspective comprehensively and as part of my doctoral course in Global Environmental Management, I organized two annual symposiums centered around the research topic. The symposiums were designed to facilitate a dialogue among various infrastructure-related professionals and gather their definitions and viewpoints on infrastructural adaptation.

The two symposiums included:

- **16 Talks and Presentations:** Delivered by experts from diverse fields such as urban planning, architecture, environmental management, and public policy. These presentations provided in-depth insights into the challenges and opportunities of managing infra-residual spaces.
- **2 Panel Discussions:** Engaged experts in interactive discussions, allowing them to share their experiences and strategies for effective infra-residual space management. The panel discussions emphasized cross-disciplinary collaboration and the integration of social, economic, and environmental considerations.
- **Global Public Survey:** Conducted with 115 participants from 37 countries, the survey aimed to capture the perceptions and preferences of general users regarding infra-residual spaces. The survey

addressed various aspects of everyday infrastructure usage, including the type of management systems preferred (formal or informal) and the perceived benefits and challenges of these spaces.

These activities were designed to gather diverse insights and foster a comprehensive understanding of infrastructural adaptation across different professional and public viewpoints. The multi-stakeholder engagement facilitated by the symposiums and survey provided a rich data set that informs the subsequent analysis and recommendations in this chapter. By integrating the views of experts and general users, this research aims to suggest sustainable strategies for managing infra-residual spaces, ensuring that they serve as valuable assets to the community while preserving the **rights and interests of all stakeholders involved.**

3.2 Expert Opinion and Discussion Through Organizing Symposiums

Two symposiums on infra-residual spaces highlighted several critical discussions, encompassing governance, architectural design, public perception, and innovative use of underutilized spaces. The seminar effectively engaged multiple stakeholders, including policymakers, architects, researchers, and general users, aiming to bridge the gap between theoretical frameworks and practical implementations as highlighted in figure 24.

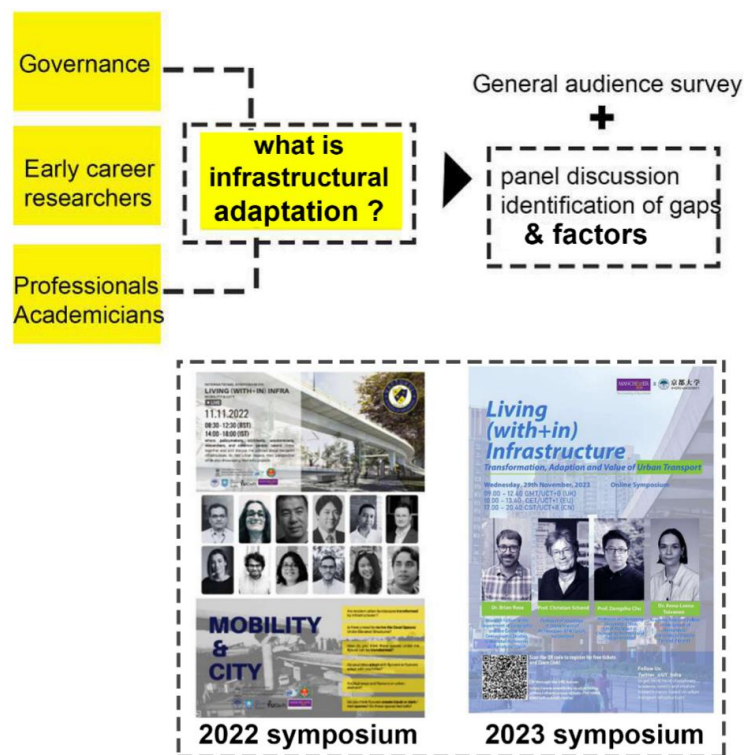


Figure 24: Objective and framework of the organized symposiums by the Author

3.2.1 2022 Symposium: A dialogue between policymakers, architects, academicians, researchers, and common users on the definition of infra-land use adaptation and role.

In the first segment professionals associated with governance were invited to share their perspective on the adaptation of social practices with transportation infrastructure.

Part 01: Governance Segment: Policies, Frameworks and Projects

(1) R K Pandey, Member National Highways Authority of India – India

Dr. R.K. Pandey, Member of the National Highways Authority of India, discussed the significance of India's highway network in connecting cities and supporting the country's rapid economic growth. Emphasizing the crucial role of transport infrastructure, particularly roadways, he noted that road transport accounts for a significant portion of India's GDP and passenger and freight movement. Despite having the world's second-largest road network at 6.3 million kilometers, improvements are needed. The network is categorized into national highways, state highways, and other roads, with national highways being central to carrying over 40% of total traffic. The central government, with assistance from state agencies, manages these highways. **Funding for highway development comes from budgetary resources, a cess on diesel and petrol, and private sector participation through public-private partnerships.** The development approach has evolved from public domain responsibility to involving private sector financing and outsourcing design, supervision, and construction operations.

(2) Shihab Amin Mostafa, National Consultant – Bangladesh

Shihab Amin Mostafa, National Consultant for Bangladesh, discussed how Dhaka's urban fabric has evolved, focusing on its transportation infrastructure. Dhaka, a city with a history spanning over 400 years, began its development along the Buriganga River, relying heavily on water transportation. Over time, the city's growth transitioned from organic development to more structured patterns, especially after gaining independence from Pakistan in the 1970s. The introduction of motor vehicles in the 1980s and the subsequent densification led to significant changes in the city's road network, including the need for flyovers and elevated expressways to manage the increasing traffic demands. Mostafa **highlighted the challenges and limitations in adapting these structures for urban use, emphasizing the importance of collaborative planning among various government agencies.** He also pointed out the necessity of maximizing the use of spaces under flyovers for practical purposes, such as offices and secondary transfer stations for garbage management, while also exploring possibilities for urban beautification and PPP projects. Despite the complexities, efforts are being made to enhance the city's infrastructure to better serve its growing population.

(3) Professional Segment: Infrastructural Reality and Adaptation

Steffen Nijhuis, Professor of Landscape Architecture at Delft University of Technology – Netherlands

Professor Steffan Nijhuis's talk at the symposium focused on the concept of "**flowscales**," emphasizing the importance of viewing infrastructure as a landscape and vice versa. He explained that infrastructures, typically seen as mono-functional and sectoral, can become supportive structures for sustainable urban development, integrating spatial, ecological, and socio-cultural qualities. Nijhuis highlighted the significance of flows—such as people, data, and materials—in urbanism, advocating for an interdisciplinary approach combining urban planning, design, and landscape architecture.

He discussed how infrastructure networks, often creating barriers in cities, **can be reimagined to facilitate various processes and enhance urban landscapes. By considering infrastructures as urban landscape systems, he argued, we can address not only transportation and sanitation needs but also food production, social services, and climate regulation.**

Nijhuis provided historical examples, such as the sewage system in Paris, which unintentionally supported urban agriculture by channeling nutrients from the city to its outskirts. Similarly, Amsterdam's internet hub evolved from a data infrastructure to a catalyst for data-driven industries.

He proposed the concept of **urban landscape infrastructures**, which integrate transportation, green spaces, and water management, to foster social and ecological interactions. Nijhuis emphasized the importance of considering both regional and local scales, and of using these infrastructures to create urban armatures that guide development and enhance the quality of urban environments.

Through examples like the High Line in New York and green infrastructure plans in Frankfurt, he demonstrated how reimagining infrastructure can lead to urban regeneration and socio-cultural benefits. Nijhuis concluded by stressing the need for **interdisciplinary collaboration and the involvement of local communities** in planning processes to create multifunctional, context-driven urban landscapes.

In summary, Nijhuis advocated for a paradigm shift in infrastructure planning, where infrastructures are seen **not only as functional entities** but also as opportunities for creating vibrant, sustainable urban landscapes that support both ecological and social systems.

(4) Mohammad Masud Islam, co-founder and CEO of Bhoomijo Architects

Mohammad Masud Islam, co-founder and CEO of Bhoomijo Architects, discussed the challenges and potential solutions for Dhaka's urban environment. Highlighting Dhaka's rapid growth and dense population, he noted the mixed modes of transport and informal street activities, which often lead to congestion and poor management of road space. While flyovers have been constructed to alleviate traffic, their effectiveness is questionable. Islam emphasized the importance of involving local communities in urban planning and adapting spaces for public use, **as demonstrated by projects like public toilets under flyovers and community-driven street improvements through his own design projects.** He advocated for a shift in perspective towards creating pedestrian-friendly infrastructures and ensuring sustainable urban development through community engagement and innovative solutions.

(5) Dr Deljana Iossifova, Professor of Architecture & Urban Studies, Manchester Urban Institute – UK

Dr. Deljana Iossifova, Professor of Architecture & Urban Studies at Manchester Urban Institute, opened her presentation by acknowledging the organizers and previous speakers. She emphasized her unique perspective as an architect, drawing from diverse fields and focusing on infrastructure and transformation from a complex systems viewpoint. Her recent project, conducted with colleagues at the University of Tokyo, explored infrastructure innovation in China, though its aims were altered due to COVID-19. Iossifova explored the definition and impact of infrastructure, emphasizing its socio-technical and eco-technical dimensions. She argued that infrastructure sustains human life, but its benefits and distribution are influenced by capitalist development. Infrastructure interlinks human

and ecological systems, shaping urban transformations over time. She illustrated this with examples from Shanghai, showing how old and new infrastructures coexist, affecting daily life and social relations. Iossifova advocated for studying infrastructure across multiple temporal scales, considering long-term impacts on human and environmental health. She concluded by calling for **ethical and sustainable interventions in infrastructure** development, highlighting the importance of just and sustainable urban practices.

(6) Nobuharu Suzuki, Urban Designer & Dean Professor, Yokohama City University

Professor Nobuharu Suzuki, presented on the urban art exhibition project under the Keikyu Railway lines of the **Koganecho Art Festival in Yokohama, Japan**. He discussed the transformation of the Kaidan Hiroba Plaza (a stair plaza under a railway lines) , **which was developed by residents and experts through a city-sponsored contest and grant. Originally a brothel area, the site was revitalized into a safe space for children and a cultural hub**. Suzuki highlighted the collaborative efforts between residents, local government, and artists to reclaim and repurpose the area, promoting social capital and community engagement through art events and workshops. He emphasized the importance of continuous community involvement and adaptive reuse of urban spaces to foster a vibrant, connected, and safe environment.

(7) Masashi Sogabe, Architect at Mikangumi & Professor at Kanagawa University, Japan.

Masashi Sogabe, an architect at Mikangumi Architects and a professor at Kanagawa University, Japan, presented on urban art exhibition projects under the Keikyu Railway lines for the Koganecho Art Festival in Yokohama, Japan. Sogabe discussed his work on the Kogane Studio and Hinode Studio, highlighting the collaboration between the local community, the railway company, and city government. The Kogane Studio, a wooden structure, was designed to integrate with the residential area, featuring a wide street-side entrance and a local path-side corridor known as Doma, inspired by traditional Japanese houses. The Hinode Studio, a steel structure, serves as a gallery and shop, designed with a more commercial focus. Sogabe also touched on the Mach-Ecute Kanda Mansabashi project, where he preserved the historic brick structure of a former station while incorporating modern elements. **His work emphasizes the transformation of under-railway spaces into vibrant community hubs that balance historical preservation with contemporary design.**

Researchers Segment: Infrastructure and speculative urbanism

(8) Leon Felipe Tellez Contreras, ESRC Postdoctoral Fellow, University of Sheffield – UK

Leon Felipe Tellez Contreras, an ESRC Postdoctoral Fellow at the University of Sheffield, presented on the evolving role and contested appropriations of a pedestrian bridge in Mexico City, initially constructed for the 1968 Olympics and the 1970 FIFA World Cup. This bridge was envisioned as a symbol of **Mexico's urban modernization** and global positioning. Over the years, it transformed from a functional link between transportation hubs to a bustling commercial space, utilized by vendors to cater to the daily influx of commuters and event attendees. **By 2017, the bridge facilitated around 90,000 daily users**, plus thousands more during events. Vendors, both fixed and temporary, adapted to this flow, creating a vibrant commercial landscape. This dynamic was highlighted by a 2017 negotiation, where vendors and market traders successfully lobbied for a permanent roof over

part of the bridge, symbolizing stability and protection for their livelihoods. This commercial evolution underscores the importance of informal economies in urban infrastructure, particularly in the Global South. Tellez emphasized **the bridge's dual role** in providing economic opportunities and shaping urban cultural practices. He concluded by discussing ongoing efforts to safeguard these informal economies against potential displacement by new mega-projects, stressing the need for inclusive urban planning that acknowledges and integrates subaltern aspirations.

(9) Demetra Kourri, Faculty of Architecture in the University of Manchester

Demetra Kourri, from the Faculty of Architecture at the University of Manchester, presented her PhD research on the controversial large car tunnel in Prague, Czech Republic. The project, which took 16 years to plan and construct, tripled its initial budget and spanned almost two decades, is a remnant of the 1970s ZAKOS transportation plan. Opened in 2015, it was plagued with political disputes and delays. Kourri's research emphasizes the concept of "**unfinishedness**" in infrastructures, drawing from anthropology, geography, and science and technology studies, to highlight how infrastructure projects extend beyond their initial purpose, creating unanticipated and unplanned consequences. Using Barry Allen's definition of technical artifacts, she explains how the Blanka Tunnel facilitated new mobility-related practices and relationships in Prague, despite its controversy. Kourri employed visual tools and keyword mapping software to analyze various articles, reports, and documents, revealing key concerns such as public transport, cycling, pedestrian safety, and environmental impact. A significant focus was on the role of cycling infrastructure, which, despite its late introduction, became a transport priority alongside the tunnel's completion. Through her empirical work, **Kourri explored the challenges of integrating new infrastructure layers into an existing dense urban fabric**, highlighting the technical and legislative adaptations required for the Blanka Tunnel to coexist with other urban elements. She concluded that the concept of unfinishedness in infrastructure projects is crucial for understanding their broader impacts on city development and the complex interplay between rigid and flexible infrastructural layers.

(10) Dr Debapriya Chakrabarti, ESRC Postdoctoral Fellow, The University of Manchester – UK

Dr. Debapriya Chakrabarti, an ESRC Postdoctoral Fellow at The University of Manchester, discussed her research on the intersection of infrastructure and everyday urban life in Kolkata. Born and raised in Kolkata, she studied architecture and planning in India. Her research explores urban transitions and the **social and spatial adaptations in city streets and alleyways**. She highlighted how urban infrastructure coexists with everyday practices, using examples like a shrine on a footpath that forces pedestrians to walk on the street and the daily wholesale flower market under the Haurav Bridge. She also detailed the cultural practice of idol crafting in the neighborhood of Kumar Tuli, which transforms streets into workshops during the Durga Puja festival. This festival, inscribed in UNESCO's Intangible Cultural Heritage List, sees roads blocked to accommodate the distribution of idols. Chakrabarti emphasized the importance of incorporating local contexts into urban policy and regeneration. She illustrated this with a 250-year-old temple situated in the middle of a busy road, necessitating traffic control during major festivals. Finally, she discussed the construction of pavilions for Durga Puja, which often block streets for months, demonstrating the everyday adaptations and negotiations within the city.

(11) Qiwei Peng, Doctoral student, The University of Manchester – UK

Qiwei Peng, a doctoral student from The University of Manchester, presented a talk on the significance and value of pedestrians' spontaneous practices under elevated traffic infrastructure, using the **Niujiuator Flyovers in Chongqing**, China as a case study. He introduced Chongqing, a city with complex geography and over **13,000 elevated infrastructures**. Peng observed how pedestrians used the seemingly deserted spaces under these flyovers for various activities like leisure, tea shops, swimming clubs, and even living temporarily. He noted that these practices often violated official rules but reflected the local culture and lifestyle, shaped by Chongqing's dense population and limited public spaces. Peng emphasized the importance of understanding and incorporating these informal uses into urban planning, suggesting that flyovers should be seen as social infrastructure that respects and accommodates local customs and everyday life. **This perspective can reveal underlying issues such as the lack of public spaces, housing difficulties, and complex land property rights.**

(12) Srijon Barua, Doctoral Candidate, Kyoto University – Japan (authors presentation summary)

Srijon Barua, a doctoral candidate at Kyoto University, presented a project in Dhaka, Bangladesh, involving the Tejgaon Nabisco flyover. Built around 2010, the flyover spans nearly a kilometer and houses a kitchen market, railway crossing, and squatter community. The surrounding area includes an industrial zone, a large kitchen market, and an old railway slum. Barua's project involved designing a community platform on the flyover's terminal wall, which evolved into a multifunctional space. The community adapted to living and working under the flyover, integrating housing and livelihood activities with the infrastructure. The project highlighted the unique socio-economic dynamics and the community's resilience and adaptability.

(13) Panel Discussion & conclusion:

In concluding the session, the emphasis was placed on the role of public surveys in understanding the perceptions and preferences of general users regarding infra-residual spaces. This data is crucial for informing governance and ensuring that the development of these spaces aligns with the needs and desires of the communities they serve. The symposium successfully highlighted the necessity of multi-stakeholder engagement and the potential of infra-residual spaces to contribute significantly to sustainable urban development when managed effectively. Overall, the discussions pointed towards a future where **infra-residual spaces are not merely byproducts of urban infrastructure but integral parts of a city's social, economic, and environmental fabric**. This requires a concerted effort from all stakeholders to envision and implement adaptive strategies that are inclusive, equitable, and sustainable.

3.2.2 2023 Symposium: A comparison between global south and global north infra-management systems and commonalities

In this 2023 edition of the symposium, the author, in collaboration with University of Manchester, explored the evolution of viaduct development in relation to cities and cultural landscapes. Four talks provided specific information on the planning and management of infra-residual spaces, highlighting the consequences of their neglect. The discussions underscored how cities inevitably reach a point where they cannot overlook the importance of these spaces.

(1) Dr. Brian Rosa, Research Fellow at the Department of Geography and the Center for Demographic Studies Universitat Autònoma De Barcelona, Spain

Dr. Brian Rosa, a Research Fellow at the Universitat Autònoma de Barcelona, began his lecture by reflecting on his decade-long work related to urban infrastructure since completing his PhD at the University of Manchester. His research has often focused on the spaces around and beneath Victorian railway viaducts in Manchester, exploring how large-scale infrastructures like highways, railways, and ports create disorderly and poorly defined landscapes at the peripheries of cities. These residual spaces, though seemingly detached from urban fabric, serve essential functions, often reappropriated by various formal and informal uses.

Rosa highlighted the **dual nature of infrastructure**, which facilitates city life but also creates barriers, disproportionately affecting low-income communities. Recent trends in the **Global North** involve dismantling or burying urban highways and transforming these residual spaces into linear public spaces, often under the banner of infrastructural reuse. However, Rosa emphasized the **"green paradox"** where such projects, while promoting public space and sustainable mobility, often lead to gentrification, raising property values and displacing existing residents and businesses. He discussed the concept of "unbundling" or "unfurling" infrastructure networks, referencing the work of Graham and Marvin, which helps sustain urban fragmentation. Rosa's PhD work referred to these spaces as "residual spaces of urban infrastructure," highlighting their unintended or under-considered roles in sustaining socio-technical systems. Rosa drew from his experience in New Orleans post-Hurricane Katrina, where he observed how infrastructures isolated low-income neighborhoods, exacerbating the disaster's impact. He also discussed the redevelopment of Manchester's Pomona Docks, showing how informal uses of these residual spaces often predate formal redevelopment plans. Rosa's analysis of the High Line in New York City illustrated how such infrastructural reuse projects can drive displacement and gentrification despite their public space benefits. **He emphasized the need for anti-displacement measures and policies to protect long-term residents.**

Finally, Rosa's work with the ReConnect project under the EU's URBACT program involved designing interventions to promote active mobility and reconnect historically segregated urban areas. He stressed the importance of incorporating social equity into infrastructural transformations to avoid displacing marginalized communities.

In conclusion, Rosa called for planners and designers to seriously consider the social impacts of infrastructure projects, balancing the benefits of **urban greening and permeability with the risk of gentrification and displacement**. He advocated for proactive measures to ensure that infrastructure improvements benefit all residents, particularly those historically marginalized.

(2) Dr. Anna Leena Toivanen, Research fellow at the school of Humanities, University of eastern Finland

Dr. Anna Leena Toivanen, a research fellow at the School of Humanities, University of Eastern Finland, delivered a lecture on the representation of the **Paris Metro in Francophone** African literature. She explored the concept of literary mobility studies, which examines how literary texts produce meanings of mobility and contribute to understanding social and spatial aspects of mobile practices. Toivanen emphasized that literature not only reflects but also shapes reality, providing insights into experiences and contradictions of mobility. She argued that public transport, as a mobile public space, can generate both racial hostility and multicultural intimacies. Toivanen analyzed various texts by African authors, illustrating how the Paris Metro symbolizes modernity and alienation for African newcomers. For instance, the protagonist in Aké Loba's "Le Trim Noir" is amazed by the Metro's technological advancement, while Ousmane Sembène's "Le Mandat" depicts racial hostility encountered in the Metro. Jean-Roger Essomba's "Le Paradis du Nord" conveys the disillusionment of African migrants with the metropolis, and Camara Laye's "Le Regard du Roi" portrays the initial fear and eventual conviviality in Metro encounters. The lecture highlighted the Metro as a site of transformation into modern mobile subjects, despite inherent contradictions due to colonial legacies. Toivanen also discussed the role of learning to navigate the Metro in understanding and belonging to the city, as seen in works by Michèle Rakotoson and Gisèle Pineau. Additionally, she examined the experiences of clandestine migrants in public transport, noting the anxiety and exclusion faced, as depicted in Wilfried N'Sondé's "Le Silence des Esprits." "In conclusion, Toivanen demonstrated that **Francophone African literature** offers valuable insights into the embodied experiences of urban infrastructure, particularly from the perspective of marginalized groups. The Paris Metro serves as **a powerful symbol of both exclusion and potential belonging**, revealing the complex dynamics of mobility in the postcolonial metropolis.

(3) Prof Dongzu Chu, Architect & Professor at Chongqing Architectural design Institute, China

Professor Dongzu Chu, an architect and professor at Chongqing Architectural Design Institute, presented on the transformation of Chongqing city through urban railway transit. Located in southwest China, Chongqing is characterized by its mountainous terrain and intersecting rivers, making it the largest mountainous city globally. Chu highlighted the city's unique topography and rapid urban development over the past 20 years, showcasing how transit systems shape the city's infrastructure and public spaces. He discussed Chongqing's layered urban structure, where skyscrapers coexist with historical monuments like the Javan monument, symbolizing the city's evolution. The urban transit systems, including railways and roads, have significantly altered the city's landscape, **creating new public spaces and challenges**. Chu detailed various phases of Chongqing's development, emphasizing the integration of infrastructure with urban construction since 1997. The city's transit systems, including urban railway lines and bridges, have created both negative spaces and opportunities for urban renewal. He presented examples of designing and reusing these spaces to create **friendly public areas, parks, and connections between communities and waterfronts**. Chu also shared a project by his team, focusing on the Chongqing East Railway Station, one of the largest high-speed railway stations in China. Their design aimed to connect the station with the city center, creating a vibrant public space with a blend of traditional and modern elements. This project exemplified how urban design can integrate infrastructure with community needs, enhancing

connectivity and urban life. In conclusion, Professor Chu's presentation presented the dynamic interplay between Chongqing's topography, urban transit, and public space design. He highlighted the city's unique identity shaped by its mountainous terrain and innovative infrastructure projects, emphasizing the **importance of creating sustainable and inclusive urban environments in infra-residual spaces**.

(4) Prof. Christian Schmid, Professor of Sociology at ETH Zurich

Professor Christian Schmid, Professor of Sociology at ETH Zurich, discussed the rediscovery of urban spaces and the incorporation of differences in Zurich. **He began by referencing Henri Lefebvre's theory of the production of space**, which includes material space, conceptual space, and lived space. Schmid emphasized the importance of understanding infrastructure beyond its utilitarian purpose, exploring how it can be repurposed for diverse urban functions. He also highlighted the commodification of space, reflecting on the tension between urban growth and the homogenization of urban differences. **Using Zurich as a case study**, Schmid traced its development from the industrial era to its current status as a global city. He explained how the city's transformation was influenced by the establishment of railway infrastructure and the liberal revolution of 1848. The railway station and viaduct played pivotal roles in Zurich's industrial expansion, which later faced deindustrialization in the 1970s, leading to a shift towards a financial hub. The 1980s saw significant urban movements in Zurich, driven by young people demanding more open and culturally vibrant urban spaces. These movements led to a redefinition of Zurich's urban life, fostering creativity and alternative culture. However, the subsequent incorporation and normalization of these urban differences by the city government led to gentrification and a loss of the initial vibrancy. Schmid illustrated this process through the example of the Zurich viaduct, which initially served industrial purposes but later became a contested site for urban renewal. The project aimed to transform the viaduct into a vibrant public space while preserving affordable housing and cultural venues. However, it ultimately contributed to gentrification, with luxury developments and rising rents displacing the original community. In conclusion, Schmid emphasized the need to **critically examine the processes of urban development and the commodification of space**, advocating for the preservation of urban differences and the creation of inclusive and diverse urban environments. **He warned against the superficial appearance of urban vibrancy that masks underlying homogenization and exclusion, urging planners and policymakers to prioritize genuine urban diversity and integration.**

(5) Panel Discussion Summary and Answer to Key Questions are shown in table 07:

Table 07 : Panel discussion key questions and their answers

Question	Speaker	Response
Can cities afford to make infrastructural residual spaces public?	Brian	In North America, such projects need economic/political support from real estate, unlike in Europe where public spaces have been transformed (e.g., Barcelona) but may lead to green gentrification.

	Christian	The state's role is crucial. Initiatives can devolve into gentrification projects. Examples include the High Line in New York and the privatization of under arch spaces in London. The state's coordination is essential in these transformations.
Are non-places in infrastructure and standardization of management across contexts possible?	Anna	Skeptical about the notion of non-place. Airports and metros have significant meaning for different travelers, and metro stations can have unique local identities.
	Brian	Non-places lack use value only to those with no investment in them. Spaces under infrastructure often informally appropriated for various uses. Standardizing management should consider socio-economic policies, like rent control.
What activities and land value considerations are relevant for infrastructural spaces?	Brian	Under arch spaces were historically undervalued and appropriated informally. These spaces become problematic when revalorized.
	Christian	It's essential to secure cheap, non-commodified spaces for public use, possibly through state ownership or cooperatives. Appropriation should avoid commodification to ensure inclusivity.
What inspired Anna's research on the Paris Metro and African literature?	Anna	The project focuses on Afro-European mobility, portraying physical mobility in literature. The Paris Metro recurs in texts highlighting different meanings.
Does Anna's research involve narrative mapping methods?	Anna	Less interested in literal mapping, more in the experience of movement in the city. Mapping theories are useful but should be clearly defined.
What are some design considerations for land use in Zurich for future ?	Christian	The future of Zurich viaducts is stable. Transformation becomes difficult once commodified.
How does Brian convince stakeholders for ideas in the ReConnect project?	Brian	Critiques were invited to provoke thought. The metropolitan area of Barcelona was open to implementing more impact assessments and addressing displacement concerns.
What final comments did the participants have?	Brian	Encouraged continuation of discussions, suggesting special issues in journals or edited volumes.

Table 08: Summary and lessons from both symposiums organized by the Author

Table 3.1.2: Organized discussions and Outcomes									
Objective	Discussion	Name	Segment	Stakeholder Type	Topic	Context Type	Key Factors	Lessons	
Symposium 01, 2022	A dialogue between policymakers, architects, academicians, researchers, and common users on infra-landuse adaptation	Talk 01	Governance Segment	Member National Highways Authority of India	Policies, Frameworks and Projects	India Global South	Governments responsibility is to plan transport-infra. Mixed financing system, Public - private finance	1. Infra-residual spaces become activated when there are social, commercial, or political values surrounding an infrastructure.	
		Talk 02		Shihab Amin Mostafa		National Consultant, Dhaka South City Corporation, Dhaka	Bangladesh Global South		Under infra spaces are being allocated to the ward councilors (in ideal situations)
		Talk 03		Leon Felipe Tellez Contreras		ESRC Postdoctoral Fellow,University of Sheffield	Mexico, Global South		Political ebbs and flows and urban neoliberalism controls what happens on infra-spaces
		Talk 04	Demetra Kourri	Researchers Segment	Assistant Professor,The University of Manchester	Infrastructure and speculative urbanism	Cyprus,Czech Republic Global North	In blanka 2 , many sub infrastructures had to adapt with the main transport infra to work together	2. Socio-cultural histories play an important role in determining the land use of an infra-residual space.
		Talk 05	Dr Debapriya Chakrabarti		ESRC Postdoctoral Fellow, The University of Manchester		India Global South	Infrastructure and culture integrates each other in the adaptation	
		Talk 06	Qiwei Peng		Doctoral student, University Of Manchester		China,Global South	How can traffic infrastructure can become social infrastructure ?	
		Talk 07	Srijon Barua	Doctoral student, GSGES, Kyoto University	Bangladesh Global South	Is infrastructural adaptation a worldwide phenomenon ?	3. Definitions of infra-adaptations vary from stakeholder to stakeholder. Policies that enable a transparent multi-stakeholder design approach can bring sustainable infra-residual spatial management.		
		Talk 08	Masud shammo	Chief Architect of Bhumijo Consultant	Bangladesh Global South	Can art and culture come together in humanizing infrastructural adaptation?			
		Talk 09	Dr Deljana Iossifova	Professor of Architecture & Urban Studies, Manchester Urban Institute	UK, Global North	Socio economic institutions are part of infrastructural adaptation			
		Talk 10	Masashi Sogabe	Professional Segment	Architect at Mkangumi	Infrastructural Reality and Adaptation	Japan, Global North	Architectural design guidelines can make infra-adaptations more acceptable to common users	4. Infra-adaptations are a worldwide phenomenon.
		Talk 11	Nobuharu Suzuki		Urban Designer and Professor at Yokohama City University		Japan, Global North	A creative city and a public space creates infra adaptation more sustainable	
		Talk 12	Steffen Nijhuis		Government Consultant & Professor at Landscape Architecture at Delft University of Technology – Netherlands		Netherlands, Global North	Every landscape is a complex flowscape of infra-human-natural factors for its own co-existence	
Questions and future directions	Panel Discussion	What are the gaps in understanding infrastructural adaptation of social practises?	What factors are common in various stakeholders combined understanding ?	What can unify the gaps in adaptation and create sustainable co-existence ?	How can we develop adaptations ?				

Symposium 02, 2023	A comparison between global south and global north infra-management systems and commonalities	Talk 13	Dr. Brian Rosa	Global North and Infra-landuse adaptation	Research Fellow at the Department of Geography and the Center for Demographic Studiesm Universitat Autònoma De Barcelona, Spain	Infrastructure and speculative urbanism	UK, Spain, Global North	Public space rights of infra-residual spaces under privatized corporations can reduce infront of the commercial needs	5. Public-private partnerships are key ways to finance infrastructural projects, and their commercial benefits are taken into consideration when determining land use.
		Talk 14	Prof. Christian Schmid	Global North and Infra-landuse adaptation	Professor of Sociology at ETH Zurich	Infrastructural Reality and Adaptation	Switzerland, Global North	A brand image of the city can become the dictator in the public infra spatial adaptations	
		Talk 15	Dr. Anna Leena Tolvanen	Global North & South and Infra-landuse adaptation	Research fellow at the school of Humanities, University of eastern Finland	Infrastructure and speculative urbanism	Paris Metro , Africa, Global North and South	Literature can be source of infrastructural adaptation parameters	6. The image of an infrastructural adaptation depends on the aspirations of a specific urban setup and what it aims to become.
		Talk 16	Prof Dongzu Chu	Global South and Infra-landuse adaptation	Architect & Professor at Chongjing Architectural design Institute, China	Infrastructural Reality and Adaptation	China , Global South	Architectural solutions for Chongjing under flyover development incorporates formal ownership-landuse adaptation	
		Questions and future directions	Panel Discussion	Can cities afford to give infra-residual spaces as rights to public common spaces ? or does the neoliberal socio economic values governs supreme ?	Can there be Parameters of comparison in the management of transportation infrastructure irrespective of context?	Are all lands created equal ? Infra-residual spaces vs privatized land economy or we just turn the blind eye ?	Are there similarities or dissimilarities in global south and north context in terms of infra-residual spaces. Can there be some form of generalization of standards in policies ?		

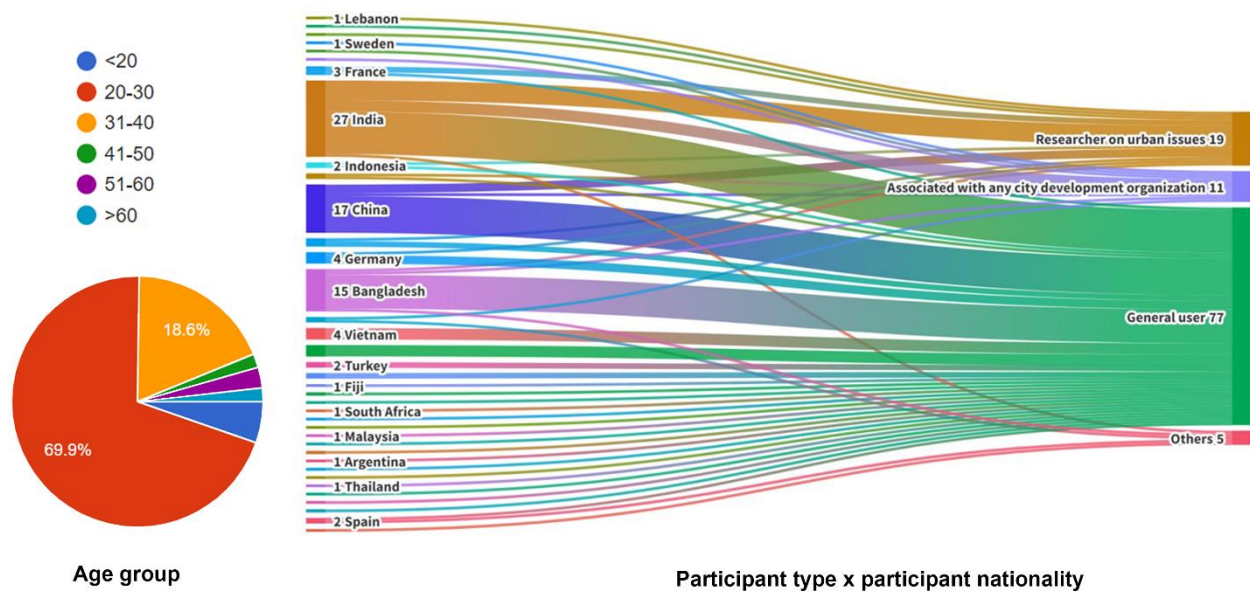
A summarized version of the core findings from both symposiums are presented in the table 08.

3.3 Common User Perspective on Infrastructure and Land Use Adaptation:

The survey form titled "Living Within Infra: Mobility and City" is designed to survey the general idea of traffic infrastructure-based land use and spatial character from the perspective of urban inhabitants. It focuses on how infrastructures like flyovers, elevated railways, walkways, and over bridges, initially built to facilitate urban mobility, modify the city landscape and create new spaces. The survey aims to gather insights on the post-construction phase, exploring how under-infrastructure spaces and elements continue to evolve and adapt to new usages beyond their intended functions.

3.3.1 Demographic Information of the 115 Participants:

The following are the nationalities, age group and current city of accommodations according to the survey outcomes. Figure 25 illustrates the age group, participant nationality with respect to the type of user of infrastructure.



Continent	Countries	Number of Countries	Total Countries
Asia	China, Indonesia, India, Bangladesh, Vietnam, Hong Kong, Malaysia, Japan, Azerbaijan, Georgia, Thailand, Bhutan, Taiwan, Russia	14	37
Oceania	Fiji	1	
Europe	United Kingdom, France, Spain, Sweden, Greece, Netherlands, Italy, Ukraine, Germany, Turkey	10	
Middle East	Iran, Lebanon	2	
South America	Brazil, Argentina	2	
Africa	South Africa, Egypt, Rwanda, Algeria, Somalia	5	
North America	Mexico, Honduras, United States	3	

Figure 25: Demographic information of the 115 participants

(1) Objective: The survey, titled "Living With_in Infra: Mobility and City," aims to gather urban inhabitants' perceptions of traffic infrastructure-based land use and spatial characteristics. It focuses on how transportation infrastructures, such as flyovers and elevated railways, impact urban landscapes and everyday life.

(2) Data Collected: The survey collected opinions on various land uses for infrastructure spaces, including public plazas, markets, shelters, and public welfare activities. Respondents were also asked about their preferences for formal and informal management of these spaces.

(3) Sample Size and Parameters: The survey received 110-115 responses varying each questions from participants of diverse professions, nationalities, and ages. Key parameters included frequency of space usage, profession, age, nationality, and management preferences.

3.3.2 Key Findings:

The survey gathered responses from people over 37 countries across six continents, including Asia, Oceania, Europe, the Middle East, South America, Africa, and North America. Participants were from diverse backgrounds and countries such as China, Indonesia, India, Bangladesh, Vietnam, Hong Kong, Malaysia, Japan, Azerbaijan, Georgia, Thailand, Bhutan, Taiwan, Russia, Fiji, the United Kingdom, France, Spain, Sweden, Greece, the Netherlands, Italy, Ukraine, Germany, Turkey, Iran, Lebanon, Brazil, Argentina, South Africa, Egypt, Rwanda, Algeria, Somalia, Mexico, Honduras, and the United States. The survey aimed to explore the coexistence of infrastructure with everyday urban life and the common functions of spaces created by infrastructure. Figure 26 revealed that **92.9% of respondents** believe that infrastructure coexists with everyday urban life (Figure 26). The primary functions identified in these spaces include open public places without specific use (66.1%), parking places (52.7%), economic activities (35.7%), public services (31.3%), leisure places (26.8%), and living spaces (17.9%). Other functions, each with minimal responses, included temporary events, skateparks, shelters for the homeless, and spaces for nomadic settlements and vendors.

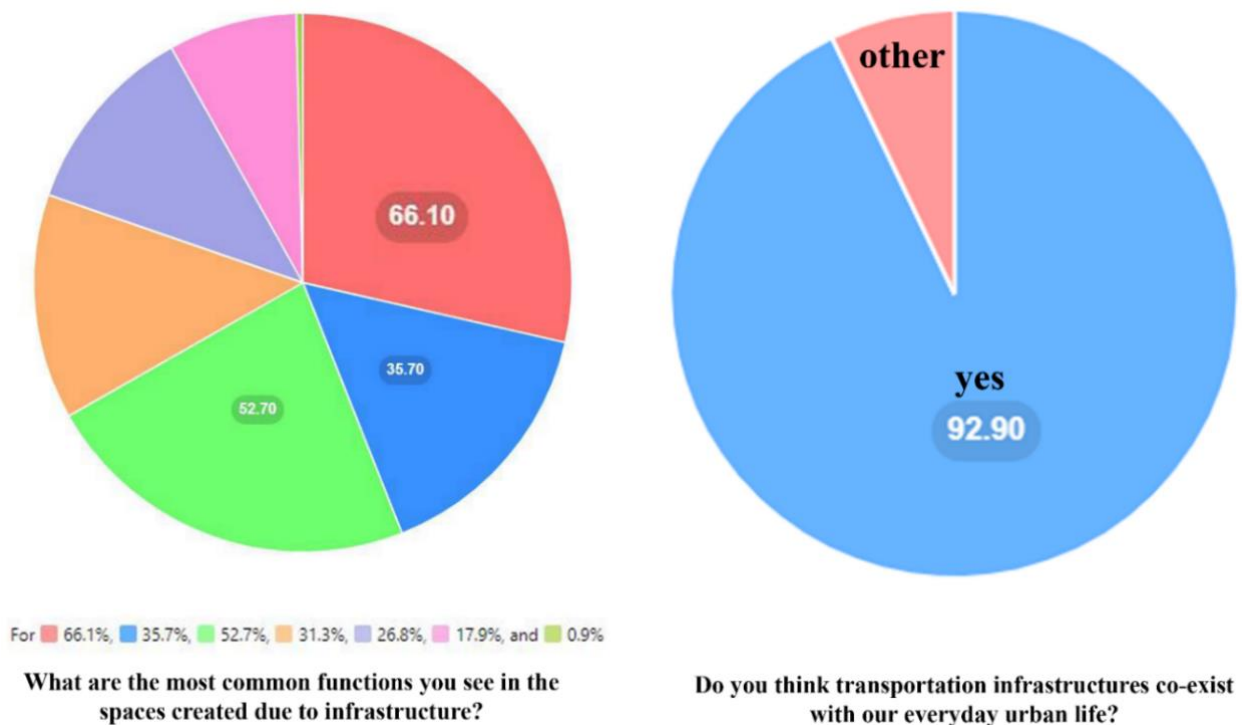


Figure 26: Left Pie chart : Open public place without specific use: 66.1%, Economic Activities: 35.7%, Parking place: 52.7%, Public service: 31.3%, Leisure place: 26.8% , Living spaces: 17.9%, Other categories: Each approximately 0.9% ; Right : infra co-exist with our everyday urban life yes : 92.90 %

Figure 27 bellow provides a comprehensive overview of public support for various uses of infra-residual spaces under both informal and formal management systems. Under informal management, there is considerable support for public plazas (95.5%) and public welfare activities (77.5%), while parking zones (56.8%) and markets (67.6%) receive moderate support. Notably, shelters are largely unsupported, with 75.7% of respondents against their use in infra-residual spaces. In contrast, under formal management, there is overwhelming support for all proposed uses: markets (92.8%), art zones (91%), public activities (92.8%), iconic landmarks (93.7%), and public plazas (97.2%).

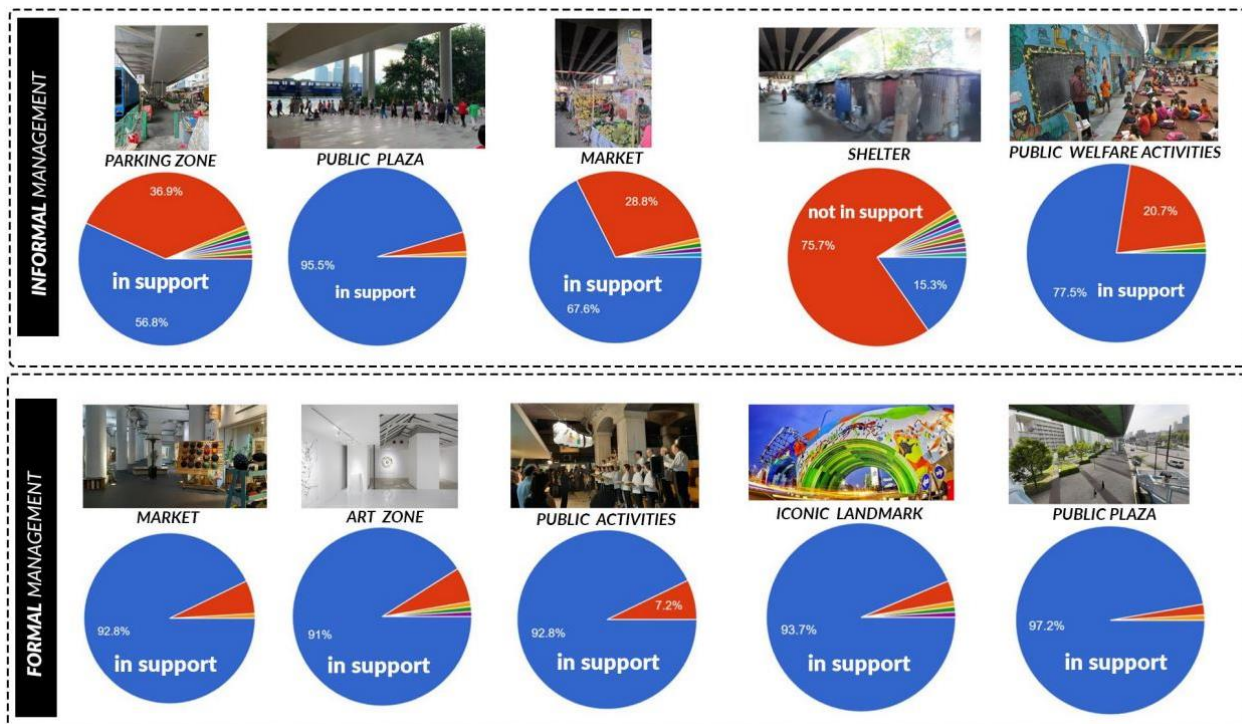


Figure 27: Question 13-15 asks land use preference and the figure provides answer to various categories for 115 participants

This data highlights a strong **public preference for formal management systems**, which receive very high levels of support across all categories. Interestingly, while informal management shows significant support for public plazas and welfare activities, it lacks substantial backing for parking zones, markets, and **particularly shelters**. This indicates that formal management is perceived as more effective and desirable for the utilization of infra-residual spaces.

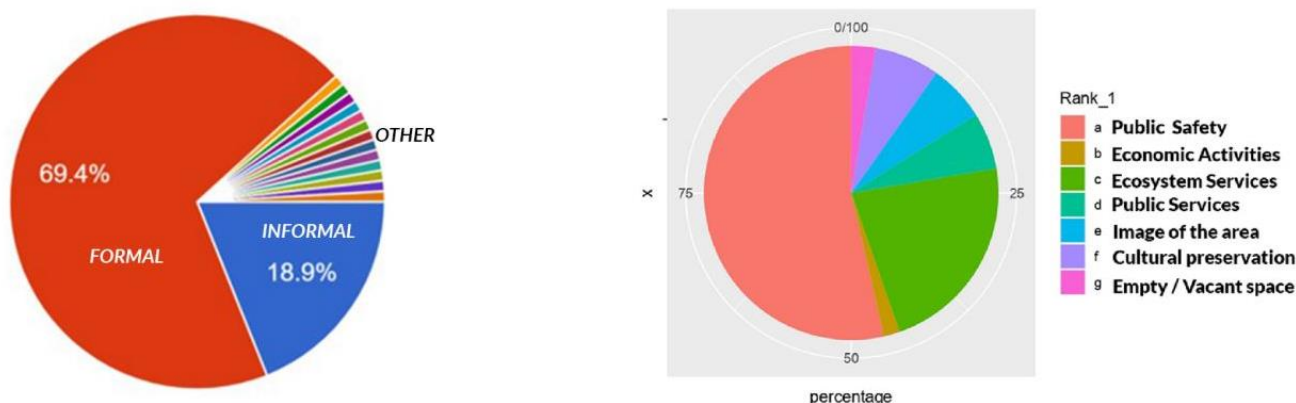


Figure 28: Left: Management System Preference for Infra-Residual Spaces, Right: Land Use design Preference ranking for Infra-Residual Spaces

The left pie chart in figure 28 illustrates the preferred management system for infra-residual spaces based on survey responses. A significant majority, **69.4%, of respondents** prefer a formal management system for these spaces. In contrast, 18.9% of participants favor an informal management approach. The remaining percentage, labeled as "Other," represents various alternative preferences that are not specified in detail. The right pie chart depicts the preferred land use for infra-residual spaces among survey participants. The most favored land use is for "Public Safety," followed by "Economic Activities," "Ecosystem Services," and "Public Services." Other preferences include enhancing the "Image of the Area," "Cultural Preservation," and utilizing the space as "Empty/Vacant Space." Each category is color-coded for easy identification, showing a diverse range of preferences among respondents.

3.4: Lessons From the Symposium and Public Survey

From organizing symposiums and conducting a global public survey, several key lessons were identified that highlight the complexities and necessities of infra-residual space management. These lessons have been crucial in shaping the understanding and approach towards managing these spaces effectively.

These lessons from Table 09 led to the identification of key factors (Figure 29) crucial for infra-residual space management: Land Use Management, Infrastructure Functionality, Accessibility of User Groups, Tenant/User Profitability, and Infrastructural Liability. A questionnaire will be designed based on these lessons and factors to further explore and refine management strategies for infra-residual spaces in the field survey. These are the basis for the interview questions during the internship period and case studies.

Table 09: lessons learned from the chapter 03 activities and key factors of infra-residual adaptation

Management Activities	Lessons learned	Research Question	Key factors
Symposium 2022 + Symposium 2023	1. Infra-residual spaces become activated when there are social, commercial, or political values surrounding an infrastructure. 2. Socio-cultural histories play an important role in determining the land use of an infra-residual space. 3. Definitions of infra-adaptations vary from stakeholder to stakeholder. Policies that enable a transparent multi-stakeholder design approach can bring sustainable infra-residual spatial management. 4. Infra-adaptations are a worldwide phenomenon. 5. Public-private partnerships are key ways to finance infrastructural projects, and their commercial benefits are taken into consideration when determining land use. 6. The image of an infrastructural adaptation depends on the aspirations of a specific urban setup and what it aims to become.	How social practise adapt with physical infrastructure? Q.A: Factors of adaptation ? Q.B: Relationship among the factors?	Landuse Management Functionality of Infrastructure Accessibility of user group Tenant/User Profitability Infrastructural Liability
Global Public Suvery	7. Common users prefer publicly accessible and safe spaces for infra-residual placemaking. 8. Formal management and planning of infra-residual spaces are more preferred by common users over informal setups.		

KEY - FACTORS
INFRA-LANDUSE ADAPTATION



Figure 29: Determined factors for infra-land use adaptation

The following questions on table 10 are prepared as part of the field survey interview and documentation.

Table 10: Potential Questions for field survey interviewee

Key Factors	Potential Questions for Field Survey
Land Use Management	1. What is the historical evolution of land use in this infra-residual space? 2. How is the public-private ratio managed? 3. What is the dominant land use currently? 4. What roles do local stakeholders play in the management? 5. Is there a specified rent system in place?
Functionality of Infrastructure	1. What is the primary function of this infrastructure? 2. Are there secondary functions? If so, what are they? 3. How does the character of the space change from day to night? 4. Are there any adaptive functions incorporated? 5. How does the infrastructure contribute at city and viaduct scales?
Accessibility of User Group	1. Is the space accessible to the public or is it private access? 2. Are there special conditions for accessing the space? 3. How inclusive is the land use? 4. Is there a balance between exclusivity and inclusivity? 5. How formal or informal is the access to this space?
Tenant/User Profitability	1. What types of tenants use this space? 2. What are the profit margins from the current land use? 3. How does the cost-to-profit ratio compare to similar spaces? 4. Are there subtenant arrangements? 5. How satisfied are the tenants with the current setup?
Infrastructural Liability	1. What are the maintenance requirements for this infra-residual space? 2. How usable is the space for its intended purpose? 3. What is the performance of the infrastructure? 4. How does the infrastructure contribute at both city and viaduct scales? 5. What is the possibility of space being abandoned?

Lessons of Chapter 03

This chapter aims to fulfill following **three objectives** -

01. This chapter summarizes two symposiums and public survey outcomes conducted by the author and leads to chapter 04.
02. Leading the investigation and research question towards **5 important factors** to consider while studying infra-residual spatial management and projects in varying urban contexts.
03. **Determination of field survey questions** to better understand gaps found in chapter 02. This chapter provides a list of questions that leads to case studies, projects to understand evolution and land-use management process.

CHAPTER 4: FIELD SURVEY, CASE STUDIES AND PROJECTS ON INFRASTRUCTURAL ADAPTATION

"Chapter 4: Field Survey" The field survey chapter starts with identifying the second gap and examines the "Evolution of Infra-Adaptation" (4.2) through case studies and timeline narratives of seven infra-land use instances. The "Lessons from Comparison" (4.3) compare factors across these cases, integrating values and visualizing them through radar charts. This analysis identifies key concepts such as management systems, rent structures, and the public-private space dynamic, drawing significant "Lessons" (4.4) for practical application.

4.1 Overview and Methodology

This chapter addresses the second gap identified in Chapter 2, providing a holistic overview of the tenant-landlord relationship from the perspective of land value adjustment examples in infra-residual spaces. The chapter presents seven different cases, narrated through the growth of six cities in relation to the evolution of viaducts within a timeline framework. It delves into the infra-land use timeline, current stakeholder dynamics, and land use displacement within the contexts of Bangladesh, Japan, Europe, and the United Kingdom.

4.1.1 Rationale for Case Study Selection:

As part of the Global Environmental Management Doctoral course, this chapter addresses the second gap identified in Chapter 02 by examining tenant-landlord relationships, land value adjustments, and the dynamics of infra-residual spaces. To achieve a comprehensive understanding, I have selected seven diverse case studies representing various cities and historical timelines:

1. Ponte Vecchio, Florence (1345, ~700 years)
2. Bermondsey Beer Mile, London (1836, ~200 years)
3. Viaduc Des Arts, Paris (1850, ~160, 90, 40 years)
4. Markthalle IM Viaduct, Zurich (1894, ~120 years)
5. Koganecho, Yokohama (1901, ~120 years)
6. Nabisco Flyover, Dhaka (2010, less than 20 years)
7. Hanif Flyover, Dhaka (2013, less than 20 years)

These cases were chosen to study the evolution, land use management, ownership patterns, stakeholder dynamics, and problems that arise in infra-residual spaces over time. By analyzing both historical and contemporary examples from different global contexts, this research aims to derive valuable lessons that can inform the development of better policies for cities that are at the early stages of urbanization, where infra-residual spaces are emerging phenomena.

The selected cases span several centuries and diverse urban settings, providing a rich variety of data on how infra-residual spaces have been adapted and utilized. For instance, Ponte Vecchio in Florence demonstrates a long history of adaptive reuse, while newer projects like the Hanif & Nabisco Flyover in Dhaka highlight the challenges and opportunities in nascent urban environments. The lessons from these case studies can help shape policies and strategies to ensure that infra-residual spaces contribute positively to urban development, benefiting both tenants and landlords while addressing contemporary urban challenges.

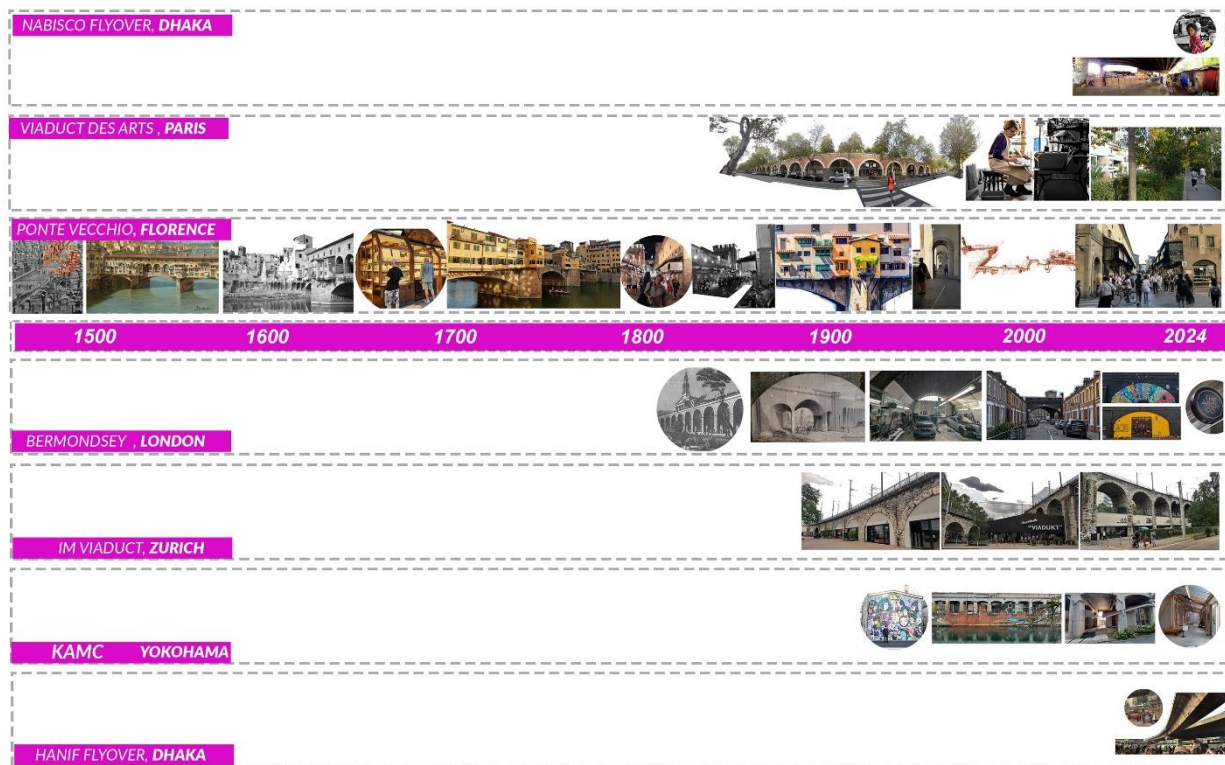


Figure 30: Case studies and projects in a comparative timeline

4.1.2 Methodology

The methodology for this chapter involves the preparation and analysis of **three types of datasets for each cases**:

A) Infrastructural Residual Space Land Use Evolution Through Timeline: This dataset traces the historical and contemporary changes in the land use of infra-residual spaces, highlighting the factors driving these changes and their impacts on urban development.

B) Examples of Eviction and Their Preventive Measures in Infra-Residual Spaces: This dataset compiles instances of eviction from infra-residual spaces and examines the measures taken to prevent such occurrences. It provides insights into the socio-economic dynamics and legal frameworks that influence tenant security.

C) Stakeholder Dynamics Involved in the Land Use Transformation of Residual Spaces: This dataset explores the interactions and power relations among various stakeholders, including tenants, landowners, policymakers, and community organizations. It aims to understand how these dynamics shape the transformation and utilization of infra-residual spaces.

For each case study, the author conducted field surveys and documentation, which included:

-Interviewing Relevant Resource Persons: Engaging with individuals directly associated with the case studies to gather detailed insights into the processes and outcomes of land use transformations.

-Participatory Action Research with Communities: Involving community members in the research process to ensure their perspectives and experiences are accurately represented and to foster collaborative solutions. Particularly chapter 01 and chapter 02 has focused on the Bangladesh cases specifically.

-Consultation Work with Organizations: Collaborating with organizations on design and concept reports to integrate practical expertise and ensure the feasibility of proposed interventions.

The seven cases are presented with their respective datasets, offering a comprehensive analysis of the tenant-landlord relationship and land value adjustments in infra-residual spaces across different geographical contexts (Figure31). This approach aims to uncover patterns and best practices that can inform sustainable and equitable management of infra-residual spaces, ultimately benefiting both tenants and landowners while enhancing urban resilience and inclusivity.

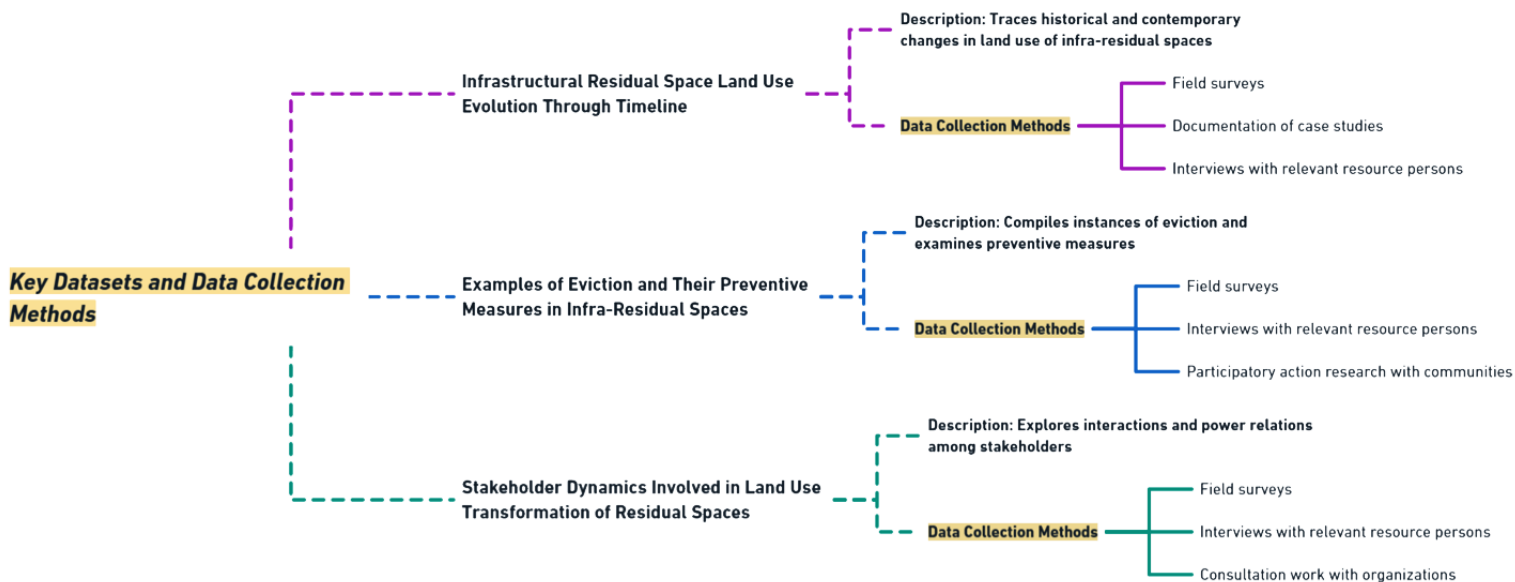


Figure 31: Diagram of dataset category and data collection process

4.1.3 List of Interviewee

24 Interviewees were interviewed for the data collection during the field survey both in the UK and The European cases. Following table identifies the key information related to interviewees

Table11: Interviewee affiliation, scope and associated case study

Interviewee	Case study specific discussion				
Name & affiliation	CASES: Bermondsy Beer Mile + London Arches				Interview Scope
	Historic,socio economic evolution of landuse	User experience	Management pattern	Advisory role	
Andrew Harris, UCL	√			√	General Communication & thesis
Richard Sobey , CASA		√	√		London arches , participatory action research
Mark Tewdwr-Jones UCL	√	√	√	√	General supervisory , london arches
Peter Bishop- UCL	√			√	London arches , overall view
Derec Hickman - GOTA	√	√	√		Tenant landlord relationship
Phill Curry- ArchCO	√	√	√		Arch Landlord & management
Deivi Norberg- QMU	√		√		Researcher on political economy
Adam Dennett- CASA	√			√	General supervisory , london arches
Ian Banfield - Lassco	√	√	√		Arch Management
Nick - Mash paddle brewery		√	√		Tenant

Interviewee	Case study specific discussion				
Name & affiliation	CASES: European Viaducts				Interview Scope
	Historic,socio economic evolution of landuse	User experience	Management pattern	Advisory role	
Christian Schmidt , ETHZ	√	√	√	√	IM Viaduct , Zurich
Dr. Philippe Koch , ZHAW	√	√	√		West Zurich and IM Viaduct
Sonja Flurry , ETHZ		√	√		IM viaduct , tenant
Baki Ullah Khan, Shop owner	√	√			IM viaduct, tenant
Nitin Bhatla , ETHZ	√		√	√	Zurich and socio economic transformations
Hubert Klumpner, ETHZ	√			√	Zurch and General Supervisory
Jonathan Sosa, Professor Uni Brussels	√	√	√		Ponte Vecchio, Florence, Italy
Marco Spinelli , Architect	√	√	√		Ponte Vecchio, Florence, Italy
Razvan , Local		√	√		Ponte Vecchio, Florence, Italy
Bicchi + Razvan , Local	√	√	√		Ponte Vecchio, Florence, Italy
Maria GravariBarbass, Paris Sorborne	√		√	√	Viaduct des arts, paris, france
Brian Rosa, Mari Curie Fellow	√		√		UK , spanish viaducts

4.2 Evolution of Infrastructural Adaptation in Case Studies and Projects

4.2.1 Ponte Vecchio, Florence (1345, ~700 years)

The Ponte Vecchio was reconstructed in 1345 after a flood. Initially used by butchers and grocers, the bridge became home to goldsmiths and jewelers in 1593 under a mandate from Ferdinand I. This change was to enhance the bridge's environment for both tourists and the Medici family. Today, it remains a prestigious tourist spot, with shops rented by high-end jewelry brands. The owners often

live elsewhere, while the city benefits from taxes and fees from these businesses. This bridge holds emotional significance like no other example with its 500+ years of history and management.

(1) Selection Rationale & method of Data Collection

Ponte Vecchio in Florence has the longest history of infra-residual spatial use as a planned land-use, and it continues to serve this purpose today. The evolution of its land-use management can teach us about the sustainable coexistence of infrastructure and social practices.

A field survey of the site in 2023, along with interviews with locals, art historians, shop owners of Ponte Vecchio, architects, and Ponte Vecchio experts, has led to the following infographic datasets. Relevant literature reviews are included in the reference segment, with recorded audio transcripts provided in the appendix.

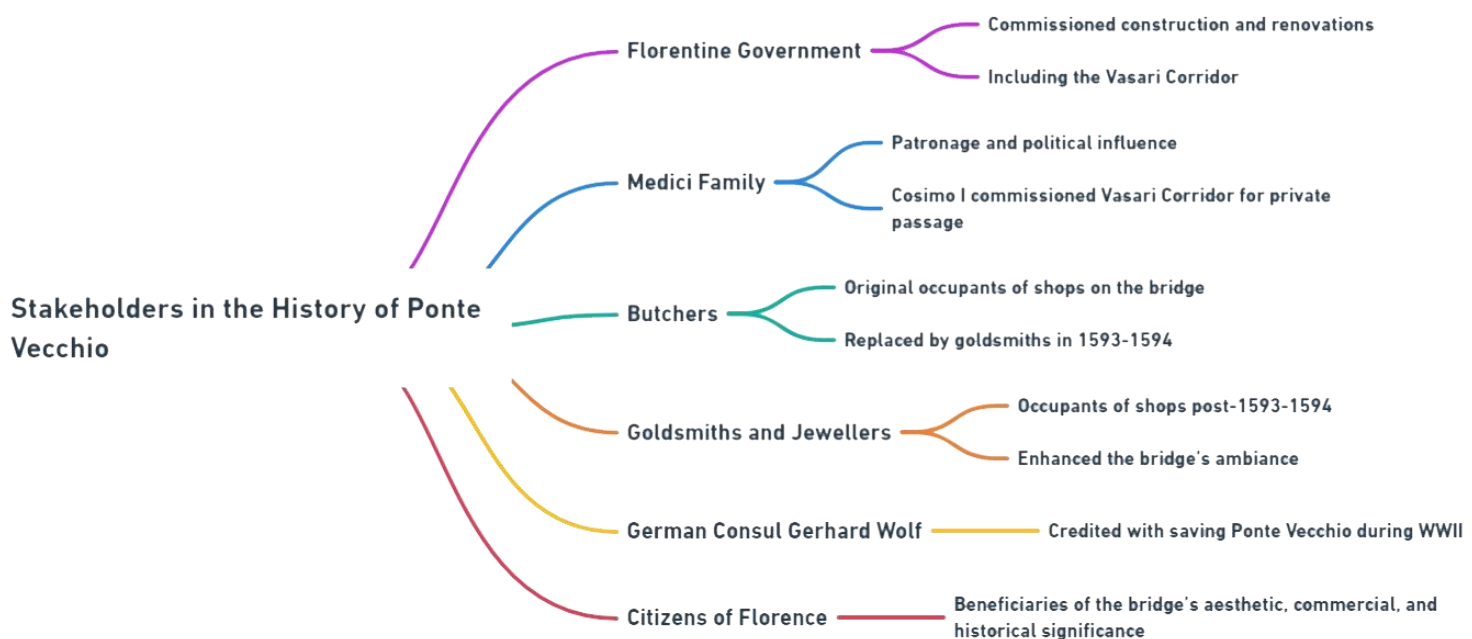


Figure 32: Stakeholder Dynamics diagram for Ponte Vecchio, Florence

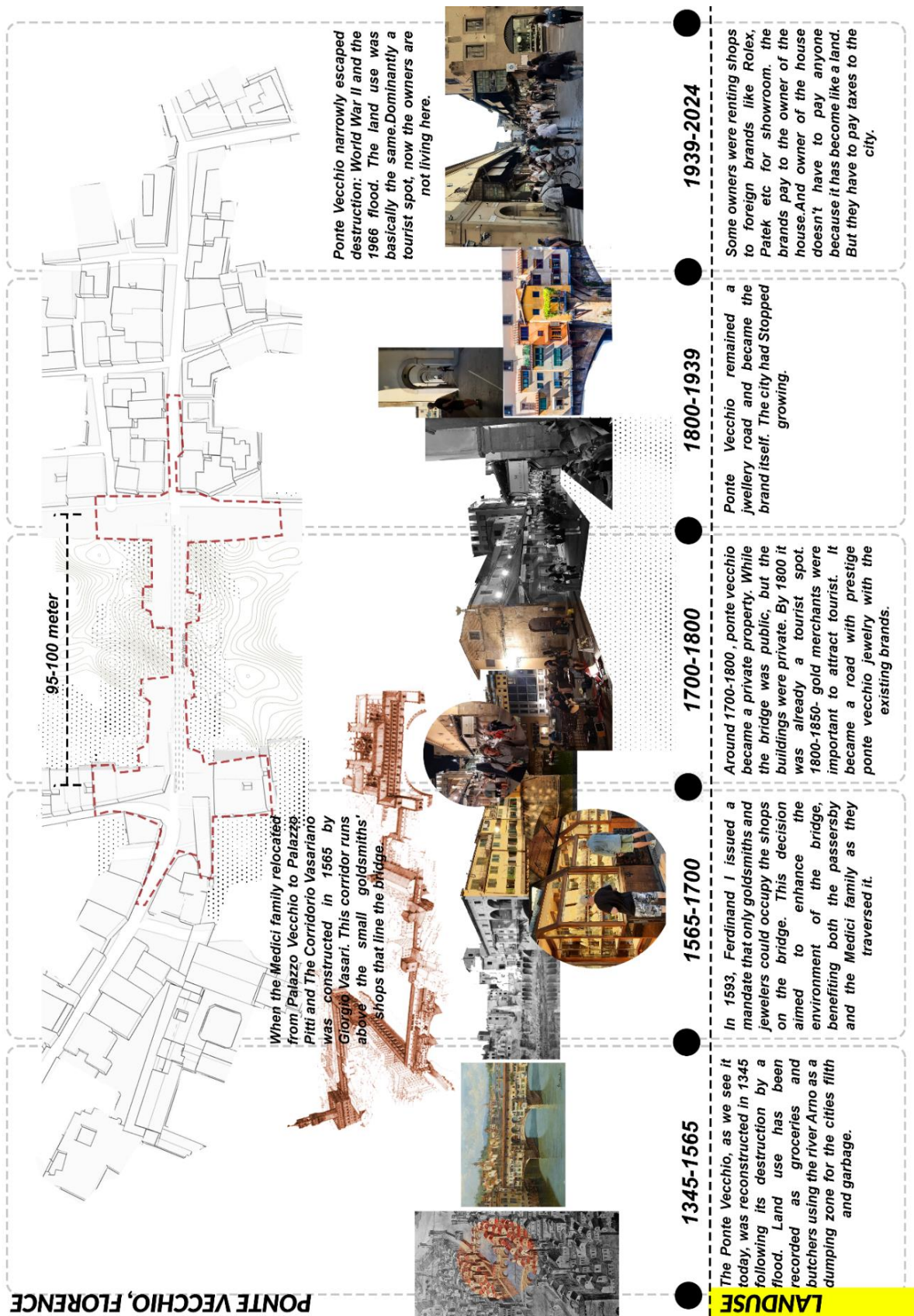


Figure 33: Infra-residual space land use timeline of Ponte Vecchio , Florence



Figure 34: Infra-residual space displacement history of Ponte Vecchio, Florence

4.2.2 Bermondsey Beer Mile, London (1836, ~200 years)

Bermondsey Beer Mile has evolved from its industrial roots into a vibrant hub for craft breweries and food markets. Located in South London, the arches beneath the railway viaducts host a range of businesses, creating a popular destination for locals and tourists. This transformation showcases successful urban regeneration, blending historical industrial architecture with contemporary commercial use.

(1) Selection Rationale & method of Data Collection

London arches have marked the beginning of industrialized automotive viaducts and their commercial use in recorded history. The evolution of these arches and the tenant-landlord ownership patterns reflect an important lesson about the capitalistic nature of urban leftover spaces and the potential consequences of leaving such spaces unmanaged and unchecked. Systematic eviction and unfair rent structure is a core study object in this exercise.

A field survey of the site, along with interviews with locals, arch tenants, various arch organizations and societies, shop owners, sociologists, architects, and current management bodies, has led to the following infographic datasets. Relevant literature reviews are also included in the reference segment, with recorded audio transcripts provided in the appendix. An internship program in 2023-2024 was also conducted with CASA-Bartlett UCL to study this project.

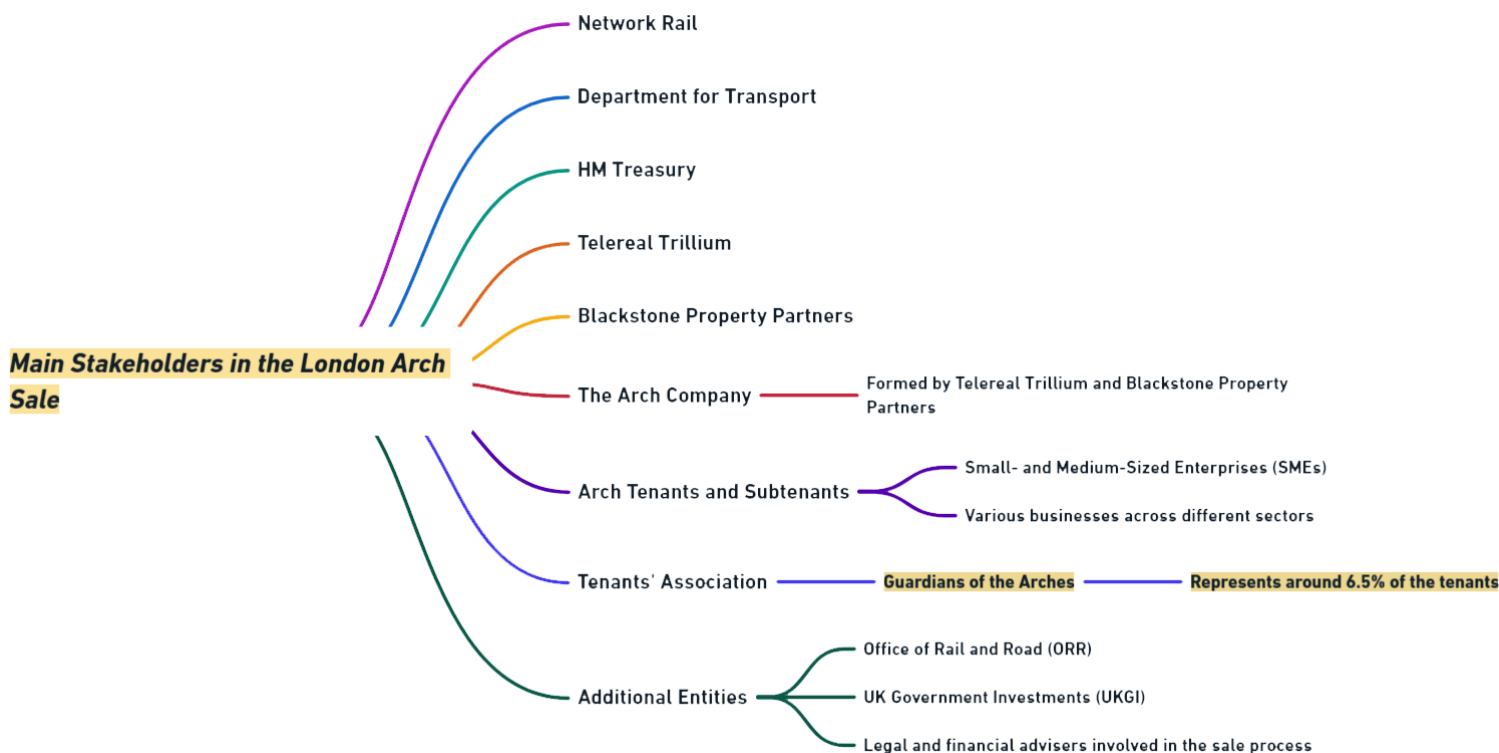


Figure 35: Stakeholder Dynamics diagram for London arches and their owner-ship pattern

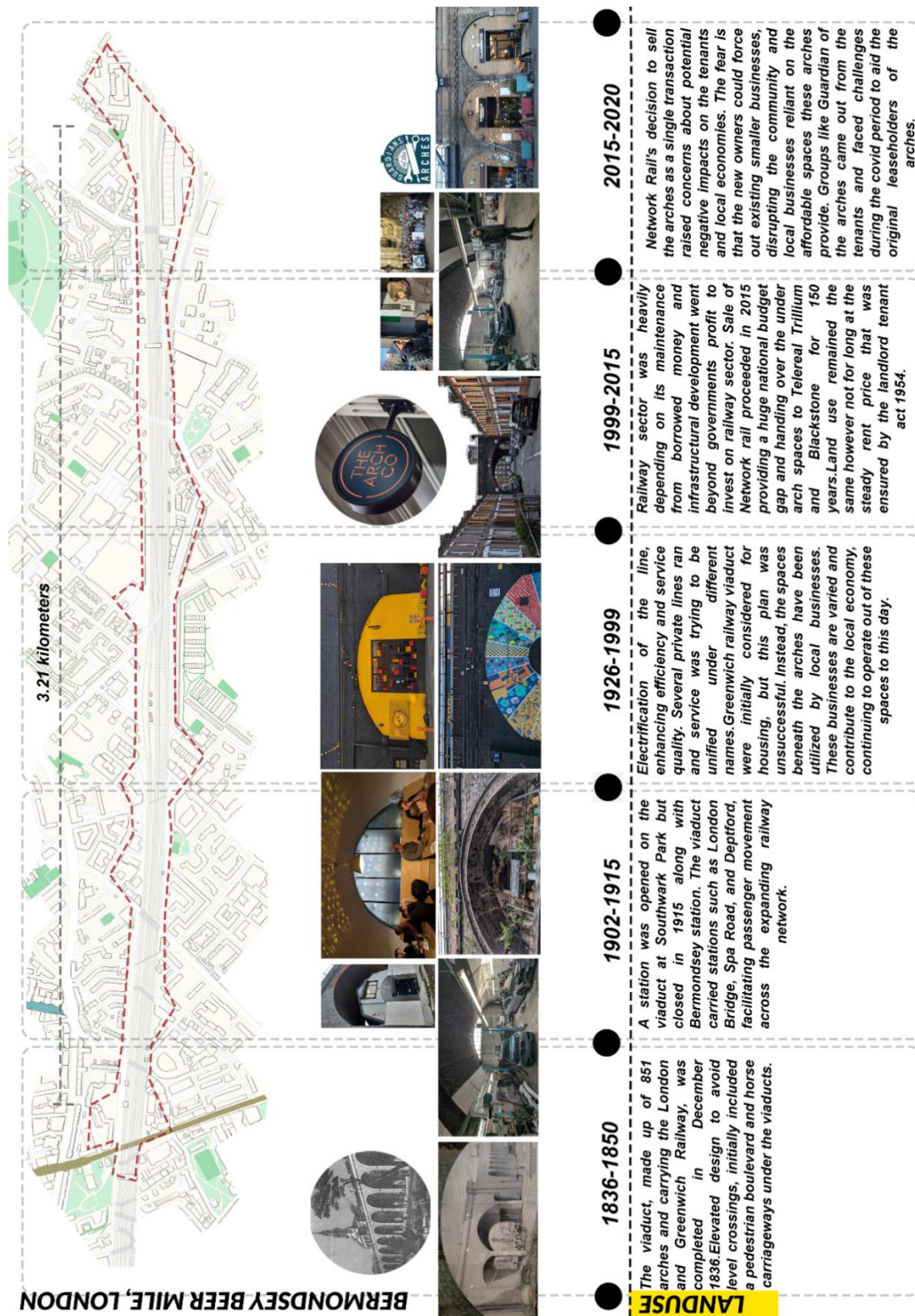


Figure 36: Infra-residual space land use timeline of Bermondsey Beer Mile / London arches



Figure 37: Infra-residual space displacement history of London Arches tenants

4.2.3. Viaduc Des Arts, Paris (1850, ~160, 90, 40 years)

Built in 1850, the Viaduc Des Arts supported a vital inner-city train line. After the railway was replaced by an underground line, the arches were repurposed into workshops, cafés, and art spaces, revitalizing the area. The Promenade Plantée, a tree-lined walkway, was constructed on the overhead tracks. This transformation, completed in the 1990s under architect Patrick Berger, has become a model for urban regeneration.

(1) Selection Rationale & method of Data Collection

Viaduc Des Arts sets a successful example by including both public and commercial spaces, along with maintaining a transparent rent structure for the arch tenants.

A field survey of the site in 2023, along with interviews with locals, sociologists, architects, and professors of urban studies has led to the following infographic datasets. Relevant literature reviews are also included in the reference segment, with recorded audio transcripts provided in the appendix.

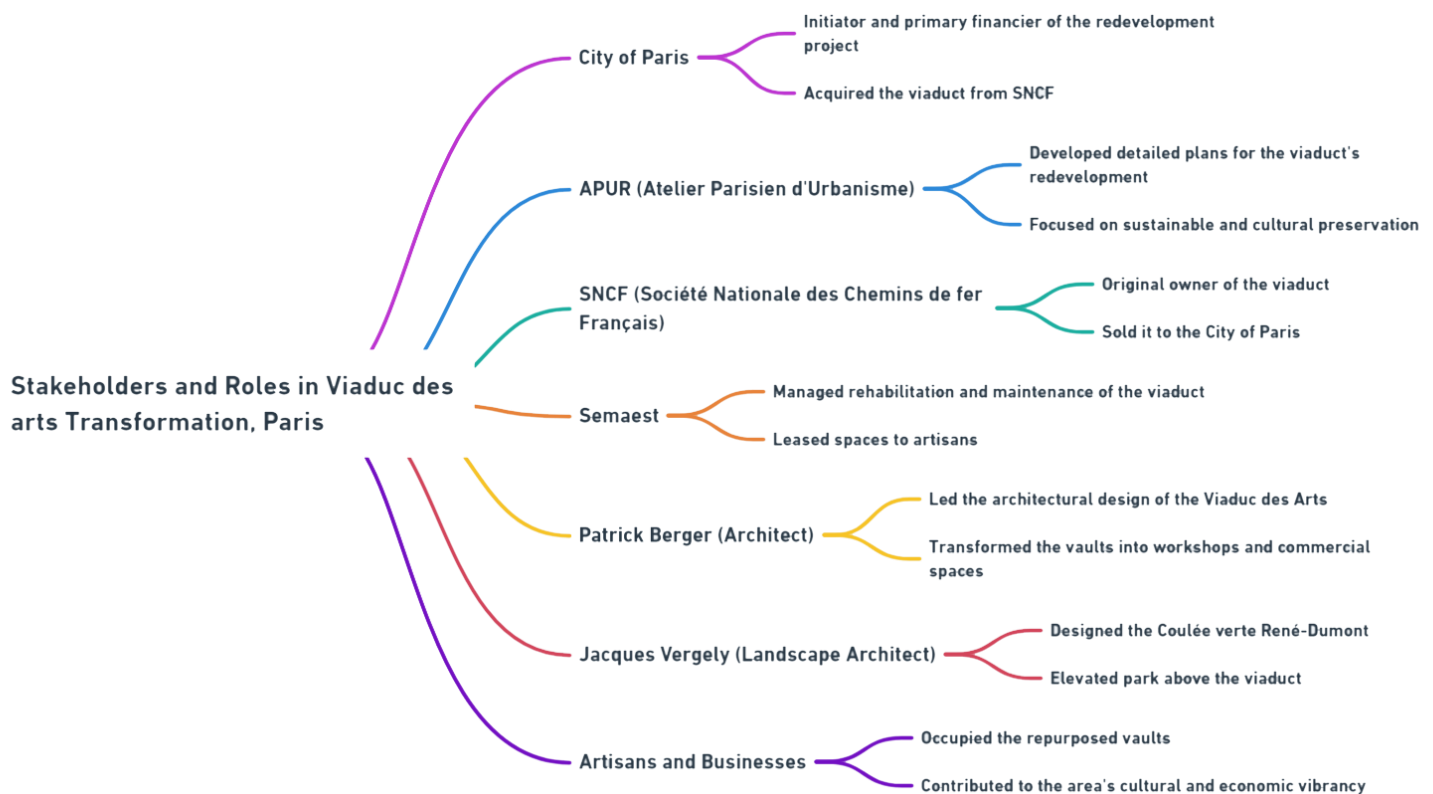


Figure 38: Stakeholder Dynamics diagram for Viaduc Des Arts, Paris

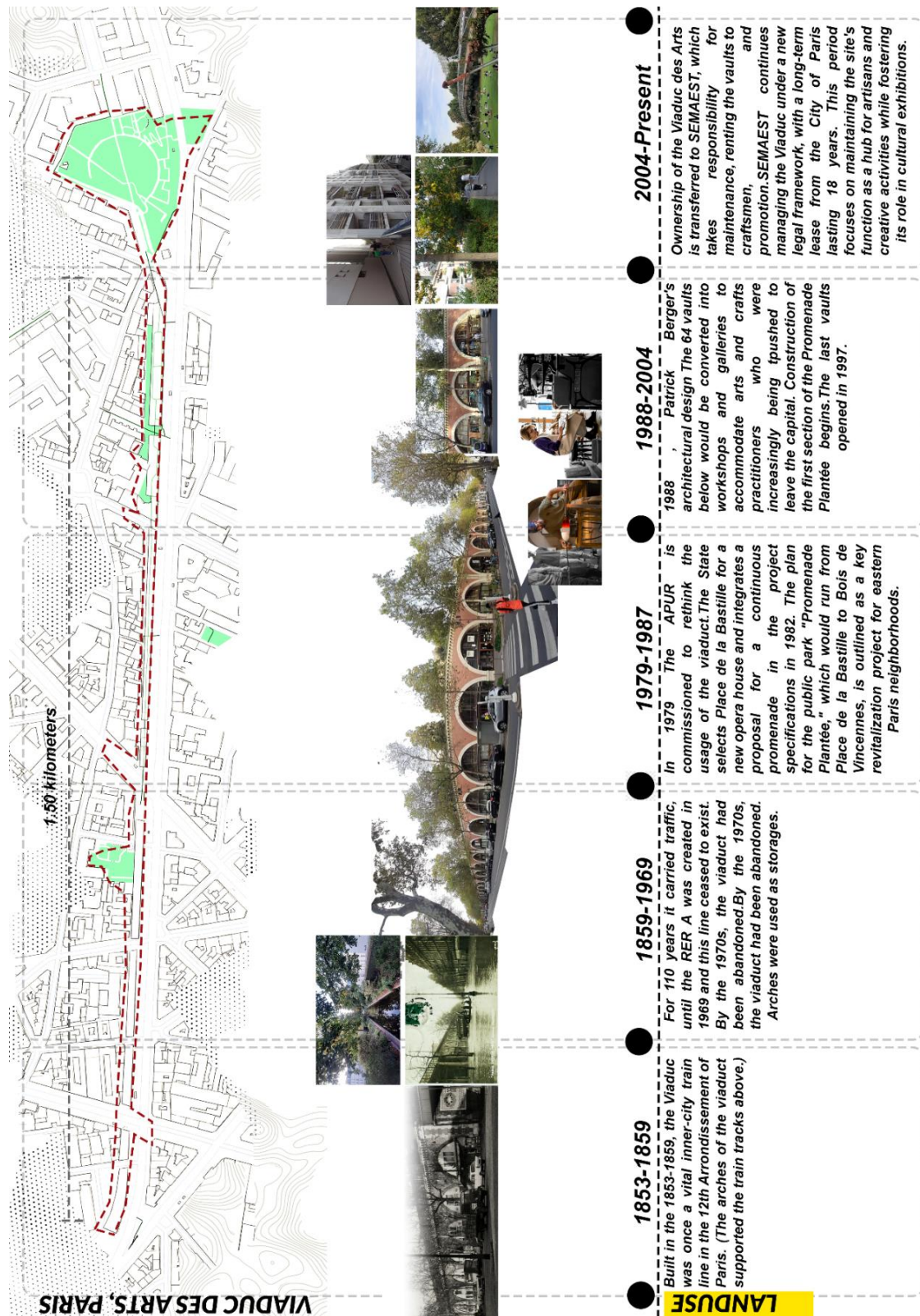


Figure 39: Infra-residual space land use timeline of Viaduc Des Arts, Paris



Figure 40: Infra-residual space displacement history of Viaduc Des Arts, Paris

4.2.4. Markthalle IM Viaduct, Zurich (1894, ~120 years)

Constructed in 1894, the IM Viaduct has undergone significant transformations. Initially hosting industrial activities, it faced public backlash over expansion plans in the 1980s. Community-driven revitalization in the 1990s led to the establishment of cultural and commercial spaces. Managed by the PWG Foundation since 2011, it now features artisan shops, restaurants, and event spaces, integrating community needs with urban development.

(1) Selection Rationale & method of Data Collection

Markthalle IM Viaduct Zurich is an example of extreme commodification of infra-residual spaces. Its evolution and gradual management history can show guidelines about the nominal control for infra residual spaces. High degree of authoritative intervention can loose local intricacies in the pretext of an image for the city though systematic gentrification.

A field survey of the site, along with interviews with locals, sociologists, architects, and professors of urban studies has led to the following infographic datasets. Relevant literature reviews are also included in the reference segment, with recorded audio transcripts provided in the appendix. An internship program in 2023 was also conducted with D-Arch ETH Zurich to study this project.

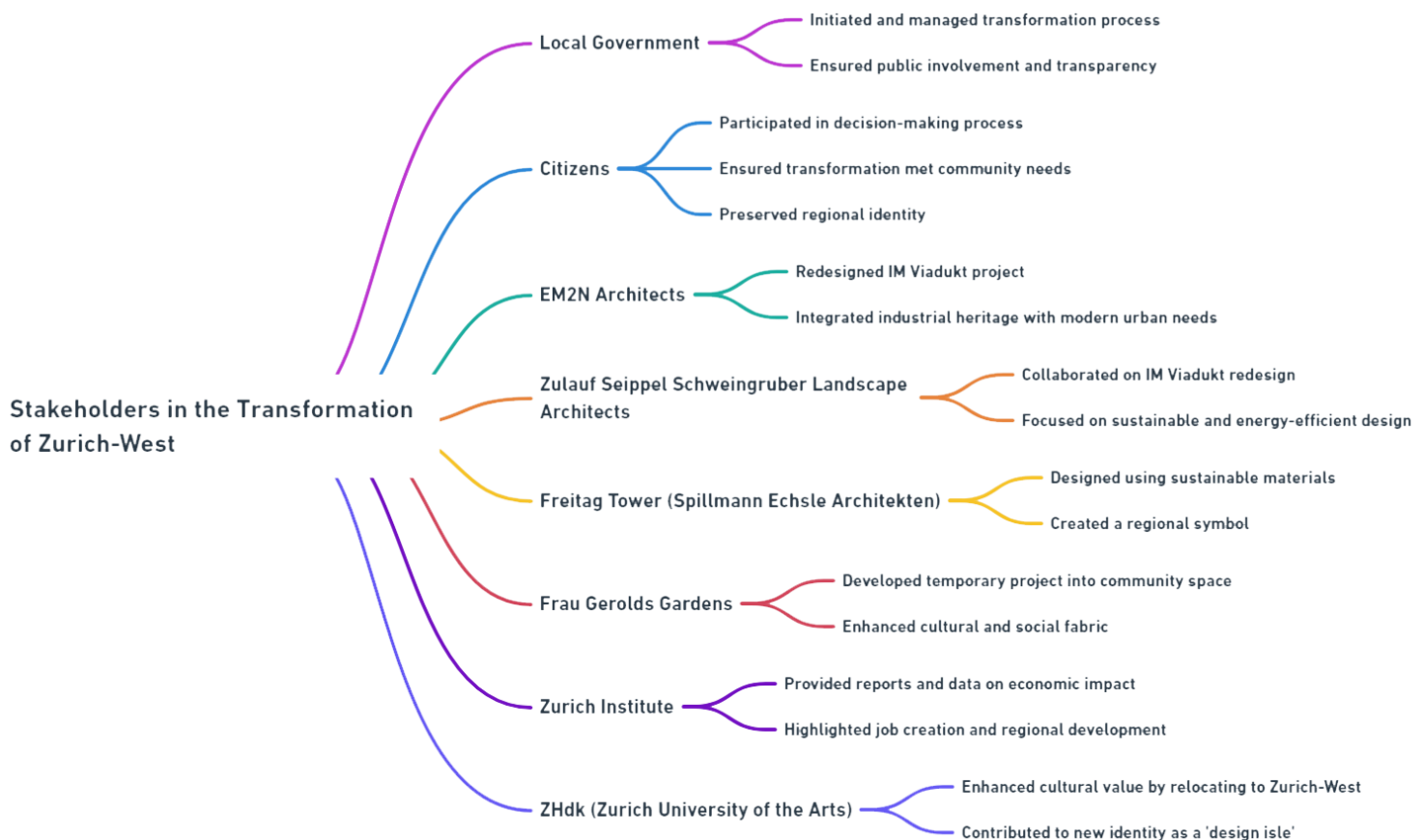


Figure 41: Stakeholder Dynamics diagram of IM viaduct Zurich

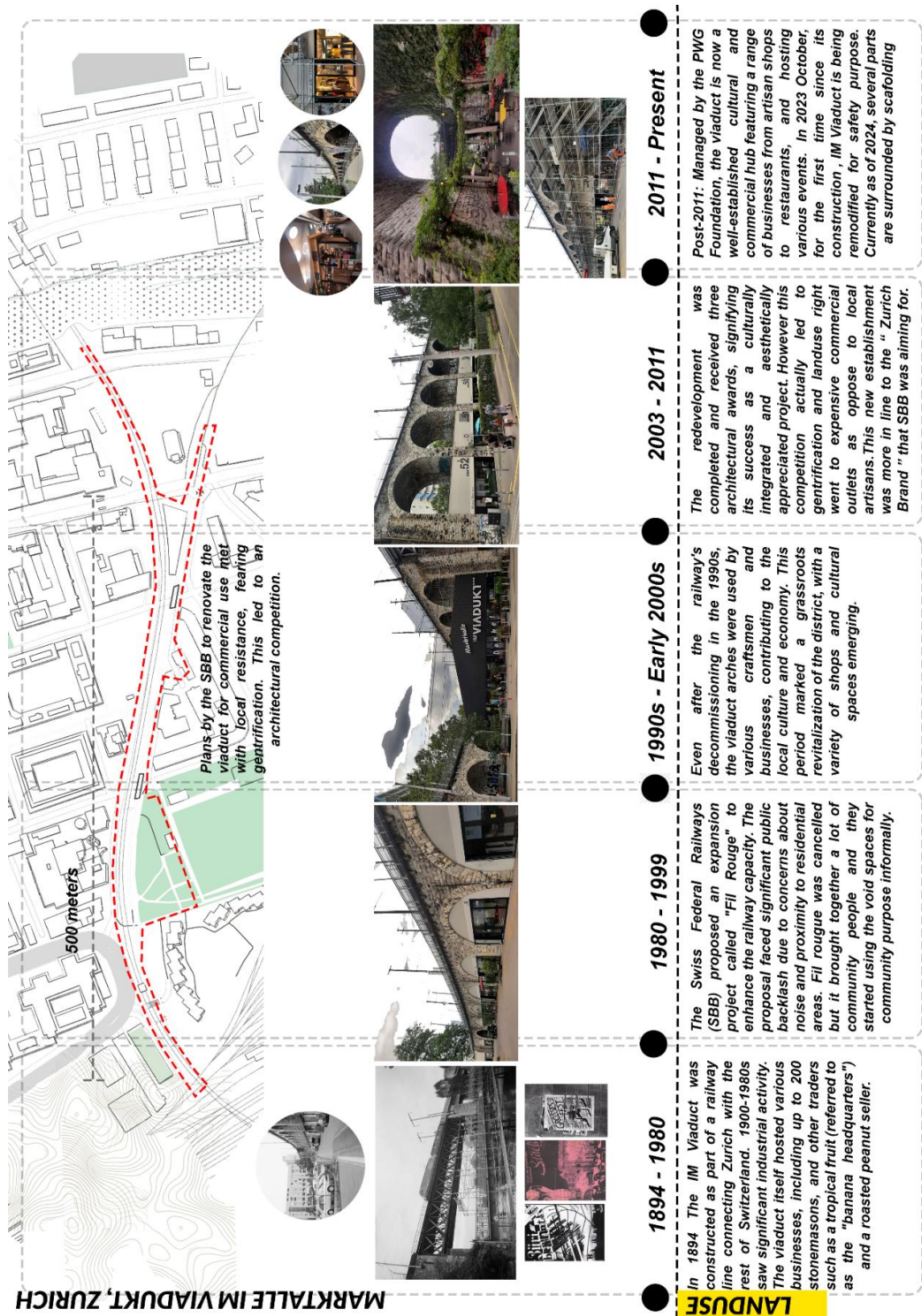


Figure 42: Infra-landuse timeline of IM viaduct Zurich

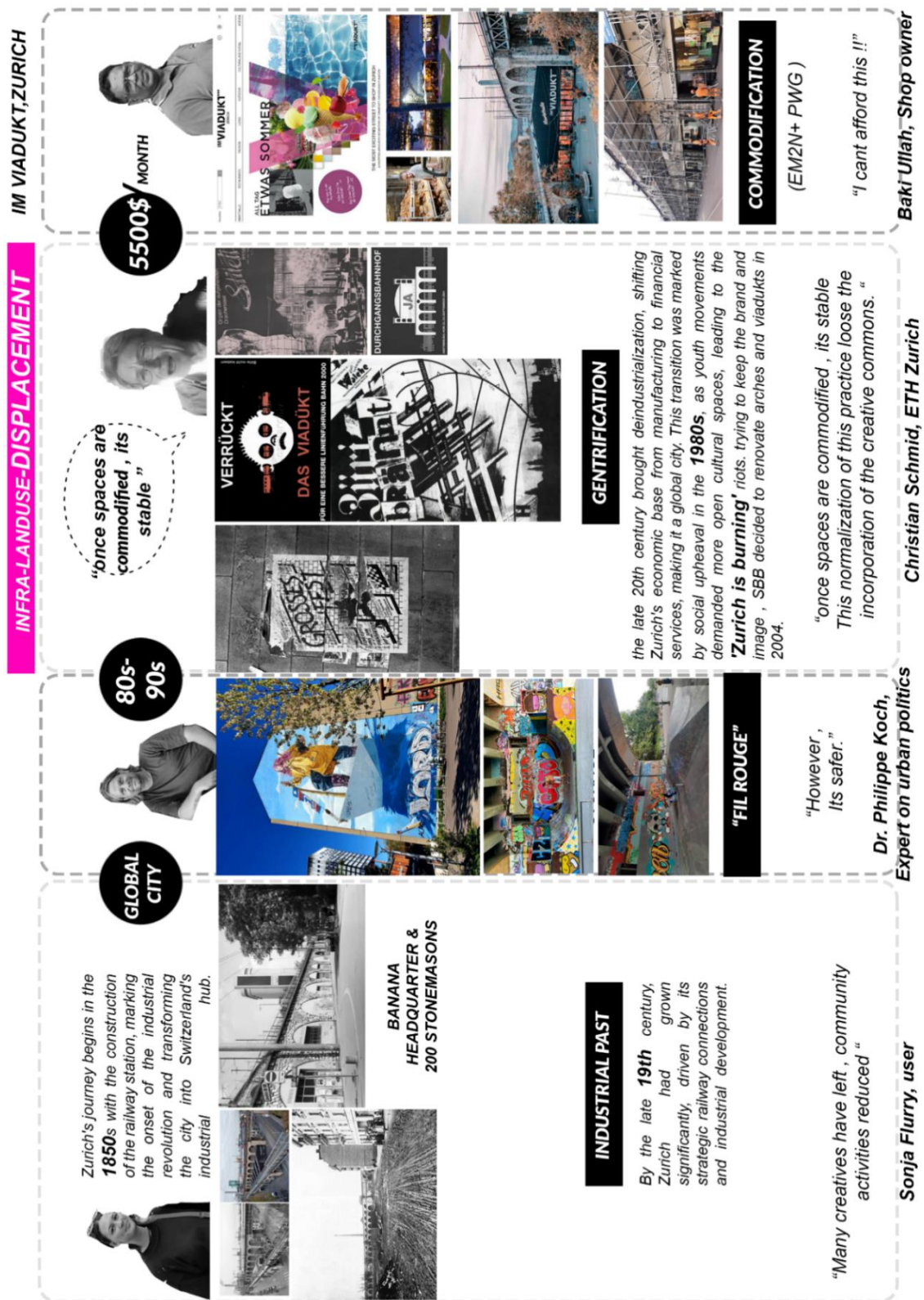


Figure 43: Infra-land use displacement history of IM viaduct Zurich

4.2.5. Koganecho, Yokohama (1901, ~120 years)

Koganecho's history is marked by post-war economic challenges and illicit activities in Yokohama, Japan. Following the 1995 Great Hanshin-Awaji Earthquake, a crackdown on these activities led to the area's transformation. Community and government efforts repurposed the spaces into cultural hubs like the Koganecho Bazaar. The area now thrives as a center for art and community engagement, managed sustainably by a collaboration of local entities.

(1) Selection Rationale & method of Data Collection

Koganecho Area Management center and ART Bazaar Koganecho reveals a successful example of conversion of an infra-residual space from red light zone to an art district through sustainable management system in a Japanese context. The gentrification process of Koganecho is also a matter of study as an eviction process. A field survey of the site, along with interviews with locals, urbanists, architects, planners, professors of urban studies and director general of the Koganecho area management center has led to the following infographic datasets. Relevant literature reviews are also included in the reference segment, with recorded audio transcripts provided in the appendix. An internship program in 2020 was also conducted with Koganecho area management center to study this project.

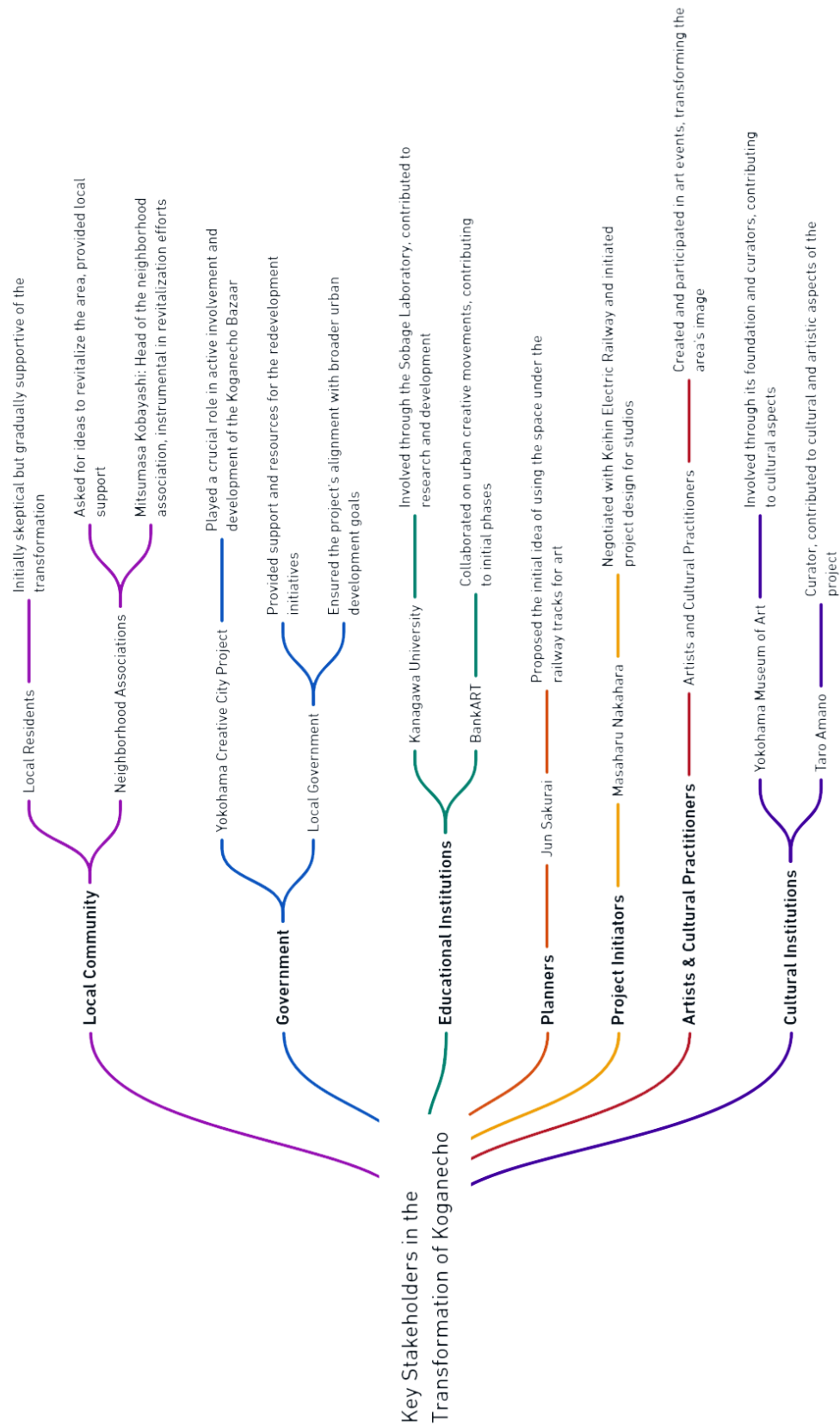


Figure 44: Stakeholder dynamics of Yokohama KAMC

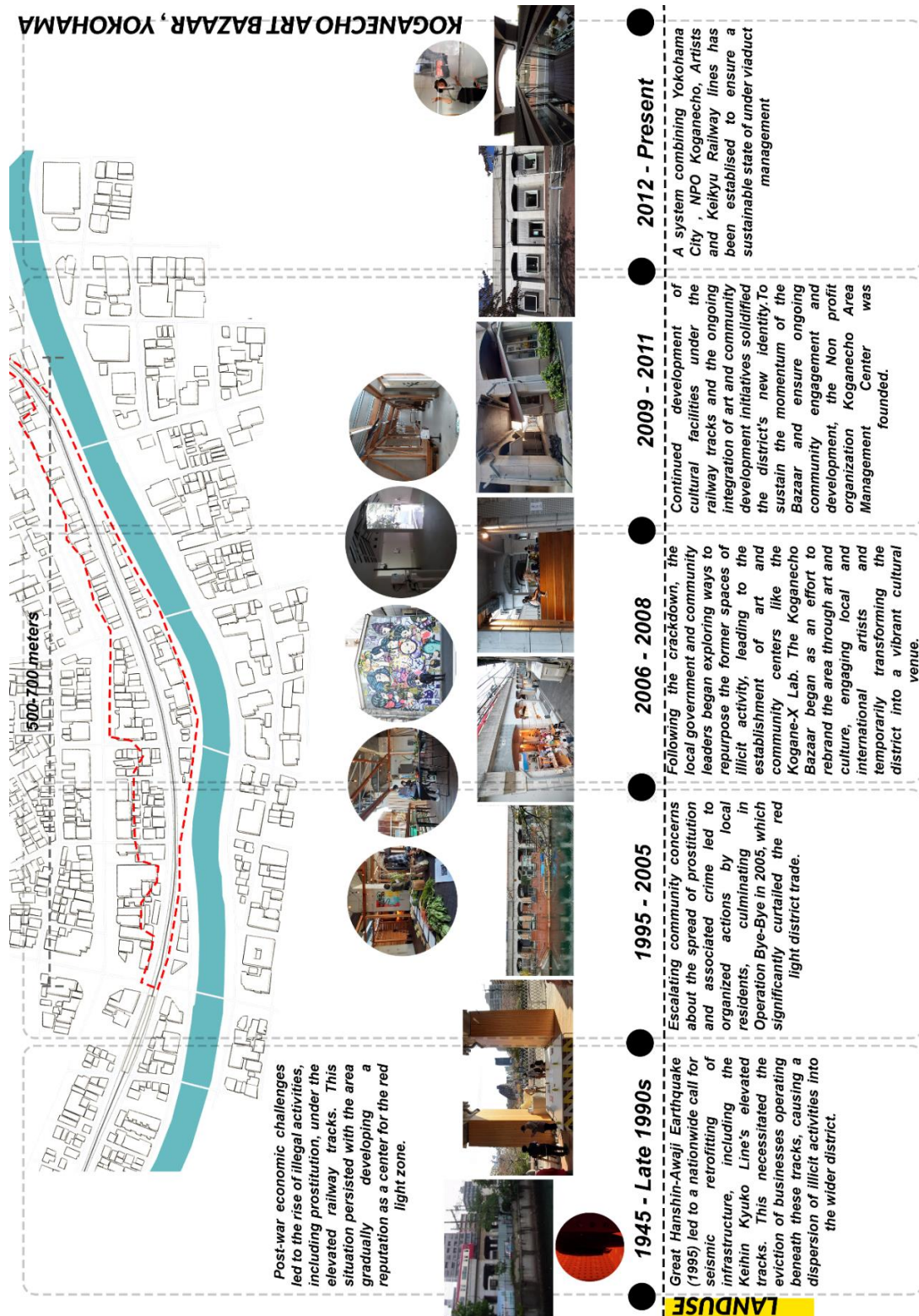


Figure 45: Infra-residual space land use timeline of Yokohama KAMC

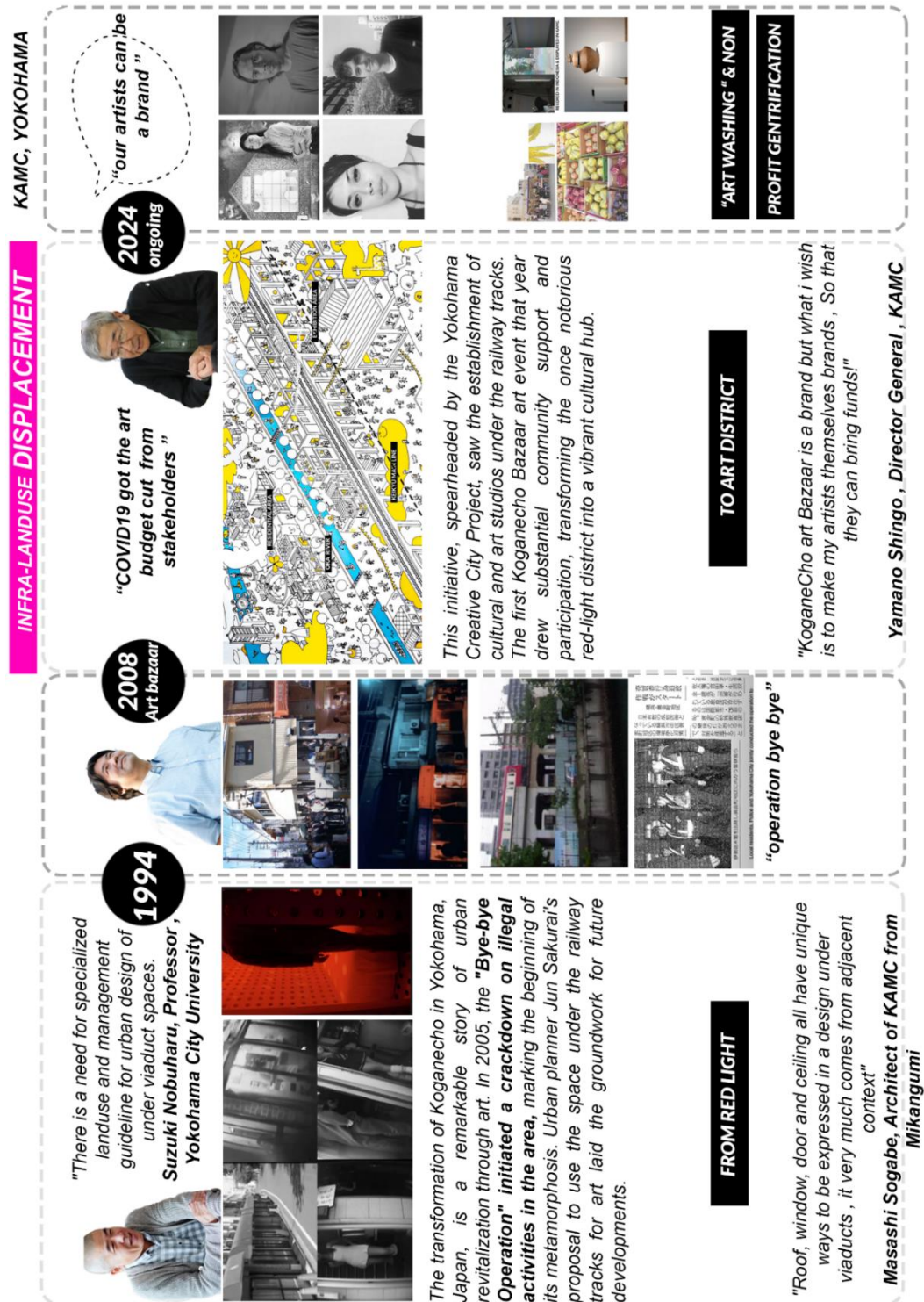


Figure 46: Infra-residual space displacement history of Yokohama KAMC

4.2.6. Nabisco Flyover, Dhaka (2010, less than 20 years)

Since its construction in 2010, the Nabisco Flyover has seen informal markets and squatter communities grow beneath it. Initiatives like the "Deyal-kotha" school designed by author, have brought positive changes, providing education and social services. Despite informal management, these spaces serve significant community functions, highlighting the potential for structured interventions to enhance urban living conditions.

(1) Selection Rationale & method of Data Collection:

Nabisco under flyover squatter and informal markets represent a fascinating case in Dhaka Bangladesh where informality along with infrastructural elements has converted the squatter communities into an asset for the city. The self-management process creates an example for the unwanted to be relevant and leftovers to be important when it comes to city and viaduct scale.

A field survey of the site, along with interviews with squatter inhabitant, participatory action research in 2020 has led to the following infographic datasets. Relevant literature reviews are also included in the reference segment, with recorded audio transcripts provided in the appendix. An actual under flyover school project was executed by author, NGO light of hope and Avantgardes headed by Shahjabin Kabir and funded by US Embassy Bangladesh in 2015 also works as a background for this data collection process.

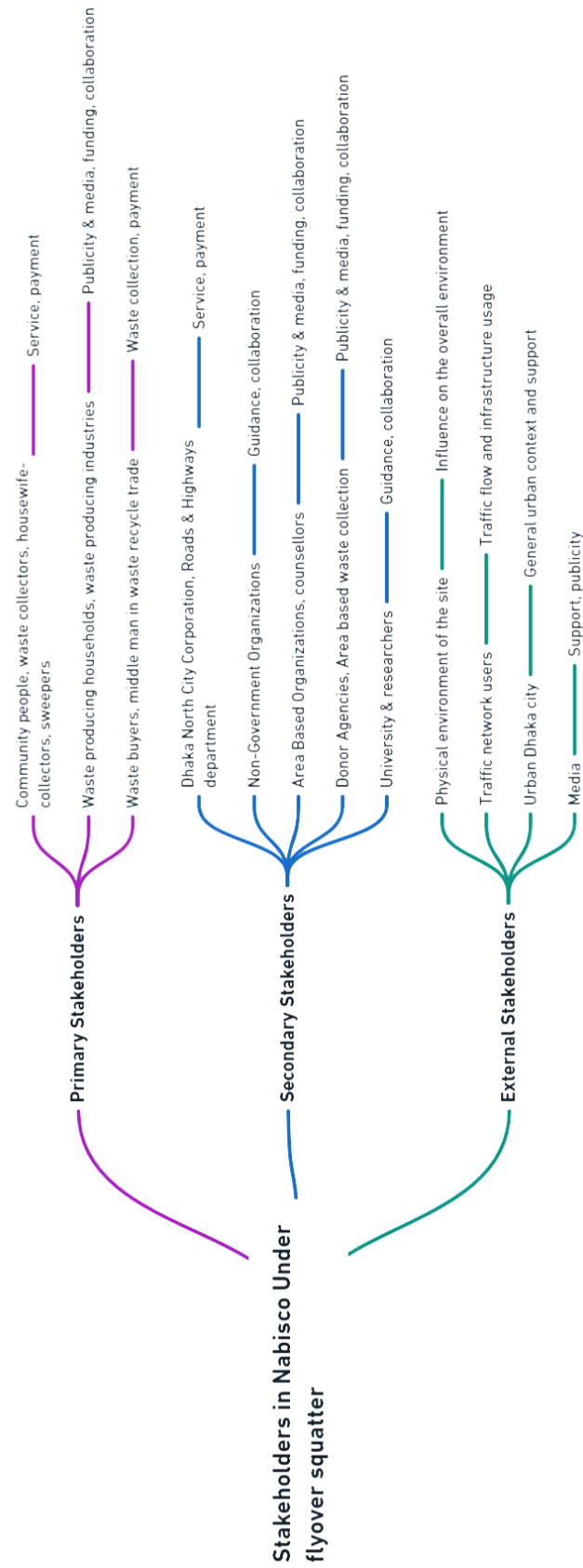


Figure 47: Stakeholder Dynamics diagram of Tejgaon-Nabisco under Flyover squatter

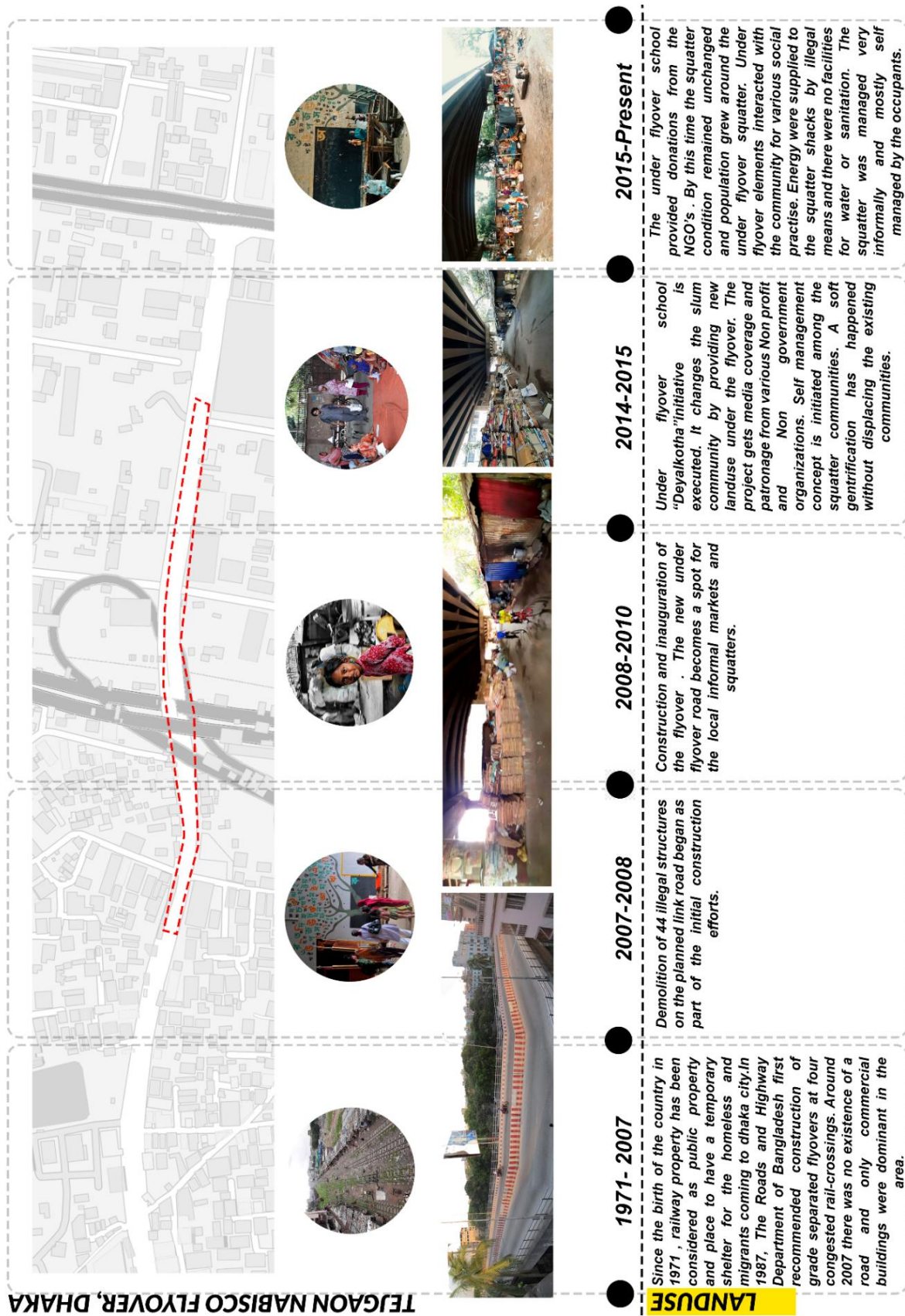


Figure 48: Infra-residual space land use timeline of Tejgaon-Nabisco under Flyover squatter



Figure 49: Infra-residual space displacement history of Dhaka flyovers

4.2.7. Hanif Flyover, Dhaka (2013, less than 20 years)

Inaugurated in 2013, the Hanif Flyover faced challenges with informal markets and traffic congestion. Initial under-flyover development projects were difficult due to these complexities. Recent beautification efforts by Next Door Consultants aim to transform these spaces into organized, aesthetic public areas. Ongoing proposals seek to balance the needs of local stakeholders with urban development goals, showcasing the evolving nature of urban infrastructure management.

(1) Selection Rationale & method of Data Collection:

Mayor Hanif Flyover represents here a practical case and project done by the author to execute hypotheses of the doctoral research. A field survey of the site, along with stakeholders and relevant government organization was done in 2021-2022, has led to the following infographic datasets. Relevant literature reviews are also included in the reference segment, with recorded audio transcripts provided in the appendix.

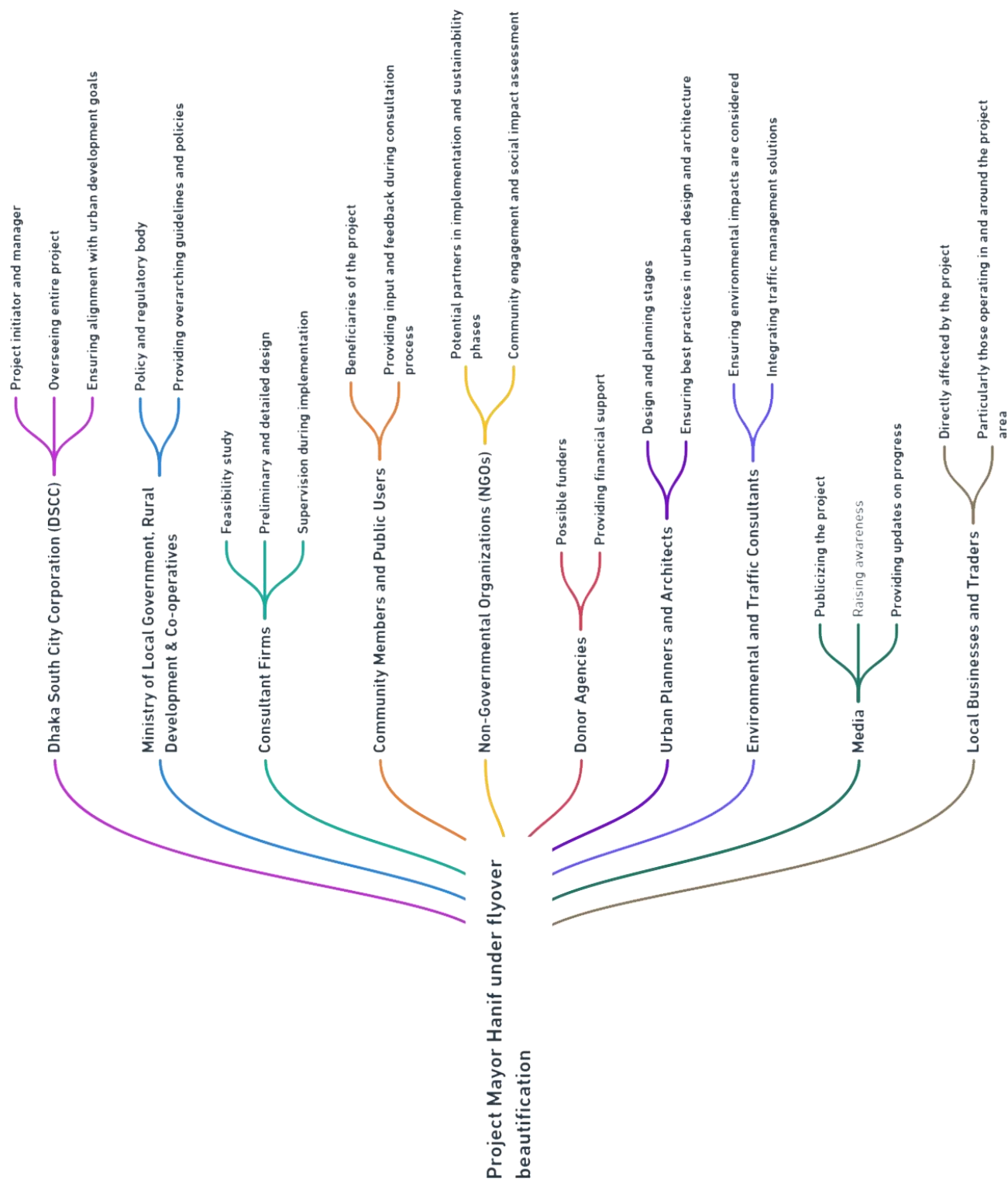


Figure 50: Stakeholder Dynamics diagram of Mayor Hanif Under Flyover Beautification Project 2022

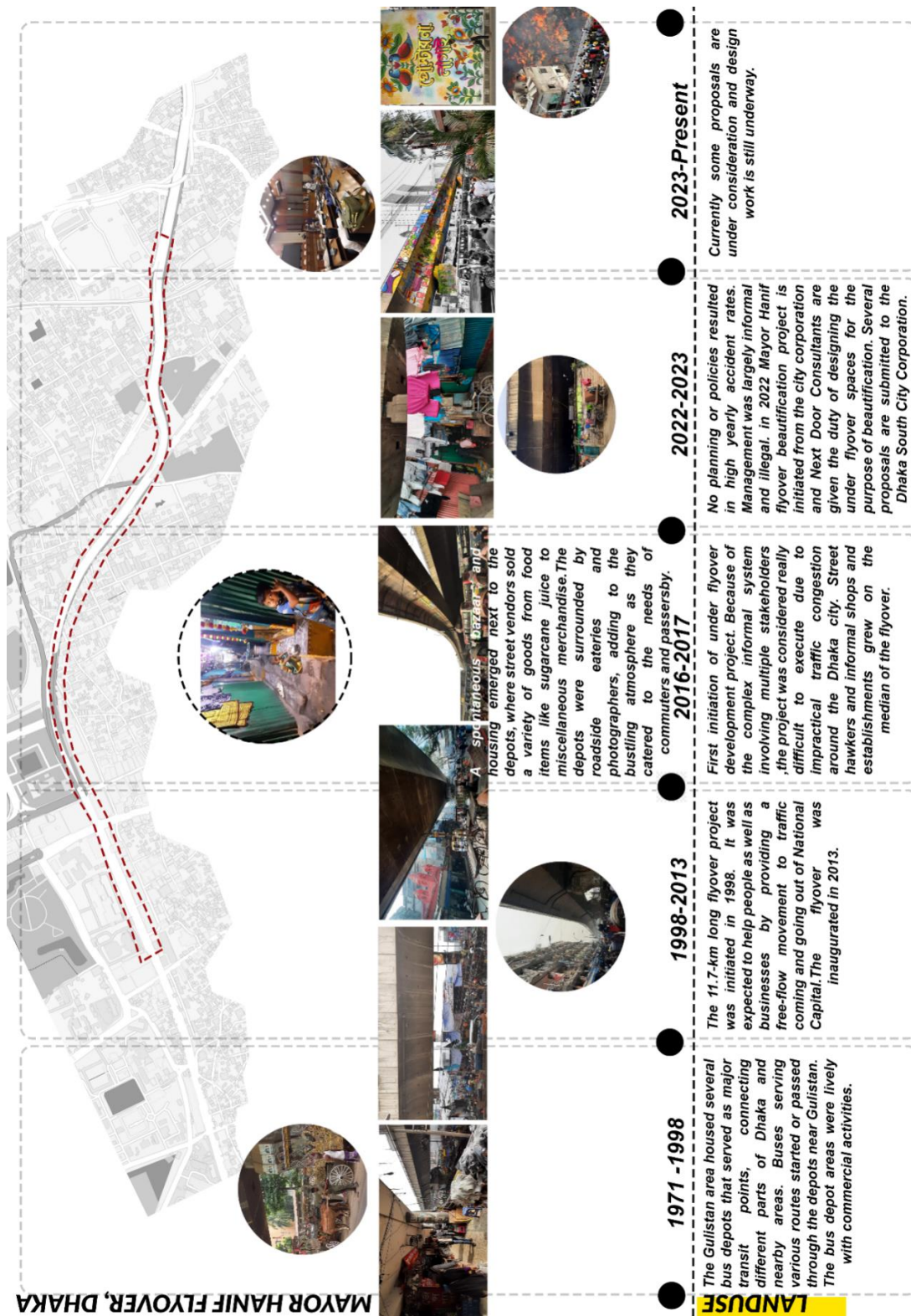


Figure 51: Infra-residual space land use timeline of Mayor Hanif Under Flyover

4.3 Comparison of Cases and Key Findings

This comparative analysis aims to evaluate and compare the performance of seven distinct infrastructural case studies: Ponte Vecchio (Florence), Bermondsey Beer Mile (London), Viaduc Des Arts (Paris), Markthalle IM Viaduct (Zurich), KoganeCho Art Bazaar (Yokohama), Nabisco-Tejgaon Flyover (Dhaka), and Mayor Hanif Flyover (Dhaka). The evaluation focuses on multiple key factors including management, functionality, accessibility, profitability (tenant), and asset/liability (city scale). Using a combination of radar charts, scatter plots, heatmaps, and qualitative visualizations, we examine the strengths and weaknesses of each case study, identify areas prone to eviction risks, and suggest improvements to enhance overall sustainability and tenant satisfaction. This multi-faceted approach provides a comprehensive overview of the infrastructural and managerial effectiveness of each site, highlighting best practices and areas needing critical intervention.

The comparative analysis of the seven case studies—Ponte Vecchio (Florence), Bermondsey Beer Mile (London), Viaduc Des Arts (Paris), Markthalle IM Viaduct (Zurich), KoganeCho Art Bazaar (Yokohama), Nabisco-Tejgaon Flyover (Dhaka), and Mayor Hanif Flyover (Dhaka)—reveals interesting insights into their respective management, functionality, accessibility, profitability, and asset/liability performance.

4.3.1 Factors and Value Integration

The comparative value system illustrated in the table evaluates seven cases based on field survey questions, using a scale of 1 to 10. The comparative analysis considers five critical factors: Management, Functionality, Accessibility, Profit, and Asset/Liability, each examined at both the viaduct scale and the city scale. **Five Factors identified at the end of the chapter 3 are crucial here.** Management ranges from 'No management' to 'Formal & Planned', reflecting the level of organization and planning involved. Functionality assesses the state of maintenance and sustainability, from 'Abandoned' to 'Sustainable'. Accessibility measures the inclusiveness of land use, from 'Restricted' to 'Formal & Inclusive Land-use' that includes both public and private uses. Profit evaluates the economic returns, from 'No Profit' to 'Formal Profit'. Lastly, Asset/Liability considers the broader social and economic contributions, from 'Abandoned' to 'Economic + Social Profit'. Value 5 being the safety margin from eviction will provide additional analysis in the chapter 05.

This grading system integrates responses from structured interviews and field surveys, translating qualitative data into a visual comparative value (table 12-13). The analysis spans both social and economic contributions of viaducts, acknowledging aspects such as self-management, the concept of infrastructure as assets or liabilities, and the impact of abandonment. The scale reflects a comprehensive view of how these factors interplay in different contexts, providing a nuanced understanding of the infrastructure's role at both neighborhood and city levels.

Table 12: Information from the field survey questions and arranged according to five factors

Infra-residual landuse information							
Factors	Ponte Vecchio	Bermondsey Beer Mile	Viaduc Des Arts	Markthal IM Viaduct	KoganeCho Art Bazaar	Nabisco-Tejgaon Flyover	Mayor Hanif Flyover
	Florence	London	Paris	Zurich	Yokohama	Dhaka	Dhaka
TYPE	Formal	Formal	Formal	Formal	Formal	Informal	Informal
HISTORICAL EVOLUTION	Formal - Formal	Formal-Formal	Formal-Formal	Formal-Formal	Formal-Formal	Informal-Formal	Informal-Formal
DOMINANT LANDUSE	Jewellery shops - Public plaza	Light Industry-café	Workshop-Green Walkway	Fashion	Art Exhibition and NPO	Squatter	Informal vendors
LOCAL STAKEHOLDER INVOLVEMENT	Historically involved	Not involved	Highly Involved	low	Highly Involved	Zero	Zero
SPECIFIED RENT SYSTEM	Tenant owns the land	No	Yes	Yes	Non Profit	Informal	Informal
PUBLIC-PRIVATE RATIO	70 to 30	5 to 95	50 to 50	30 to 70	95 to 5	60 to 40	60 to 40
PRIMARY FUNCTION	Bridge (Functional)	Railway viaduct	Walkway	Railway viaduct	Railway viaduct	Flyover Road	Flyover Road
SECONDARY FUNCTION	Shopping area-landmark	Light industrial rental	Art workshops	High end shopping	Squatter- service road	Informal shops - road	Informal shops - road
DAY TIME CHARACTER	Shopping area	Business area	Art District	Shopping area	Art District	Squatter	Informal shops
NIGHTTIME CHARACTER	Public plaza	Bar-Dark & unsafe	Art District	Dark area	Art District	Squatter	Dark-unsafe zone
ADAPTIVE FUNCTIONS	Street vendors- musicians	Bar	Cafes	Parks , cafes	Café , Hotel		
CITY SCALE AND VIADUCT SCALE	Viaduct scale is dominant	City scale is dominant	Both scale is equally useful	City scale is dominant	Both scale is equally useful	Viaduct scale is dominant	Viaduct scale is dominant
PUBLIC ACCESS	Mostly public access is given	Mostly public access is not given	Mostly public access is given	Medium	High	High	High & Risky
PRIVATE ACCESS	10-20 Percent of the spaces are not accessible by public	Mostly Private	Both access is given	Medium	Low	low	low
SPECIAL CONDITION	Vassari Corridor (exhibition space & not accessible)	Some arches are abandoned	Goes through buildings	Walkway on the top of the arches	Public plaza with stairs, under the viaducts	Under flyover road is not used for vehicular access	Under flyover road is vehicular and also used for markets, making the use risky
INCLUSIVITY IN LANDUSE	Public Inclusive landuse	Non inclusive landuse	Inclusive	Exclusive	Inclusive	Informal	Informal
MIXED USE	Not mixed land use	Not mixed landuse	Not mixed landuse	Mixed use is given	Not mixed landuse	Informal	Informal
INFORMALITY-FORMALITY	10 to 90	10 to 90	0 to 100	0 to 100	0 to 100	100 to 0	100 to 0
TENANT TYPE	Shopkeepers	Industrialist, Mechanics	Artisans	Shopkeepers	Artist and NPO members	Informal squatter residents	Informal vendors
PROFITS FROM LANDUSE TYPE	Mostly profit , tenant pays tax	Low	High	Medium	Non-Profit	low	low
COST TO PROFIT	High	Low	Medium	Medium	Non-Profit , sustainable	low	low
SUBTENANT	Brands of Jewellery and Clocks	Bar , café , Industry	Artisans	Fashion & lifestyle based	Accommodation based	Informal	Informal
TENANT SATISFACTION	High	Low	High	Medium	High	low	low
MAINTENANCE	High	Low	High	High	High	low	low
USABILITY	High	Low	High	Medium	High	Medium	Medium
PERFORMANCE OF THE INFRA	High	Medium	High	High	High	low	low
INFRA- CONTRIBUTION - CITY SCALE	High	Low	High	Medium	High	Medium	low
INFRA-CONTRIBUTION - VIADUCT SCALE	High	Low	High	Medium	High	Medium	Medium
ABANDONMENT POSSIBILITY	Low	Medium (several arches)	Low	Low	Low	Medium	Medium

4.3.2 Visual Comparison Among the Cases

Table 13: Value integration based on performance of infra-residual space factors of seven cases

Factors	Scale									
	1	2	3	4	5	6	7	8	9	10
	Viaduct scale	City Scale	Viaduct scale	City Scale	Viaduct scale	City Scale	Viaduct scale	City Scale	Viaduct scale	City Scale
Management	No management		Self management		Informal Tenant		Formal Tenant		Formal & Planned	
Functionality	Abandoned		Requires Maintenance		Functional		Functional & Mantanied		Sustainable	
Accessibility	Restricted		Informal & exclusive		Informal		Formal & Exclusive land-use		Formal & Inclusive Land-use (public+ private use)	
Profit (Viaduct Scale)	No Profit		Informal Profit		Formal low profit		Formal Non Profit		Formal Profit	
Asset/Liability (City Scale)	Abandoned		Liability		No Profit		Economic Profit		Economic + Social Profit	

Factors	Value approximation of Case Studies						
	Ponte Vecchio Florence	Bermondsey Beer Mile London	Viaduc Des Arts Paris	Markthalle IM Viaduct Zurich	KoganeCho Art Bazaar Yokohama	Nabisco-Tejgaon Flyover Dhaka	Mayor Hanif Flyover Dhaka
Management	9	7	10	8	10	4	5
Functionality	10	5	10	8	9	5	5
Accessibility	10	7	10	8	9	4	3
Profitability (Tenant)	10	5	9	6	8	4	3
Asset/Liability (City Scale)	9	6	10	8	9	6	4

Ponte Vecchio (Florence) stands out as a high performer across all factors. It achieves high scores in management, functionality, accessibility, profitability, and asset/liability, positioning it well within the sustainable zone. The high tenant satisfaction and low abandonment possibility indicate strong and effective management. In comparison, Viaduc Des Arts (Paris) closely mirrors Ponte Vecchio's performance, with slightly lower profitability but maintaining high scores in other areas, demonstrating a robust management model. KoganeCho Art Bazaar (Yokohama) also displays high performance, especially in management and functionality, reflecting its structured and well-planned approach. However, its unique feature of being dominated by artists and NPO members highlights a focus on community engagement and cultural activities, differing from the more commercial orientation of Ponte Vecchio and Viaduc Des Arts. Markthalle IM Viaduct (Zurich), while performing well, shows moderate profitability. Its mixed-use land approach and high public access suggest a balance between commercial viability and public engagement, though there is room to improve profitability to match the top performers. Bermondsey Beer Mile (London), although benefiting from moderate public access and private tenant space, lags in functionality and profitability. This indicates potential gaps in infrastructure utilization and tenant engagement, which, if addressed, could elevate its performance. Nabisco-Tejgaon Flyover (Dhaka) and Mayor Hanif Flyover (Dhaka) are the most vulnerable, with both

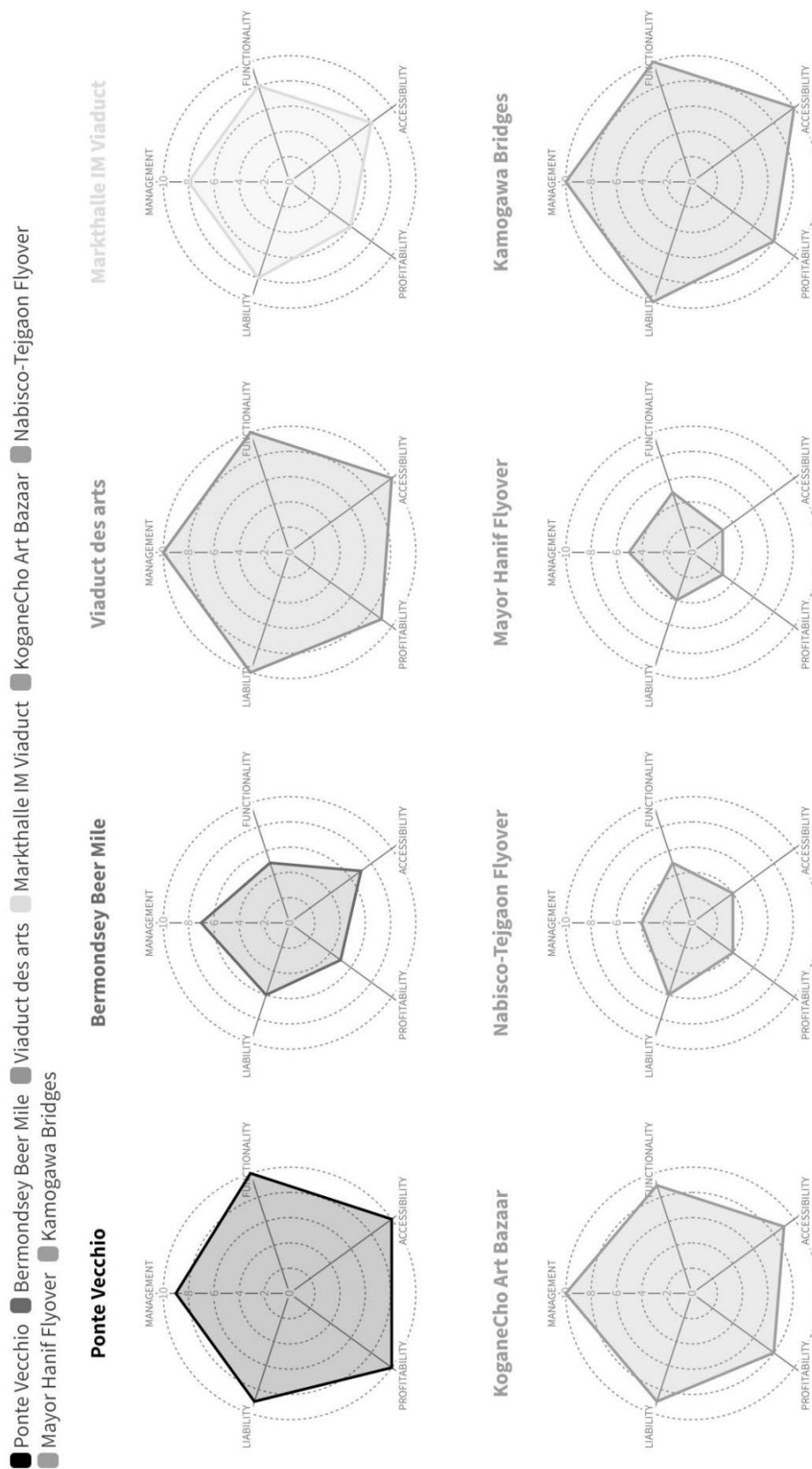


Figure 52: A radar chart comparison to visualize performance of each seven cases based on the value based factors

showing low scores across management, functionality, accessibility, and profitability. Their position in the eviction risk zone highlights significant challenges, particularly in tenant satisfaction and infrastructure maintenance. Kyoto Kamogawa under bridge informal uses can also be included as a point of reference to understand relatively(Figure 52).

The radar charts and relationship graphs emphasize that the high performers have balanced their management and functionality well above the safety thresholds, ensuring sustainability. In contrast, the lower performers, particularly the Dhaka flyovers, need substantial improvements in management and tenant engagement to transition from the eviction risk zone to a more stable state. The bubble chart further underscores this by linking public and private access with tenant satisfaction, highlighting the critical role of accessibility in determining overall success.

The dark blue zones in these radar charts (figure 53) represent the eviction margin, while the light blue zones depict the current conditions of the projects and tenant situations. The Koganecho Art Bazaar is safe from further eviction, as indicated by its radar chart. In contrast, the Nabisco-Tejgaon Flyover community in Dhaka is not secure, showing a higher risk of eviction. These diagrams provide a visual comparison between Koganecho and Nabisco-Tejgaon Flyover, highlighting the relative stability and insecurity of the respective communities. Please see the seven cases in a comparative visualization.

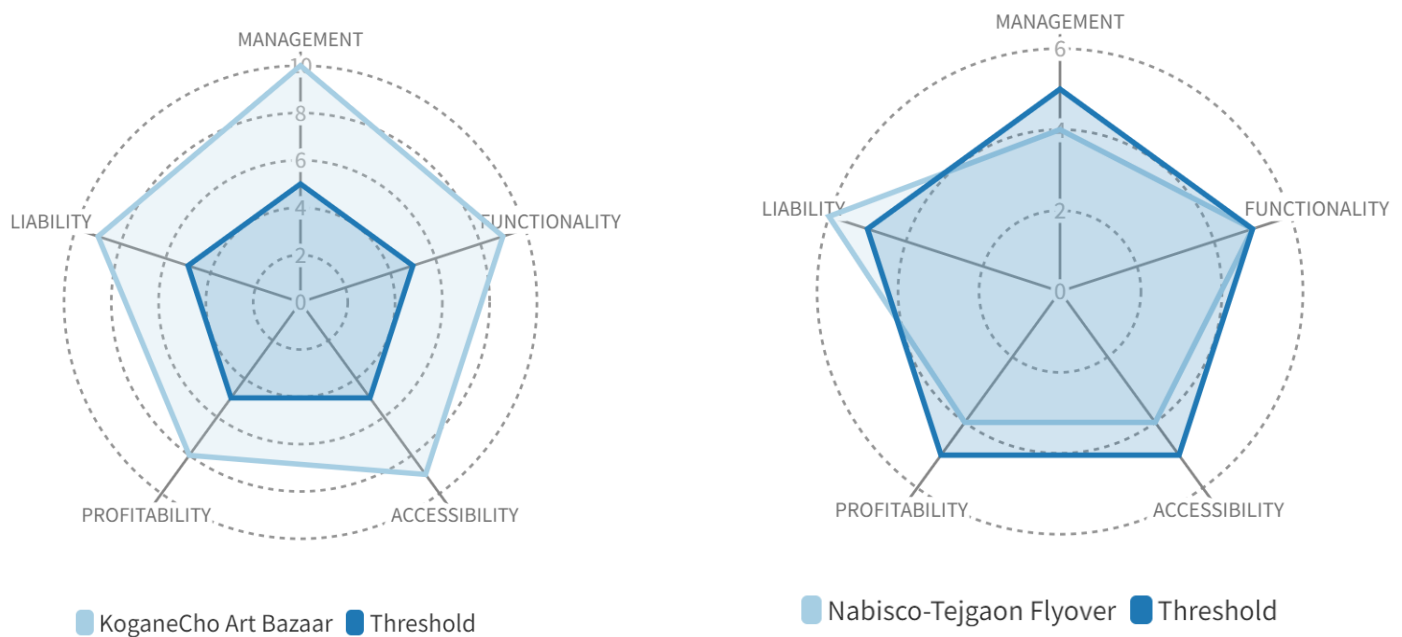


Figure 53: A safety margin and actual situation of the adaptation factors in Kogane Cho area management center and Dhaka Nabisco under flyover squatter. Later example is in the close proximity of eviction as its almost engulfed by the safety margin from eviction.

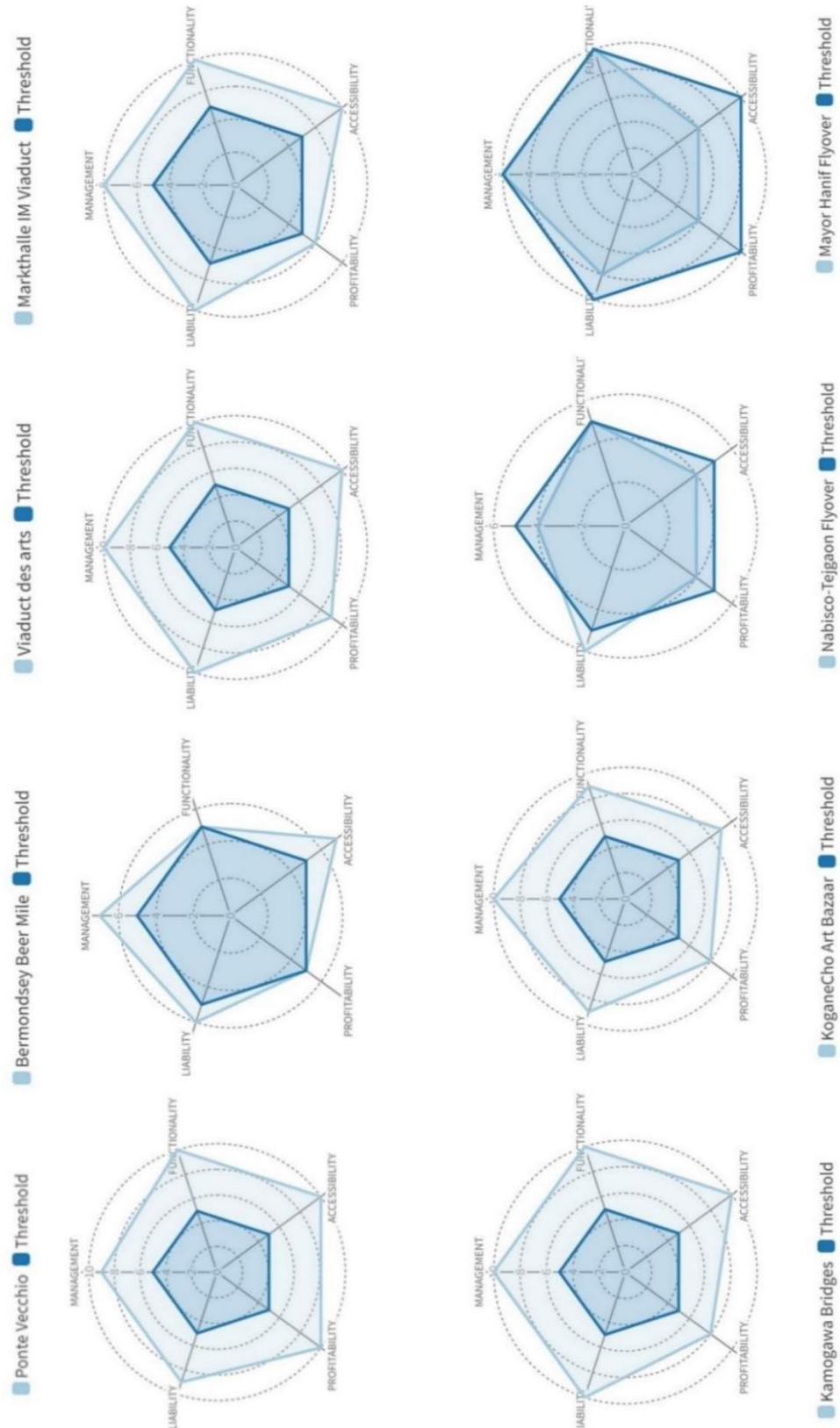


Figure 54: A safety margin and actual situation comparison of the seven case studies.

These radar charts provide a comparative analysis of various viaduct projects, further comparing with a safety margin from eviction and becoming liability. The dark blue zones indicate the eviction

margin, while the light blue zones show the current conditions of the projects and tenant situations. The Markthalle IM Viaduct and Viaduc des Arts projects demonstrate stability with balanced conditions across all factors, showing low eviction risk. In contrast, the Mayor Hanif Flyover and Nabisco Tejgaon Flyover face significant challenges, with factors near the eviction threshold, highlighting the need for improved management and functionality. Bermondsey Beer Mile shows good functionality and profitability but requires better management and accessibility. Ponte Vecchio serves as a model for sustainable coexistence with strong management and accessibility. Both Kamogawa bridges and KoganeCho Art Bazaar is secure with no immediate eviction risk. Overall, balanced management, functionality, and accessibility are crucial for the sustainable use of infra-residual spaces and preventing evictions.

4.3.3 Comparative Insights:

1. Ponte Vecchio vs. Viaduc Des Arts: Both exhibit high sustainability, but Ponte Vecchio has slightly higher profitability, making it a better model for commercial success.
2. Markthalle IM Viaduct vs. KoganeCho Art Bazaar: Both have high functionality and public engagement, but KoganeCho's unique cultural focus differentiates it in tenant satisfaction.
3. Both Bangladeshi cases are in severe need of subsidization or intervention

4.4 Lessons from case studies and field.

These are the core lessons learned from Chapter 04 survey and data collection:

1. Eventually, spaces generated by physical infrastructure (having social, commercial, and political value) cannot be overlooked for development, and this is a worldwide phenomenon.
2. Evictions can occur in any formal management trying to structure informality. It is better to assist the process transparently and justly rather than resist it. However unfair rent structure is an artificial crisis which can even occur in formalized structure. Therefore, transparency and public consultation is the key to maintain public spaces and control excess capitalism.
3. All stakeholders need to benefit at both city and viaduct scales for an infra-residual project to be sustainable in the long run. This includes maintaining inclusive access and an appropriate public-private space ratio as an urban space.

CHAPTER 5: FINDINGS AND RECOMMENDATIONS

"Chapter 5: Findings and Recommendations" provides a thorough "Analysis" (5.1) of factors from the case studies, relationships among these factors, and hypotheses represented through diagrams. It evaluates the implications of these findings and presents "Recommendations and Application of the Hypothesis" (5.2) tailored to the context of Dhaka, Bangladesh, offering strategies for better management and utilization of infra-residual spaces.

5.1 Findings

Following are the **two major findings** that will be discussed in this chapter.

Lesson 01: Factors & their relationship in infra-residual development cases.

Lesson 02: Findings & recommendation for sustainable infrastructural adaptations.

Both of these findings for the infra-residual spatial management is the outcome of the core investigation of this research. This circles back to our original research question and explain the process of a sustainable adaptation. We check the original objective & methodology to define infra-adaptations of the research in figure 55.

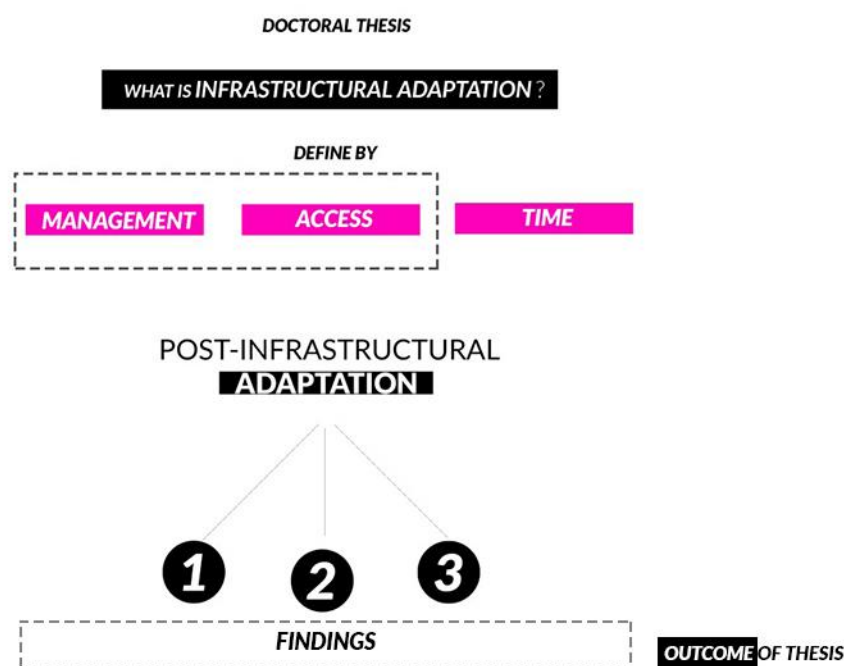


Figure 55: Doctoral Research Framework and research question

Following methods of analysing cases in a safety margin of eviction establish a relationship diagram (Figure 56-57) to establish interrelations among the factors and explains the point of eviction, subsidization , sustainable adaptation and other factors associated with infra residual space management.

5.1.1 Lessons 01: Factors & Their Relationship in Infra-Residual Development Cases.

Using methods of analyzing cases within a safety margin of eviction, the following diagrams establish interrelations among various factors, highlighting the points of eviction, subsidization, sustainable adaptation, and other aspects of infra-residual space management. These images illustrate the threshold of eviction, providing a basis for comparison and understanding of when eviction and unfair rent structure adjustments occur, and emphasizing the necessity for land value optimization. By examining these relationships, we can better understand the dynamics of eviction and the importance of sustainable management in infra-residual spaces and determine transparent land value rent structure.

(1) Graph to Explain Factor and Their Interrelationship

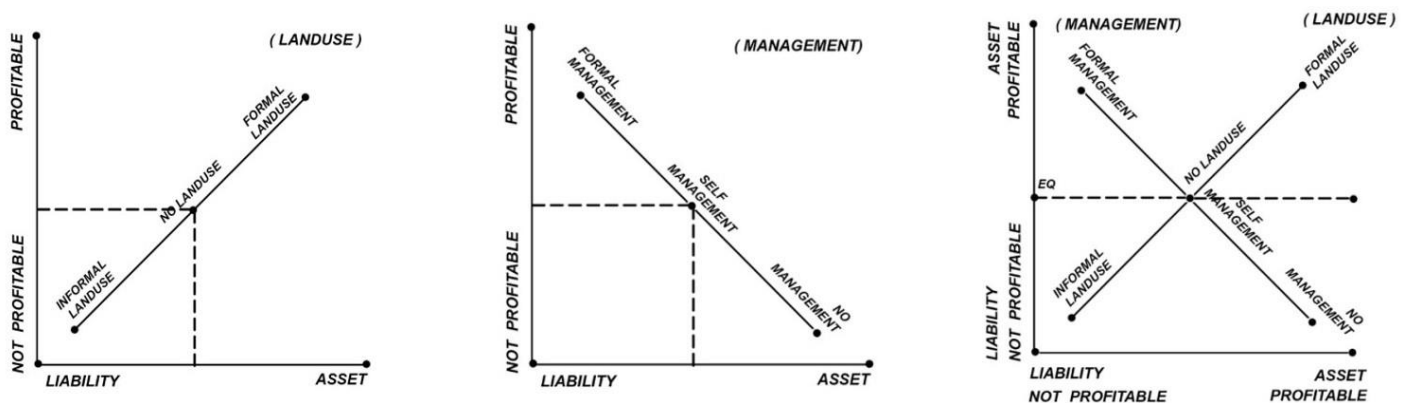


Figure 56: Relationship graph among factors of infra-residual adaptation.

These graphs in figure 56 illustrate the relationships among the five key factors: land use, management, profitability, liability, and asset value. In the first diagram, land use is depicted on an axis from informal to formal. Informal land use tends to be seen as a liability and less profitable, while formal land use is perceived as an asset and more profitable. The second diagram shows management types from no management to formal management. No management often correlates with higher liability and lower profitability, whereas formal and regulated self-management aligns with being an asset and more profitable. The third diagram combines both land use and management. It demonstrates that for infra-residual spaces to transition from liabilities to assets and from unprofitable to profitable, both formal land use and formal management are crucial.

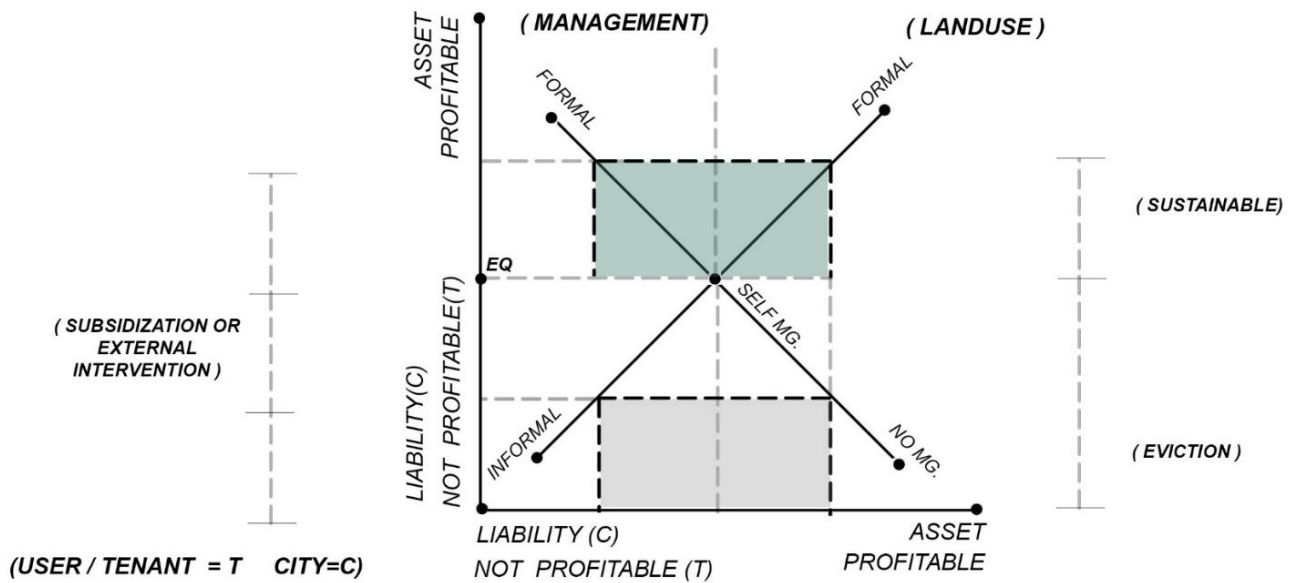


Figure 57: Relationship Diagram of Infra-Land use factors diagrams

This graph of figure 57 illustrates the relationships among land use, management, profitability, liability, and sustainability within infra-residual spaces. The vertical axis represents the profitability of these spaces, ranging from liabilities to assets, while the horizontal axis indicates the type of management and land use, spanning from informal to formal.

When examining the lower-left quadrant, we see that informal land use combined with no management results in spaces that are liabilities and not profitable. These conditions are prone to eviction due to the lack of structured oversight and economic benefit in addition to potentially becoming dark crime zone. To prevent crime and eviction, transitioning these spaces toward self-management or formal management is crucial. Subsidization or external intervention can play a significant role in this transition. By providing financial or structural support, self-managed spaces can stabilize and gradually evolve into formally managed entities.

Moving towards the upper-right quadrant, spaces with formal land use and formal management are shown as profitable assets. These spaces represent sustainable coexistence and adaptation, where both economic and social benefits are maximized. This sustainable state is reached when management is structured, and land use is planned, ensuring that all stakeholders, including tenants and the city, benefit equitably.

In the middle zone, self-management represents a transitional state where the spaces are neither complete liabilities nor full assets. With proper subsidization, self-managed spaces can improve their infrastructure and economic conditions, moving towards the upper-right quadrant. This external support helps in bridging the gap between informal and formal systems, promoting a gradual shift towards sustainability.

In conclusion, preventing eviction in infra-residual spaces requires **a combination of structured management, planned land use, and subsidization**. Formalizing management and land use

transforms these spaces into profitable assets, ensuring their sustainable coexistence with urban life. This approach benefits both tenants and cities, ensuring inclusive and productive urban environments.

5.1.2 Lessons 02: Findings & Recommendation for Infrastructural Adaptations.

Infrastructural residual spaces, such as those generated by viaducts and other physical infrastructure, hold significant social, commercial, and political value that cannot be overlooked in urban development. This research establishes **three key findings as recommendations for managing such spaces, particularly in the context of Dhaka Bangladesh cases**. Firstly, **eventual development of cities must recognize the inherent value of these spaces**. Secondly, **ownership and management structures, whether privatized or state-owned, should incorporate local councils for land-use guidance to ensure area-specific needs are met**. Lastly, **implementing a transparent rent structure based on rent arbitration and cost-to-income ratios, rather than market-driven willingness to pay, is essential for both public and commercial uses**. This approach will facilitate equitable and sustainable development of under-viaduct spaces, ensuring their effective integration into the urban fabric. The three hypotheses are graphically presented as follows.

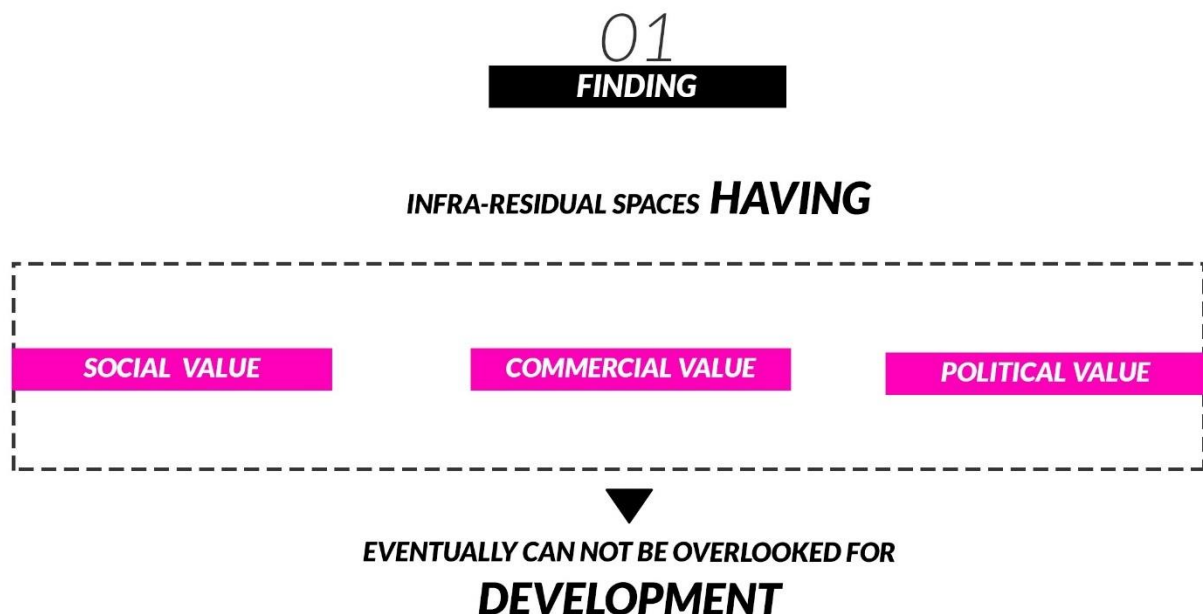


Figure 58: Finding 01 diagram

Finding 01: Eventually spaces generated by physical infrastructure (having social, commercial and political value) **cannot be overlooked** for development and it is a worldwide phenomenon.

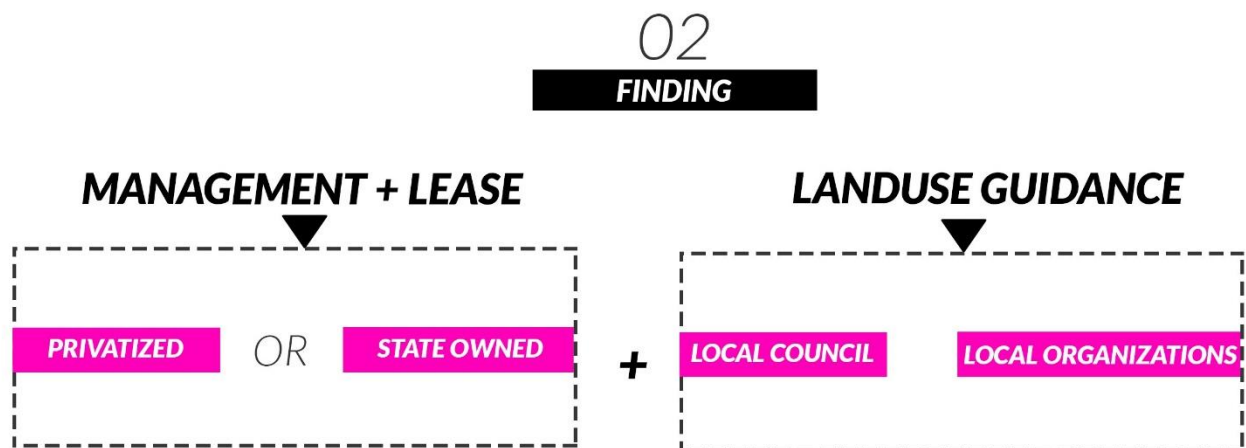


Figure 59: Finding 02 diagram

Finding 02: While developing an infrastructural residual space, the ownership and management may go **under either privatized or state owned organization**. Whether state owned or privatized, the management system needs **to integrate local council** for area specific land use guidance.

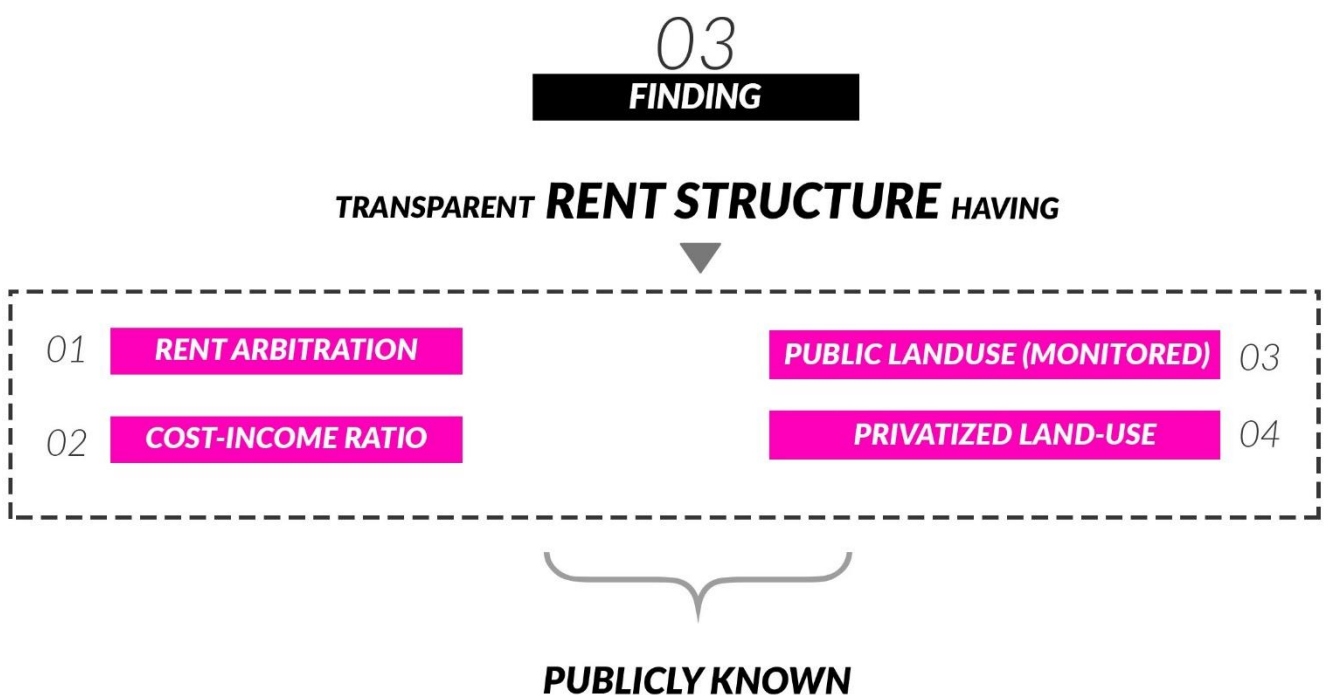


Figure 60: Finding 03 diagram

Finding 03: A transparent rent structure which is based on rent arbitration and appropriation for residual spaces based on cost-to-income ratio, **not what one is willing to pay-is** required for both public space and commercial space usages. As a public space, there should be provision for **monitored public usages for under viaduct spaces**.

5.2 Application of the Recommendations in the Context of Global South Case of Bangladesh

As part of Global Environmental Management Activities for the doctoral course, In 2022-2023, author had the opportunity to serve as a consultant for the inception report of Mayor Hanif Under Flyover Beautification Project in Dhaka, Bangladesh. This project aimed to transform the underutilized spaces beneath the flyover into vibrant, functional areas, leveraging the three core hypotheses developed through my research. These hypotheses emphasize the importance of integrating social, commercial, and political values in infrastructure development, ensuring a balanced management system that involves both privatized and state-owned entities with local council guidance, and establishing a transparent rent structure. The project focused on creating a sustainable, inclusive environment that aligns with these principles, aiming to enhance urban life and prevent issues like eviction and mismanagement. **Core concept for the project is creating a system for the infrastructural adaptation ensuring safety, usability, management and cultural beats of Dhaka and the parts of Dhaka that the flyover touches upon.** This can be illustrated as in figure 61.

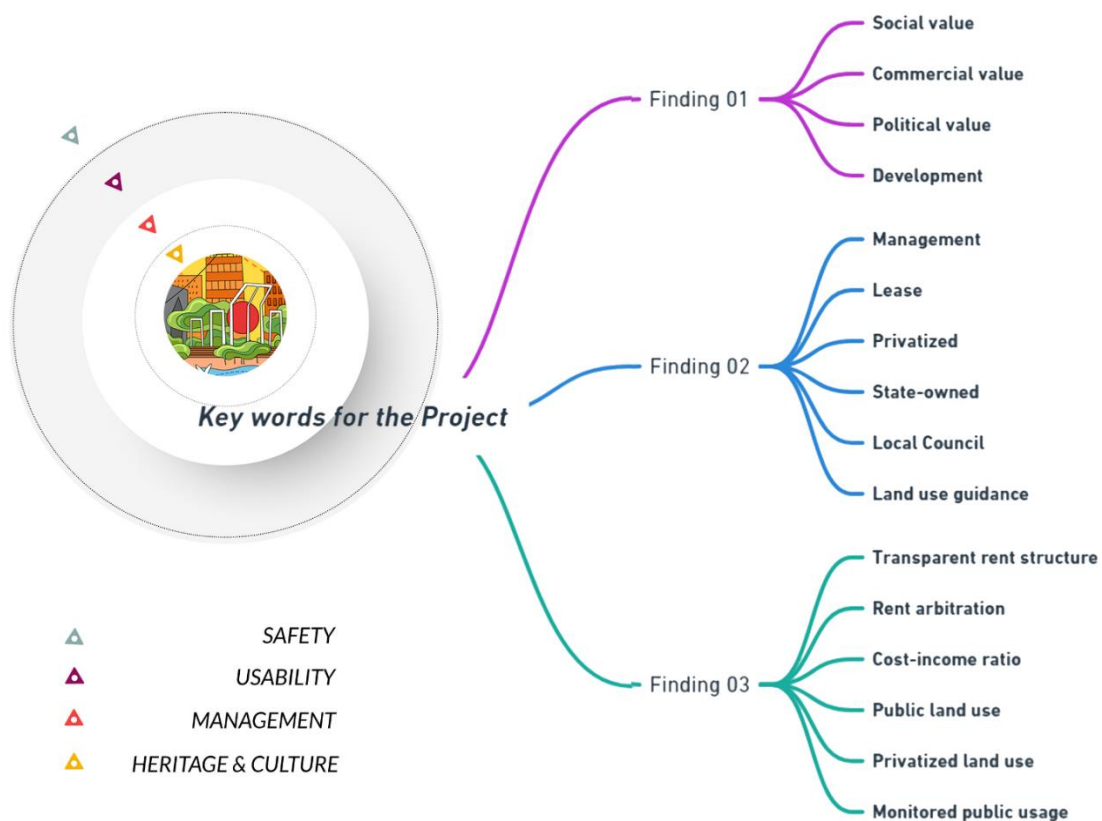


Figure 61: Concept for inception report for Mayor Hanif Under flyover beautification project connecting the findings 01, 02, 03

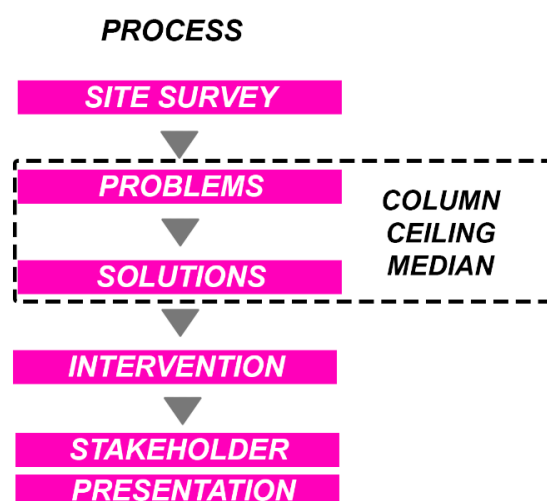


Figure 62: Example project process Mayor Hanif Under flyover beautification project

The Dhaka South City Corporation (DSCC) has issued a Request for Expression of Interest (EOI) for consultancy services aimed at the beautification and urban design of areas beneath the Tejgaon Nabisco Flyover(Ref No: 46.207.000.09.27.178.2021-209). This project is part of a broader effort to repurpose residual spaces created by transportation infrastructure, transforming them into functional and aesthetically pleasing public spaces. The goal is to enhance the urban environment by addressing both the social and economic aspects of these areas. Process of the project follows the figure 62 steps.

The key stakeholders involved in this project include the DSCC, Next Door Consultant, and local community members. The DSCC is responsible for the overall project management and implementation, ensuring alignment with city planning and development goals. Next Door Consultant, serving as the consultancy firm, brings expertise in urban design and architecture to the project. Additionally, local community members and business owners are engaged to ensure the project meets their needs and contributes positively to the community. Kindly refer to Figure 49 for the stakeholder dynamics

The scope of the project encompasses a detailed analysis of the existing conditions, development of preliminary and detailed design plans, and supervision of the implementation phase. The consultancy team will conduct surveys, prepare CAD drawings, and engage in stakeholder consultations to develop a comprehensive plan. This includes landscaping, public space utilization, and creating a cohesive design that integrates with the surrounding urban fabric. The aim is to create vibrant, accessible, and sustainable spaces that serve the local community and contribute to the overall beautification of Dhaka.

5.2.1 Project Execution Process

The process followed for the execution of the project under the Dhaka South City Corporation involved a detailed and methodical approach to identifying and addressing issues related to the flyover infrastructure (Figure 61). The steps involved in the process are as follows:

1. **Site Survey:** A comprehensive site survey was conducted to gather data and understand the current conditions of the flyover and its surroundings. This involved both visual inspections and technical assessments to identify various issues.

2. **Problem Identification:** The survey revealed several problems associated with different parts of the flyover: (Figure 62-63)

- **Column:** Problems included garbage dumping, extensive posterage, waste disposal, and public urination, leading to unhygienic and unsightly conditions. As shown in figure 63.

- **Median:** Issues identified were vendors and hawkers creating congestion, illegal encroachment, unhealthy environments, illegal parking, and heavy construction activities obstructing views and future urban development. (figure 64)

- **Ceiling:** The ceiling surfaces were marred by advertisements, wall writing, and posters, contributing to visual pollution.

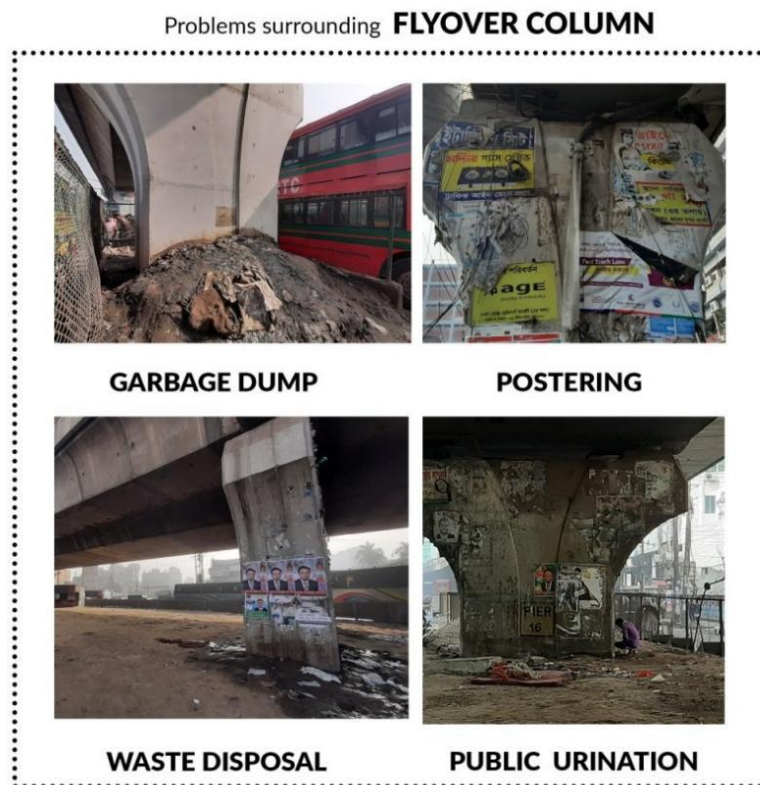


Figure 63: Problems generated in Under flyover Column element

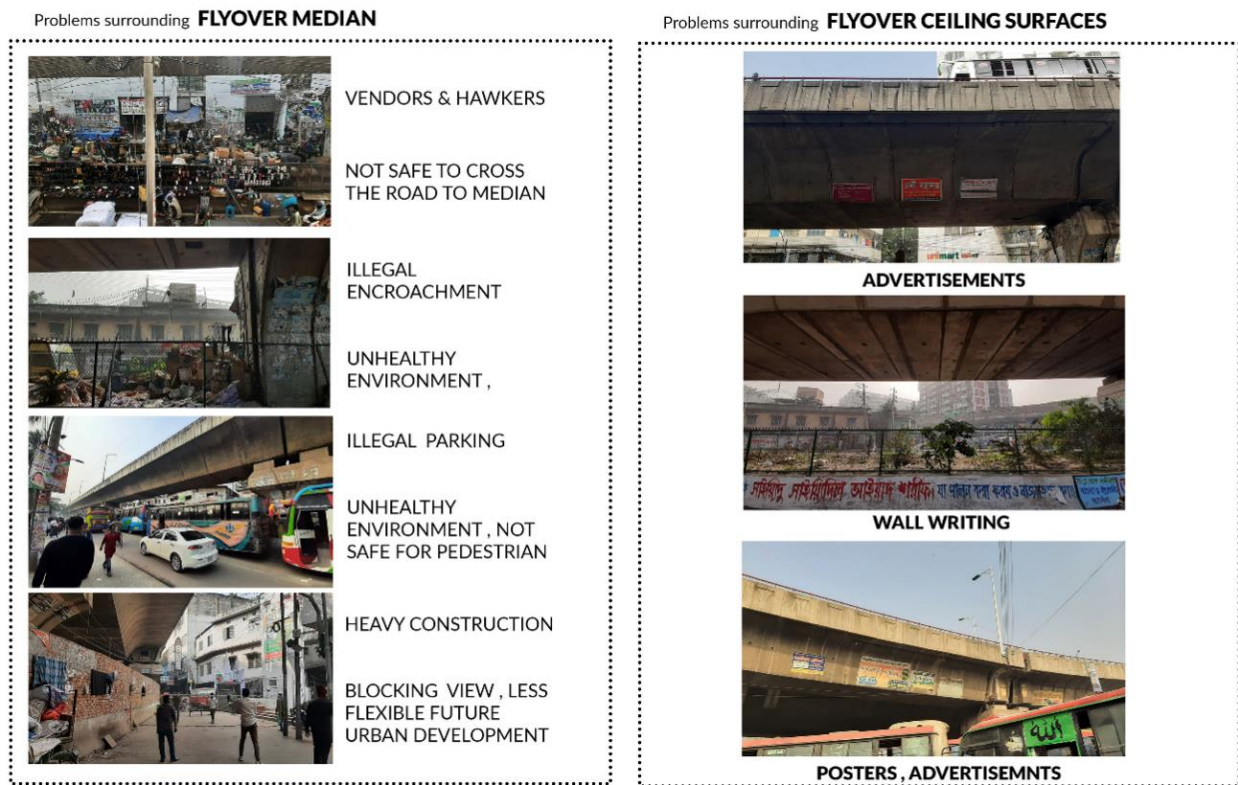


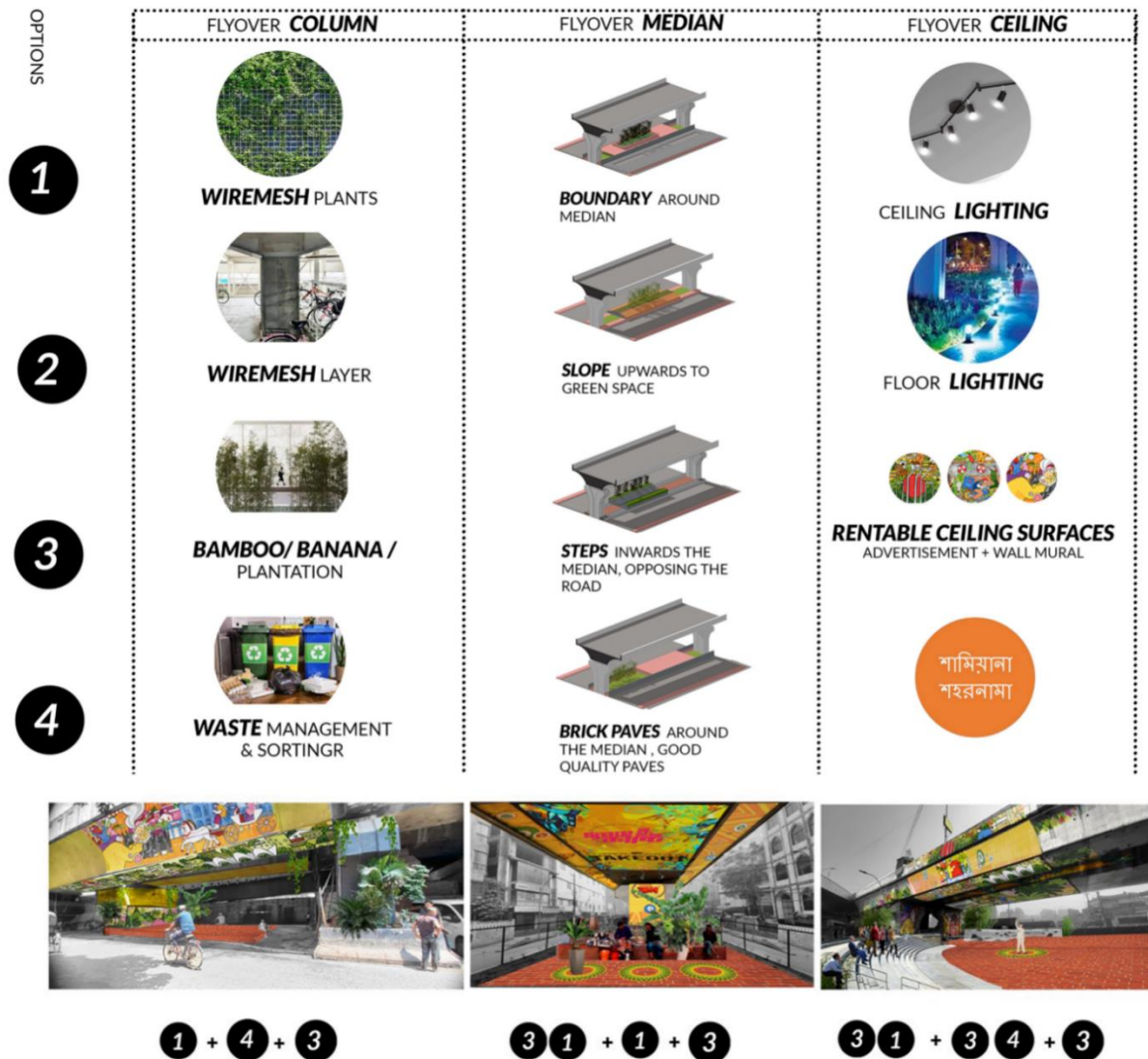
Figure 64: Problems generated in Under flyover median and ceilings

3. Solutions: After identifying the problems, suitable solutions were proposed(Figure64) . These solutions aimed at cleaning up and maintaining the flyover areas, implementing regulations to control illegal activities, and beautifying the spaces for better public use.

4. Intervention: Interventions included practical steps such as cleaning and regular maintenance, installing proper waste disposal systems, regulating the use of space under the flyover, and implementing design features to enhance the area's aesthetic and functional value.

5. Stakeholder Presentation: Finally, the proposed solutions and interventions were presented to the stakeholders, including local government bodies, community representatives, and other relevant parties, to ensure buy-in and collaborative effort in the execution of the project.

This structured process ensured a thorough understanding of the site-specific issues and the development of targeted interventions to transform the flyover space into a more functional and aesthetically pleasing urban environment.



SOLUTION MATRIX : PERMUTATIONS AND COMBINATIONS ACCORDING TO CONTEXTS

Figure 65: A solution matrix addressing problems in the three elements and incorporating lease able flyover surface through integration of local commerce and local culture

The solution matrix (Figure 65) for the Mayor Hanif Under Flyover Beautification Project proposes a variety of innovative strategies tailored to different urban conditions beneath the flyover. It includes permutations and combinations of elements such as wire mesh plant installations, waste management systems, bamboo and banana plantations, and lighting solutions for both the median and ceiling areas. This approach aims to enhance the aesthetic and functional value of the space through adaptable solutions that cater to the specific needs of the area. The matrix emphasizes flexibility and context-specific design, ensuring that each segment of the under-flyover space can be optimized for public use, environmental sustainability, and economic benefit. By integrating these diverse elements, the project aspires to create a vibrant and engaging urban environment that supports community activities and improves the overall quality of urban life.

5.2.2 Flyover Ceiling as a Leasable Surface (the core idea): Co-Operative Surface Lease System

The management process for the ceiling and surfaces of the flyover incorporates a creative and sustainable approach to urban space utilization, fostering a sense of community ownership and economic activity. The process is structured as follows:

1. Conceptualization and Design:

Local artists are commissioned to capture the essence of the community's heritage, culture, food, and other contextual elements. These themes are then transformed into vibrant mosaic artworks that will adorn the ceiling and surfaces of the flyover. The aim is to create a visually appealing and culturally significant environment that also functions as an advertisement and local icon.

2. Implementation of Artworks:

The designed mosaic tiles are installed on the ceiling and surfaces of the flyover, covering the entire segment. This not only enhances the aesthetic value of the space but also promotes local culture and history, making the area a landmark for both residents and visitors.

3. Leasing to Local Businesses:

The surface spaces with installed mosaic artworks are leased to local business stakeholders for a specified period, typically several months. This provides businesses with a unique advertising platform while supporting the local economy. The leasing process is managed by the local council, which maintains a detailed list of available viaduct spaces for advertisement leases.

4. Cyclic Economy and Maintenance:

After the leasing period ends, the mosaic tiles are recycled and leased to other companies, ensuring a continuous cycle of use and economic activity. This cyclic approach minimizes waste and maximizes the utility of the space. The local council oversees the maintenance of these areas, employing local residents for upkeep tasks. This not only ensures that the spaces remain clean and well-maintained but also fosters a sense of belonging and community ownership among the locals.

5. Community Engagement:

The engagement of local artists and the employment of residents for maintenance activities create a deeper connection between the community and the project. By involving locals in the management and upkeep of the space, the project instills a sense of pride and responsibility, further enhancing the social value of the infrastructure.

6. Monitoring and Evaluation:

The local council regularly monitors the condition of the mosaic artworks and the effectiveness of the advertising spaces. Feedback from business stakeholders and the community is collected to assess the impact and identify areas for improvement. This iterative process ensures that the project remains responsive to the needs of the community and continues to provide value.

Through this structured management process, the project not only beautifies the flyover spaces but also integrates economic, social, and cultural elements, creating a sustainable and vibrant urban environment. Visualizations of such concepts are presented in Figure 66.



Figure 66: Visualization of surface renting through lease by local commercial organizations to create sense of belonging and infra residual asset

5.2.3 Findings Integration on the Infra-Residual Management Concept

The project integrates concepts from three key hypotheses to create a comprehensive approach to the development and management of infra-residual spaces. The first hypothesis focuses on recognizing the social, commercial, and political values of these spaces, ensuring they are not overlooked in urban development. This is achieved through the commissioning of **local artists to capture the community's heritage, culture, and food in vibrant mosaic artworks**, which are then installed on the flyover's ceiling and surfaces, transforming the area into a local icon and advertising platform. The second hypothesis **addresses the management and leasing of these spaces, emphasizing the need for either privatized or state-owned management systems** to work closely with local councils for specific land use guidance. The local council manages the leasing process, maintains a list of available viaduct spaces, and oversees the maintenance of these areas by employing local residents, fostering a sense of belonging and community ownership. The third hypothesis advocates for a transparent rent structure based on rent arbitration and cost-to-income ratios, ensuring fair and monitored usage of both public and privatized land. The surface spaces are leased to local business stakeholders for several months, and after the leasing period ends, the mosaic tiles are recycled and leased to other companies, creating a cyclic economy. **This approach minimizes waste, maximizes the utility of the space, and supports the local economy**, while the **local council regularly monitors the condition of the artworks** and the effectiveness of the advertising spaces to ensure the project remains responsive to the community's needs and continues to provide cultural and commercial value. See figure 67 for detail category.



Figure 67: Methods to incorporate stakeholders through flyover residual space art advertisements

5.3 Public Evaluation of the Example Project: Example Outcome and Public Response At Dhaka

The project inception report was presented to the mayor of Dhaka South City Corporation and members of both Dhaka city corporations in Dhaka on January 23, 2023 (figure 68). The report was specifically prepared for the Dhaka South City Corporation. As of April 27, 2023, several similar executions have been carried out on flyovers in the Dhaka North City Corporation area. In April 2024, additional locations implemented superficial surface coloration to adorn the flyovers. However, detailed cyclic economic proposals have not yet been implemented or considered. The hypotheses have been partially implemented on a separate flyover. As of July 2024, the process remains steady but is currently on a budgetary halt. Author considers these interventions not as a direct outcome of the inception report rather a passive byproduct of the proposals.



Figure 68: Dhaka South City Corporation Mayor presentation of the report on **23 January 2023**

5.3.1 Evaluation of the Project: Public Evaluation at Social Media

Figure 69 shows the Dhaka Flyover beautification project (February 02 , 2024 Dhaka Tribune report) and the proposal images (January 23, 2023).

The public reception of the surface artwork concept on infrastructure, as evidenced by a Facebook post from The Business Standard, shows a highly positive response. The post, highlighting the street art on Mohakhali Flyover in Dhaka North City Corporation (DNCC), received a total of 5.3K reactions, including 3.3K likes, 1.6K loves, 158 wows, and 148 other reactions, indicating widespread appreciation. The artwork, implemented to mark Victory Day, has been well-received, as demonstrated by the 66 comments and 243 shares, reflecting the community's enthusiasm and support for beautifying urban spaces through creative initiatives. This positive feedback underscores the project's success in enhancing the aesthetic appeal and cultural vibrancy of the city's infrastructure.

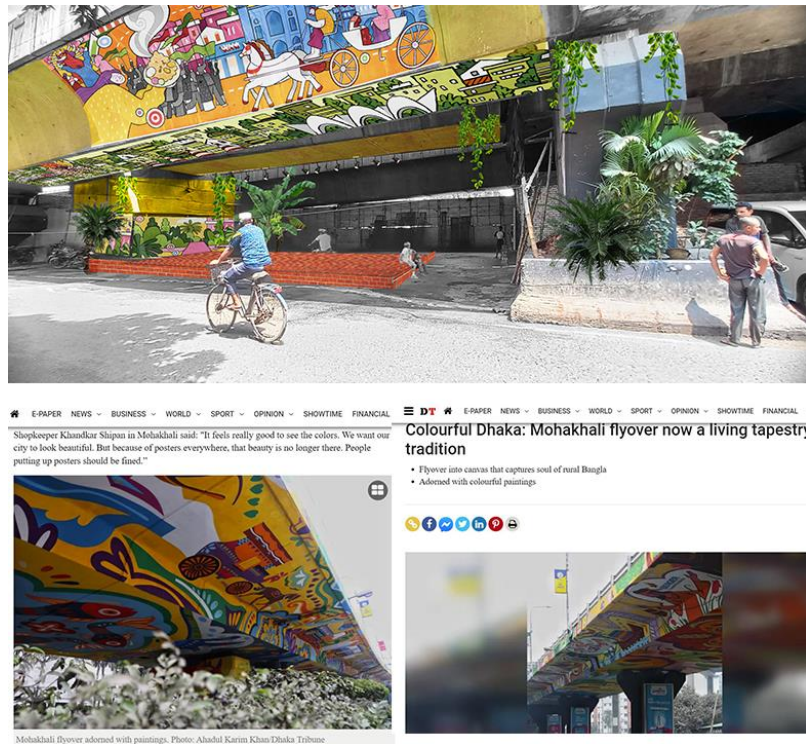


Figure 69: A before after scenario and comparison of proposal vs reality, news in 2 Feb 2024. Upper visualization picture by author in his January 2023 inception report for Dhaka Flyovers

5.3.2 Challenges of the Project:

In Dhaka, Bangladesh, city corporations face numerous challenges in executing large-scale projects. One significant issue is the separation of responsibilities among various stakeholders. As of 2023, during the time of this research, bus operations are controlled by the police. In pursuit of profit, buses often stop arbitrarily along roads to pick up passengers, contributing to traffic congestion and unsafe road conditions. Lack of specific bus stop hinders several development activity to be implemented. Implementing such projects, while successfully integrating local businesses, is complicated by the involvement of various unrelated entities that seek to profit but bear minimal responsibility for the overall system. Additionally, the decentralization of power further exacerbates this issue, allowing organizations to sidestep public safety responsibilities and diminish their accountability.

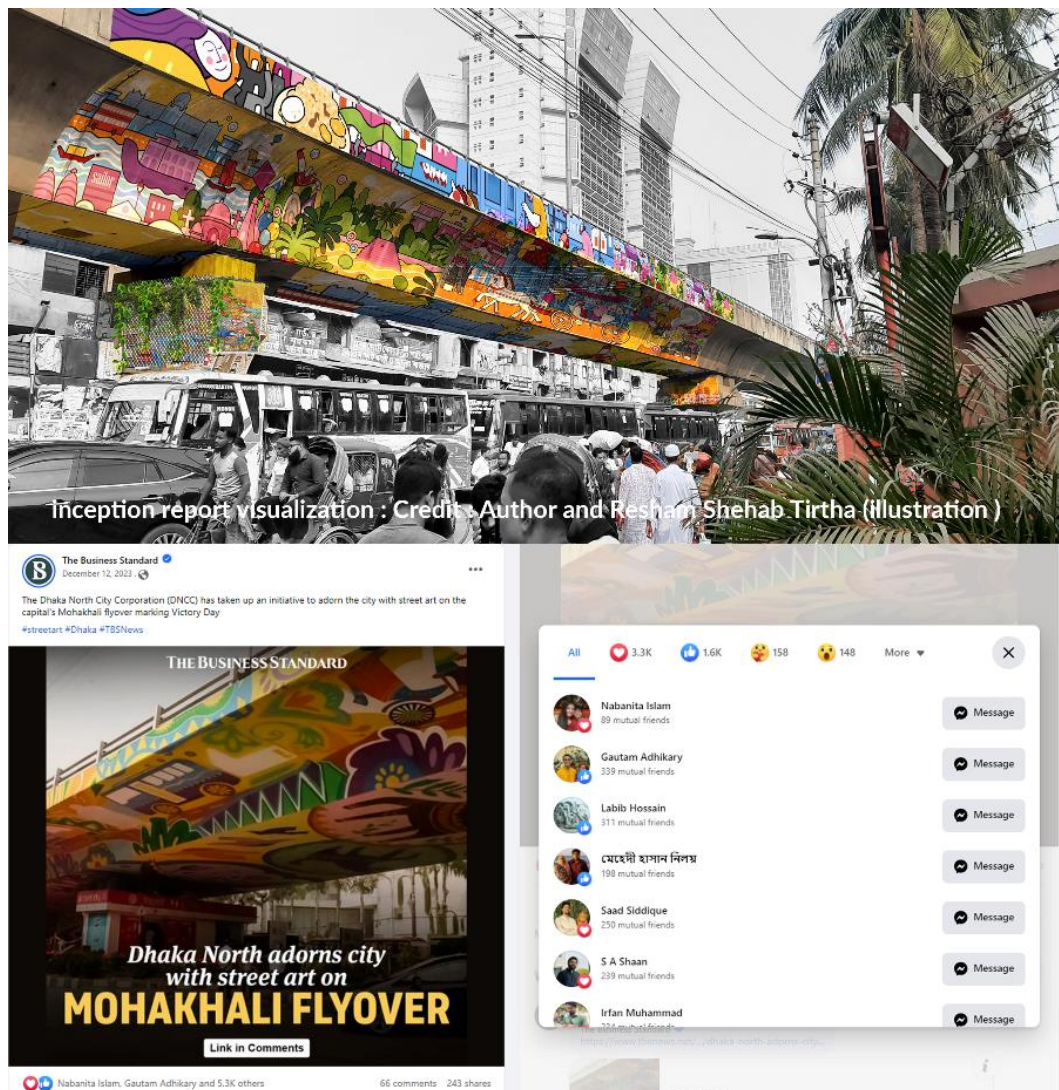


Figure 70: A facebook post of the project through newspaper “The Business Standard” on December 12 2023 and large positive public reception of the project in Mohakhali flyover, Dhaka

5.3.3 Self-Evaluation:

The example project is ongoing and requires more structural organization and further information to be gathered and categorized. The project has not implemented flyover surfaces as an advertisement to income review through a lease system. The project site has been changed but the core concept is similar. However, it marks a significant beginning, and the author is hopeful for positive urban renewal through infra-residual space management that benefits all stakeholders. For now the outcome is only superficial at best and requires further stakeholder integration. Figure 70 denotes an expression of public reaction through the Facebook post of the business standard with over 5 thousand positive response for the surfacecolorization. This shows publics acceptance of culture , heritage as a placemaking element for infrastructures emotional expression.

Chapter 6: Conclusion

6.1 A Discussion on the Nature of Infra-Residual Spaces (IRS): A Summary

Based on the findings from the previous chapters and methodologies followed in this dissertation, the author would like to introduce the term IRS, short for Infra-Residual-Spaces, in this conclusive chapter. This dissertation has explored the complex nature of Infra-Residual Spaces (IRS) and their evolving role in urban contexts. IRS, often characterized as leftover spaces created by large-scale transportation infrastructures, present unique opportunities for urban adaptation. The research highlights the important value of infrastructural residual spaces (IRS). It puts forward three main ideas: First, the social, commercial, and political value of these spaces must be recognized for future development. Second, whether owned by private or public organizations, the management should involve local councils to address specific local needs. Third, a clear and fair rent system should be based on actual costs and income, rather than what people are willing to pay, ensuring these spaces are used fairly and sustainably. A short summary of the activities and achievements are as follows- (please see the appendix for further clarification)

Table 14: Activity , methodology and achievement chart as a summary of the research

Activities	Methodologies	Academic Achievement	Management Achievements
Field Survey Dhaka Nabisco Site	Participatory Action research	Article at Springer Nature	Organization of PAR with 33 sample living under the flyover
Yokohama Koganecho Internship	Interview, Art Curation , case study documentation	Master's thesis recommendation, Doctoral thesis hypothesis	Internship as assistant art curator and organize interviews to collect data
Organization of Symposium on the Post Infrastructural Adaptation topic	Yearly Lecture series , Google form survey	Doctoral thesis hypothesis	Organizing curated lectures with established network of infrastructure scholar and practitioners
Consultation of Dhaka Mayor Hanif Flyover beautification project : Inception Report	Site Survey and analysis of problems, Stakeholder meeting, report	Grant as Primary Investigator, Doctoral thesis hypothesis & recommendation of Global south	Consultation of large scale project concept and design direction considering global south challenges.

	preparation , mayor presentation		
Academic affiliate program: 1. ETH Zurich D-Arch, Switzerland 2. Bartlett CASA, UCL , The UK	Site Survey and documentation, Interview of resource person, Academic activities	Grant as Primary Investigator, Doctoral thesis and upcoming article publication	Management of internship program from GSGES doctoral course of environmental management. Planning and execution of field survey and interviews

Through a methodology focused on ethnographic surveys and case studies, the research has revealed that the commodification of IRS as a high-value product without recognizing their unique social and environmental features can disrupt the balance between urban mobility and local community needs. The central question—whether IRS should be treated as marginal or high-value spaces—sets the foundation for future policy recommendations, advocating for place-making strategies that are sensitive to both economic imperatives and the local community's needs. Appendix will elaborate more on the achievements and outcomes as part of the research management and academic activities.

6.2 The Feature vs. Product Problem of IRS: Next Question

This research has illuminated the parallel challenges faced by IRS in both the Global South and Global North, albeit through different lenses. In rapidly urbanizing cities of the Global South, IRS is often subject to informal uses, leading to issues such as eviction and unfair rent adjustments. These spaces are frequently caught between local socio-economic demands and the lack of formal management, leading to their marginalization. In contrast, the Global North faces a different set of challenges. As transportation infrastructure ages, IRS under these structures require increasing maintenance costs. The question of IRS value persists as cities grapple with the costs of maintaining these spaces while determining how they can be repurposed or redeveloped to benefit urban growth. In both contexts, the absence of a clear value-based pricing system has created inefficiencies in IRS utilization. By drawing commonalities between the Global North and Global South, this dissertation has underscored the importance of IRS as a valuable feature of urban infrastructure, regardless of the socio-economic context. Both regions require policies that can adapt to the evolving demands of IRS, including fair pricing, inclusive design, and sustainable management. So what should we focus next that can look into this topic holistically and from a general perspective? One key question can be - Are IRS a product or a feature? To clarify further land value adjustment arguments, we need to define the terms "feature" and "product" within the scope of the research. Many of the problem statements (eviction, unfair rent structures, unjust management regimes) and issues observed in these cases stem from the undetermined nature of the value of IRS.

If Facebook is considered a feature of a smartphone, which is the product, can IRS be viewed as a feature of transportation infrastructure? If so, the price of a feature and the price of a product need to be balanced and determined respectively. As the hypotheses dominantly assert the formal land use nature of IRS, it is imperative to examine this feature with the aim of providing a structure to rate its

value. Determining whether IRS are a product or a feature will help address the challenges in managing these spaces and set a foundation for fairer and more effective utilization.

6.3 Future Research Directions: Policy, limitations and Methodological Recommendations

6.3.1 Focus on the Global South, Value-Based Analysis & Sustainable IRS Practices:

For rapidly developing cities, preemptive planning is crucial to prevent IRS-related issues from escalating. Future research should explore methodologies that can help cities with new infrastructure establish frameworks for IRS management early in the development process, thereby avoiding the pitfalls experienced by more developed regions. There is a need for standardized value assessments for IRS. Creating guidelines for the pricing and management of these spaces will ensure fairness for landowners and affordability for tenants. Such research can help resolve the ambiguity between IRS being treated as either a product or a feature, offering a clearer framework and transparent rent structure for their valuation. Further case studies on the long-term management of IRS are needed, particularly those focusing on public-private partnerships. These case studies should emphasize sustainable management practices, ensuring that IRS serves not just as leftover spaces but as integral components of the urban ecosystem.

6.3.2 Limitations

The research could be benefitted further with the integration of existing laws from the respective city council. Furthermore, the research can incorporate more global south perspectives like cities in Thailand, India, Brazil and some other latin American cities. Lessons from these regions of the world is planned for future scope and needs to be studied in the similar methodologies for comparative purpose. Integration of findings are a continuous process and therefore projects and research outcomes needs to be updated regularly.

6.3.3 Concluding Remarks

This dissertation has shown that IRS is far more than mere leftover spaces in urban environments. They hold significant socio-economic potential if managed and utilized effectively. The potential for IRS to contribute to socio-economic development is vast, but it requires a concerted effort from policymakers, urban designers, and the local communities to realize it. The fundamental condition for any IRS management is its balance of top-down management and local value integration. As infrastructure continues to evolve, so too must the strategies for managing IRS. This research calls for global collaboration in the creation of adaptable policies that can accommodate the evolving nature of IRS across different urban contexts. Only through an integrated approach can IRS fulfill their potential as valuable urban assets.

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Appendix 1: Nature Springer Publication

Content: Participatory action research on Nabisco Under flyover squatter community and lessons learned from the case.

Post Construction Infrastructural Adaptation of Social Practices in Dhaka's Under Flyover Spaces

Srijon Barua¹ and Hirohide Kobayashi²

Corresponding Author: Srijon Barua¹

Contributing Author: Hirohide Kobayashi²

¹PhD Candidate, Global Environmental Architecture Lab, Graduate School of Environmental Studies, Kyoto University, Kyoto, Japan. Email: Srijonbarua42@gmail.com

²Professor, Graduate School of Environmental Studies, Kyoto University, Kyoto, Japan. Email: kobahiro@archi.kyoto-u.ac.jp

Post Construction Infrastructural Adaptation of Social Practices in Dhaka's Under Flyover Spaces

Abstract:

Transportation infrastructures often impose a rigid and controlled formation over the organic dynamism of urban areas. This blend of infrastructure and urban context redefines transportation systems beyond their purely functional roles, creating opportunities for new land uses, social interactions in spaces beneath them. The management and adaptation of these urban void spaces under elevated infrastructures can become either assets or liabilities, particularly under the unique conditions prevalent in the Global South Megacities. Using participatory action research datasets and zoning models, this study explores the spatial relationships between physical infrastructure and its contextual accommodating opportunities. This article highlights how the squatter community under the Tejgaon-Nabisco Flyover in Dhaka, Bangladesh, autonomously organizes and utilizes these spaces, fostering adaptive place-making and developing local economic practices supported by the flyover's structural elements.

Introduction

Infrastructure is an expansive term and is used in various ways in academic literature based on applicability. Its conventional definition and usability refer to essential utilities and services like roads, water systems, telecommunications, electricity, and drainage systems, which, when interconnected, create an efficient and functional urban environment [1]. Physical infrastructure, such as power, irrigation, and transport, is essential for production sectors, while in contrast social infrastructure, including education and health, is crucial for human development and economic growth of a nation [2]. This research delves into the social and economic implications of flyover viaducts, examining how they impact urban social practices and how strategic management of these spaces can provide value for both the city and the infrastructure itself. When placed in a densely populated mega-city, flyovers can serve as a critical physical element that controls the natural dynamics of the context, potentially impacting the concurrent situation. Such transportation infrastructure, by its imposition, acts akin to a form of colonization—introducing new systems into preexisting urban fabrics. This phenomenon represents an adaptation of contextual social practices due to the presence of flyover infrastructure.

Transportation infrastructure has traditionally been designed with a singular purpose in mind, aimed at serving geopolitical and economic objectives. Often, this approach has led to adverse outcomes, including disrupted landscapes, the defacement of retrofitted constructions, and the loss of cultural and natural heritage [3]. In contemporary global policy, infrastructure projects have become central, recognized as the primary domain for public investment [4], and pivotal for shaping privately financed urbanization [5]. The complexity of modern infrastructure blurs disciplinary boundaries among landscape architecture, urban design, civil engineering, and architecture, challenging conventional planning and design norms. The significance of strategic planning, efficient decision-making, and the availability of data are underscored as essential for mitigating traffic congestion and facilitating sustainable infrastructure development. It effectively touches many areas of our modern lives [6][7].

Throughout history, infrastructural developments such as Roman aqueducts, castle walls, and medieval bridges have not only served their primary functions but have also been integral to social, commercial, and residential life. Examples like the Berlin Hochbahn, Água de Prata Aqueduct, Ponte Di Rialto, Ponte Vecchio, Pont Notre Dame, Viaduct des arts, etc. illustrate this multifaceted utility. In the Global South, similar adaptability is observed with the Flyover Pelangi in Antapani, Indonesia, the Matunga flyover in Mumbai, India, and many more. Prasetyo [8] highlights the reclamation of under-flyover spaces in Bandung, Indonesia, for community activities, paralleled by Wang's [9] account of vegetable markets under flyovers in Changchun, China. Urban infrastructure management is a multifaceted challenge influenced by social, economic, and environmental factors. The complexity of managing interlinked systems such as water, energy, transportation, and land use demands a holistic and sustainable approach [10] [11]. The integration of green infrastructure is essential for enhancing urban quality of life [12] (12), while community management in developing nations addresses service provision gaps for the urban poor [13]. These instances of **"infrastructural adaptation"** of social practice signal a recurring theme of spatial re-purposing, yet the systematic management of such spaces in informal mega-cities remains relatively under-explored.

Historically urban planners, architects, sociologists, and urban thinkers have tried to explain the post-construction infrastructural usage phenomenon and its after-effects in many different forms and illustrations. Rem Koolhaas, in his famous 2002 article entitled “Junk space” stated the aforementioned phenomenon in one of the most useful metaphoric ways possible. To quote him “The product of modernization is not modern architecture but junk space. Junk space is what remains after modernism has run its course. If space junk is the human debris that litters the universe, Junk-space is the residue that humans leave on the planet”. Koolhaas further elaborates by asserting that modern architects and engineers have created more architecture than all the history together. Hence the junk space or such post-construction infrastructural residue spaces are the total of our current tangible infrastructural mass.

The development of highways and roads has been a key driver of economic and social change, with a focus on the benefits to users and the community [14]. However, this perspective has been criticized for its limited view, with calls for a more holistic approach that considers local innovations and negotiations [15]. This is particularly relevant in the context of modern urbanism, where the integration of road infrastructure with the city is crucial [16]. The construction of roads and highways also provides valuable insights into the formation of urban fabric and state [17]. The famous 1968 Lower Manhattan Expressway conflict between Jane Jacobs and Robert Moses highlighted contrasting visions for urban development: top-down, large-scale infrastructure projects versus preserving existing communities and prioritizing public needs. Jacobs believed that existing buildings and the organic layout of streets were valuable assets to a city, fostering a sense of community and social interaction.[18]. Koolhaas, in the 1990s, provides an alternative perspective which states that this phenomenon is neither negative nor positive, it is just an **inevitable byproduct of urbanization that necessitates coexistence** [19]. In modern times, an infrastructural future is inevitable, especially with the massive scale construction of transportation infrastructures in the current urban conjuncture. Therefore, the need to accommodate the values of local communities in the post-construction infrastructural context demands an understanding of Jacobs' concepts now more than ever to ensure a human-centered approach to infrastructural planning and adaptation. This research examines one similar case in Dhaka, Bangladesh, where two major infrastructure projects are currently underway: the Dhaka Elevated Expressway and the Dhaka Mass Rapid Transit Lines. Construction is expected to be completed by 2030. Elevated expressway, a total of five MRT Lines, along with the 7 existing flyovers in Dhaka, will total around 68 kilometers in length, with the potential to exceed that figure in the future [20].

Arefin [21] argues that flyover projects in Dhaka City mainly serve the interests of the capitalist class under neoliberal schemes. Another way of looking at flyover-induced land uses can be found according to Graham's [22]article "Elite Avenues". He discusses the fetishization of elevated highways or flyovers by development and planning elites in megacities of the Global South. The article also notes that flyovers have been sold as transformative icons offering the allure of free and uninterrupted circulation, but they are often more electorally persuasive than cost-effective traffic management schemes for the cities. This is further emphasized by Orski [23], who highlights the need for a methodology that is sensitive to social and economic goals, and the importance of new institutions to aid in goal formulation. Cascetta [24] proposes a decision-making model for transportation systems that integrates cognitive rationality, stakeholder engagement, and quantitative methods. Wachs [25] suggests broadening research programs to include alternative perspectives, such as organizational and personal perspectives, to enhance our understanding of transportation systems. To sum up, an adaptive co-existence of infrastructure and urban life is inevitable as we enter the age of infrastructural transformations. The research narrative emphasizes the **process of adaptive approaches to co-existence** that balances infrastructure's economic, and socio-cultural contributions, community life, and local environments.

Infrastructure management is in many cases seen as exclusively a management of the physical body of infrastructure. However, traffic infrastructure or flyovers, elevated walkways, and elevated railway viaducts create additional usable spaces that are part of the infrastructural configuration. Formal management methods of infrastructure are discussed at large as in MCDM or multi-criteria decision-making methods for infrastructure management [26]. Including under infrastructure land use types in infrastructure management is important, especially in the Global South. Here, due to the absence of formal policies for managing spaces under viaducts, self-management by the communities often becomes the primary approach. Additionally, such places are often under the threat of constant eviction for development works. There is a gap in understanding how these under-viaduct spaces are utilized as an asset rather than a matter of eviction, particularly when it involves unclear ownership of the residual spaces.

Rudneva and Kudryavtsev [27] argue that transportation infrastructure constitutes a form of regional capital that imbues areas with both economic and socio-cultural benefits, fostering a synergistic effect upon its implementation. Infrastructural residual spaces are also an asset for the infrastructure. This perspective is crucial, as many countries continue to reorient urban spaces to accommodate the automobile, affecting both formal and informal contexts beneath viaducts or flyovers. Viaducts, defined as a series of arches or columns supporting elevated railways or roads, serve as vital links within the urban fabric, enabling passage over geographical impediments. These infrastructural residual spaces, pivotal to this research, offer the potential for enhancing urban connectivity and economic development but also risk exacerbating the displacement of marginalized communities [28]. Kabir [29] in her *Rethinking Overpasses* thesis mentions the informality issue as a dominant factor of the everyday life of the under-flyover squatter situated in the same research site (Tejgaon - Nabisco Flyover) as this article.

To achieve such purposes, a range of participatory approaches and adaptive reuse strategies have been explored in the Global South. Brown [30] emphasizes the need for transformative shifts in understanding and the use of participatory scenario planning to stimulate forward-looking social learning for adaptive management. Ogu [31] underscores the importance of a bottom-up participatory stakeholder partnership approach in urban environmental infrastructure improvement. Mouton [32] discusses the material dimensions of 'smart city' initiatives in the Philippines, while González [33] highlights the potential of participatory design in improving urban spaces in the slums of Caracas, Venezuela. These studies collectively underscore the value of participatory approaches in addressing the unique challenges of infrastructure development and management in the Global South.

Prasetyo highlights how communities promote self-governance, self-regulation, and independence, playing a key role in informal discussions and practices while preserving their self-organized nature. This approach has transformed areas into attractive public spaces, inspiring others to similarly utilize such spaces effectively. Kelbaugh [34]) refers to this phenomenon as "Everyday Urbanism," celebrating how indigenous and migrant groups creatively use public spaces, especially in developing countries with growing informal settlements. According to Kelbaugh, this reflects a desire among underserved populations to participate in the city's economic life. Furthermore, Simone [35] emphasizes the need for a detailed examination of how urban life on the fringes adapts through evolving relationships with infrastructure and social dynamics, underscoring its significance for critical urban studies.

Dhaka, the capital city of Bangladesh, is in the process of significantly expanding its physical infrastructure domain with the construction of over 68 kilometers of elevated transportation networks. This development introduces a new layer of complexity to the already dense urban mobility system of a city that accommodates 400,000 migrants annually [36], adding to its existing population of 21 million. The emergence of slums, squatter settlements, and an informal economy thrives in the underutilized urban spaces created by such infrastructural projects. As these spaces evolve, they serve as vital areas for the homeless population, merging infrastructure with the daily lives and activities of the city's inhabitants.

This study concentrates on the post-construction phase of the "Tejgaon-Nabisco Flyover," also referred to as the Tejgaon Link Road, a key element within Dhaka's extensive network of seven flyovers. Spanning approximately 1 kilometer, this flyover is notable for housing a squatter settlement beneath its viaduct. This settlement is a hub of socio-economic activities, presenting a unique microcosm between infrastructure and urban life. The Tejgaon-Nabisco Flyover exemplifies the adaptive use of infrastructural spaces, hosting a diverse range of practices that are emblematic of the broader socio-economic dynamics at play within the context of Dhaka's urban environment. Communities living under flyovers face the burden of paying high service bills for their unique living conditions. Additionally, they live under the constant threat of eviction and are exposed to serious environmental health risks. Although the flyover is owned by the City Corporation, unclear ownership of the residual spaces beneath it allows exploitation by various local authorities with significant power. This research aims to understand the operation and integration of these spaces into the broader urban fabric, focusing on two main questions.

Question 01: How do communities participate in the production of places by utilizing infrastructural residual spaces?

Question 02: How do infrastructural residual spaces and their governance adapt to the context of informality in the Global South?

Results & Discussion

Finding 01: Infra-element induced microcosm of social practice

Infrastructural elements (flyover column, terminal wall, under-viaduct road, etc.) influence a microcosm of socio-economic practice endemic and adaptive to the local informality, thereby making its nurturing a potential asset for the city. Coming from research question 01, the PAR workshop data analysis reveals how the community utilizes flyover elements—such as the median, median columns, road, and terminal walls—for mixed commercial-residential place-making purposes. Based on an examination of 27 samples, the following key insights emerge:

Median Utilization: The majority (70%) of inhabitants prefer maintaining the current use of the median for sorting, reselling, and storing waste and household objects, predominantly as a service zone and, secondarily, as a community gathering space as shown in fig 1.

Road Usage: The road beneath the flyover serves dual purposes; one lane facilitates vehicle movement, while the other is adapted for cooking, socializing, and other household activities. Approximately 51.8% express a need for housing services, and 63% indicate a demand for housing extensions, highlighting a significant need for shelter facilities as seen in fig 1.

Terminal Wall Function: Previously hosting an informal school managed by the NGO (Non-Profit Organization) Light of Hope, the terminal wall is favored by 66% of participants as a community space, with 59% advocating for the integration of service facilities alongside educational activities in fig 1.

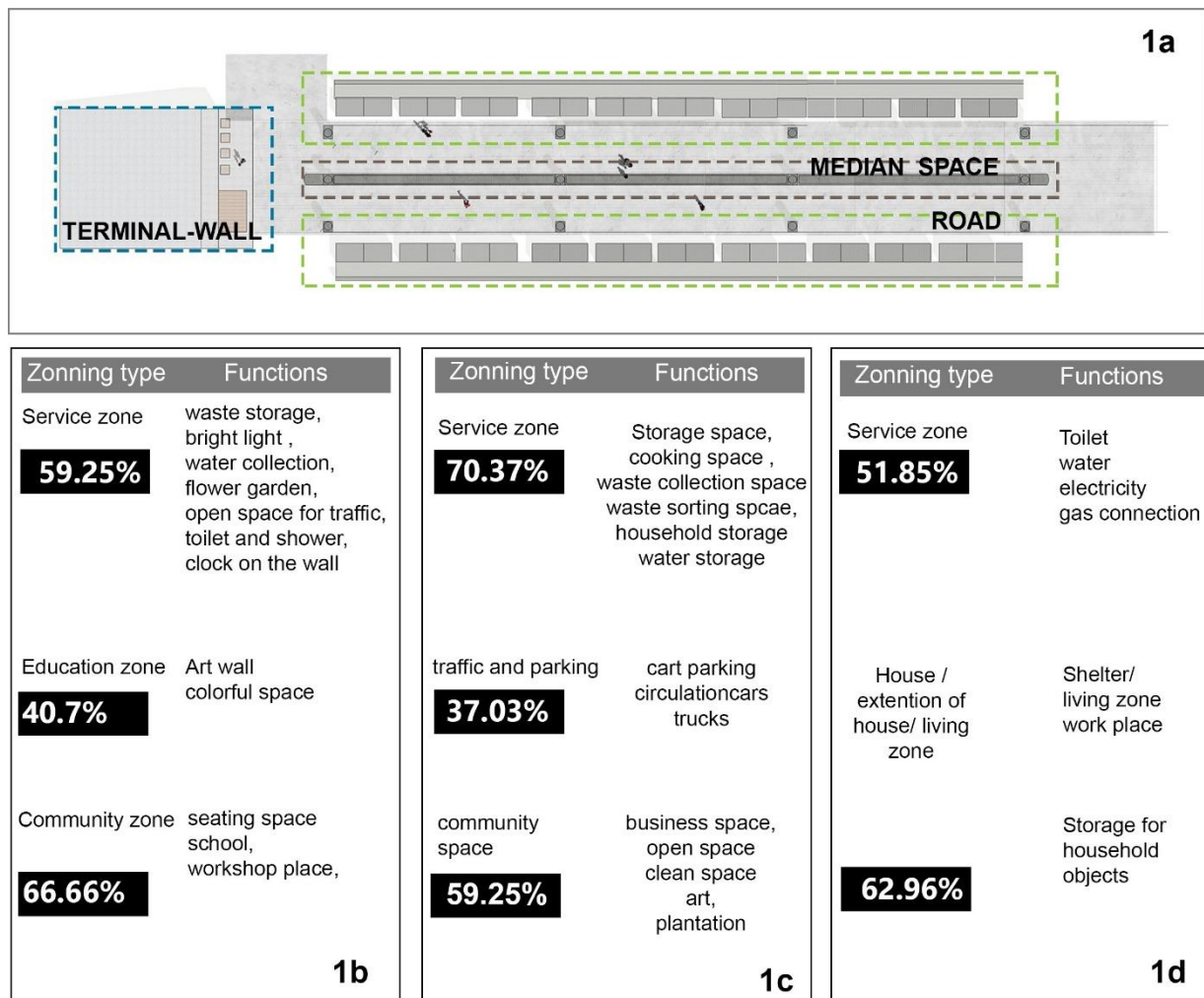


Fig. 1: Land Use Facilitated by Flyover Infrastructure: This diagram summarizes the usage and zoning ratios of the median, terminal wall, and road based on 27 samples collected during the Participatory Action Research (PAR) workshop. All samples represent residents of the under-flyover squatter community. Panel 1a shows the site layout having 3 dashed zoning. The dashed lines on the site layout denote the areas: Blue: Terminal wall spaces, Gray: Flyover median spaces, Green: Under-flyover Road spaces converted to habitation and socio-economic activities. Participants can suggest multiple usages for a given under viaduct zone and percentages are provided in the figure according to dashed zoning layout of the site. All the percentage shows a ratio out of 27 samples. Panel 1b is the information associated with terminal wall, panel 1c is the information associated with median of the flyover and panel 1d is the information associated with the road under the flyover zone.

Layout patterns suggested by the participants: 27 sets of Participatory Action Research workshop drawings, marked by the direct inhabitants of the under-flyover squatter, not only highlights the current use and problems of the adaptive process, but they are also reflective of the needs and potential image of the under-flyover setup. A comprehensive view of the suggested patterns is presented in the Supplementary Figure 1-10 with scaled drawings besides the above-mentioned summary of the findings 01.

The squatter community provides an environmental service by cleaning up waste discarded in the area by local industries, markets, and households. They collect and resell the waste and byproducts, creating an informal economy rooted in the local urban context. However, since the polluters do not take responsibility for waste management, the squatter collectors essentially perform the task of cleaning the vicinity and transforming it into an informally operated economic system. This microcosm of informality is crucial to the people, place, and infrastructure, and it relies heavily on the waste management of the Tejgaon industrial area. The colonization of the flyover entity has acted as a catalyst, fueling newer forms of socio-economic practices. This leads us to consider the fact that the squatter community and the under-flyover setup should not be seen as entities to be evicted but rather as assets to be nurtured with specific frameworks.

Finding 02: Autonomous self-governance of infra-residual spaces

In the absence of state-sanctioned or privatized management frameworks, communities autonomously develop self-governed processes to manage infrastructural residual spaces.

The participatory action research data reveals that the current management of these under-viaduct spaces predominantly rests within the realm of self-governance by the inhabitants themselves. This grassroots-led approach entails the inhabitants assuming responsibility for the maintenance, upkeep, and adaptive evolution of the space. Periodically, this self-driven management is complemented by the intermittent support of Non-Governmental Organizations (NGOs). However, it is noteworthy that the onset of the COVID-19 pandemic witnessed a significant reduction in external aid, rendering the inhabitants more reliant on their self-initiated management strategies.

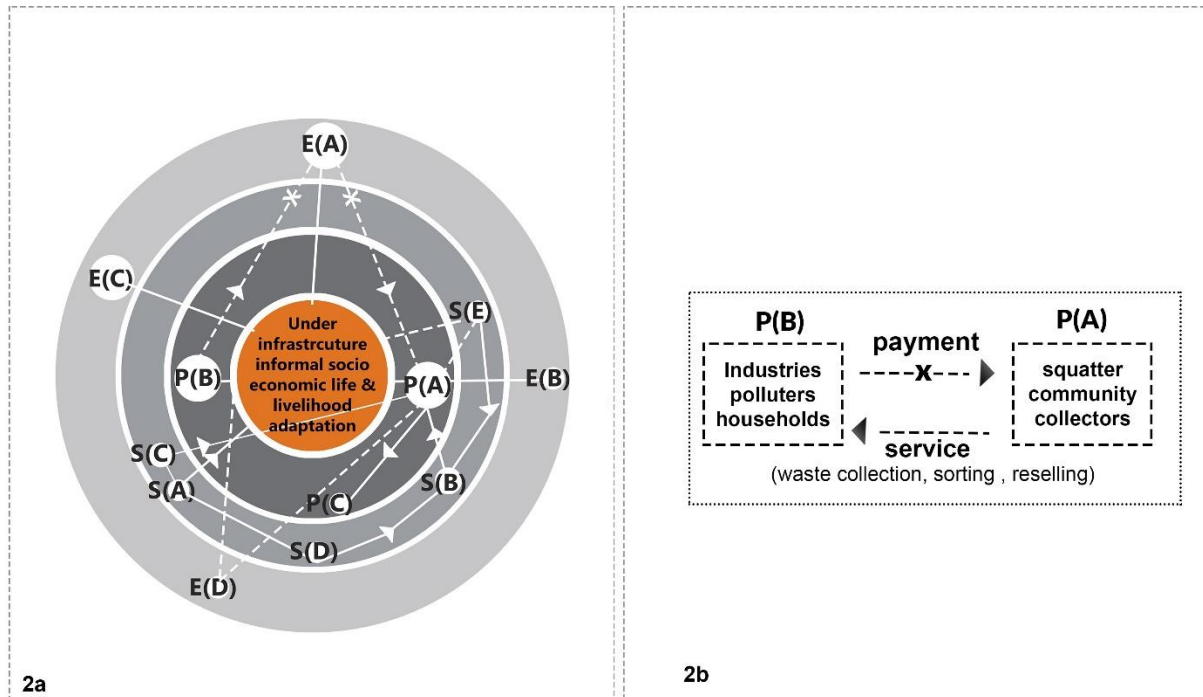


Fig 2: Stakeholder Network and service pattern: Panel 2a depicts a stakeholder "onion diagram" in current context with the under-flyover squatter community at the core, showing the level of connection among primary, secondary and external stakeholders. Stakeholders closer to the center are more involved in environmental management, while those towards the outer layers are less involved. Orange color at the center depicts core site context and living within infrastructure / infrastructural adaptation as the main issue of the research. The second layer of darker gray band shows the Primary stakeholders. The third layer with lighter gray bands depicts secondary stakeholders and outer band gray depicts external stakeholders on the fourth layer. Dashed line shows an indirect/weak connection among stakeholders while unbroken lines show direct/strong connection among stakeholders in the system. In both panels the direction of exchange is shown with triangular arrows while cross shapes denote no exchange of information or resource. Panel 2b illustrates the symbiotic relationship between the flyover infrastructure, local industries and the squatter community. The community transforms the space for habitation and commerce, potentially managing wastes from the polluters (collection, sorting, resale) while generating income from under-flyover activities. This relationship of Infrastructural elements and self-management by the occupying community is identified as an asset for the environment. Table 1 refers to the list of stakeholders associated with the current system.

The Stakeholder Onion Diagram is a strategic tool designed to visualize the importance and roles of stakeholders in relation to a system. It typically consists of three or four concentric layers, each representing different groups of stakeholders based on their proximity and relationship to the central issue. As Alexander [37] noted, primary stakeholders are those who will operate the system and thus remain close to it. Secondary stakeholders are users who will not operate the system but will consume its output. They are managers who rarely consume the system's output directly but utilize the information for planning and strategic control. Table 1 illustrates the role and category of the stakeholders.

Examining the onion diagram in fig. 2 panel 2a, we observe that organizations of policymakers (S(A)), categorized at the secondary onion level or as secondary stakeholders, are largely disconnected from the systems operating within the under-flyover squatter community and its closest actors, P(A) the squatter community, and P(B) the local industries. Services such as electricity are provided at a higher cost by local area-based political organizations (S(C)), yet the locals (P(A)) are far from being the primary beneficiaries. A significant connection impacting the economic dimensions of the system exists between P(A) and P(B). The reciprocal nature of this system highlights that community squatters offer a rudimentary waste management service to local polluters free of charge (illustrated on fig. 2 panel 2b). This system, autonomously developed among the squatter inhabitants, ensures the continuity of sustainable management, environmental cleanup and survival of the locals. This cycle has persisted for several years, predating even the construction of the flyover. The presence of flyover infrastructure enhances the setup, intertwining people and places, and offers a foundation with its infrastructural elements to host multitude of socio-economic practice. This evidences that, in the absence of formal policies governing spaces under flyovers or infrastructural residual areas, contextual socio-economic systems emerge, adapted by the communities themselves.

Discussions

This study provides a few key issues regarding the management and utilization of infrastructural residual spaces, emphasizing their inevitable role in urban development in the future of global south cities.

First, eventually, spaces generated by physical infrastructure (having social, commercial, and political value) cannot be overlooked for development and it is an organic phenomenon. The research explored a specific context. Further studies could analyze under-viaduct spaces in different geographic locations, climates, and socio-economic settings. How do these factors influence spatial utilization, management strategies, and community needs? Comparative case studies of successful under-viaduct projects across the globe could provide valuable insights.

Secondly, effective management of these spaces, be it privatized, state-controlled, or self-managed — necessitates collaboration with local councils, communities, and area-based organizations. This partnership is essential for providing sustainable land use guidance that transforms these people and places into valuable assets rather than liabilities subject to eviction. When organizational support is missing, communities depend on autonomous self-organization. Future research could delve deeper into effective collaboration models. What are the best practices for engaging local councils, communities, and area-based organizations? Could digital platforms facilitate communication and co-creation processes? Evaluating existing collaborative models can inform the development of successful partnerships for future projects.

Thirdly, establishing a transparent facilities and service rent structure based on a cost-to-income ratio, rather than market willingness to pay, is essential for equitable access to both public and commercial spaces beneath viaducts, including provisions for monitored public use. The research highlights the need for equitable access to under-viaduct spaces. Further research could explore innovative rent structures that consider affordability and social impact alongside cost recovery. Can a blended approach that combines market rents and subsidized spaces promote social inclusion and diverse uses?

Are existing policies flexible enough to accommodate the diverse and evolving needs of urban negative spaces? Are infrastructural residual spaces a product or a feature? If a feature, how do we appropriate the value of it? As urban centers continue to evolve around efficient mobility systems, it becomes crucial to consider the socio-economic and cultural phenomena arising in conjunction with such infrastructure. This research underscores the need for development proposals to consider the multifaceted values of users and communities, ensuring integration with the urban fabric. Moving forward, exploring under-viaduct spatial design, community self-management, and resource utilization will provide valuable insights for formal and informal urban growth strategies, enhancing post-infrastructure adaptation efforts. Future research could analyze existing planning regulations and legal frameworks governing under-viaduct spaces. This research can inform the development of policies that promote sustainable and adaptive use of under-viaduct or infra-residual spaces.

Methods

Urban Context Analysis: site forces and stakeholders

The Tejgaon-Nabisco Flyover, also known as the Tejgaon Link Road, is a 1.114 km structure inaugurated in 2010 to connect The Tejgaon Industrial Zone with Dhaka's main Mirpur arterial road, crossing over the Tejgaon railway lines. This area is home to a significant population of urban poor and lower-middle-income communities. Initially approved at a cost of Taka 114 crore (approximately 11 million USD) by the National Economic Council in 2007, the flyover surrounds an industrial and commercial landscape, juxtaposed with railway slums and Karwan bazaar kitchen market atop the Tejgaon industrial zone (As shown in the fig. 3). Historically, since the 1970s and well before the flyover's construction, slums have occupied this area. These communities have adapted to the under-viaduct spaces since 2010. Industrial activities dominate the Tejgaon area, significantly impacting the environment through non-organic waste production and contributing to health hazards due to inadequate waste management. Despite daily road and drain cleaning efforts by Dhaka city corporation, policy implementation gaps, insufficient waste disposal infrastructure, and limited recycling capabilities exacerbate the challenge of managing industrial byproduct waste. Dhaka faces a growing waste management crisis, with daily waste generation projected to reach 47,064 tons by 2025 [38]. Dhaka recovers only 37% of its waste, leading to widespread environmental degradation. The Tejgaon industrial area is a major contributor to this issue, underscoring the urgent need for enhanced waste collection and recycling efforts.

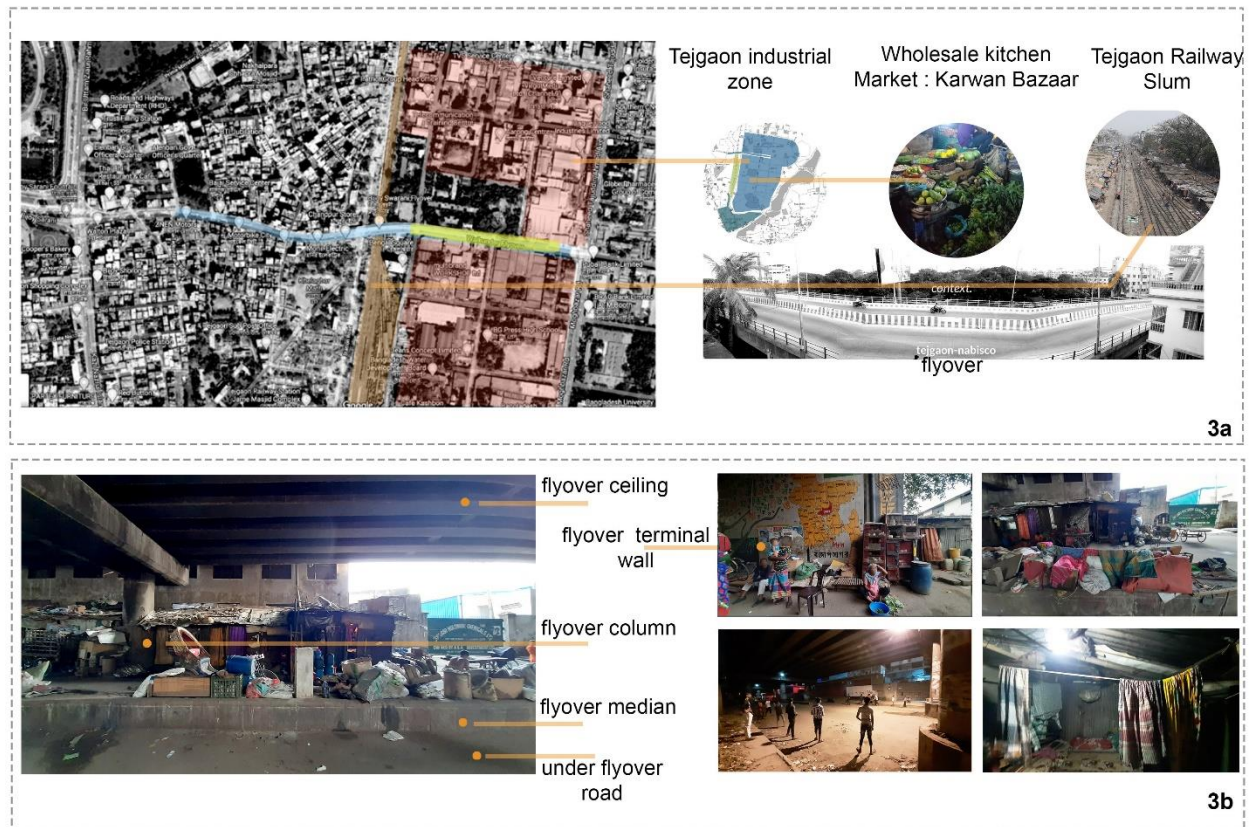


Fig. 3 Infra-land-use adaptation of social practice. Panel 3a at the top depicts the site's condition and three major surrounding contextual forces. The flyover is strategically located near Tejgaon industrial zone, Karwan Bazaar, the largest kitchen market in Dhaka, and Tejgaon railway lines. Pink is shown as an Industrial zone, Yellow as research site, blue as the full span of the flyover while gray marks the railway slum. Panel 3b at the bottom showcases the living conditions within the squatter settlement situated under the flyover and highlights the flyover's structural elements (ceiling, terminal wall, column, median, roads) supporting the livelihood activities of the squatter community. The aerial map was collected from Wikimapia and edited to color code the adjacent zones by the authors.

Our research focuses on the squatter zone under the flyover, which houses 33 housing units and serves as an active living area. In analyzing this residential zone, we've identified various stakeholders based on their roles and proximity to the site. Primary stakeholders, designated as P(A), include the squatter community living and operating within close vicinity of the area. Industries, householders, and polluters in the area are categorized as P(B). Additionally, businessmen who profit from purchasing waste and byproducts from the squatters are classified as P(C) in table 1. The stakeholders' chart is essential to understand Research Question 01. It shows how primary stakeholders create economic activities using infrastructure. We will visually represent these relationships in the Findings 02 section with an "onion diagram" of stakeholders, highlighting how place making, economy, and infrastructure are interconnected.

Primary Stakeholders	Secondary Stakeholders	External Stakeholders
P(A) community people, waste collectors, housewife-collectors, sweepers	S(A) Dhaka North City Corporation, Roads & Highways department	E(A) physical environment of the site/infrastructure
P(B) waste producing households, waste producing industries	S(B) Non-Government Organizations	E(B) Traffic network users
P(C) waste buyers, middleman in waste recycle trade	S(C) Area Based Organizations, councilors	E(C) Urban Dhaka city

Primary Stakeholders	Secondary Stakeholders	External Stakeholders
	S(D) Donor Agencies, Area based waste collection	E(D) Media
	S(E) University & researchers	

Table 1: Stakeholder Dynamics: Positioning the under-flyover squatter community as the center point of this phenomenon, the relationships between three layers of stakeholders and the site context are analyzed. The information provided is subsequently organized into an "onion diagram of stakeholders" to visually represent the stakeholders' relationships with respect to the existing condition under the flyover (see fig. 2)

Participatory Action Research (PAR) Workshop

Our study focuses on the Tejgaon Nabisco under-flyover squatter community. To effectively understand the interaction between community and physical infrastructure, we employed participatory action research as our methodology. This approach facilitated the collection of comprehensive data, encompassing both visual representations (drawings) and demographic information, through the conduct of two workshops. These efforts provided insights into the spatial and social relationships forged between the community and the infrastructural elements, revealing the operational dynamics of these urban spaces. As seen from the fig. 4, participants were selected from among the occupants of 33 houses situated beneath the Tejgaon Nabisco Flyover. This focused sampling aimed to capture insights from individuals directly engaging with and adapting to the unique conditions presented by living under the flyover, alongside the prevailing site dynamics. A total of 27 sample datasets were collected out of these 33 household inhabitants. Participatory Action Research (PAR) was chosen for this study to enable a longer and more meaningful interaction with participants than other methods. PAR methodologies also engage residents in revealing the three-dimensional place making qualities associated with infrastructural adaptation on a 2D perspective through mapping respective zoning patterns. Participants actively considered their surroundings and the flyover's infrastructure elements, transforming them into place making tools and incorporating existing forms of infra-residual land use. This method of drawing and providing information involved the squatter dwellers in a broader and deeper scope. Photographs contain no identifiable faces of individuals, and all images are of public spaces on a thoroughfare road under the Tejgaon Nabisco Flyover. Necessary permissions were obtained while photographing visible public spaces and adapted livelihood patterns associated to it.

Aim and Objectives:

The workshops aim to engage the under-flyover community, equipping them with tools to articulate their experiences and interactions with under-flyover spaces. Aim of the workshops are as follows-

Workshop	PAR Workshop Aim	Research Question
Workshop 01	Collect demographic information of the community.	Q2: Spatial governance pattern, informality of the context
Workshop 01	Understanding the stakeholders of the site	Q2: Spatial governance pattern, informality of the context
Workshop 02	Investigate how the community utilizes structural elements of the flyover.	Q1: Community participation in place making
Workshop 02	Create zoning diagrams to illustrate land use patterns within the site layouts.	Q1: Production of places by infrastructural elements (ex. Column, terminal wall, road etc)
Workshop 01, 02	Relationship of site forces and physical infrastructure	Q1, Q2

Table 2: Workshop Aim and its relationship with the research questions

As part of this study, a detailed map of Site A, (Fig. 4 panel 4b) was created using dimensional surveys and AutoCAD. This map serves as the foundation for participatory action research workshops, enabling squatter inhabitants to engage in the usage identification of their living spaces. The data analysis is done by collecting land use patterns through scaled drawings, highlighting the community's integration with the flyover's infrastructure. Table 2 highlights the aim and objective of the setup clarifying the questions asked in the process.

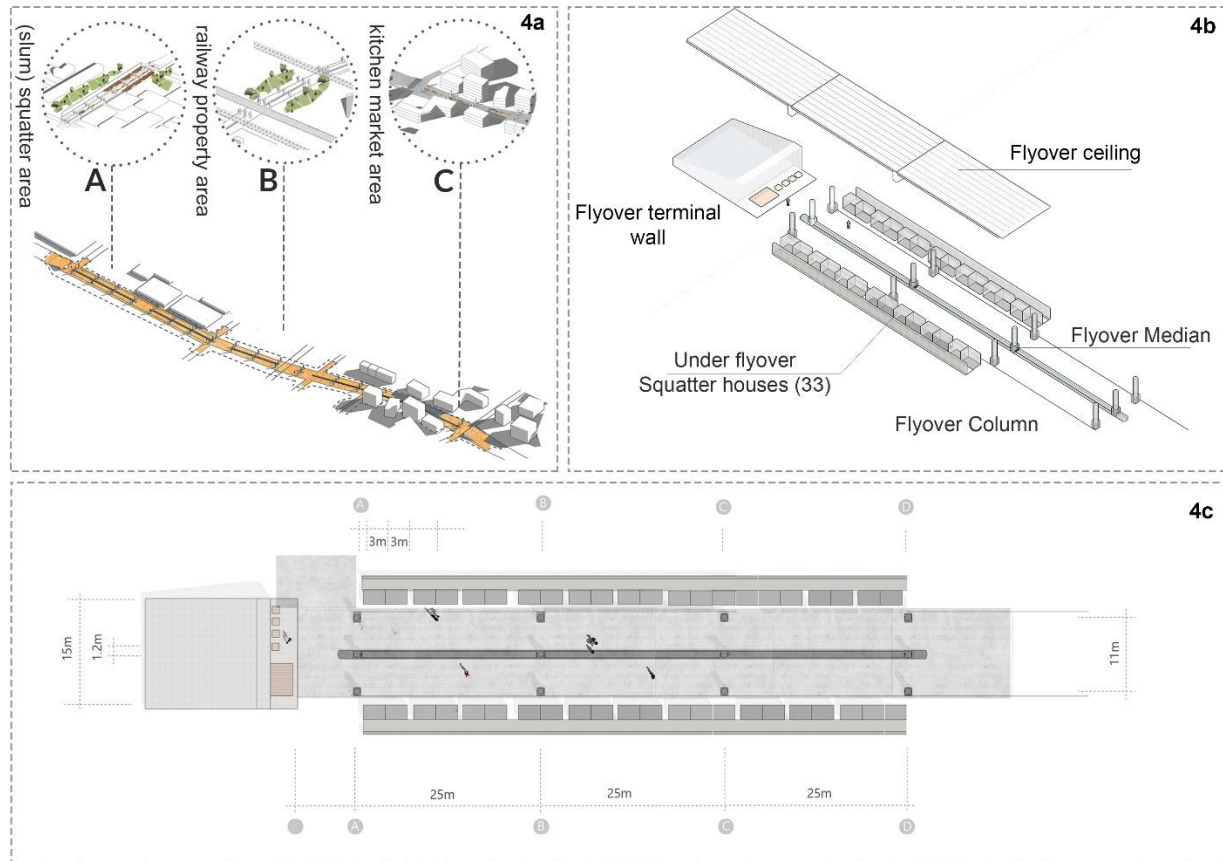


Fig. 4 Research site layout and basis for data collection: The Tejgaon-Nabisco flyover is divided into three distinct zones, with our research specifically focusing on Site A, identified as the squatter community zone. This area is actively occupied and utilized for housing beneath the flyover. Panel 4a shows the full layout of the 1.14km long under flyover land-uses. Figure panel 4b highlights the setup under the flyover site A, squatter zone (flyover terminal wall, flyover ceiling, flyover median, squatter houses, flyover column, under viaduct roads etc) and the composition of the squatter community in an axonometric diagram. Panel 4c presents a scaled layout of site A, intended to serve as the basis for the participatory action research diagram.

The questionnaire design for our participatory action research (PAR) workshops was crafted to engage the community living under the Tejgaon Nabisco Flyover, consisting of 33 households. Fig. 5 panels reflect the under-flyover squatter setup that has been presented in the 4b site layout. A total of 27 samples were collected from these 33 households through participatory action research workshops (see fig.5e -5g) . The objective was to gather detailed demographic information, understand living conditions, and map out the spatial utilization under the flyover. The questionnaire was divided into two main sections:

1. Demographic and Living Conditions Survey: This section aimed to collect basic demographic data such as gender, age, family size, the occupation of the primary earner, monthly household income, and the extent of public space utilization for livelihood activities. It also sought insights into the types of waste products collected in the area, aiming to understand the environmental impact of the squatter settlements.

2. Spatial Utilization and Zoning Mapping: Participants were asked to identify and illustrate the current patterns of usages under the viaduct and how the infrastructure elements (terminal wall, median, road, ceiling) support or hinder their livelihoods. This part of the questionnaire facilitated a hands-on approach, allowing participants to draw their living and working zones directly on-site layouts provided by the researchers

(datasets 02). These drawings were later digitized and scaled using AutoCAD for a precise analysis of land use patterns (datasets 03). All the graphical data sets (data set 02, 03) try to depict the conditions seen in fig. 5 photographs.



Fig. 5: Overview of the site & PAR process: 5a provides a view of the under-flyover squatter: Median use as storages, squatter house composition under the flyover. 5b shows Terminal wall used as community platform and art wall as an under-flyover school "The wall attic". 5c gives a look at the waste and by product collection at median by the community waste collector and sellers. 5d shows Participatory Action Research Workshop organized on the road and median of the under-flyover space by the authors.

Workshop Instructions & Color-Coding Chart		
Instruction/Element	Description	Color Code/Symbol
House Location	Mark the position of residences	Black
Household Activities	Indicate areas for household tasks	Black
Service Zone	Show service areas	Red
Circulation Paths	Paths of movement / networks	Dashed line
Community Spaces	Community gathering and house extensions	Black
Water Facilities/Issues	Water-related facilities and problems	Blue
Vehicle Parking	Designated parking areas	Brown
Plantation	Areas for greenery	Green
Desired Conditions	Written/drawn conditions as dictated	Author's discretion

Table 3: Workshop instruction and color coding for the dataset 02

The workshops produced three types of datasets: demographic information, hand-drawn maps of land use (Datasets 02), and AutoCAD representations of these maps (Datasets 03), offering a comprehensive view of the community's adaptation to under-viaduct spaces following the table 3 conventions. This approach was tailored to the community's ability to express their spatial experiences and aspirations, blending quantitative data with qualitative insights into their daily lives and challenges.

Workshop data analysis:

Sample 01: Within the scope of Workshop 02, which collected output from 27 participants, the accounts of Zahid—a 25-year-old male cart puller—provides insightful observations on the adaptive use of under flyover spaces in urban settings. His contributions, documented through drawings, reveal the median platform's dual

function as both a communal gathering space and a site for waste collection and storage, illustrating the community's innovative re-purposing of infrastructural elements for essential services.

Zahid states that the terminal wall also serves multiple purposes: continuing its role as a canvas for community art while incorporating a new design feature, including a wall clock to assist in synchronizing communal activities. This observation not only retains the wall's cultural significance but also enhances its utility for the community's daily routines. Median serves primarily as a service zone while the terminal wall is community space.

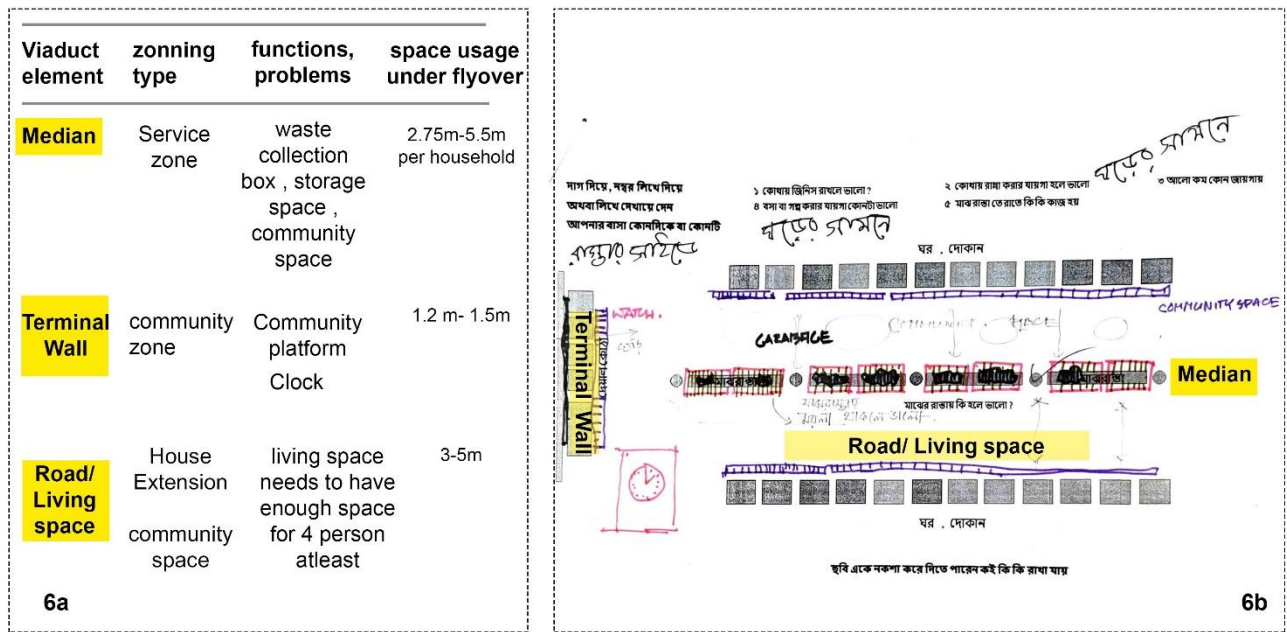


Fig. 6: Dataset 02: Participant Data sample 01: Panel 6a of the figure displays the usage and zoning of three infrastructure elements as identified by Participant 01, Zahid (Sample 01). Panel 6b features a drawing by Zahid, illustrating the zoning and usage patterns around the median, terminal wall, and road beneath the flyover. This is labeled as data set 02, sample 01. The right side follows the codes and instructions as per table 3 above. Participants were requested to draw or identify the current use of median, terminal wall and road under the flyover. Yellow highlights in both panels depict the location of the infrastructural elements on the participant drawing.

Despite these adaptive strategies, Zahid and his fellow residents express concerns over the spatial constraints for family residences and the lack of adequate service facilities and housing extensions on the road under flyover. He identifies the exterior porches of houses on the road as potential areas for expansion, suggesting their use as extended communal spaces to mitigate the shortage of living space. Zahid's feedback on the current usage of the flyover Median, column, road is illustrated in fig 6. His perspectives highlight the necessity for urban designs that accommodate and enhance the lived experiences of marginalized communities, advocating for a more inclusive approach to infrastructural development.

It can be noted that all 27 samples in Dataset 02 adhere to the same format and workshop instructions as outlined in Table 3. Each sample in Dataset 02 (see fig. 6, fig 8a, fig. 9a) showcases the existing zoning types of flyover elements (terminal wall, column, road). After collecting information from Dataset 02, each sample was redrawn in AutoCAD to create a scaled version that reflects the informal setups as per each participant's view (labeled as dataset 3). For instance, fig. 7 presents the scaled drawing based on fig. 6.

In fig. 7, the suggestions from Zahid (sample 01) regarding the use of the under-flyover area are depicted with specific symbols and legends, as provided in fig. 6. The zoning layout in fig. 7 emphasizes the prevalent use of the median in platform symbols, indicating medians primary use for storing collected wastes, byproducts, and household objects. Photographic evidence of this drawing can also be seen in fig. 5.

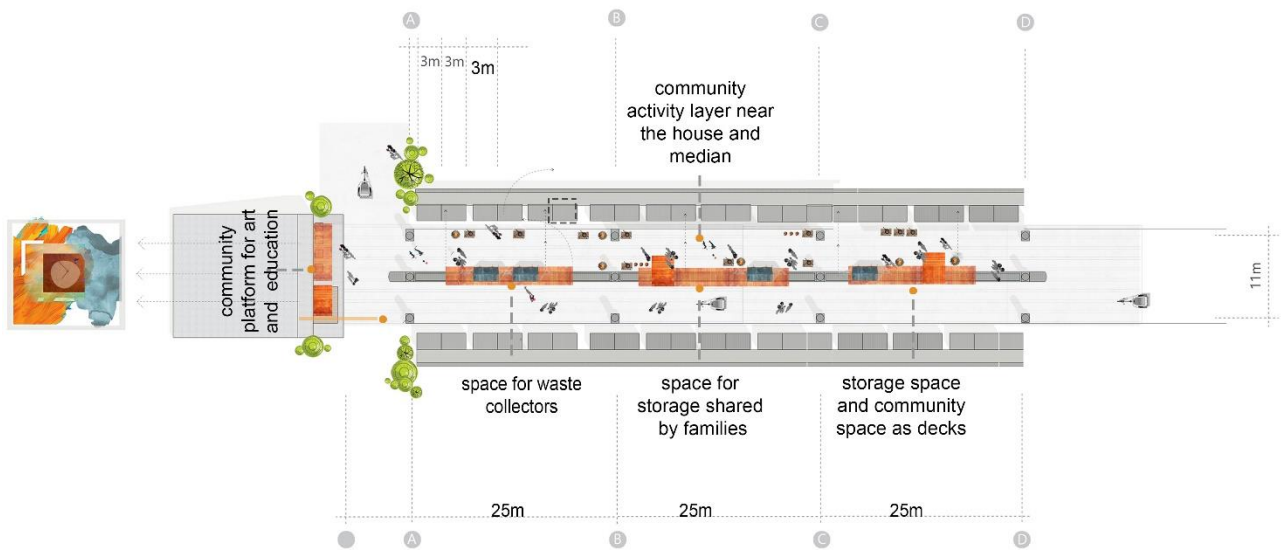


Fig. 7: Participant Data Sample 01 (Scaled Plot): This scaled AutoCAD drawing is based on the layout created by Participant 01, Zahid (Sample 01), in Figure 6. It represents Zahid's interpretation of how the squatter community currently adapts to the infrastructure, highlighting the zoning and active use of infrastructural elements. The drawing, labeled as Dataset 03, Sample 01, denotes the locations of the storage zone with orange-colored outlines, the cooking zone with a gray outline, and household objects in the median with blue-colored outlines. The community platform area within the under-flyover space is also outlined in orange. Dashed lines mark the connectivity inside the layout zones.

Like Dataset 02, Dataset 03 includes 27 scaled drawings gathered from participants across 33 squatter households under the flyover. These drawings were analyzed to produce the findings presented in the results chapter (see fig. 1). Two more samples (Sample 02, 03) are discussed as an example.

Sample 02: Anguri, a 30-year-old female and a factory worker, highlights the dual use of the median and road under the flyover; she describes these spaces as serving both as living areas and rickshaw and vehicle routes, as shown in Fig. 8. The median is also utilized for parking rickshaws owned by some residents of the squatter community beneath the flyover. Anguri suggests extending the houses and increasing their height as development strategies for the squatter area. Similar to Zahid (Sample 01), Anguri identifies the median as a service zone and the flyover's terminal wall as both a community platform and an art wall.

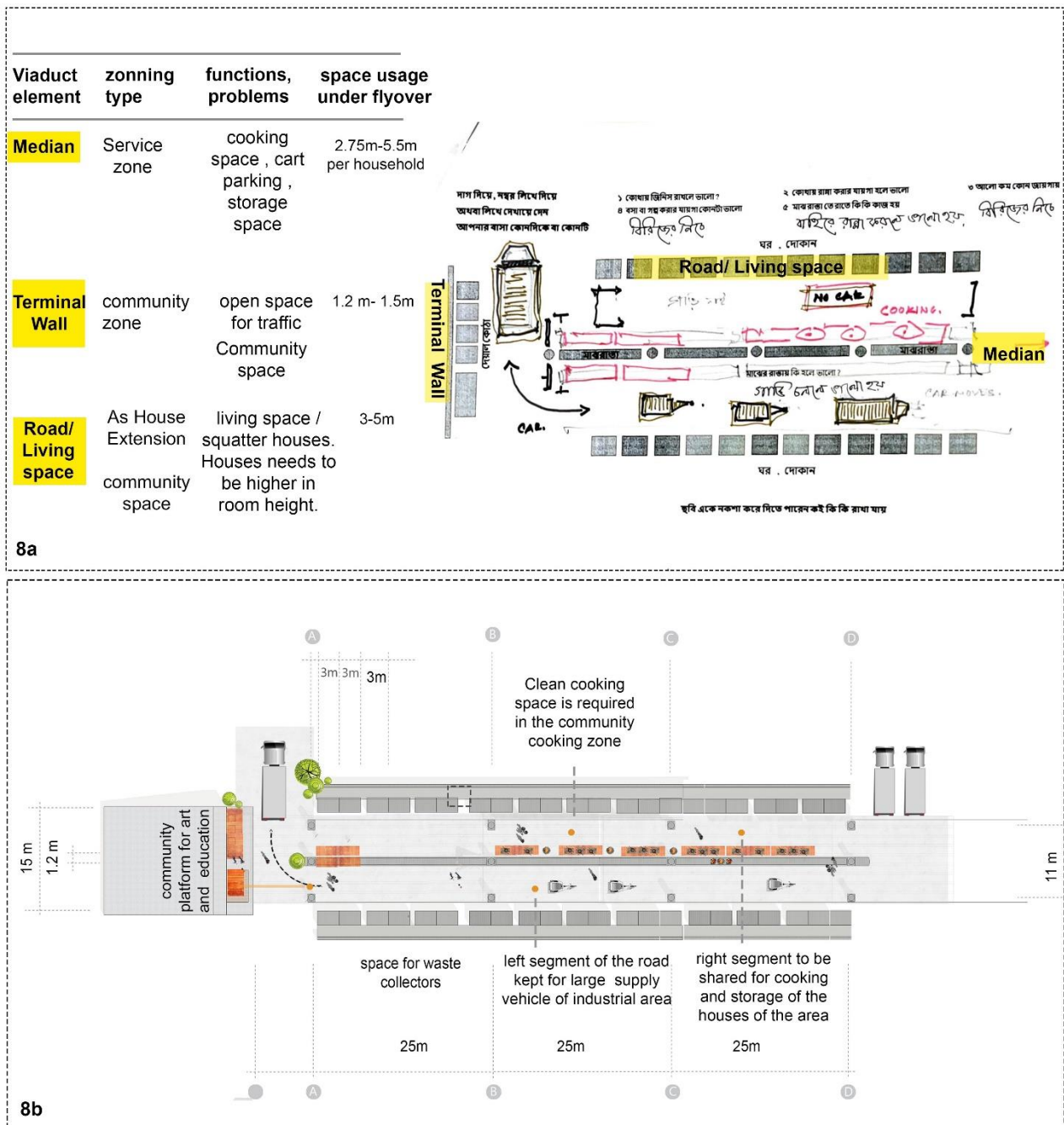


Fig. 8: Participant data and Scaled Plot for Sample 02, Panel 8a represents Anguri's view on the squatter community's current adaptation to infrastructure and its problems. These sets illustrate the zoning and active utilization of infrastructural elements by the community, focusing mainly on vehicular connections and waste collection zones. Yellow highlight depicts the location of the infrastructural elements on the participant drawing. Panel 8b shows a scaled AutoCAD plot of the layout from Panel 8a. Dashed lines mark the connectivity inside the layout zones. The following legends are used in the diagram: the storage zone is outlined in orange, the cooking zone is outlined in gray, and household objects in the median are outlined in blue. Additionally, a truck outline indicates the location of the industrial area vehicle movement route.

Sample 03: Sample 03 features Bacchu Miah, a 60-year-old rickshaw puller, who views the terminal wall primarily as a service zone rather than a community platform. Contrary to Zahid (Sample 01), Bacchu Miah envisions the median more as a communal cooking area than a storage space. He adds that both the median and terminal wall are fully utilized as service zones. Bacchu Miah sees the road beneath the flyover as a potential living space and advocates for its expansion to accommodate additional housing facilities (see Fig.9) . He also points out that the service costs, such as electricity, are significantly higher than in formal households,

and highlights a critical shortage of potable water and sanitation services under the flyover. As depicted in Fig 9, Bacchu Miah shows his suggestions through drawings and written observations. A similar methodology as sample 01, was applied to translate Dataset 02 Sample 03 into a scaled AutoCAD drawing for Dataset 03 Sample 03.

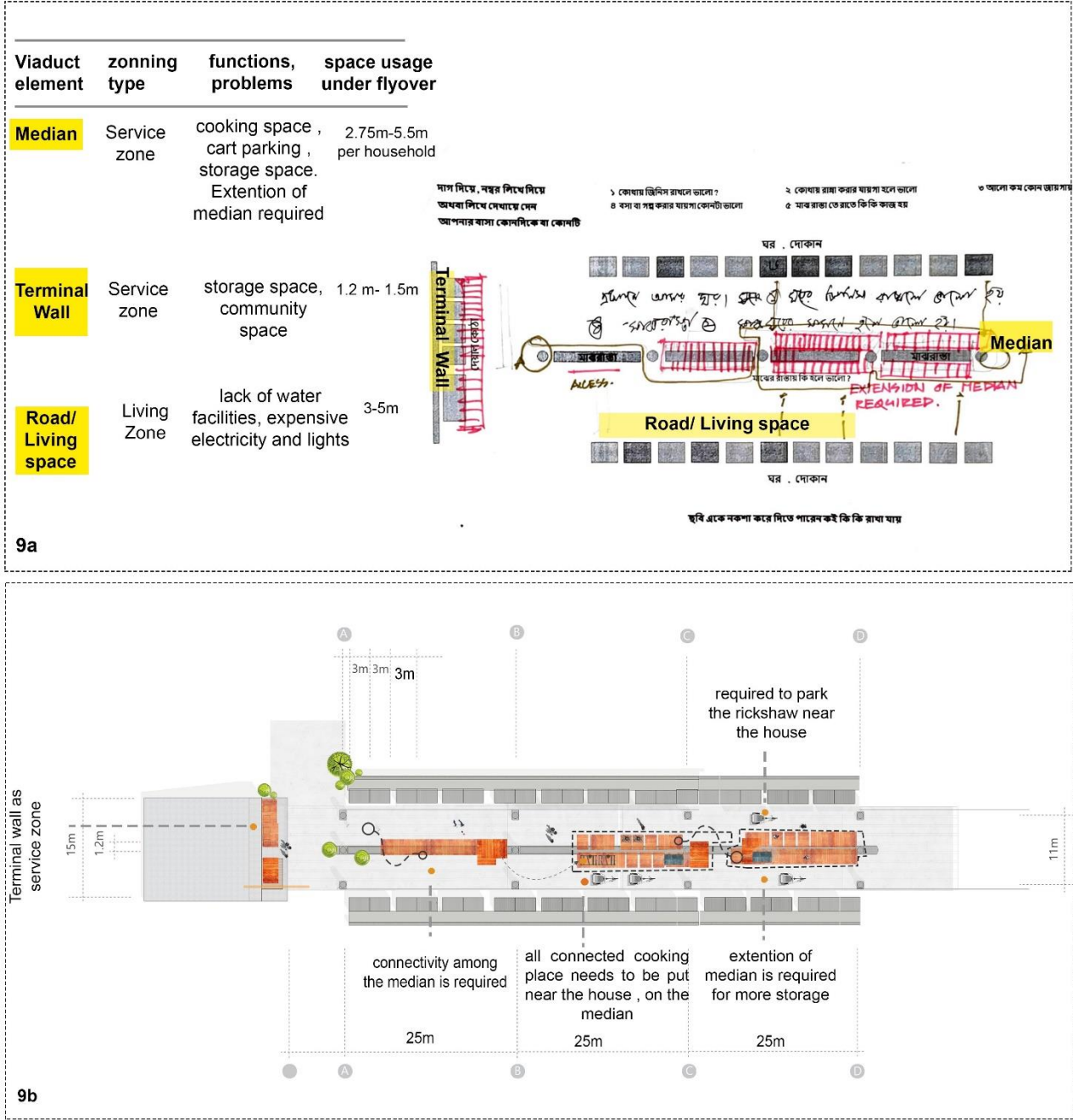


Fig. 9: Participant data and Scaled Plot for Sample 03, Panel 9a depicts Bacchu Miah’s perspective on the squatter community’s current adaptation to infrastructure and its problems. These sets illustrate the zoning and active utilization of infrastructural elements by the community as he emphasizes the under-flyover land use for storage facilities. Yellow highlight depicts the location of the infrastructural elements on the participant drawing. Panel 9b reflects the scaled AutoCAD plot of the above 9a layout. The following legends are used in the diagram: the storage zone is outlined in orange, the cooking zone is outlined in gray, and household objects in the median are outlined in blue. Additionally, a rickshaw outline indicates the parking zone and movement route of the rickshaw owners of the squatter.

Our first research question focused on how communities engage in place-making by utilizing spaces left over by infrastructure. The analysis of 27 pairs of Datasets 02 and 03 reveals the layout patterns, usage typologies

as observed and drawn by 27 out of 33 households in the squatter community under the flyover. (see the supplementary figures 1-10) The primary insight from these datasets pertains to the predominant zoning types as perceived by the inhabitants. While each participant proposed their unique development strategies, the scope of this research prioritizes the current usage of flyover elements and their role in fostering connections among people, places, and social practices. A summarized finding is presented in the discussion chapter. Consequently, future research should investigate the role of urban planning authorities and the integration of infrastructural spaces into the broader urban ecosystem, addressing critical questions of governance, access, and sustainability.

All subjects gave their informed consent for inclusion before participating in the study. The study was conducted in accordance with the Declaration of Helsinki. The participatory action research data from Dataset 02 provided in the manuscript were produced by the participants themselves, with informed consent and full knowledge of the research methodology. The research, 'Post Construction Infrastructural Adaptation of Social Practices in Dhaka's Under Flyover Spaces,' was approved by the ethics committee and thesis review board of the Global Environmental Architecture Lab, Graduate School of Global Environmental Studies, Kyoto University, Japan."

Data Availability:

The authors declare that data supporting the findings of this study are available within the paper and its supplementary information files. Additional data that support the findings of this study are available from the corresponding author upon request.

Code Availability:

Qualitative data visualization and analysis of interviews were conducted using Autodesk AutoCAD.

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Author Contributions:

Corresponding Author S.B conceived the idea of the research, carried out the field work. Contributing Author

H.K helped supervise the project, provided critical feedback. Corresponding Author S.B wrote the manuscript.

Both authors approve of the manuscript.

Competing Interests:

The Authors declare no Competing Financial or Non-Financial Interests

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Appendix 2: Dhaka Mayor Hanif Flyover Project Report

Content: Dhaka South city corporation consultancy project on inception report preparation as part of environmental management activity.

MAYOR MOHAMMED HANIF FLYOVER

UNDER-VIADUCT BEAUTIFICATION PROJECT

INCEPTION REPORT



CONTENT

PART 01

- 1.1 . INTRODUCTION
- 1.2 . HISTORY OF MAYOR MOHAMMED HANIF FLYOVER
- 1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT
- 1.4. EXISTING ISSUES & PROBLEMS

PART 02

- 2.1 . EXAMPLES OF RELEVANT PUBLIC SPACES
- 2.2 . INFRASTRUCTURE MANAGEMENT CONCEPTS

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- 3.2 . SOLUTIONS BASED ON INFRASTRUCTURE
 - COLUMN
 - MEDIAN
 - CEILING
- 3.3 SOLUTION MATRIX



INCEPTION REPORT

Myor Hanif flyover underviaduct beautification project inception report guidelines

1.1 . INTRODUCTION

Flyovers are bridge-like structures that are built over existing roads, railways, or other obstacles to allow traffic to pass over them. They are commonly used in urban areas to alleviate traffic congestion and improve traffic flow. Flyovers can be constructed in a variety of materials, including concrete, steel, and composite materials, and they are typically designed to be sturdy and able to withstand the weight of the vehicles that use them. Flyovers can be either single-level or multi-level structures, depending on the needs of the area in which they are built.

Overpopulation and its related problems have plagued Bangladesh's vibrant city for more than 40 years. The rapid population explosion that took place soon after independence caused the most harm in Dhaka. The population has tripled in recent years. As a result, many brand-new problems surfaced. The unemployment rate was at an all-time high, environmental pollution was at an all-time high, and more people were dying from diseases and malnutrition than ever before. Although nearly all of these issues had been resolved in some form in the 21st century thanks to governments' careful, astute, and strategic planning, the dreadful traffic situation was still giving city dwellers nightmares every single day. In the past 15 years, the government has built 7 flyovers to help with the irksome traffic congestion.

Even if flyovers have greatly improved the flow of traffic generally, it is still insufficient. Controlling the traffic congestion in various areas of the city is getting more difficult as the population grows. Therefore, in order to further ameliorate the situation, it is now time for another redesign. Which is where we now aim to utilize the underneath spaces of the flyovers .Under flyover spaces can be used to help cities by providing additional public spaces, using art, creating factivities such as parks, gardens, and recreation areas. This can improve the livability and aesthetic of urban areas, and provide residents with access to green spaces and fresh air. Additionally, utilizing under flyover spaces for public use can help to reduce urban heat island effects, and can serve as a platform for community building and social interaction.

1.2 . HISTORY OF MAYOR MOHAMMED HANIF FLYOVER

Prime Minister Sheikh Hasina inaugurated the Mayor hanif flyover on Friday 11 Oct 2013, the foundation stone of which she had laid on Jun 22, 2010. The project is estimated to have cost Tk 21.08 billion. Constructed on a Public Private Partnership (PPP) basis, the flyover connects with main roads and bus terminals. The four-lane flyover has six entry and seven exit points.

In 1998, the project was started. A Canadian construction company developed the flyover, which was erected by the Indian construction company Simplex Infrastructural Ltd. Orion Infrastructure Limited funded and carried out the project. Construction was managed by Dhaka City Corporation. The flyover will be managed by Orion Group, which will also manage toll collection, maintain it, and use toll revenue over a 24-year period to pay for construction costs. A daily toll contribution of 5% will be made to the Dhaka City Corporation (South) fund. After 24 years, the DCC South will take over the flyover. The structure's expected lifespan has been set at 100 years. It will let traffic from 30 southern and south-western districts to bypass bottlenecks and arrive in the capital.

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

The current DSCC project of Mayor Hanif Flyover under neath space beautification project has started in 2022. The concept of the project relies on utilizing the unused space generated by the flyover. There are many different ways that the space underneath flyovers can be used, and the specific use will depend on the location, the needs of the community, and other factors. Some possible uses for the space underneath flyovers include:

Public parks or green spaces: The space underneath flyovers can be transformed into a public park or green space, providing a place for people to relax and enjoy the outdoors.

Retail or commercial space: The space underneath flyovers could be leased or rented to businesses, providing an opportunity for local entrepreneurs to set up shop.

Public art installations: The space underneath flyovers can be used to display public art, providing a platform for artists to showcase their work and enliven the area.

Recreational facilities: The space underneath flyovers could be converted into recreational facilities, such as playgrounds, skateparks, or outdoor gyms.

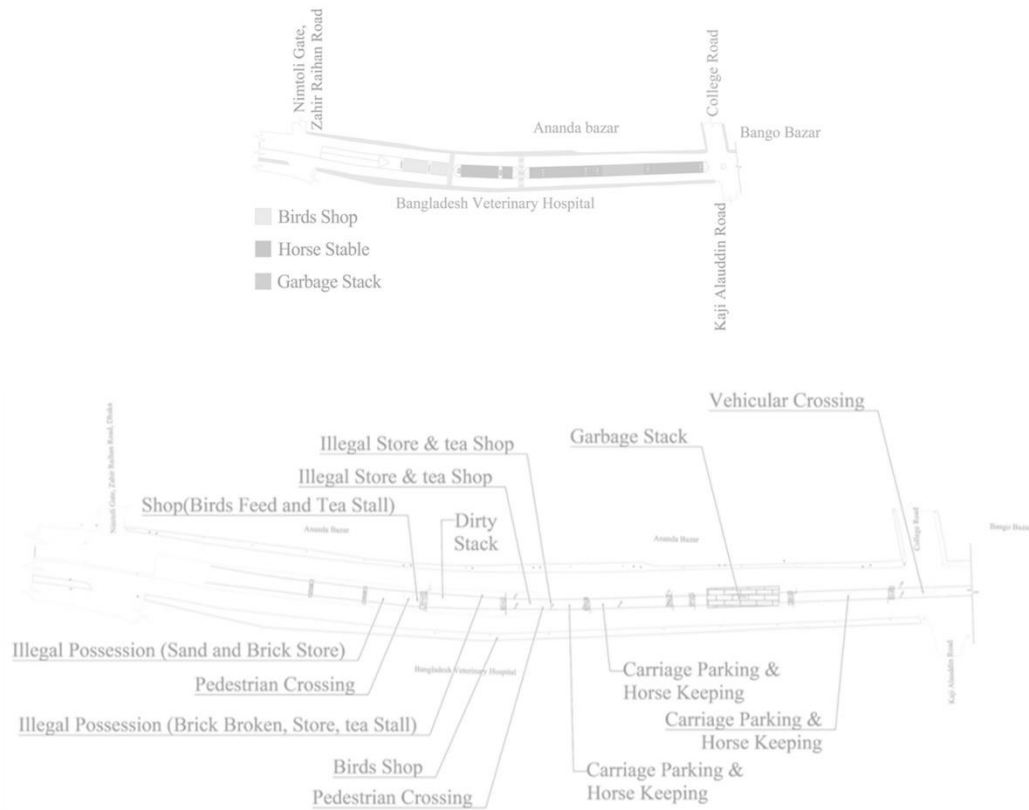
Community centers: The space underneath flyovers could be used to house community centers, providing a place for people to come together and participate in activities and events.

Overall, the use of the space underneath flyovers should be guided by the needs and desires of the community, and should aim to create a vibrant and welcoming public space that benefits the local community.

However for this specific case, there are several area based solutions required as this is a unique urban project. In the following pages we will be introducing the area layouts, relevant case studies, concepts and implementation ideas as part of the inception report.

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

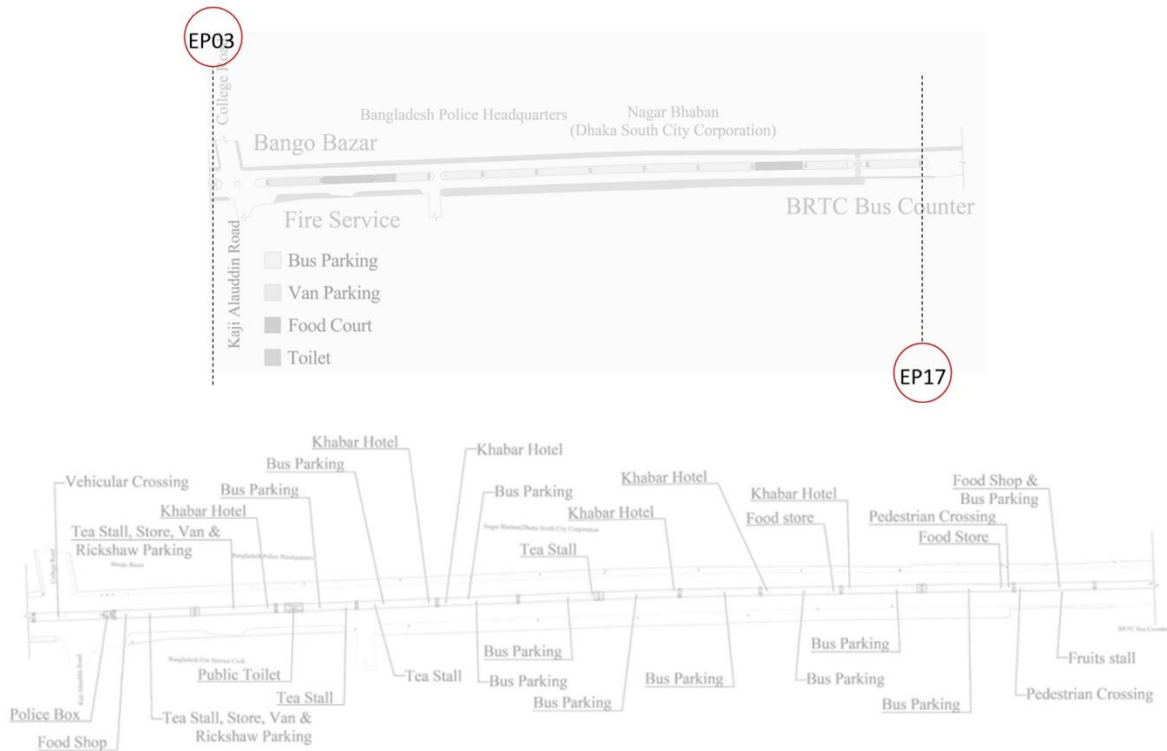
Area 01 : Chankharpul to Bongo Bazar (EPA06 - EP03)



As the starting point of the mayor hanif flyover this area has some existing scenarios which contains , Horse Keeping , Carriage Parking, poultry farms , Garbage dumps etc . Narrow roads and commercial landuses on both sides.

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

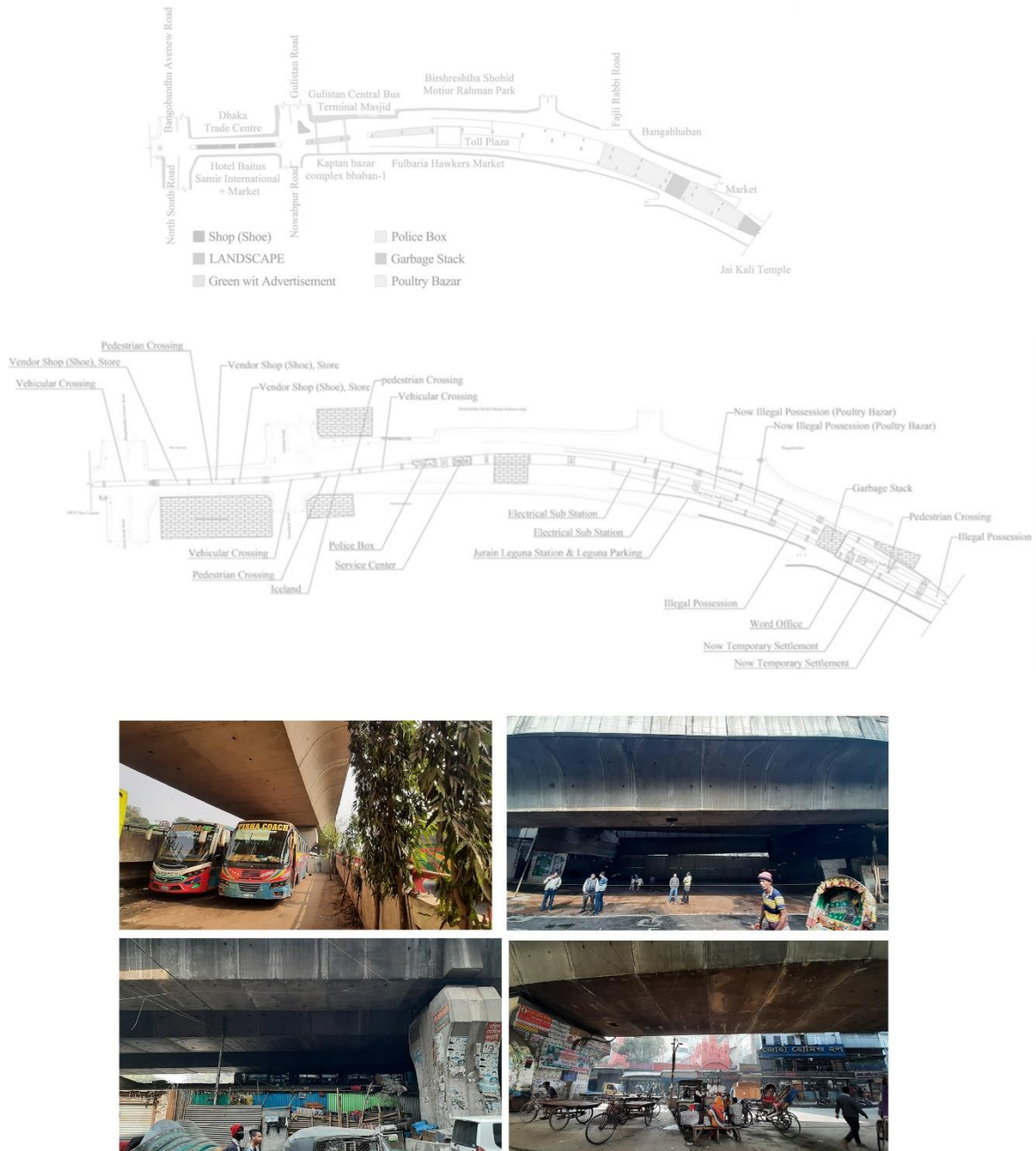
Area 02 : Bongo Bazar to BRTC Bus Counter (EP03 – EP17)



As shown in the layout the area under flyover landuses mostly constitute Parking of buses , median hotels , vendors for various objects etc ,

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

Area 03 : BRTC Bus Counter to Jaikali Mandir (EP17- P01)



As shown in the layout the area under flyover landuses mostly constitute Vendor Shop (Shoe), Heavy Traffic Node, Unused Space, Police Box & Public Service Center , Poultry Bazar at night, Temporary Settlement and view of historic joykali temple.

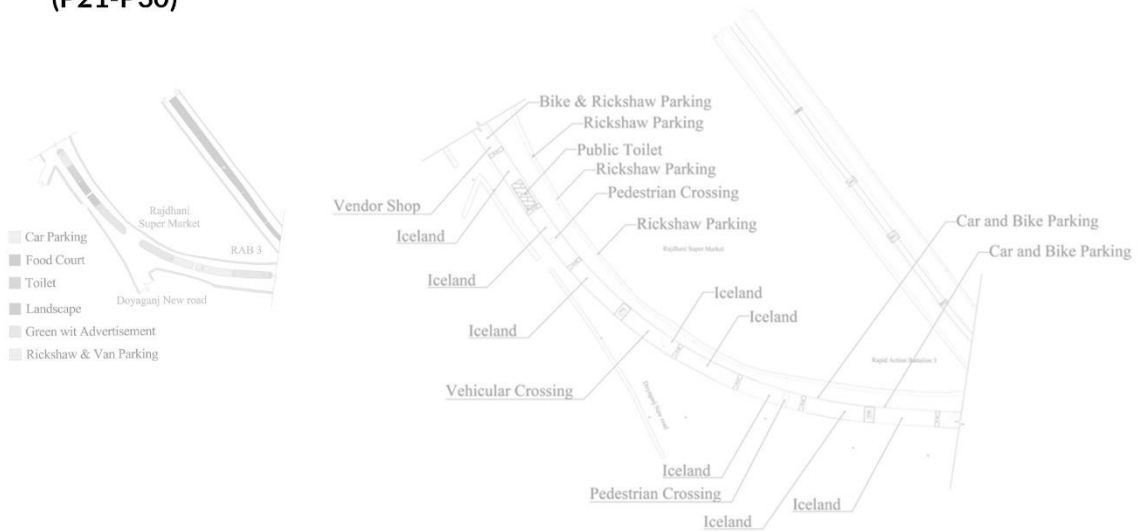
Area 04 : Jaikali Mandir to Rajdhani Super market (P01-P21)



152

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

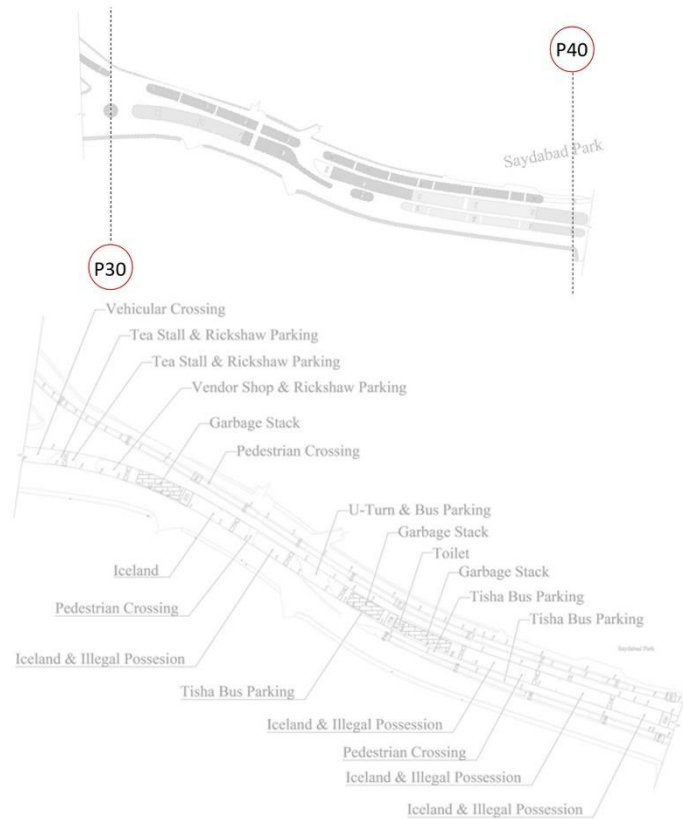
Area 05 : Rajdhani Super market to Swamibag (P21-P30)



As shown in the layout the area under flyover landuses mostly constitute empty spaces , Public toilet, Car & Bike Parking, Vendor Shop & Bike Parking

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

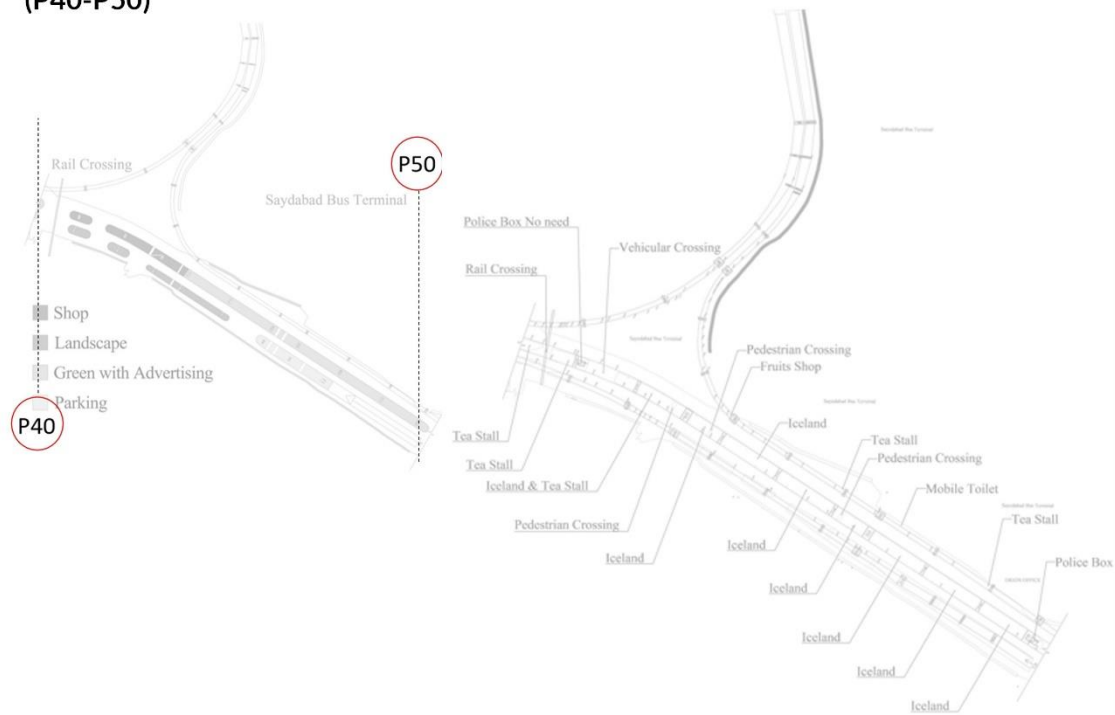
Area 06 : Swamibag to Saydabad (P30-P40)



As shown in the layout the area under flyover landuses mostly constitute bus depot , empty spaces , banana plantation etc

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

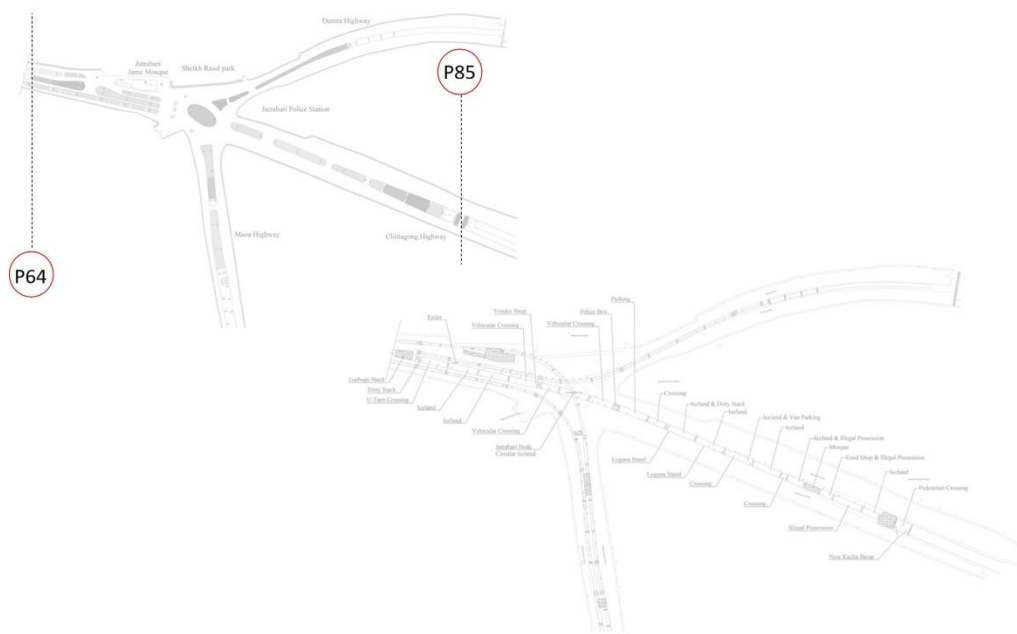
Area 07 : Saydabad to Janapath Mor (P40-P50)



As shown in the layout the area under flyover landuses large open spaces and medians having empty spaces

1.3. FLYOVER LAYOUT AND ZONING FOR THE DSCC PROJECT

Area 08 : Jatrabari to Kutubkhali (P64-P85)



As shown in the layout the area under flyover landuses large kitchen market , nursery , auto parking and small shops.

1.4. EXISTING ISSUES & PROBLEMS

After analysing the existing situations , we have identified core issues and problems into three categories of flyover infrastructure elements .

- A. Problems surrounding flyover **column**
- B. Problems surrounding flyover **median**
- C. Problems surrounding flyover **ceiling surfaces**

A. Problems surrounding **FLYOVER COLUMN**



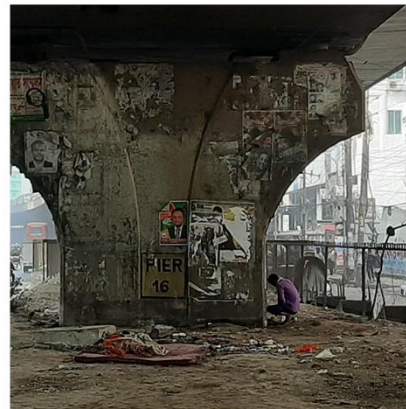
GARBAGE DUMP



POSTERING



WASTE DISPOSAL



PUBLIC URINATION

Roadside urination, garbage dump is a common issue in many cities, particularly in areas with a lack of public restrooms., waste disposal spots It can be unsanitary and can contribute to poor public hygiene and sanitation. Flyover columns tend to be a common spot for such activities as it provides a terminal end and enclosure to hide and do activities .

1.4. EXISTING ISSUES & PROBLEMS

B. Problems surrounding **FLYOVER MEDIAN**



VENDORS & HAWKERS

NOT SAFE TO CROSS
THE ROAD TO MEDIAN



ILLEGAL
ENCROACHMENT

UNHEALTHY
ENVIRONMENT ,



ILLEGAL PARKING

UNHEALTHY
ENVIRONMENT , NOT
SAFE FOR PEDESTRIAN



HEAVY CONSTRUCTION

BLOCKING VIEW , LESS
FLEXIBLE FUTURE
URBAN DEVELOPMENT

The median space of a flyover or an overpass, also known as a central reservation, is often misused in many cities. This can include illegal activities such as littering, informal vending, and even squatting. Misuse of median space can not only be unsightly, but it can also pose safety risks to both pedestrians and drivers.

1.4. EXISTING ISSUES & PROBLEMS

B. Problems surrounding **FLYOVER CEILING SURFACES**



ADVERTISEMENTS



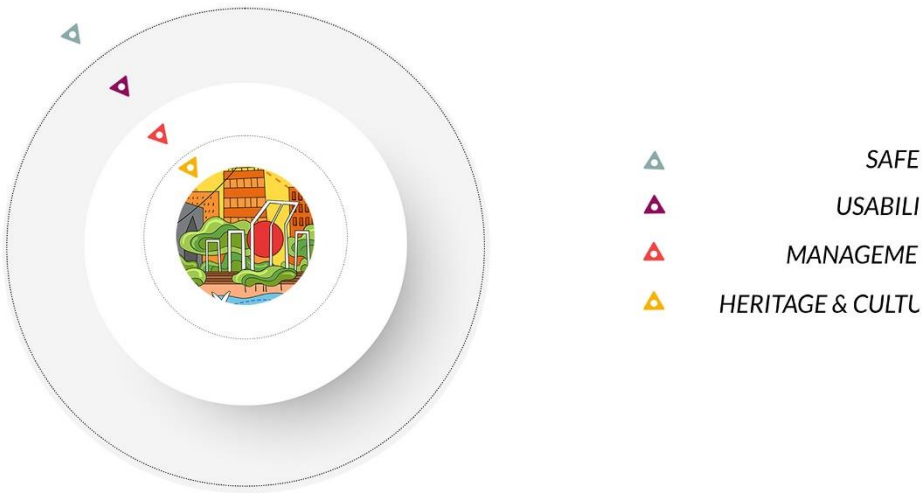
WALL WRITING



POSTERS, ADVERTISEMENTS

The median space of a flyover or an overpass, also known as a central reservation, is often misused in many cities. This can include illegal activities such as littering, informal vending, and even squatting. Misuse of median space can not only be unsightly, but it can also pose safety risks to both pedestrians and drivers.

inception report **concept** for intervention



CIRCLE OF INTERVENTION

COLUMN

MEDIAN
CEILING



POSTERING
GARBAGE DUMP
WASTE DISPOSAL
PUBLIC URINATION

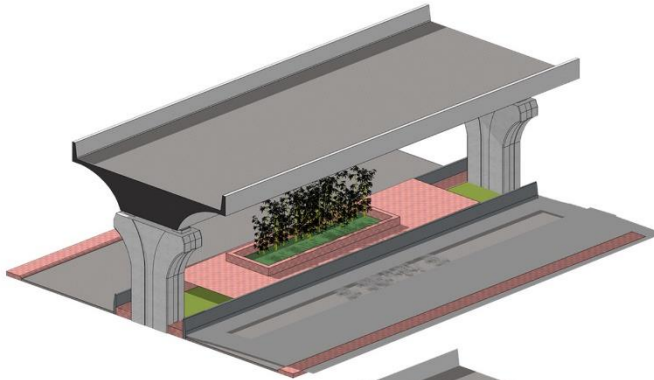


- 1. WIREMESH** AROUND THE COLUMNS
FUNCTION -- A. **ANTI POSTERING**
B **BASE FOR PLANTATION GROWTH**
C **URINATION PREVENTION**

case study from yao city under railway space japan

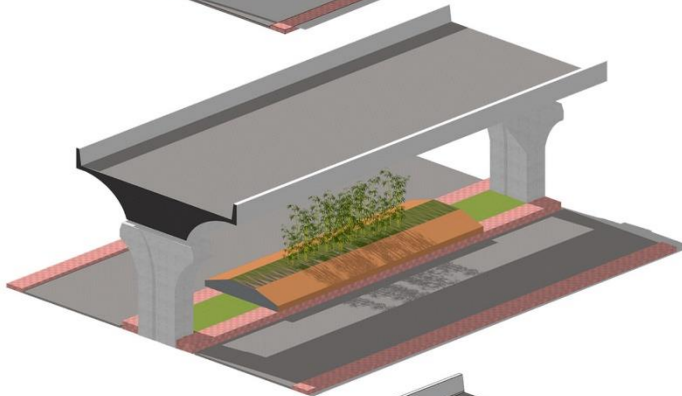
COLUMN
MEDIAN
CEILING

1.



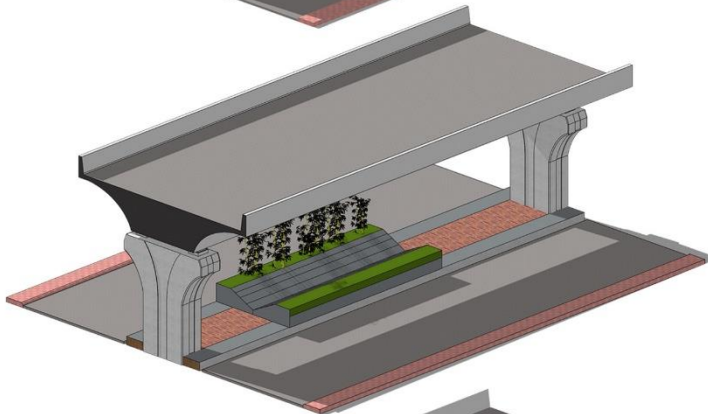
BOUNDARY AROUND
MEDIAN

2.



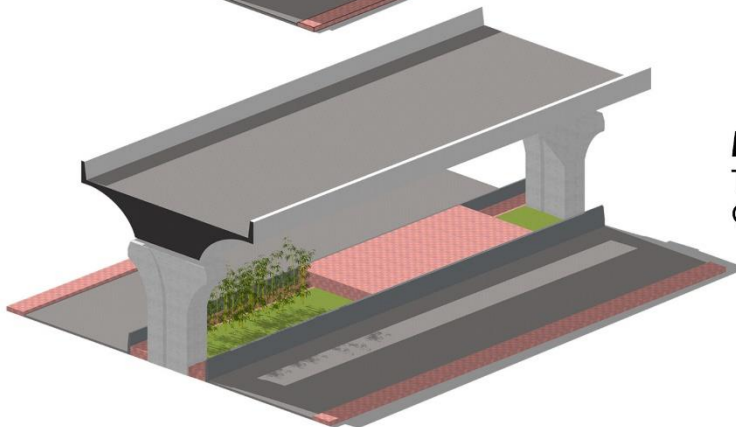
SLOPE UPWARDS TO
GREEN SPACE

3.



STEPS INWARDS THE
MEDIAN, OPPOSING THE
ROAD

4.



BRICK PAVES AROUND
THE MEDIAN , GOOD
QUALITY PAVES

COLUMN

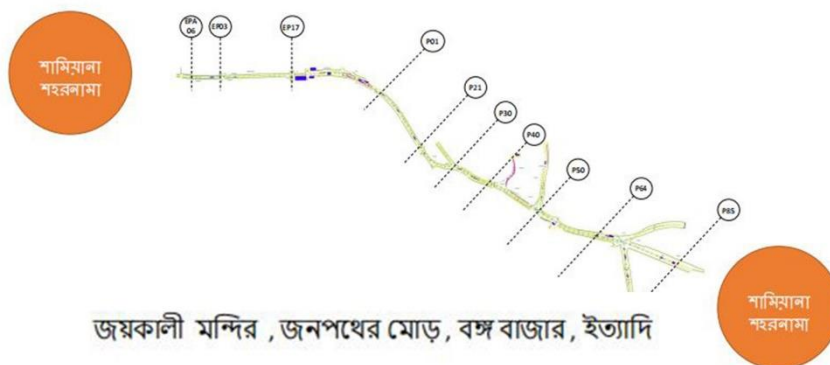
MEDIAN

CEILING SURFACES



2.

RENTABLE CEILING SURFACES



ON SELECTED AREAS

নগরে উড়ালসড়ক ,
শামিয়ানা শহরনামা

আপনি যদি কখনো স্বামীবাগ , ওয়ারী বা জয়কালী মন্দির এর পাশে হেঁটে যাবার সময় আচমকা দেখতে পান কিছু লোকজন রং , তুলি নিয়ে বেশ শোরগোল করছে , তাহলে একটু মাথা উঠিয়ে উড়ালসড়কের ছাদের দিকে তাকাবেন । হয়তো বিস্তীর্ণ রঙিন শামিয়ানা দেখে চমকে যাবেন । একটু খেয়াল করলে দেখবেন, কে বা কারা যেন নকশি কাঁথার মতো আমাদের নাগরিক গল্প গুলোর পালা বসিয়েছে । হয়তো গ্রাম বাংলা বা বিপ্লবের কিছু চিত্র ও পেয়ে যাবেন । এলাকার নাগরিক হিসেবে হয়তো উৎসাহে পাশের অপরিচিত পথচারী কে দেখিয়ে বলেও বসতে পারেন "আরে এটা লালবাগ কেলা না ! ? "

আমরা এমন কিছু গল্পের জন্যই অপেক্ষা করছি নগরের উড়ালসড়ক নিয়ে ।

শহরনামার শামিয়ানায় স্বাগতম !



শামিয়ানা
শহরনামা

শামিয়ানা
শহরনাশা

ওয়ারী সড়ক



শামিয়ানা
শহরনাশা

ফুলবাড়িয়া - গুলিস্তান



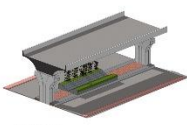
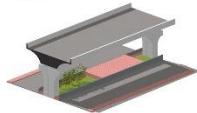


জনপথের মোড়ে



ওয়ারী - স্বামীবাগ



OPTIONS			
	FLYOVER COLUMN	FLYOVER MEDIAN	FLYOVER CEILING
	 WIREMESH PLANTS	 BOUNDARY AROUND MEDIAN	 CEILING LIGHTING
	 WIREMESH LAYER	 SLOPE UPWARDS TO GREEN SPACE	 FLOOR LIGHTING
	 BAMBOO/ BANANA / PLANTATION	 STEPS INWARDS THE MEDIAN, OPPOSING THE ROAD	 RENTABLE CEILING SURFACES ADVERTISEMENT + WALL MURAL
	 WASTE MANAGEMENT & SORTING	 BRICK PAVES AROUND THE MEDIAN, GOOD QUALITY PAVES	 শামিয়ানা শহরনামা

Appendix 3: Symposium poster and google form questionnaire

Content: Organization of symposium and talk series on infrastructural adaptation. Google form survey on infrastructural adaptation from general people and experts. As part of environmental management activity.

INTERNATIONAL SYMPOSIUM ON
LIVING (WITH+IN) INFRA
MOBILITY & CITY

11.11.2022
08:30 - 12:30 (BST)
14:00 - 18:00 (IST)

where policymakers, architects, academicians, researchers, and children people gather together and discuss the policies about transport infrastructure. Its role urban impact, their perspective while also showcasing their infra projects.

MOBILITY & CITY

Are modern urban landscapes transformed by infrastructures?
Is there a need to redesign the Dead Spaces under Elevated Structures?
How do you think these spaces under the flyovers can be transformed?
Do you cities adapt with flyovers or flyovers adapt with you cities?
Are highways and flyovers an urban element?
Do you think flyovers create black or dark / non-spaces? Do these spaces feel safe?

TU Delft

Living (with+in) Infrastructure
Transformation, Adaption and Value of Urban Transport

Wednesday, 29th November, 2023

09.00 - 12.40 GMT/UCT+0 (UK)
10.00 - 13.40 CET/UCT+1 (EU)
17.00 - 20.40 CST/UCT+8 (CN)

Online Symposium

Dr. Brian Rosa
Research Fellow in the Department of Geography and the Center for Demographic Studies, Universitat Autònoma de Barcelona, Spain

Prof. Christian Schmid
Professor of Sociology at Department of Anthropology, ETH Zurich, Switzerland

Prof. Dongzhu Chu
Professor at Chongqing University China, Chief Architect at Chongqing Architectural Design Institute

Dr. Anna-Leena Toivanen
Academy Research Fellow at the School of Humanities, University of Eastern Finland, Finland

Scan the QR code to register for free tickets and Zoom Link!

Or through the URL below:
<https://www.eventbrite.co.uk/e/living-with-in-infrastructure-tickets-7341008689877?aff=mobilecreator>

Follow Us:
Twitter: @UT_Infra
to get more multi-disciplinary academic events and creative research trends based on urban transport infrastructure!

Mobility & City

Demetris Kourati
PhD in Architecture, University of Barcelona

Masashi Sogabe
Professor of Architecture, Chongqing University, China

Reiharu Suzuki
Professor of Architecture, Chongqing University, China

Mobility & City

Promenade Plantée, Paris (France)

Dr. Steffen Nijhuis
Professor of Architecture, Chongqing University, China

Qinwei Peng
Researcher, The University of Hong Kong, China

Why do pedestrians want to use/occupy these under-flyover spaces?
How can we make traffic infrastructure as social infrastructures to respect local pedestrians' everyday life?

LIVING WITH_IN INFRA



How **urban systems, communities and human practices** co-exist and adapt with transportation infrastructures like flyovers, elevated railways, over bridges etc ?

what is the current state of our **understanding** on infrastructural adaptation ?

LIVING WITH_IN INFRA : MOBILITY AND CITY

srijonbarua42@gmail.com (not shared) [Switch accounts](#)

A SURVEY ON THE GENERAL IDEA OF TRAFFIC INFRASTRUCTURE BASED LAND USE AND SPATIAL CHARACTER FROM URBAN INHABITANTS PERSPECTIVE

Transportation infrastructure like flyovers, elevated railways, walkways, over bridges etc. are built to facilitate urban mobility. While doing so, these traffic infrastructures change and modify the city landscape, creating new spaces adjacent, under or within in it. In the post construction phase, as they are put into an already existing system of urban networks, the under-infrastructure space and infra elements continue to evolve into interesting usages by common people. Transportation infrastructure continues being utilized as an urban element, beyond their intended function in many cases. This is a survey on the general perception of infrastructure based land use and spatial character from urban dwellers perspective.

(The information of this questionnaire will be used for the academic research ONLY)



[Next](#)

[Clear form](#)

PART 01: BASIC DEMOGRAPHIC INFORMATION

1. What is your nationality?

Choose

2. Which city do you currently live in?

Your answer

3. Age group

- ☐ <20
- ☐ 20-30
- ☐ 31-40
- ☐ 41-50
- ☐ 51-60
- ☐ >60

4.How do you identify yourself as an user of the city?

☐ General user

☐ Researcher on urban issues

☐ Associated with any city development organization

☐ Others

5. Your profession

Your answer _____

[Back](#) [Next](#) [Clear form](#)

Never submit passwords through Google Forms.

PART 02: YOUR EXPERIENCES WITH TRAFFIC INFRASTRUCTURE AND SPACES CREATED AROUND IT

6. Do you think infra co-exist with our everyday urban life? *

☐ Yes

☐ No

☐ Other: _____

7. Do you have the experience of using flyovers , bridges , over-bridges , elevated walkways etc. ?

☐ Yes

☐ No

8. How frequently you use spaces created by traffic infrastructures?

- ☐ Everyday
- ☐ Weekly
- ☐ Monthly
- ☐ Yearly
- ☐ Never

9. How long you use or stay in these spaces on average ?

- ☐ less than 30 mins
- ☐ 30 mins - 1 hour
- ☐ 1 - 3 hours
- ☐ half a day
- ☐ a whole day
- ☐ more than one day
- ☐ negligible

10. How do you use these spaces created by traffic Infrastructures?

(e.g. I buy fruits in the temporary market under the flyover / I use it for commute / I meet my friends there etc.)

Your answer _____

11. What is the first word that comes to your mind when you see spaces created by transportation infrastructures? *

Your answer _____

12. What are the most common functions you see in the spaces created due to infrastructure? *

- ☐ Open public place without specific function
- ☐ Economic Activities
- ☐ Parking place
- ☐ Public service
- ☐ Leisure place
- ☐ Living spaces
- ☐ Other: _____

PART 03 : LANDUSE PREFERENCE

13. Following are some photographs of infrastructure based **systems of land use in spontaneously generated urban contexts** (By spontaneously generated , we mean not designed , curated or planned by appropriate design authorities)

Your opinion about the shown examples of land uses as **temporary market** *



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

Your opinion about the shown examples of land uses as **public welfare or public activities** *



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

Your opinion about the shown examples of land uses as **parking and unloading area** *

Your opinion about the shown examples of land uses as **formal or informal living zone** *



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

Your opinion about the shown examples of land uses as **leisure area** *



☐ In support

☐ Not in support

☐ Other: _____

What are some key words that comes to mind when you see **spontaneously generated landuse** (as shown in above pictures)

PART 03 : LANDUSE PREFERENCE

14. Following are some photographs of infrastructure based **systems of land use in consciously designed** under infras contexts (by consciously designed , we mean designed , curated or planned by appropriate design authorities)

Your opinion about the shown examples of land uses as **commercial area** *

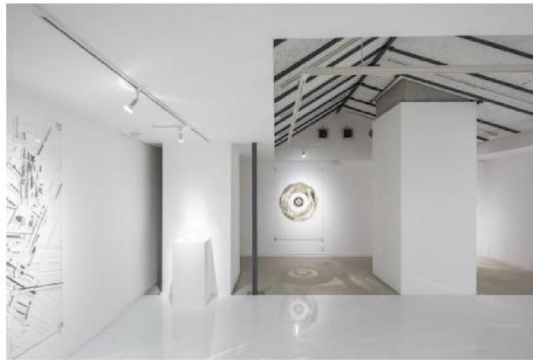


☐ In support

☐ Not in support

☐ Other: _____

Your opinion about the shown examples of land uses as **art zone, such as theatres, galleries** *



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

Your opinion about the shown examples of land uses as **public plaza and communities activities** *



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

Your opinion about the shown examples of land uses as **iconic image of the city** *
or an area:



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

Your opinion about the shown examples of land uses as **ecosystem services** *
through plantation and public parks:



- ☐ In support
- ☐ Not in support
- ☐ Other: _____

What are some key words that comes to mind when you see **consciously generated landuse** (as shown above)

PART 04: YOUR SUGGESTIONS

15. Which of the following urban systems generated by traffic infrastructure you prefer? (as shown in previous segment of the questionnaire) *

- ☐ Spontaneously generated urban land usage
- ☐ Consciously designed urban land usages
- ☐ Other: _____

16. Do you know the location and name of any similar example case or site? If yes please write down the name or area of the project.

Your answer _____

17. What can be some positive land use or functions for spaces created by infrastructures in your opinion?

Your answer _____

18. Can art have a positive impact or image on infrastructure based area revitalization? *

- ☐ Yes
- ☐ Not necessarily
- ☐ Other: _____

19. What type of character would you prefer to see in spaces generated by traffic infrastructures? *

- ☐ Vibrant
- ☐ Bright
- ☐ Dark
- ☐ As it is
- ☐ Natural
- ☐ Vacant

19. What type of character would you prefer to see in spaces generated by traffic infrastructures ? *

- ☐ Vibrant
- ☐ Bright
- ☐ Dark
- ☐ As it is
- ☐ Natural
- ☐ Vacant

20. While planning or designing land use around or within the traffic infrastructures in the city, which of these should be prioritized according to your opinion? *

Please rank them in an order (For example : abcdefgh , Please do not put any comma inbetween)

- a. Public welfare & safety
- b. Economic activities
- c. Ecosystem services (Green plantation, park)
- d. Public services
- e. Image of the area

Conclusion

21. Following are some of the Artificial Intelligence generated images with specific keywords and groupings of under infrastructure land uses titled from 1 to 8 . Please choose any three out of eight scenarios you like and write their numbers (Example :123 or 278 or 321 etc . Please do not put any comma inbetween)

1



☐ A

2



☐ A

3



☐ A

6



☐ A

7



☐ A

4



☐ A

5



☐ A



☐ A

21. Please write your three choices (example: 123 , *)

Please do not put any comma inbetween)

Your answer

22. Please write some of the keywords behind your reason of the above choices

Your answer

23. Any other comments for this symposium?

Your answer

Back

Submit

Clear form

Appendix 4: Internship & Activity Documents

Content: Internship program GSGES environmental management course agreement forms.
Visiting Research at ETH Zurich D-Arch
Academic affiliate at UCL Bartlett CASA

Internship Program Agreement

The student Srijon Barua of the Doctoral program in Environmental Management, Graduate School of Global Environmental Studies Kyoto University (hereafter GSGES), will take part in the Internship Program by the host organization/institution Department of Architecture [D-ARCH], ETH Zürich.

1. Name : Srijon Barua (Date of birth: 05/12/1990)
 Contact details : Heights Mikage, Room 208, TanakaHinokuchicho 5 Sakyo-ku, Kyoto, 606-8222, Japan
 E-mail : srijonbarua42@gmail.com Tel : 070-4109-2091
2. Educational background : Master of Environmental Management, GSGES, Kyoto University
3. Name of Internship Program : Post Infrastructural Adaptation: Spatial and management patterns of under-viaduct land uses in the European context
4. Period of internship : 04/08/2023 ~ 31/10/2023 (intended)
5. Content of Internship Program : Field survey, case study and interview of resource person relating to the research topic
6. Location of Internship : Department of Architecture [D-ARCH], ETH Zürich
 Address: Stefano-Franscini-Platz 5, 8093 Zurich Hoenggerberg, Switzerland
 Tel : +41 44 633 29 91 Fax : _____
7. Name of academic supervisor : Prof. Kobayashi Hirohide
 (associate academic advisor) : Assoc. Prof. Ochiai Chiho
8. Name of supervisor at the place of internship : Prof. Hubert Klumpner
9. Accident insurance details : Student Accident Insurance (GAKKENSAT) and Personal Liability Insurance for Students (GAKUBAI) and Overseas Travel Insurance
 ※ While the student is obliged to take out appropriate student insurance, the host organization/institution and GSGES agree to work together to resolve any problems pertaining to disasters the student meet with during the term of his/her internship (including commuting time).
10. Travel expenses : Prepared by the trainee and the GSGES
11. Lodgings : Prepared by the trainee and the GSGES
12. Remuneration : None
13. Terms of Employment : In conformity with the terms met by full-time staff.
14. Keeping confidentiality : The student agrees to keep strict confidentiality. On no grounds is he or she to disclose information obtained over the course of the program which is deemed classified by the host organization/institution.
15. Others : None

Two copies of this Exchange Agreement are to be prepared, to be signed by both parties, with one copy to be retained by each party.

21 June 2023
 Date
Tom Emerson
 Signature

Prof. Tom Emerson,
 Dean Department of Architecture, ETH Zurich

2023.06.01
 Date
Katsumi Takeshi
 Signature

KATSUMI Takeshi
 Dean, Graduate School of Global Environmental
 Studies,
 Kyoto University
 Yoshida-Honmachi, Sakyo-ku, Kyoto-shi, Kyoto-fu, Japan

Internship Program Agreement (Sample)

The student (Srijon Barua/Year 2) of the Doctoral program in Environmental Management, Graduate School of Global Environmental Studies Kyoto University (hereafter GSGES), will take part in the Internship Program by the host organization/institution (The Bartlett Centre for Advanced Spatial Analysis, UCL).

1. Name : Srijon Barua (Date of birth: 05/12/1990)
 Contact details : 〒606-8222, 5-Tanakahinokuchi Cho, Heights Mikage,
Room 208, Sakyo-ku, Kyoto, Japan
 E-mail : Srijonbarua42@gmail.com Tel : 070-4109-2091
2. Educational background : Master of Environmental Management, Kyoto University
3. Name of Internship Program : Visiting Research
4. Period of internship : 03/11/2023 ~ 26/01/2024 (Intended)
5. Content of Internship Program : Post Infrastructural Adaptation : Spatial and
management patterns of under-viaduct land uses in the context of The UK.
6. Location of Internship : The Bartlett Centre for Advanced Spatial Analysis, UCL
 Address : University College London, Gower Street, London, WC1E 6BT
 Tel : +44 (0) 20 7679 2000 Fax : _____
7. Name of academic supervisor : Prof. Kobayashi Hirohide
 (associate academic advisor) : Assoc. Prof. Ochiai Chiho
8. Name of supervisor at the place of internship : Professor Adam Dennett
9. Accident insurance details : _____
Student Accident Insurance(GAKKENSAN) and Personal Liability Insurance for Students
(GAKUBAI)
※While the student is obliged to take out appropriate student insurance, the host
organization/institution and GSGES agree to work together to resolve any problems pertaining
to disasters the student meet with during the term of his/her internship (including commuting
time).
10. Travel expenses : Prepared by the trainee and the GSGES
11. Lodgings : Prepared by the trainee and the GSGES
12. Remuneration : None
13. Terms of Employment : In conformity with the terms met by full-time staff.
14. Keeping confidentiality : The student agrees to keep strict confidentiality. On no
grounds is he or she to disclose information obtained over the course of the program
which is deemed classified by the host organization/institution.
15. Others : None

Two copies of this Exchange Agreement are to be prepared, to be signed by both parties, with one copy to be retained by each party.

3/11/23
 Date
 Signature Adam Dennett

Adam Dennett
 Professor, The Bartlett
 Centre for Advanced Spatial Analysis, UCL
University College London, Gower Street, London, WC1E 6BT

5/6/2023
 Date
 Signature Katsumi

KATSUMI Takeshi
 Dean, Graduate School of Global Environmental
 Studies,
 Kyoto University
Yoshida-Honmachi, Sakyo-ku, Kyoto-shi, Kyoto-fu, Japan

Appendix 5: Selected Transcripts of interviews from field survey

Content: Interview discussion of selected interviewee from Florence , Zurich , Paris & London.

Interview of Marco Spinelli and Giesele Perez Rodriguez, Florence, Ponte Vecchio
September 29, 2023



Srijon: Okay, so the recording has started and thank you so much for sharing your experiences. To summarize I will ask again it's more about what you want to share about Ponte Vecchio or about the city, like how the city influenced Ponte Vecchio or Ponte Vecchio influenced city, the architectural part and what's your opinion about the management system and as an architect what you want to share. I am okay with whichever you want to share.

Marco Spinelli: Well, you translate. Okay. The story of Ponte, you already know it, is certainly one of the oldest structures of the city.

Gieselle: So you already know the story of the Ponte Vecchio. It's for sure one of the ancient structures of the city, buildings of the city.

Marco Spinelli: Because the whole city, let's say, apart from a few elements and all of the re-birth of the city, so 1500 years ago.

Gieselle: So also because it's one of the ones left, all the rest of the city except for some portions of some buildings has been rebuilt. The fact that the age of the city in general is

renaissance around 1500, while this is more older.

Marco Spinelli: The Ponte Vecchio, which obviously became a Ponte Vecchio when they built a new city, even if it wasn't the oldest Ponte Vecchio in the city.

Gieselle: So it's called Ponte Vecchio or Old Bridge. It became the Old Bridge when they realized and they constructed a new bridge. So it became the Old Bridge once the city has built a new bridge. Ah, okay.

Marco Spinelli: So this was the bridge that reunified the city. The south and the north part of the city because in those days you had all the defense of the city that was built around it. And this bridge was connecting these two parts of the city. The bridge, in fact, in the state it was built in, around 1340. Obviously, before that, other structures were born that were destroyed during the years of the floods of the river. Here the city has always followed the floods of the river.

Gieselle: So the way you see this bridge is around 1350. Of course, before this, before this, but there were structures before this one that were older. But they were continuously destroyed by the floods. Because this city is very, very vulnerable to the floods. Just to think that the last one that was covered the city by mud was 60 years ago only. So...

Marco Spinelli: So, its initial function was to reunite the two parts of the city.

Gieselle: So at the beginning, the common things or shops you would find in that bridge were the groceries and the butchers. And they were used because they could throw in the river all the remaining parts of these shops. So this was the beginning and used for this

because the river was the one that would clean up directly.

Marco Spinelli: So, the old town of Vasari, for the orders of the Lord of Florence, and so on, realized what was on the bridge, the Vasarian corridor, that had the purpose of uniting the old town to Palazzo Pitti. Palazzo Pitti is the town that was the political center of the city. There were the political offices. That is the office gallery. The office gallery. The residence of the doctors, which was on the other side of the river.

Gieselle: So around 1500, this architect, Vasari, constructed the corridor to connect the Palazzo Vecchio, which was the political center of the city, the place where the people were politically doing everything. And then go to their residence and connect the residence in Palazzo Pitti. So Cosimo first was the one who ordered this corridor to connect this to buildings. So they could go directly from one place to another.

Marco Spinelli: You can see from there how it goes, the corridor.

Srijon: So they wouldn't have to go in the middle with the people.

Gieselle: So a few years later, one of the heriads of Cosimo I, around 30 years later, took away all the groceries and the vouchers because they produced a bad odor, a bad smell. So to the corridor where they were passing all days.

So they instructed and took away these shops and put inside order to be the orefischi, which are the people that worked the gold. There were not jewellery at the beginning. There were people working with the gold, creating handcraft with gold.

Marco Spinelli: And here begins the real trade phase of the bridge. Because the municipality, the lady who was the owner, gave the funds to the foundation to run a profession. So the municipality agreed privately to the people who were working in these places under the bridge, obviously discussing a task.

Gieselle: So the property was from the common, the community, it's the city hall. And they get licenses only to the people, these handcraft of gold, and they would pay for the spacer.

Srijon: So the city would pay for these places?

Gieselle: The city would give the license to these people, so they could occupy the bridge and they would get a tax for the space usage.

Srijon: Interesting. So this is the past history you were saying?

Gieselle: Yes, this was when the Renaissance time.

Srijon: Yes, Renaissance time.

Marco Spinelli: From there, the funds in the course of the years, I think, after 1700, around 1800, became private property. And then there was a whole passage of property with various speculations about the funds. And since then, the activities of the heuristic people have remained, even if from the very beginning we went through the business, and consider that...

Gieselle: So it's only around 1700 when these places became private. And there has been a lot of speculation also within these vines and the usage of this, but it's private since then.

And although at the beginning these were handcraft of jewelry, gold, they became now the shops of jewelry around those days. Okay. 1700, the big day. The big day, it's a little bit.

Marco Spinelli: I was going down, I mean, it's considered that since 1800, from the early years of 1800, Florence was already a tourist destination, especially from the northern Europeans. So this has made sure that the fact that these jewelry shops, of gold, let's say, have wanted to make these bottles more and more attractive, because they have transformed themselves into real glass vines for tourists, already since 1850 and so on.

Gieselle: So these shops of jewelry became so important because they were something that could get more tourists to get into the city.

Srijon: Okay, that's true.

Marco Spinelli: It's been closed to the public since the beginning. It was a private corridor, but since the time when the lady no longer existed, that is, a corridor has been closed. Twenty years ago it was reopened and some visitors were organized. It's considered that this corridor is a real museum, because there are pictures, pictures, pictures, pictures. It's part of what was not in the offices, it's all the stuff that was left in the stores.



Gieselle: So it's only 20 years ago, around 20 years ago, that the Vassalia and Corridor has reopened. It was always closed because it was a passage from the regions of the city. And it's only around 20 years that it's opened. They organized tours and indeed it is a museum itself, because there are a lot of artworks inside, paintings. I believe there are portraits of many famous paintings. And also because

there were some arts that were not able to fit in the Uffizi. Uffizi. So they put it somewhere.

Marco Spinelli: This is the story of the bridge. Obviously, being so in the city center and in such a characteristic way, with all these bottles of gold, they always made a half of all the tourists. Even because, as an architecture, it's not that it's a great point at the end.

Gieselle: So this is the story of the bridge. And it's so characteristic, so different from others, that it has become a popular tourist point. Because if you see it, it's not so special, architectural style in the city. But it is different from all the others. So this has remained part of the sign of the city. In this course of the weather.

Marco Spinelli: When the World War II was over, at the end of the Second World War, when the Germans, who were occupying Italy, withdrew the front, they left Florence, they did it more or less in all cities. They did it all, they mined it all, they did it in all cities. They didn't do it, but they did it in Agibide, because they did it all around the houses. No, but the houses did. So you couldn't...

Gieselle: These are also old palaces.

Marco Spinelli: Those, especially from the side of the lake. Sorry, from this side. Because from here the aldehyde came. They were all made to jump. They were all made to jump from the other side too, because in Agibide, there were at least one bridge.

I don't remember if it was the bridge to the Grazia or the bridge to the Carraia, which was very beautiful, with statues, especially on very similar bridges that were not made in Rome, but in a smaller bridge. So this

Gieselle: was the only bridge that was left by the Germans after the Second World War. So it

was the only one that was not destroyed by them, because they used as common practice on their way away when the Allies were arriving from this part of the city to burn or to destroy the bridges.

This one, they considered an artistic point. They wouldn't destroy it, but they did destroy the houses around the extreme points, so it could not be accessible, because they were leaving away and they didn't want the Allies to come and use the bridges to align with them. So although the bridge has remained, because they for sure considered an art, they would destroy the buildings around it. And as you can see, if you go to the bridge at that point, on this side of the city, those buildings are pretty new. This is the reason why, because they were destroyed 16 years ago or so. And there was another bridge that was very beautiful with all the statues, like the one in Rome, very similar to the one that connects the Vatican with the city, with the Sant'Angelo, with all the statues, but it was destroyed. It's not here anymore.

Marco Spinelli: How did you live from the Fiorentines? I was telling you before, in this historical period, Fiorentines, or local people, in the historical centre of the city, almost nobody lives anymore.

All the apartments are given in a place, in a shelter, in tourist places, for the Airbnb, one, two, three days. So the historical centre is no longer lived, it's like a tourist hub, you see.

Gieselle: This is what I was telling you before. So in this particular period, historically, Florentine people are not living in Fiorentines anymore, almost. Of course, there are still some people that own some buildings and live spots in the downtown, especially. It's mainly all for tourism usage. So people that own, it's all given to Airbnb, hotels, and places where tourists can arrive and stay one, two, three days. Also because tourism has become very

express, very fast. So people come one, two, three days and they just need a place to stay and go. And so the downtown of the city and the buildings are mainly just tourism or offices, some of their offices, like less, always less.

Marco Spinelli: I have always seen the points, always as a point of finding tourists. For me, it's not even the most beautiful points or that I like the most, in Florence, actually. I have never felt that as a particular point of finding, particularly where the city lives, because even in Fiorentines, there have always been just places.

Gieselle: So I do not see or have never seen or see today the Ponte Vecchio as a point of reunion for myself, because it has always been a tourist point. So for me, there are other bridges or places in the city that are more characteristic and where I can find myself, or with other people. But it's purely tourist.

Marco Spinelli: This is what I tell you in 2023. But even 40 years ago, no, 40 years ago. So this is what I tell you now, but I don't know if it was also the same some years ago. 40 years ago it was already a tourist point only.

So it's always his function to unite the city, because this part of the city has always been a much more residential part than the northern part of the city, where there are more buildings, more buildings, more institutions. Here it was very residential, there were apartments, or boutiques, where there were artisans, and the houses were sold, and here they were produced.

Gieselle: So the function is still the same to connect the city from the north to the south, because in that part, the northern part is where the buildings and the shops are located, and the offices. In this part, in the south part, it's a residential part. So in this part, in the southern

part, you have people living, producing, creating for selling in the northern part.

Marco Spinelli: That bridge has always been a characteristic of the tourist area, because if you are a citizen who has to go from one side to the other, you surely go first to go to another bridge, which is from that where... In the days I really don't go, I have to move people.

Gieselle: A lot of tourists, you have to go. So as a citizen, if you need to go from one place to another, probably you will choose one of the other bridges, because when you will see it, maybe when we return there, that there are some moments of the day that you cannot even pass, you have to do this slum between the tourists.

Marco Spinelli: There is always a concentration of people who try to take pictures, but then they always pass, there is never a moment...

Gieselle: In the middle of the bridge, you see there is a statue. Yes, yes. It's the Minuto Cilini. He knows what it is. And there are, you see always a lot of people that are trying to take the picture of our selfie, whatever, but there are always so many people in the middle, so it's very difficult even to get the picture there.

Srijon: I have a short question here, like, sorry to ask, is that since you said that the north part is more commercial, exhibition and other things and these part people live, I wonder where does the gold shopkeepers they live? Like, it's just a curiosity question that do they used to live at one point maybe there, but now maybe they don't live there?

Do they come from like far and then they come here? Then how it's more private? It's just for a shopping place now or something, if you know anything about it. Yes, all right.

Marco Spinelli: Obviously, but today or in the future...

Srijon: Today, nowadays... More on time, the gold shopkeepers. Do they live there or do they come from far place?

Marco Spinelli: They don't live absolutely there. Those you've seen, you too, that are from the city, maybe you've seen people who have an operative, let's say it's a collection, it's an extra-extra-luxury service for more and more customers. No one lives there. They live well.

And those who are in the business, maybe there are, yes, the owners, but also many commissioners. So I don't know exactly where they can live, but they certainly don't live there. And it's not said, actually, I don't think it's the right thing to .

Gieselle: So the people that own the jewellery, for sure they are not living there. There's no people living there. All the people that you have seen in the roofs, making the aperitif, the drinks and everything, it's part of the service of buying in those shops. It's not actual living there. Most of the people that you see inside the shops are just people that work for the jewellery, not the actual owners.

The owners for sure are not living here, are living either in other parts of the city or outside of the city. And you can see for example there was Rolex. So for sure the owner, it's a franchise. And nowadays what you can see is that the owner of the shop might not be the owner of the jewellery. They rent the space to the most famous jewellery shops. So the owner of the space might also be different than the brand. Ah, interesting.

Srijon: So it's like there are some houses that is owned by an original owner. And then they rent it to the brands nowadays. Ah, interesting. So the brands pay to the owner of the house.

And owner of the house doesn't have to pay anyone because it has become like a land. You have to pay taxes. Oh, I have to pay taxes. So these taxes are paid to the city and do you know if anyone pays the maintenance fee for the, does anyone comes to maintain the bridge or it's just always like this? Maybe it's...

Marco Spinelli: The price of the road is the same.

Gieselle: How much do you pay for the maintenance fee?

Marco Spinelli: Yes, yes.

Gieselle: It's part of the city hall to maintain the city.

Marco Spinelli: The building is private.

Speaker 5: So for example in this space, which is a park, this land belongs to the city hall. So the city hall will clean for it, will maintain it, will keep it in good use. But the walls of the buildings that surround it are property, are private property and they must keep it and they must maintain it.

Marco Spinelli: So private is a private building.

Gieselle: If it's a public building, the city hall will maintain for it. But maybe it's also important to consider that Florence has more of their daily population of 1 million people, which more than half of it is tourism. So actual florentines that live are only like 4,000, 400,000 and the other 600,000 that are around the city every day are tourism. And tourists pay in the hotels and the airbnbs a tax, the Tassa di Soggiorno, the stay tax, 2, 3, 4 euro per person per day. So it helps to pay for the maintenance of the public spaces.

Srijon: So it's interesting because I am coming from Bangladesh and the bridge is very new, like 20 years. Now we don't have any personal connection to the bridge spaces yet and they also are not very special something.

But it is a Viaduct space. Now I wonder, like all the case studies I've seen in Zurich, Yokohama, Dhaka and Florence, I see that this place has created a care. Like for example, maybe people look at it as a... For example the Nazis, they didn't break it because it's more historical. So it has a care. So because it has care and also it became like a public space and private space both in the same place.

So I'm wondering what is the secret of sustaining a bridge for a long term. So the secret of building is it privatization because if you make the buildings private, people take more care because it's a private building. And the rest is public space, the road. Only the road is public space. But the buildings are private. So if I want to think for the future, like policy making for the government, that if the government wants to preserve any under viaduct space in any countries or any places, is privatization away or give them the responsibility.

You belong to this place or someone buys the land and then they start to make things and then they take care of it. Like what is the lesson from Pontevecchio here? What is your opinion about sustaining a bridge? Do you think privatization is a good way to keep the bridge sustainable for a long term? Just an opinion.

Gieselle: It's a public passage. But the buildings that are private are private forever. They have been made since recently. And the maintenance of the bridge is given by the taxes that the owners pay us. And then, as they are used, this is what they do.

Gieselle: No, but I understood that if you think about it, it is a secret because just a bridge like this, or a space like this, keep it for so many years, and then you will find a private bridge.

Marco Spinelli: There is no bridge above everything, For how beautiful it can be, there is a passage, that is to say, the bridge of Brooklyn, to say, it is just a passage above, under, feet, cars.

There is nothing private, how do you do if there is something private? Here, there are always private constructions that are made with their imposes, that survive, but it is not that it is preserved because there are private structures above, it is preserved, for the type of work that comes up there, so there are extra Russian activities and so the Russian senders are extra controlled, maintained.

Gieselle: So it is kind of a mixture between the privatization, yes, but also the appeal that these kind of shops have on people or the effect they have, also because it is so a luxury place, these shops, they are very controlled and they are very well preserved. So he says it is not only the fact that it is private buildings over the bridge itself, because if you only have a bridge, like the Brooklyn Bridge, there is nothing in it.

And it is public, it is not private, so what does it say to you? Yes, it is the structure, the architecture, but in this case it is a mixture of the private buildings over the bridge, the appeal that it has, the meaning itself of the bridge and the quality of the place making.

Gieselle: I think I remember if it was before the covid or in the time of covid, something happened that came out very clamoring in the city, the old bridge was closed for a private event, closed from one side and closed from the other, because above it is not in the bottom, on the bridge, because the passage, the road is colonial. They organized a boat for the Ferrari,

they fixed the bridge, so that day, I remember it was a few hours in the evening, but you could not pass.

Marco Spinelli : There was a certain point of view, it seems to be something, you know, you go to a private use of the public, if you are raised, so much, so much fame. But on the other hand, it is not that these money there, if it is put in a bag, they are entered into the common class, it happened once, maybe twice, for a few hours, Ferrari agent, the automotive case, which they paid, I do not know how many, I do not know, a thousand and a half euros, many, to have the available, and here too that is a way to keep it, to save.

But anyway, let's say, to put it in a row, to make it fruit a little money, so that if you think about it, a point that can generate profit, if it is not for private use, it is enough.

Gieselle: So there was a case a few years ago, maybe right after Covid, that Ferrari, the automobile company, rented the bridge, the passage, the road, which it is public space, rented to the city hall, and they closed it for a night, like for three, four hours, for a private event, so you could not pass. And the Florentos were very angry, they were very, very upset, because it's not public, etc. But if you think at the same time, it was not like the mayor took the money, it was given for the usage of the city hall to maintain the city itself, maybe to create or to maintain these public spaces, or to create something else that was needed for the city hall. So sometimes it happens that they rent the public spaces for this, or a fashion show, or maybe this kind of things, and it's part of how the city itself can get money, because otherwise how would you obtain money from a bridge, that it's only for connection between two points.

Srijon: But that was not popular, people did not like it that much. So it is interesting that

although the city wants to generate money, but when it's at the cost of public place, people don't like it, so they want it to be a common space, a common place where people can walk or do shopping or something. But because Ponte Vecchio is historically buildings, the buildings stay there. But people just don't buy from that, but they just love the road, specifically the tourists. So it's an interesting case in which I really want to create examples, like how can we preserve under viaduct spaces, and what should be the use, land use type. For example, if you, the Zurich case, as I told, that was like excess road, but they put very expensive shops there.

So now the exclusiveness has lost, became more exclusive, but not inclusive. So yeah, it is an interesting case, like what kind of land use we can propose in the bridges. So another question is that if you were to design under viaduct space, or under bridge space, or over bridge space, what would be the land use you prefer? Like, or is it going to be mixed, like some shopping, some common space, or fully open space? Like what kind of character of the space, say for a modern bridge, not an old bridge, there is a bridge, and then there are some spaces under it, how would you like to approach your design philosophy here? So to make it successful or have a good balance, so that like the example in Bangladesh, that people are evicted, they just burn down the place, the people who come here, they just move. So is it better to have a vision or just let common place? How would you design that?

Marco Spinelli: For me a bridge is a way of crossing and conjunction. So this is a single bridge built on this, it is particular, as I see it, a bridge.

Gieselle: No, as you see it, it is a new bridge, as you would do it.

Marco Spinelli: And you would do it not with structures above, but a passage point, where you could also open space, where you could stay, a space to sit, talk, but you wouldn't see other activities above a bridge. It is a huge bridge, but a better bridge, beyond architecture, could be more or less modern, more or less futuristic materials. But it is something where you have to go through, not where there are shops or houses, something where you can be a fan, sit, but not a market space, a sale space.

Gieselle: He only says that at a passage point, place to go through, he wouldn't build anything over it. He would not recreate this kind of structure. If it's large enough to have some spaces like sitting or having some public space, it's large enough, of course, but he would just reserve the fact of its connection between two points.

Srijon: So that is the main function of a bridge. So you have to keep the main function. For example, as I told, somebody said, why don't we see more bridges like Ponte Vecchio? So the answer somebody gave was that it stops the passage of the ships. So people stopped making bigger bridges like this example.

Gieselle: The city does not evolve.

Srijon: And the city does not evolve. So any bridge has two functions. One is the main axis of the city. Another is viaduct scale, like more small scale like Ponte Vecchio is giving like community spaces. So the more important one is the basic one, the city axis.

So if you have the good city axis, then it's okay. You don't need to make anything. And if it can become like something like this, then there is like more small users and something like this. So, okay. I think I got like really good information about what makes Ponte Vecchio

successful and how would you design Ponte Vecchio if it were a new project?

Gieselle: You know why he says, I believe in the bottom, he says something like that because this city is very difficult to drive. And it's the traffic because it's the places where you can actually move within the city are not very limited. So the main function of a bridge, again, is to connect to places. But here it's private and in this and the other one, you have the limited area and you cannot cross through here. So it has become more difficult to get access to it. So it all depends always on where, what do you see that is missing? Maybe in this city, but it's missing. It's the actual function of the bridge. The connections.

Srijon: That's nice. Any final comments on the architectural facts you want to share? Like is there any architectural details that you feel interesting about Ponte Vecchio that creates space? Any challenges about architectural features on the bridge? Or any favorite points in the bridge that you like? You said like you would not prefer to cross this bridge because of the tourists. But say, first time you went to the bridge, remember that bridge? What was the most attractive part for you? What was like the good place making example in the...

Marco Spinelli: What always reminds me of the childhood is that when you see it from outside, it seems to be actually houses. If here it seems... Then when you get to the archipelago of the bridge, you are on a bridge. But it's very contrasting to this effect of seeing from outside, both here and from this side even more, because there is a bigger space. When you go up there you see that you are on a bridge. Then, architecturally, yes, it does not differ much from the rest of the architecture of the city.

Yes, it's beautiful, especially these... Among them are some additions that have been made,

perhaps more recently, of others, that are the 800 of the... The in-agent sports, those that are considered on the good ones, the support. That is also something that I quite like. What are the reasons?

Gieselle: So, one thing that really impressed me as a child, it was that when you see it, especially from this part of the city, is that there is... It seems to be houses, buildings, apartments, but once you are in the middle of the bridge, you realize that there are no houses, apartments or buildings, it's a bridge. So, the contrast itself of seeing it from the outer part and from the middle of it, it was very characteristic. I think that's one of the points that have remained so characteristic. And also, those buildings that we will see that are... That come out from the front. That are a realization of 200 years ago, more or less, are very beautiful.

Srijon: That attracts you the most about the place. That's so interesting. And yeah, thank you so much. I think I got some basic information. For example, the questions that I asked was about history and about what you think about the place as an architect.

And what's your feeling as a Florentine? And also, I get the information about the land users and some information that was really interesting, that the renting of the franchises or the brands and then how the mechanism works like this way. So, it's an interesting information for me.

I think I can work with these information a lot and this is very fascinating to me. Because in my core, what I want to do is like propose visions for my own country, where people are using the place as a common space. But they are evicted and they are burned away. So, there should be some in between solutions that involves a peaceful solution. Because informal city, Bangladesh doesn't have house, informal

jobs and informality is important. So, that's what I'm trying to find the balance, the policies, so that I can propose these examples of the seven cities that I am doing now and then come up with a solution from there. Thank you so much. Do you have anything else you would like to share or give me suggestions and something like this? It's perfect.

Gieselle: Check for the... I mean, if you ever come back in the morning, in the early morning, or in the evening, the light. And it's the mirroring of the river and the buildings. When I arrived here in the first time, my favorite thing was to take the pictures not of the buildings, but of the mirroring of the river. One of the most characteristic things in France, I believe, is when you see the buildings mirror through the water. So, it's very, very nice, but you need to get the correct light. Usually in the morning, early morning, or in the evening, you have the sunset all over the bridge and it's very, very nice. Maybe you will be able to see it because... I saw it yesterday. So, it's one of the most characteristic with the colors because you see the color...

Marco Spinelli: The city looks much more in the daylight than in the evening. The evening is very... Maybe he takes a good look at the buildings, but it's much more beautiful.

Gieselle: The buildings, you see all

Marco Spinelli: these yellows, small inches, they look like a lot. They do this characteristic thing with the light.

Srijon: And finally, some comments from you because you are also part of the city. So, if you have something like summarized version, you have already... I have already asked all the questions based on everything, any comments from you. Like, what do you think about Ponte Vecchio, what's your favorite part? And how

do you think it's sustained? Do you think it's successful?

Gieselle: The function of the city, it is tourist mecca. Yes. So, but it's also there, it's pain point for me. Being from a big city, so chaotic, but yet beautiful and evolving continuously. I think that the only point is that it's beautiful, it's some museum under the sky.

When you see it the first time, you just are amazed, are glazed by everything. But then, living in there, and you would like some things sometimes to evolve, to change for young people, for young artists or whatever people working here. If you want at least a future different from tourism, you have to go out. I think that's the only point of the city in their last years, that it has become so typical. You see the same shops in Rome, in Florence, in Venice, in Padua, it has lost its characteristic artisans.

I would like that to return. Especially having kids that are younger, and if I see a future, I don't see such a bright future for them. Here, maybe in the outer suburbs or other cities that are more willing to change. I don't think that it's easy to change here. And in change, there is future. That's nice.

Srijon: That's beautiful. And as you have said, **the city is itself a museum, and Ponte Vecchio is probably the oldest exhibition there.** The statues that we see in different palazzes, they were very new I guess.

They took out in the streets, but Ponte Vecchio has been the oldest exhibition in a way. And it keeps going. It keeps going. And then, it inspired this side of the city. It inspired that side of the city.

So in this case, the growth, the evolution was influenced a lot by the bridge itself and its interesting architecture. Thank you very much

for this amazing experience and all of your experiences. I'm journeying different cities and learning all of these things from different people.

And Ponte Vecchio is certainly the most unique case that I have encountered so far as a bridge. Thank you so much. Maybe I will stop the recording now if it's okay.

And do I have the permission to upload your conversations and also write in my book? I'm going to write a book about the viaducts. And I call it post-infrastructure adaptation. Infrastructure and adaptation. How social practice and living adapt with the bridge. So that is the theme of the whole research. I'm doing for the last 7 or 8 years. And thank you so much. Thank you.



Interview of Christian Schmidt, ETH Zurich
October 13, 2023



I started recording. Okay.

Speaker 1: No, it's okay. I mean, that's also fine. Tell us a little bit. Okay.

Speaker 2: So, okay. For your cues, like the original history, how it evolved, and everything.

Speaker 1: Um... So, um... I don't know where the starting point is. I mean, um... I mean, for that, I'll just give you a name. Um... Which is, um... Thomas Stahel. I don't know, did you meet him already? Not really. I met Philip Kuh.

Speaker 2: Philip Kuh. K-O-C-H. His name. Philip... Koch. Koch. I'm sorry. Koch, yeah.

Speaker 1: Yeah, yeah. German. It's not amongst the easy languages. Yes.

Speaker 2: And he briefly told me about the West Zurich's industrialization and referred you again.

Speaker 3: He would be able to tell more. And how that forced the narrative of inviada to be developed as a more... I think I heard that initially it was supposed to be more inclusive and cheaper.

Speaker 1: Yeah, I can tell you everything. But for the starting point, you need Thomas Stahel.

He is a historian and he wrote an important book about squatting in Zurich. But what is more important, he had...

They had a cultural center there. Okay, so I start now. So the point is that... So this viaduct was constructed... Well, it's easy to find out. It was constructed actually at the end of the last century. And at a certain moment, but I don't know when that was because I never did any kind of research about that, this space under the viaduct was rented out for small businesses.

As a kind of... Was used for all sorts of, let's say, storage for small ateliers. So it became a complete microcosm. And I don't know when that started, but I'm sure it started... I'm sure it was already there after the Second World War. I don't know before the Second World War.

I don't know. And it was also, for instance, one of these bow was... It became quite famous because it had the title... Bananas and fruits. Bananas and fruits.

Okay. So, I mean, bananas is obviously a fruit. But anyway, they called it bananas and fruits. So they had... It was a storage for this on-grow business.

So you make the business with fruits and vegetables and stuff. Really? I don't think... And then you have to storage it somewhere. So they used it for that.

Yes. And so about that time, I just don't know anything about it. I just know that it was there. And it was... For our understanding, it was there forever, but I have no idea when it started.

And that became... It became an interesting space in the early 2000s. Because, I mean, the

development of Zürich West starts actually in the late 1990s.

Okay. So the history of that is that, I mean, Zürich West was an industrial area. As such, it was... Large parts were not accessible.

I mean, obviously not. I mean, these were factory areas. I mean, they produced heavy stuff. So they produced, for instance, the turbines for the Ataturk dam. So, I mean, big scale.

And a lot of other stuff. So that changed very, very quickly. So the point is that that changed in the 1970s when we had this world economic crisis that ended what we call 40s in Western countries. And it was a moment when... So this was also the moment when industrial production somehow started to be undertaken, for instance, in Singapore, Hong Kong, Taiwan, South Korea.

So it's sort of famous for tigers or dragons. And so that was the moment when then industrial areas all over Europe and the United States started to really get into deep trouble now. The industrialization process that went on. I mean, the rural area, for instance, in the north of England, the famous Detroit car industry.

And many more. So Zurich was the industrial city. It was the industrial center of Switzerland. And in 1970, Zurich was still an industrial city in the sense that more than 50% of the workforce worked in the secondary sector, in industry.

So more than 50% in Zurich, in the city of Zurich. What then happened was a radical restructuring. So in Switzerland in about three years between 1972 and 1975, 10% of all jobs were eradicated. 10%. That means at the time it meant 300,000 people. 300,000 people. And unemployment rate stayed below 1%.

Why? Well, these were all so-called guest workers. And the guest workers were not welcome anyway. And they lost their residential permit. When they lost their jobs, they lost their residential permits. They had to go back to Italy, Spain, Portugal.

So that was one half of the story. And that had a lot of consequences because there was also a lot of houses that suddenly were available. In the 1970s, these areas were all this foreign workforce, which parts of them came to Switzerland in the 19th century. Switzerland is an immigrant country since the second half of the 19th century.

I mean, all our famous tunnels were constructed by Italians and so on. So then this was the starting point of the development of these neighborhoods in class 4 and 5, both sides of the railway tracks, became slowly but surely places for young people in places because there was cheap housing. So it was available for collectives that just wanted to live together, which was at the time... I mean, they didn't like that, but the houses were empty. And before they had all these immigrant laborers. Okay, then they rented it out to students and young people. And that was the starting point of an alternative milieu in both neighborhoods.

And that's the reason why they are there. So this was the center. And then what happened with the economy was that... So we can say that between 1970 and 1990, this percentage of labor force working in the industrial sector collapsed from about more than 50% to about 10% if they imagine.

And this 10% includes construction. Construction sector, that means almost all factories. They just shut down, relocated, merged with others. So in 20 years, Zurich completely changed from an industrial city,

international oriented, highly export, high quality export products, also for instance locomotives and stuff. They made really... And that changed into what we call a global city, financial services, insurance, headquarters. It's a complete change of the entire local economy. Now we had all these areas and we have basically two large industrial areas. One is in Ölikon, used to be in Ölikon over there. And by far the biggest one is here now. It's industrial neighborhood.

It's even called the industrial neighborhood. Now, then we had the 1980s. And the 1980s was, for sure, people told you, it was a moment of what we call an urban revolt. And it was a huge uprising in 1980, 1981. And I mean, with everything, with fierce street fighting and real riots. But at the same time also with a complete new kind of way of life that somehow started to evolve in Zurich. And it ended after two years, but it didn't end in that sense.

So the riots ended, but somehow what followed was two things on the one hand. The demands of the young people were urban life. Zurich was seen as a very narrow space. Everything was controlled, nothing was allowed. It was a very rigid, narrow-minded, provincial space. And suddenly it became, I mean, it has something infectious, because it was not only street riots, but it was all sorts of events happening. A lot of that fight was also for cultural venues.

There was absolutely no alternative culture possible. And after the collapse of that riots, the city of Zurich started a policy of integration. And that meant, first of all, to give a lot of money, actually, year after year after year, more money for alternative culture. All different things now. So at that time, in the 80s, the 80s became an absolutely legendary time with all sorts of venues. Maybe you know about the Rotefabrik.

Speaker 2: Oh yes, I read something in the BB Gees website. But I'm not sure, at least... No, no, no, but that was part of that whole story. So I don't go into the details, because otherwise we are sitting still here tomorrow. But that belonged to the city of Zurich, and

Speaker 1: was meant to become a cultural center. Zurich didn't do it, but then suddenly they opened it as an alternative center, which is actually self-organized, which is interesting. It's a really great place. And many other places like that became possible. So these were the legendary 10 years, so the 1980s in Zurich were really a kind of... Zurich was a really great city at that time. Cultural zeitgeist was really... Zurich became really famous.

In the early 1980s in Europe, there were several movements and riots all over Europe. So famous was Berlin, famous was Amsterdam, famous was Krakow, famous was quite some Italian cities, with autonomous youth centers, and also some other places. But from all of those, Zurich was the most spectacular. I mean, it really was really super spectacular at the time, because nobody ever dreamed of that Zurich could... Zurich was the most boring city you could imagine, nobody saw that.

Anything could happen. And suddenly Zurich was the most exciting place. But Zurich is a very productive place. So people really work hard.

Even the alternative media, they work hard. And so they made a lot of... So there were a lot of things, I mean, in all the sectors.

The film sector, the cinemas, the theater, dance, etc. So Zurich became really a place of alternative culture, in the very broad sense. And also a very international place. You could have bands and groups and stuff from all over the

world. Also strong relationships with Africa, for instance.

Latin America. So there was a very lively milieu. And the core of that was actually, if you go up here, maybe... I think now it's helpful to see an overview, if you have a... Google map? Yeah, Google map, why not? Because it makes it easier to understand. Yes, I think so.

Speaker 3: And now we need some...

Speaker 3: Yeah, once again. We need... Yeah, exactly. So this is the invite. Yeah, zoom out a little bit.

Speaker 1: Now what you see is here. So... If you zoom out a little bit. So... So the core of what I said is... This place is with all the immigrant laborers.

And also the center of the movement and the center of alternative culture. So these are these two parts. So this is Kras 4. With the barracks and Langstrasse. And Langstrasse continues here.

Here and that's the upper part of Kras 5. So these were the places where a lot of things went down. So now if we go up here, then you'll see... And so here, I'm sure you were here.

I mean, if you zoom in, you see the structure. Now this is called what we call blockrand. Blockrand. So this very typical 19th century type of speculative housing. But very kind of a great structure.

You can use it in many ways. Full of shops and stuff. So now you go down here and you'll see this. So these are the remnants of the industrial area.

So these were full of factories. So what happened was... So towards the end of the...

So what happened was as a parallel thing that is important to understand is... So all the industrial functions leave Zurich. So now the question is what shall happen with the area? Now you have this area.

So what shall happen with this area? This is Hartbrücke here. And there is this famous scene at the end of the 80s where the boss of the organization of the banks, the Zurich banks, stood here, gave an interview, stood here on the bridge and said, all this, all this we need for our banks. For banks. For the banks, no. The finance place was expanding.



They were desperately looking for new offices. And the city of Zurich is very small. And I mean super small.

I mean in fact the city of Zurich is... It's not very big. It's this part actually. It's just this part here. And it's Barnausstrasse and it's more or less that part between Barnausstrasse. So this is the city of Zurich now.

Speaker 3: It's super small. So they were desperately and they expanded, expanded, expanded.

Speaker 1: And there was not enough space. And so then they even moved towards the north, even outside of the city borders and to the west and

stuff. So, okay. So then here, but this was industrial areas and the use was restricted in the zoning. In the zoning plan it was, you could only use it for industrial areas. You were not allowed to construct offices.

You were not allowed to construct housing. So there were a huge discussion going on. What shall we do with that? Which is a story in itself, a long story, a long struggle. And there was an extended phase of, let's say, uncertainty, what will happen with the area.

And that meant that at a certain moment these industrial functions relocated. And the area was empty. There were huge areas, just empty.

Just empty space, huge holes and stuff. So then you have this movement and they were anyway, they were all here. So they found that, okay, this is the industry and they had nothing to do with us. But suddenly people saw these empty holes.

Wow, we can make concerts, we can make parties. And so at the beginning, during the 1990s Zurich became a really different city. So in 1990 Zurich got a red-green government, which still has a red-green government. That means in 30 years Zurich has a red-green government.

It's 35 years. And during the 90s, I mean, more and more venues opened here. So a very famous venue was here.

This was a textile factory here along the limit. And now it's housing, it's a bit boring housing. But it was absolutely, and that became a theater. So off Broadway theaters were there and artists. So illegal bars and so illegal bars. And in the 90s Zurich became a kind of famous place for parties.

I mean, you don't imagine that. I mean, in London it was famous to go to Zurich for parties. So that's the starting point of the myth of Zurich West, as an absolute in-kind of neighborhood. Fancy, trendy neighborhood. And what then happened was that after long, long, long debates and fights, a new zoning plan was imposed.

It's a long story, I don't tell you the details. It was imposed actually by the Kent. And it was a really heavy battle. And the people of Zurich wanted to have. So the idea was it could become a kind of a mixed, an interesting mixed neighborhood with housing, with venues.

There was so much space. And actually the city of Zurich voted in favor of that. But the Kenton somehow turned it down, which is a difficult story that I can't explain you without explaining the entire planning system, which is not the point here. But then also a kind of a more, I mean, despite the left wing government of Zurich, it turned to a more, it was still red greens or social democrats and greens, but more right wing social democrats. So particularly the guy who was responsible for planning was actually, we could say, a quite a neoliberal guy. And so he, and at the same time there was a new economic crisis in the 90s. So then they sold, yeah, we have to push Zurich's economy. And so he had the idea to even allow more buildings and instead of a little bit of housing, but not much and a lot of offices and towers and stuff. So what then happened was on the one hand still this kind of trendy neighborhood. Zurich became really famous. Zurich West became famous.

And the city of Zurich, the government who somehow sold that, I mean, saw that it becomes a trendy neighborhood and they sold it because of them. But the government did nothing. On the opposite, they demolished everything. It became such a neighborhood only because of all this innovative and active people who

Speaker 3: made great stuff, who activated the area. So, and then starts a story

Speaker 1: of, well, I mean, it's even not change the location. We call it incorporation of differences in the sense of it's a kind of, it's not change the location in the sense of that you suddenly have a fancy neighborhood and then it becomes more expensive, which of course happened too. But basically it was just tearing down the buildings and constructing new office towers and just a little bit, even not so much expensive housing.

But basically office towers, office towers, office towers, which is the most boring thing you can construct in a city. And if you go today through Zurich West, I mean, there's just some little remnants that are still somehow telling you a little bit of that experience that we had here in the 1990s. So, I mean, along the along hard brick, I mean, at the Saturday, I mean, it was packed. It was packed. It was completely packed. No, it was, you don't believe it.

No, it was. And so around the turn of the of the century, so around 2000, this was probably the most happening. Yeah, the height, the height of this movement. Okay, so, so in that in the wake of all that, this, this, this, this, this, this, this kind of spaces in the viaduct became became quite sought for, no, they were became are interesting. So, so, so people started to install some cafes or some, some, some, some, some, some, or, and that's the reason I should call you that discuss this. Thomas Stahel, he lives in Zurich, so he will for sure give an interview.

Because, because he, he was part of a group, but he was the initiator actually of that group. And they, they, and then rented also one of those bows and made made made a nice. So that rented from SBB.

Speaker 2: Okay. SBB was always the owner of the viaduct. Yes, of course.

Speaker 1: Yeah. Okay. SBB was the owner. SBB. Okay. The land, I mean, the story of that is the land belong to the city of Zurich. And the city of Zurich gave it to the SBB for a very, very cheap price.

Okay. Because Zurich at the time, this was still in the 19th century, they were interested that, that the train was an important attractor, of course. I mean, they were interested that, that, that, that the railway station can really be expanded. And so this was a key, I mean, for an industrial city, you need railways. Of course.

Okay. So, so, so they were absolutely interested in that. So, and then they gave it, they gave it to the, to the railways. And, and so, and so, and, and the railway just rented it out to, I mean, it was for them, it was just kind of a very normal, unimportant business.

No, you have some empty spaces. You just give it to them out. And so, and then suddenly this kind of more interesting groups rented this places. And, and, and started to make events and festivals and stuff. So, and for that reason, you have to, you have to discuss with Tom Astor. Because he, he also, because he, he's also specialist in urban development, he was there. So he knows more than I do because, because he was just one of the active actors. Now what happened then is, so somehow, so you can imagine we are now in the early 2000s.

So in that time, you have. So this, this, let's say, very contradictory movement on the one hand, a huge party, party, a big community, and lots of events and, and, and everything is happy. Everybody's happy with it and it becomes new, zero X, new trendy neighborhood, everything.

And at the same time, this process that now goes on of demolition, no demolition and reconstruction.

And, and, and it's a kind of, we could say almost kind of. It was, it was a complete demolition. No.

So that means scourge earth. No, it's, it's like, it's, it's, it's Tableau Rossa. No, it's Tableau Rossa.

Tableau Rossa politics. So everything goes and, and, and, and then something else is there and you can't use it for anything else as an office. So, so, so this, these two processes were the main processes during the first decade of the 21st century. So in that moment, the SBB plans to, already in the, in the late 1990s, SBB plans to says they have to demolish the, the bad act. In the sense of, no, they would kept it, but would have kept it, but but the point was that they said they would, because they had to improve. So, so, I mean, because, I mean, this was a constant problem because the railway station of Zurich, which is the most central, which is the heart of the entire railway system of Switzerland. It was always a kind of greener suck.

No. So, so then they started with the first through railway station, which is underneath, which is now the SBB. And then, and then they plan to they needed more, more capacity. So then they said we will, we will keep the verdict, but we will, it's only one, it's only one track. So we make two tracks.

Speaker 2: Let them, let it, or the other parts as well.

Speaker 1: So I think the project was just to reinforce, to reinforce the viaduct. Basically, basically almost reconstruct the viaduct and then make a two tracks instead of one. And that, but that meant also to make a new tunnel, a second

lines. I mean, because it goes, it goes directly into the tunnel. No, no, no.

It goes to early tunnel. Oh, okay, yeah, yeah. And, and that became a kind of a question of concern. So the neighborhood said, yeah, but, but then this, this viaduct, you demolish, so here are these other viaducts, of course. So, so, so they said, okay, yeah, but you demolish the kind of, this is a heritage.

You demolish that and, and, and we want to keep this life under the viaduct. And so there was a lot of, a lot of opposition against it. And, and then a whole range of discussions started. Well, what could be done? It ended that the SBB decided to not to enlarge the viaduct, but to make a completely new train station. Okay. So they, so they found, I mean, it was, it was a decision to keep this viaduct as it is. I don't know how many billion they spent.

Speaker 2: SBB is the richest entity in Zurich, right? The railway, SBB. It's what? The richest. So far what I have seen, they, they earn each second. Like I feel like money.

Speaker 1: No, no, no, but this is, it's a Swiss company. I mean, it's, it's, it's a state company. No, yes, state company. But they have, of course, they have, they have, of course, I mean, they have just all this land. Yeah. This, this bill, once you, you re, I mean, you can, you reuse it for other uses now.

What they did now for housing and shopping and, and offices and stuff. Yes, of course. I mean, I mean, and this is our prime site now. So what they did at the end was to construct a completely new railway station again. So we have two, now we have one on the, on the East railway station.

Now there's a second one and they made it then really, I mean, really. So, so the, I mean, for the

SBB, the, the, let's say the economic rationale, it was not only the viaduct, but they, they could, because the problem, now they have a through. Now, now, now we have trains that go through, no, but can go through directly. They don't have to wait. They don't have to turn around again. No, I mean, if you go, no, I mean, if you look and so, so you come in and then you have to go out and then you have to make that loop. Now, now they can just go through. Now they can just go through. So, but it's a massive, it is a massive project. And, and that opens. And I think it's almost 10 years ago now. Okay, you found all that.

Speaker 2: You found all that on the internet. Like, am I fantasizing or is it like just to keep the viaduct that did all of this? Yeah, no, there's no other reasons as well.

Speaker 1: Yeah, this is what I said. So the viaduct played a key role. Played a key role here. Played a key role and sparked a debate. And then people said, yeah, well, could we find a better solution? Better solution.

And then this idea came up. But my point is for the SBB, they said, okay, I mean, it is still, I mean, you spend a lot of money for new viaduct and a new tunnel. They had to anyway to pay for the tunnel. They put the tunnel, yeah. So they said that if you pay for a tunnel, we could pay for a better tunnel. Better tunnel. That if you look on the whole network, so a tunnel that is, that allows us to go through directly. So they, so you spend, you save about 10 minutes. If you go from, let's say from Geneva to Zengal, I mean, here you, I mean, because the train just goes through, no?

It's now underneath and it goes through. So I think for them at the end, it made a lot of sense. And they saw that they invest somehow something in a kind of a project that is not really oriented towards the future.

They said, okay, let's forget about the viaduct just and let's make a new railway station. We need anyway more capacity. It gives us much more capacity, makes it much faster. So in that logic, it makes a lot of sense. A lot of sense. So I think, yeah. So I would say at the end that was the logic.

Speaker 3: No, no, I agree. But the starting point of the discussion was the viaduct. Viaduct? And so then it was much easier for them than to get that, no? Okay, makes sense. We found the compromise. So we don't demolish the viaduct. We become saints as well. Okay? Yeah.

Speaker 1: So, but it's important that the viaduct played an important role in public discussion. There was a long, long, long discussion. During the entire 1990s, I mean, the timeline, I would have to check. But I would, I mean, you can easily, you find these projects in the Internet. I mean, no problem already on Wikipedia.

Speaker 2: But this is valuable. What you're saying is unbelievable. But I mean, that's no.

Speaker 1: And then everybody was happy and the neighborhood was particularly happy. Oh, we keep our viaduct. And even more so because this small, let's say, this small enterprises that they more and more went out, no, from this viaduct, because this kind of business is not really, well, you don't, this is a type of, it's a type of, so all the, let's say, the storage spaces was reorganized anyway. And so this is anyway kind of, these were uses that are not very profitable.

They just left, not anyway, or shut down. So the perspective was that it could be really great. I mean, people were really happy. We see this very colorful, so this and that and then and then.

So the old, old small kind of kind of venues and small enterprises and start up and things. No, it was really a nice atmosphere. It was, it was, I mean, people loved it. And then, and then, and that's then typically Zurich. This is now a very typical Zurich story. Then this, then SBB came and said, yeah, but the viaduct is old. So because they thought they would anyway construct the kind of new viaduct or extended viaduct, they didn't invest anymore into the maintenance.

Okay. They said, okay, we can't, anyway, constructed new or we enforce it. So we don't have to invest into maintenance, but at that very moment they said, okay, now we keep it, but now we have to maintain it. No, it needs a renovation.

And then the neighborhood, you take away our shops and all our venues. Okay. And then, and then they started to discuss about that. And then the city of Zurich said, okay, so we support that this can become a place for shops and stuff.

And we, and they use this organization that you know, know the VBG. PWG. PWG. Yeah.

Prasklünzige Wohnungsund Gewerbeba. Yes. So they use this instrument, which is a foundation of the city. It's a foundation. It's a foundation, a nonprofit foundation. And they used it, okay, so they shall somehow organize to refurbish all that. And so that it is still a place for the neighborhood.

Okay. And what happened was, of course, they had to renovate it. So they kicked out all the uses now. They said that has to be empty, which doesn't seem, I mean, which to me doesn't seem necessary.

I mean, it's a product. I mean, you could just go on step by step and could say, okay, now we take the first three bows, we renovate that. And then, and then, and then they can move around and

then we make the next three. I mean, they could have done that step by step. No, but they didn't do it step by step.

They did it the Zurich way, everything. So everybody has to go out. And then they saw they are very clever. And then they said, yeah, but it needs. No, it looks quite unordered. No, this is just a mess here.

So the city of Zurich, no, I mean, this left wing government, red wing government, but they are, they are really, bureaucrats, no, quite, and some of them and quite, they have this kind of, yeah, but Zurich is an international city. And actually, I mean, this is just shabby that stuff. No, this is a kind of shanty town. This is not really, I mean, this is now a new neighborhood. No, there are quite some, there were new housing, suddenly new luxury housing and new luxury housing. And then they look on this shabby kind of. Yeah, doesn't look like Zurich. So we have to offer them something better.

Speaker 2: Okay, that's how it is.

Speaker 1: So they, so they, so they then made the first step. And so they, they mandated an architectural firm, quite famous one. EM-20. Yes. Yeah. To make a design, which is completely unnecessary. No, you don't need that design. You don't need it at all. Absolutely no reason.

No. So what they, what they needed was structural reinforcement. And that's, that's, that's the stones. No, I mean, this is a viaduct. These are stones. I think it's even not concrete. I think it's, it's stones. It's stones. Yeah.

Maybe reinforced somehow. But anyway, you have to fix that. Fix that. And that's it. And you could say, okay, okay, it's it now.

And now, now we let the people do it. No, very simple. No, very simple. We just, we just rent it out. No, they made this kind of huge construction, huge thing. And then, and then they made these roofs.

Yeah. The skylight roof is now we can, now we can go back. So this, this one, this one, but also here, this snow.

Oh yeah. And this, this here, there are also roofs. No, for example, like this. Because before, I don't know what the roofs were. I think this, this are the, this is still a roof. So, so, so they could have, I don't know, we would need some photographs from before. But anyway, so, so, so how you solve it architecturally, no? But, but there, there was nothing

Speaker 2: to, I mean, these roofs, I mean, the roof is anyway in the bow. So you can make, I mean, I don't have to tell you, no? So, so you don't need a very, a very sophisticated construction here to get some shelter, no? And have you been recently like this week? No.

Since the construction, luckily I got to see that now is the time they are reconstructing everything with maintenance and it's huge infrastructural feature. Like, let me show you the picture. It's just the picture from yesterday.

I went there yesterday and massive, massive construction and I was wondering who is paying for all of this? Okay, so there you go. Here, maybe you can see this.

So all, all of the structure has been like massively. Shit. Yeah. What the hell is that? Yeah, yeah, they are doing the huge construction now. Right now maintenance. Okay. Yeah. It's really strange.

Speaker 1: I mean, they did it some 10 years ago. I mean, why did they have to do it again? Anyway, so, and then, and then the point was, then they had one, one responsible person, no? I mean, from, from, from, from the pay-we-gain, one person who had the job to rent it out. Not the neighborhood. Not that you could, you could have assigned a committee or something.

I mean, they're on neighborhoods organizations. You could have, you could have something with a board or something. No, this one person who has absolutely, who had absolutely no relationship with any kind of alternative venues and alternative culture. And you had this ugly kind of design. No, I mean, it's, you see it already, it's very dated. No, at the time it was, it was a very...

It seemed to be very, very novel and everything. Today it looks very, I mean, it's a safety. No, it's really, I mean, you see, sometimes you see this problem, no? So you think, so after 10 years it's already gone, no? You can just forget it.

It's not interesting anymore. And then, of course, they had prices. Now your question of prices. So they said, yeah, but we had to pay for all these renovations, no? Yes. And for these roofs and for these. For all of these things.

Speaker 2: So, so, so. That no one asked for. So nobody wanted that, but now we have to pay for it.

Speaker 1: And so the prices to rent something is quite high. It's quite high. And I'm sure, I mean, I don't know, but I'm sure that before they made internal constructions, no, there were kind of intermediate floors and stuff. There was a lot of, probably today it is not allowed anymore.

No, it becomes a very, and then they put in all sorts of, all sorts of this kind of, well, I mean,

quite high price kind of fashion stuff and furniture stuff and designer stuff, no? That at the time, I mean, nobody was asking for that. Absolutely nobody.

And the people in the neighborhood were absolutely devastating, no? So they said, no, now we got our Vado back, but it's not our Vadoct anymore. It's not our thing anymore. We wanted, it's about yours, no?

It's not about your shiny stuff. We're not interested in that. And we don't want, and people even were angry, said we don't want these kind of clientele. These are just all just Yuppies. This is for the bankers.

And then this is not our thing. And I mean, it was a real, I mean, from my point of view, it was a real scandal. It was a real scandal, no? To do that. It was, and the only thing that is accepted in the neighborhood even, I think it's really expensive is this Mark Tolle, no, this Mark Tolle, which-The market. Yeah, so people like it.

People like it. But I think, I still think it's a very, high price. It's a high price. If you look at it, it's a high price. It's for the typical, let's say, high income, green, for, no, this kind of green ecological clientele is good jobs.

And everything has to be biological and then, but even high range, biological. I think it's quite expensive. And it's not something people might disagree.

So I know people from the neighborhood, they like it very much, but I'm not convinced. I mean, my concept for that would have been something totally different. I think that the Mark Tolle is okay. I mean, fine. The construction we can discuss. I mean, it's okay that, so they made a new construction, fine. I mean, it's a market, fine. I mean, but it could have been, let's say, a

more, the whole thing could have become a microcosm.

That was it before. And now you imagine, you had already certain uses and then you add to that the market hole and the market hole could have some, I mean, if you go to France, for instance, you have market holes. And some of them are relatively expensive, but they always also have some cheap stuff.

Speaker 2: I was going to say you the example of Viadat Des Arts and I was impressed. I went there two weeks ago and I interviewed a sub-bomb professor and she told me that they had the policy intact to rent out those spaces, made sure that it is cheaper than the marketplace so that the artists who cannot pay for those places, they get it. And on the top, they made a high-line like thing which connects the whole community as a connection, a prominent plant that they call it. It's amazingly activated. I've been there and I was surprised that the top layer serves commons, the bottom layer a bit exclusive, but also marketplace is they made sure it is the main fundamental that they would keep it cheaper so that these under viadat spaces are not treated as just another land that is on the city. So I do have a fundamental... Which market is it in Paris? It's called Viadat Des Arts in Paris.

Speaker 1: Oh, Viaduc Des Arts.

Speaker 2: And this is very Paris? In, let me show you. I'm inside Paris and very... I mean, I do not know the most exact location, but it's not somewhere very touristic. It's not somewhere very touristic. Oh, yeah, yeah, yeah, yeah, yeah, yeah.

Speaker 1: Of course, of course, yes. It's not touristic, but it's... I know it, I know it, I know it. It's relatively close to the bus. Busy, yeah, yeah, yeah, yeah, yeah. It's on that part of Paris.

Speaker 2: Yeah, it's great. One of the fundamental questions that I am, looking at all the cases, also Bangladesh case, Sarajevo case, in which the informality is like... So I find it like, you can just take your music instrument and sit under a viaduct and play music and it not necessarily has to contribute to the maintenance fee of the viaduct. And in Bangladesh, where it's informal, as you have seen the informal markets, they are just selling their things and it's not very different from Zurich, per se.

Like both are informal, both are contributing to the society betterment, but not actually providing for the maintenance of the main fee or making it activated. So I have this very fundamental question, is that can we treat under viaduct spaces or spaces created from the transportation infrastructures as just like another land? Just like another land.

If you treat it like that way, then you have this so many regulations that happened with Zurich, that makes things very difficult to be free. Yesterday I was talking with this person who has a shop there. He said that previously there used to be a kitchen on the top part of the viaduct and it was very informal and people were very interested in eating there, as opposed to just opposite side, it's very high end restaurants and everything. So if there are rules, people won't be motivated to rent out those places, just like a typical land in Zurich. It is not just a typical land in the Zurich, it is a residual space that has been created. It's beyond the fundamental use of this infrastructure. It was created for transportation, now they found this place and if you want to treat it just as the same land as Zurich, when you just increase the land value?

Speaker 1: I think it's scandalous.

Speaker 2: It supports completely. I was really upset and the people from the neighborhood too, I mean they really were upset about that. But the point is that at the end, you use this kind of institution that is meant to provide cheap housing and cheap... Common space, I would say. All sorts of cheap commercial spaces actually.

Speaker 1: But cheap and then they make this operation. I mean it's just scandalous. It should be something that is as you've said about Paris, it should be a kind of an organization, a typical organization that has a vision, that takes responsibility and thinks about how to... It is a huge space. And it is a very important space because it goes through the entire neighborhood and it affects the entire neighborhood. And as you said, it has the prolongation and then it has the bridge and then it has the parking

Speaker 2: space, park lots and all that stuff. That area is now a skateboard area and people are doing...

Speaker 1: Of course, I mean they don't know very well. So for me it was...

Speaker 1: And I would say I had a lot of contacts. I mean, I was an activist and everything. It's been a long time. So I knew most of the important actors, even from the city government. And my impression was that it is a kind of... What is the right term in English? It's a kind of... In French it's the *mépris*. It's a kind of... *La mépris*. Even such a... What is the right term? *La mépris* in English.

Speaker 3: Here. The contempt?

Speaker 1: Yes, contempt.

Speaker 3: It's a kind of contempt towards the activities of the people.

Speaker 1: I always saw that. I always say, look, I mean, all these qualities that were produced in Zurich and why Zurich West became such an interesting neighborhood is the people. And it was a contempt. They said, what do you think? Why do they... Why are you defending them? Because they make a great city and the citizens here... Well, but they are not professionals and...

I mean, it's really contempt. A bunch of these kind of things. We don't want these kind of things. Zurich... And you have in Zurich all this idea, it has to look very orderly. It has to be very... I mean, I could tell you stories.

I mean, I have a find... I mean, in the house I live, which is close to here, which is, of course, an expensive area. And I have my bike in front of the house.

And I have... Now I won the battle, but it was a long battle to get. So you have to put the bike in the basement. But I use it every day. Yeah, but...

I saw this kind of understanding. So, no, no, no, no, a bicycle is... You can't have a bicycle in front of the house. That doesn't look nice. It looks like a... Immediately, it's a shanty town. No, it's a slum.

It's just a slum. It's not something that is fashionable. It's not something that is proper. So this kind... Yeah, contempt. It's a contempt towards ordinary people, towards self-initiative, towards... I mean, it's amazing, no?

From a red-green government, no? And that's... And that is the point. So the point was exactly, okay, we commissioned a famous architectural firm, and then it looks really fashionable.

And we also... And then they could say, we made that a fancy neighborhood. No, they destroyed it.

They destroyed it. They are... I mean, this is a vandalization of it. No, they are the barbarians of the city, that destroy the qualities that are developed by the people in this city.

I mean, that's the result of it. So for me, I would really... All the arguments that came up, I think I wouldn't... I just wouldn't accept them, because it is a public space, and they pay a lot of money.

No? They make something, and then they say, well, I mean, they make... What was that? They have now... What was it? It's just recently... I mean, they paid some hundred millions more.

Just trying to remember what it was. But I mean, several of our buildings, I mean, that the city constructs, and then suddenly costs much more. Yeah, but I mean, the city deserves that, no? So that is not a problem, to pay a hundred millions more for a school, or a hundred millions more for a... What was it? Okay.

And... But here, no... No, no, no, we can't... No, we can't subsidize these people here, no? So, even if it's not a subsidy, but you have to pay for the viaduct, as you said, absolutely rightly so. I mean, they have to make that viaduct, and they should somehow take that into consideration.

And then they should say, okay, now we just give the space to different groups, and we can organize how that shall be done, and they could have paid themselves, no?

Speaker 2: This is exactly what I was working on this January, and trying to come up with a solution in which we do not make things to make it more expensive, rather use the... We came up with the solution in which we use the surfaces of the viaduct itself, not making something. So we tried to create advertisement of the local big companies, renting out the surfaces, not renting

out the land, so that you have this kind of advertisement on the surfaces.

They create some sort of... It could be for Swisscom, for example, or the local food biryani, or Indian food brand, or something. The local people, they would be renting it for six months, and this money goes to the people who are using those spaces, but they will now do it for the maintenance, because maintenance is the most important part, that they need to take care of it, and create a sense of ownership locally. So usually you see these kind of arts, but we try to do it so that it creates some sort of local economy, and somehow not renting the architecture, but not thinking as an architect. So we try to do it, and government is starting some parts of the country, but not exactly the way I am saying. They started, some part has been started.

So I am also an activist on this part, and I am trying to do these kind of things for myself. The main fundamental question boils down to this, like I will not take so many times from you now, it was a pleasure just to find time to be. Do you think that if it's under a regime who only thinks about economic profit to generate from the residual spaces from infrastructure, then the vision falls more and more like privatization of these spaces, or there should be a ratio of commons?

Speaker 1: Here you have to understand this is Zurich, this is a different situation, it's not about privatization, it's not producing profit, it's not for profit. The point is a certain perfectionism. Prestige of Zurich. It's prestige, but it's also the laws, construction laws, so they say, you have so many laws, this makes it, and then they come with the point, but it needs energy, and it needs this, and it needs that, and it needs to be handicapped friendly, and this, and this.

Speaker 2: But this is not a place that is formal land. But here you should say, so the point is, and this is a key moment here, and I just gave an interview at the NSZM Zone Talk last Sunday, where I put forward the same point. I mean, this is perfectionism, this is Swiss perfectionism, Swiss finish, and it's absolutely devastating if you have that in urban design and architecture. So we should stop that.

Speaker 1: As I said, we need much more provisional stuff, we need much more open stuff, we have to change our planning laws. They always think they construct something, and then it's constructed for 100 years. We should say, no, it's fine, we make it for 20 years, or for 10 years, and then we can make something else. And it needs a kind of, so we need much more improvisation.

Speaker 2: Improvisation. We need much more of that, because we cannot survive. This is not, this model, I mean, if you look on the challenges we have, the climate crisis and all the crisis, society is changing very quickly. So we can't survive in this way, you know? So we need much more flexible structures, and these structures have to be much cheaper and much more inclusive in the sense that people can participate in the production of it. That's beautiful. Production of it, yeah. I think that's the key thing.

Speaker 1: Fascinating story of the day. It's not that they don't make profit out of it, they don't. No, this is just, and that is just a burden, it's just a burden on the society. If you look what you have to do in Switzerland, I mean, we still have, as you might know, every house in Switzerland has to have an atomic shelter.

Speaker 2: Every bloody house. I don't know, but I can see that.

Speaker 1: That is a law that exists in 50 years. And I mean, they spent, I mean, billions and billions and billions for these concrete atomic shelters. Every house has to have it. Even a single-family house has an atomic shelter.

That you can even with an air filter and stuff. I mean, it's unbelievable, no? It's absurd, no? And it makes it so expensive. I mean, they didn't stop it. I thought they stopped, but it is still.

It's still somehow, yeah, it's a little bit soft, but still it still exists as a rule. And then you have all these things that make housing so expensive. And we should have options to say, okay, we only constructed for 10 years, for 20 years, so different rules should apply to that. Yes, exactly. This is the point. This is the point. And it can be an improvisation for the next time. It can be a kind of a tent or something.

I mean, and forget about also the energy. So this Minergy thing, I mean, we actually here, this department, I mean, campaigns against it since a long time against Minergy standards, because the argument was brought from the beginning to say, look, so Minergy standard, the point is not that we isolate houses. This is not the goal that the isolate houses. The goal is that we have zero emission of CO₂. So CO₂ is the goal.

Speaker 4: Not making the expenses more than. How we make that is a different thing.

Speaker 1: So we can work with different, we can produce additional energy with the houses, with the earth's zones and stuff, earth energy. And so there are many ways to do that. And here it's, of course, it's a coalition. It's a coalition. Here it's a coalition between ecological greens and ecological forces and, of course, the construction industry.

They make a huge fortune. And the problem is, this Minergy, just to give you an example, I mean, you have to replace it after 20 or 30 years. I mean, it's absolutely not, it's not sustainable. It's not sustainable. You have to, it's absurd. No, they use materials that are not sustainable. So it's completely absurd. And that goes on and on. So these kind of things. So what they need is, they need a totally different philosophy.

Speaker 2: Philosophy. Philosophy of addressing this. No, but I completely agree with that. And the more I see, the more I look into it, you cannot just let it do whatever illegal activities happen under viaduct spaces or something. You need to have some sort of supervision, but more in the sense of improvisation is given the chance so that the participation can be more common and production. They can participate in the production. This Zuri case is fascinating for me. In this case.

Speaker 4: It's the most extreme case. You won't have a more extreme case.

Speaker 2: Yes, I mean, this was like really, I'm so happy I came in Zuri. And I am just looking forward to London next. Like this is my next stop. And all of these cases, what we are trying to do is like, I'm funded by Japan Kyoto University so that I can travel all of these places. But Manchester University also has a keen interest on my research. So they actually collaborated with me in global scholars funding or something like that. So we are doing a symposium in which we choose like three presenters from global south under viaduct cases, global north under viaduct cases. And my hypothesis is that it doesn't matter north or south. You have to have this solid.

Speaker 4: Yes, yes, yes, yes. I agree. I mean, in our research, we do research across.

Speaker 1: Yes, we don't accept this kind of north south device.

Speaker 2: Yes. And this is the point of that symposium where we do these things. And in the end, the south ask question to north and north. And then we have this general concept of like, what happens after this? So, yeah, so Manchester, they are asking me so that you could make an appearance on the symposium. It will be zoom.

So you don't have to do too much works so that we are planning that now. And I think Penny Harvey Penelope Harvey from Manchester University, she will be there for the south part. And if you could play the case of Zurich viaducts, then it would be like absolutely blasting. And we will have one person from London, probably Alex. No, no, no, no, Brian Rosa, he worked on the London Viaduct.

And yeah, we are having like some seniors on the north part, south part. And from this part, I was like, they were emailing me a few days ago. Can you, did you get the interview with Christian Smith? What's the result? I said, I didn't even get it until today.

And I'm like super happy today. Partly because the case is fascinating. And you can imagine all of these cities has their own fundamental zing. That makes the management and accessibility of the viaducts unique. And somehow that's what I'm trying to do is like first, objectively just show them what's the story, what happened in these cities.

And then, yeah, I would like to end very soon. And if you have any suggestions for my thesis and try to define, I'm just basically trying to define what is post infrastructural adaptation from the perspective of this management access. And time. And if possible, at the end of it, I can

suggest some sort of like a general something if it's like too much not to ask or something like that.

Speaker 1: I do not know yet. I would just go ahead. I mean, I can always give you give you additional. I mean, if you can always give you feedback, that would be so good.

Speaker 2: Like I am everywhere I'm going, all the resource persons I met like around 10, 12, everyone is being so supportive of this research. Like I am sure in Paris. And then there is the Maria Maria Barbas, Maria Gravari Barbas. She is also a UN consultant and she knows about the viaducts in Paris. She is the one in I interviewed in Paris. I'm hoping she would also join in the.

Speaker 3: She said yes. And when will that be?

Speaker 2: The one at what date? Oh, end of November. We were thinking if it's too early for you. Let me know because we can like we were thinking 28 and 29 and 30 of because so that they do not conjecture with the. Vacation in December and January use usually have vacation. All the professors we were trying to get on this time. Yeah, I think it should work. That's great.

Speaker 1: Like and if you I mean, I can give you the address of Christian Sto. No, no. Thomas Stohel. Thomas Stohel. Thomas Stohel and just. Okay. Yeah, here it is. Yeah. Okay. Um.

Speaker 2: Yeah. There is so great. Like, uh, and finally I would like to have a picture with you as part of as part of my report. I have to present this as like, okay, I have interviewed this. Okay. Person and I have had a chance to talk with him. It's fascinating.

Speaker 1: Okay. Now you have to give me your now. Oh, the what is your email?

Speaker 2: I think you are in the email. You send me an SRI. If you search SRIJOM. SRIJOM. SRI. SRIJOM. Oh, okay. IJON. Oh, yeah. Okay. Yeah. Okay. I cannot wait to see the London case now. Yeah, sure. Like everything made sense today. Actually, the Zurich case made sense today. Like how it evolved. Like, uh, it makes, I feel really happy. That's fine. That's nice. So, yeah, now it works.

Speaker 1: Okay. And I tell him my best greetings. Okay. Okay. Of course. It's an old friend of mine and he can really tell you everything about this phase in the 1990s. The processes they went through. I mean, that's how that came into being. Yeah.

What they did. And, and, and, and he probably knows a little bit more than I about this process of, I'm sure he knows it quite precisely about, about what happened with the SBB and so on. Yeah. So, so he's, and he's a historian. So he's really great. Okay.

Speaker 2: So if you give me permission, I would like to stop the audio record and one of our jelly made this website in which I, I, I stored these stories of each cities with biohazards and in these websites, we would like to have the interviews stored as well, like the narratives and the interviews that we are having with this resource persons and everything. In, in what form? Um, written form. Of course we will show you whatever. Oh, in written form.



architectural objects and urban objects. And the fact that we are connecting parts of the city really makes them absolutely interesting and very structural, I mean, in the city, for the city.

Srijon: So, if I would like to give you some cue to start, maybe if you'd like to share some interesting parts, like historical parts, how it evolved and how it became what it is now, if you know, and if you'd like to share how the management system works, in general, these four points are just over.

Professor Maria: Again, I don't work on these issues. I'm very interested in these kinds of objects, not only for the viaduct, but also for the functions which are located underneath. In the case of the Gulliverta in Paris, it's absolutely interesting because it's not only, as we mentioned before, a very nice promenade in the upper part. It's very important for Parisians, in fact, because I don't think that this is a touristic place. I'm not sure that you do have a lot of touristic visitation there, but you do have a lot of Parisians. You have people just go there for jogging.

You have kids, you have middle-aged people. And you have also people who take the promenade as a means to go from a point A to a point B. And in fact, it's as far as I know, one of the longest promenades, longer than the High Line, for example, in the States, and older than the High Line, which was inspired, I think, by the Gulliverta. Which is also interesting is what happens underneath the fact that the city of Paris had this so great idea of concentrating there, the activities of the artisan. And connecting this place also to a very important policy of the city of Paris, which is to allow the artisan to still live and work in Paris. Paris is a very expensive city.

**Interview of Professor Maria Gravari
Barbass, Paris
October 04, 2023**



Professor Maria: My projects are very interesting objects for you in games,

The workshops for people working with artisan crafts, design, fashion, is very complicated

because working spaces are expensive. As far as I know, the city of Paris is one of the cities, probably the city, which makes the most of the efforts in order to keep these people inside the city. So make Paris still being a very important city for fashion, for creativity in general, for design. This is why you do have this concentration of shops there. Mostly artisans. Mostly artisans. And you also have some associations which are very, very interesting.

And they are working on skills and they work also on socialization of people. Thanks to this design or artisan craft work. So I think this is the most interesting force for this viaduct, which is located in the 12th district, which again is not one of the tourist areas in Paris.

Srijon: What I find interesting just from this information is that the artisans are given access to the viaduct spaces. So I'm not a Parisian and I've been there only once. And may I ask, how popular that place is for artisans themselves? They can sustain their business there, can they get good enough economic return, and who do they pay to if you know the organizations?

Professor Maria: I will not give you very precise information here. I have some elements, but I think it will be much better if you ask for very precise information from the city. As far as I know, there is a rent, so it's not free. It's not free. You need to pay. And this is the case also for all the other venues which belong to the city of Paris and which are opened specifically to designers and creative people.

Again, with the same policies. So this is one of the places which is offered to designers. As far as I know, the people who rent this place, they need to pay, but they pay less than normal market prices.

That's good. So there is a kind of help which could be something, let's say, they pay 70% of the real value, something like that. They have a quite prestigious address. They also have the possibility to work with others because of course concentration creates a movement, creates a place where people are really willing to go. Even if they go for this shop, they can also continue working and find eventually others. Some of the shops are quite ephemeral, so they change quite often, which is, I guess, a symptom of some fragility of the site. I think so, but this again is something that we need to ask.

Some of the others, they stay for many, many years. And you also have there some of the artisans, the creatives, which have received a specific label from the city of Paris, which is the label *Fabriquers Paris, Made in Paris*.

Srijon: *Made in Paris*.

Professor Maria: *Made in Paris*. So it's a branding. It's a brand because it's very, very important for the city of Paris to say, okay, Paris is not a museum city, it's a city where it is possible to have industrial activities, arts and crafts and this kind of stuff. So this is a label which was created, I think, five years ago with this idea to say, okay, we will facilitate your work inside Paris.

And in fact, if your products are most of them prepared, I mean, produced in Paris, even if the materials come from other places, but if they are designed and most of the production in Paris, they receive this label. So some of the artisans of *Fabriquers Paris*, they have places which are located in the Viaduct.

Srijon: So it's a very interesting contrast with Zurich, as I've seen, is that they are giving access in the Zurich Viaduct to gymnasium, shopping malls, and then like coffee space, hairstylist, all

sorts of land uses. But in case of Viaduct, these arts or Culevardes, it's only limited to the artisans so that they get access to a cheaper place and produce more artworks. And they can see these kind of artworks when somebody comes, they can see that, okay, this is art alley.

Professor Maria: Well, yes, I think this comes because the city of Paris has a policy. I don't know the situation in Zurich, but maybe just open market. Open market. And I mean, we are in a capitalistic society, we are in a neoliberal economical context. So if the places are attractive, of course, cafes and restaurants will come, except if there is a protected land use, which says, I mean, not anybody can come here. It's exclusive. So it's exclusive and there is a selection process in order to get there, in order not to have only commercial brands.

Srijon: Yes. And it's, as I've seen, it's not only exclusive, it's also inclusive, the upper part. Okay, I'll go to that later, but another example that reminds me is from Tokyo as well. It's called Akioka Artisan. It's also under fireproofed space, which is full of artisans from all over Japan. But they chose the position very strategically in Akihabara, which is kind of like very cosmopolitan area, because all the foreigners come there to buy anime merchandises or manga merchandises. So what happens is like that alley attracts a lot of foreigners. They enter and they see all the Japanese artisans, et cetera. It's a, as opposed to that, it's not a cosmopolitan touristic spot, as you have said, but it has the same idea. Yes. And if I may ask, like, around what time they started to set up this artisan area? Is it like 80s or 90s?

Professor Maria: Maybe I can find it in the website. You will find very easily this information. I don't remember if that is true. I think this is a policy from the 90s. It's one of the oldest viaducts. The idea was already there in a

way. But I think that probably changed the policies. You will find information.

Srijon: Okay. Then I will check it there. Recently I've been to Ponte Vecchio. And in Ponte Vecchio, for like around 600 years, it has been a jewelry shop street. And it has become prestigious. Like, a Ponte Vecchio gold chain is very prestigious. But when I went there, it is completely touristic. Like, the Florentine people prefer to avoid that bridge, because it's always full of tourists.

And at the same time, both are on the same level. The shops and the street. And what I have seen, I have videos as well, like people are singing, having music and other kind of things. Which is kind of like the upper layer of Cudevarte, in which people are sitting and enjoying the promenade.

And then connecting and jogging and other things. So how do you look into this phenomena, to giving inclusivity to the common people? Maybe now we can move into the discussion of like, okay, it's exclusive. But interestingly, they tried to make it inclusive as well.

Professor Maria: It's not exclusive in a way. The only way to be inclusive and to include functions which, in fact, cannot access the public space differently, this is for me, inclusivity is not exclusivity.

What happens with the artisans in the first floor of the viaduct? For me, it's inclusivity. It's to say that the city needs to be inclusive.

And we cannot just let the important brands to come to this place. So for me, it's rather a possibility to say, okay, people with less revenues and more fragile jobs such as all these artisans, they can find a nice place in Paris. This is why the city helps. This is why the city helps.

So by no means I wouldn't qualify this as exclusive.

Srijon: Okay, that's really interesting to know. And have you ever used yourself the upper part for your job?

Professor Maria: Yes, yes, yes. I use it. It's not my area, so I don't live near there and I'm not passing there very often. But I use it just to walk my students, for example, sometimes, because I think this is a kind of place that they need to know. It's not that well known. This is quite strange, but it's not that well known, in fact. And the fact that it is not that well known, though it is, there is a lot of people, I mean, enough people, let's say, for a small space, of course creates totally different practices than the one you described before in Pontewakiu.

In Pontewakiu we are in the hypersenter of the touristic of Florence. And there is this kind of regularization and all these singers. I mean, you can eventually qualify them as inclusive because there is no control for the moment. Till recently, at least, because now Florence tries to control over tourism, but I don't think they are really efficient, by the way. So this kind of just, I mean, no regulation, finally, is exclusive, excludes other kind of people, because as you mentioned before, local inhabitants will never go there. So again, I would not qualify this policy as inclusive.

I think that this is just no policy. It's just an open bar. It's an open bar. You can come and then there is a kind of, how can I say, organic market regulation that makes some of the shops stay there, because they sell these very cheap objects today to the tourists, while there was a kind of tradition before. And can you imagine, Pontewakiu, if Florence and Italy had the same policy and had kept the real creatives, it would

not be this quite cheap touristic place. It would be a creativity place.

Srijon: Yes, it would be a creativity place. When I went to Culevate, I have seen that some of the parts even went through buildings. They go through buildings and then buildings even give up some space for the bridge itself.

So, yeah, would you have some comments about it? Because I was wondering how old the planning policy, as I've seen from 2004 to 2008, around that time they make the viaduct roads and everything. But what was it before that?

Professor Maria: It was a railway from Vincennes, so suburbs of Paris, so a small railroad, not a kind of railroad connecting cities. It was a railroad that used to connect Vincennes, suburbs of Paris, to the center of Paris, near to Gardelieu. So the line was already there.

Of course it was adapted. It's less intrusive, I think, for the nearby buildings than the High Line in New York, much less, because for the High Line you are passing, I mean, you can see what they are cooking.

Srijon: Yes.



Professor Maria: It's not the case in the Culevate, but which is really interesting for the Culevate, is that they offer views to Paris which are impossible to have other areas. Yes, they are wonderful. They are in a good distance from the

buildings, at least when you go from Gardelieu to Vincennes. In your right part there is a huge distance, because there is this big avenue, and the avenue allows you to see these very nice Osmanian buildings, from the distance of, let's say, approximately 10 to 15 meters. So a good perspective on your left hand. You are passing closer to the buildings.

Buildings. But it's quite interesting also. I really feel that this is not that intrusive. Yes, it's not intrusive. It touches to some of the buildings. It was also a good opportunity to rework some of the rear walls in some of the buildings.

Srijon: And I felt that it's not only just jogging place, it also connects from different smaller parts. So people just use it for the accessibility rather than just going through the road.

Professor Maria: Yes, it's so much pleasant too. In fact, if you want to go from one of the places the Culevate passes from to another, it's so much pleasant to do it up there, than in the Culevate.

Srijon: It's such a pleasure. And also it opens some views, as you have said. It's really nice views to do it. So one of my hypotheses, or one of my real things that I want to prove through my research or something, or maybe disprove, is that eventually all the under viaduct places, or as I've seen, like upper part as well, like the viaduct created spaces, go through a... So people generally just go there and do their economic activities that happens naturally there. As I've told you, the WEST management project that I have worked on, done by the self-management of the community people, is really a nice example.

And do you think, as from the example of Kulevarthe, is that a unified vision is necessary first? Like, to how much extent I allow the informality and I allow the formality? And how

much do I design and how much do I leave for the people's use is important, as opposed to just keep it empty, like let people use whatever you use.



This question comes from the perspective because I always see the bridge itself is taken for the maintenance, but one takes the liability of the space under the bridge. Yes, yes.

Professor Maria: This is totally true and this is so site-specific. It depends so much on the area of the city where the viaduct is located. For example, in Paris there is also, well, there are a lot of viaducts of course, not as visible and interesting as Kulevarthe, but there are many of those. And I'm thinking now at one which is in Porto de Clignancourt, which is totally in the north of Paris, near the flea market. So you are passing under this viaduct, which is a train viaduct, and then you access, you go out from Paris, this is on the limits of Paris, you go out from Paris, and then you arrive to a suburb which is called Saint-Touan. Saint-Touan is one of the most important flea markets in Europe, with millions of visitors, not exactly tourists, not only tourists, but tourists also. And in fact you are passing under this viaduct, and there you find this kind of informality.

Nothing is done for the moment, as far as I know. It is used by any people who have something to sell. It can be really seeing modest objects.

It can be sometimes drugs, it can be whatever you can imagine. So, I mean, in the same city

you do have these two different situations. Of course, it's much more difficult, I think, to organize the functions if the viaduct is systematically traversed. If it is, I mean, if you have passages under the viaduct, which is the case of this bridge I mentioned in Saint-Touan. And this was quite easy in Culebert. It was quite easy, in fact, to totally close these spaces under the viaduct. Of course, there are some openings, there are some crossing streets, I mean, I don't have that many, so it was quite easy to do it.

And I guess that this also depends a lot on the city fabric nearby, and the connections that can be created by the viaduct. But, yeah, how much informality can you allow? This is a very good question, a very good question, and I don't have the answer. I think that for me, again, it's not only a question of central or local government, it is also a question of how local inhabitants accept, tolerate or wish things. So sometimes this total informality can be really problematic for the people living nearby.

Srijon: This question specifically comes to my mind because I live in Kyoto, and there's a nice river there called Kamogawa, and there are some bridges over it. What happens there is that we students and sometimes even musicians go there and just take a guitar and just play music, which is very informal, and to me it's beautiful as well, and I don't find it very different from the informality in Dhaka as well, because none of them are actually paying tax to have music or selling things.

So as I am going through different cities and seeing these interesting policies for each city, I find it interesting that it's better to have some sort of idea about the percentage of how much you should be giving to the community and how much it can be more commercial or something. So for example, common space, I try to work it as my hypothesis as well, is that just like water,

air is common space, sometimes these under-infrastructure spaces has the desire to be used as a common space, just like music or as the informality of San Luiz or San Thuan, the bridge you have said. So this is also an ongoing investigation of mine, is that can this informality be designed in the policy level? In case of Kullivert, they have on the top level in some sort of way, which is giving access to the community people. It's a common space. So yeah, I would like to hear more your opinion on this.

Professor Maria: I think that the definition of informality is absolutely not the same in Tokyo and in Dhaka. So you cannot just using the term of informality try to make this kind of comparison. And you spoke about the kind of informality in Tokyo, the kind of informality in Dhaka. In some cases it can be also people living there. And the question is how can you allow this? How can eventually facilitate this if you wish? But in this case the investment of this state is much more important because informal accommodation is a problem by any case.

Yes, that is not the case. So there are some functions that can be informal, just go there and play music. Yes, this can be informal of course. But selling things, probably this needs to be regulated because you never know what kind of things they can be selling. And other functions as working there or as living there, this really needs to be organized. So informality, for me it depends on the place because the definition of informality into different cities is not the same. It depends also on the type of functions that can be tolerated, accepted or encouraged.

Srijon: So if I can try to spell it in this way is that if the under viaduct space is under a vision from a conscious vision from another places, then these informal activities can be categorized as commons activity. So we can have some activities that are exclusive or inclusive like a

commercial and some places are given to the commons so that the people are using it as a commons activity but still under the supervision of some body who are checking what kind of goods can be sold, what kind of activities can be done. So this is something that I am working on. It cannot be answered.

Professor Maria: Well yes, but what are the commons? I mean if part of this place is taken by a family, it's not the common anymore.

Srijon: It's not common anymore, of course not.

Professor Maria: So I mean, yes, it's a kind of appropriation of space. Yes.

Srijon: So yeah, that's a very good example because in Zurich it's not very common anymore because it's given to more commercial spaces. But it has actually had some good sides as well. It has become more secured. Previously it was not that secured and the families didn't use to come with kids near the park because it has become a really touristic spot or not touristic.

Well, you can see in the top 10 things to do in Zurich, the case study comes in like go to Marthal. So it has become more secure and people are also coming to the nearby park. So I think that also has a positive side and many people count it as positive. So in a way, most of the cases, those are having a case policies from beforehand about how you use the space and who owns the liabilities and maintenance are performing better than as opposed to language.

Professor Maria: Maybe, maybe. I would say that it's positive to secure the site because it becomes commercial. In a way, airports are very secured because there is security. Security. Because I mean everything is observed. You have cameras everywhere. Everything is controlled. Yes. But I don't see, I mean, as

positive the fact that some places are secured because they become private, because they are totally privatized and because they are now given to Bronx, Starbucks or whatever.

I don't think this is positive. I think what could be really positive for these places is to discuss about these functions, which are important for the city, important for the neighborhood and important for the people living nearby and try to see how in fact some of the parts can be auto managed by the neighborhood. But auto managed means also to define some of the functions that could eventually take place there. I mean, if there is prostitution, if the community wish to do auto managed with prostitution, obviously this is not acceptable.

This is not acceptable. So, yeah, I mean, again, give the keys to the community does not mean that we are not in a state of law and that the law is cancelled. I mean, there are laws that say that you cannot sleep in the street. There are laws that say that you cannot do this, this and that.

So, there are always these limits and there is no need, I think, there is no need to give these places to the private sector in order to make the laws respected.

Srijon: Yeah. Just with this point, I would go back to the point of the viaduct scale and the city scale. That means like the bridge has to perform in two scale. Obviously, it cannot just stop the city's main function for it, which it was built for. So, coming back to Kulevarthe, I think it performs the role, the regional role it had, which is connect from A to B. And then the shops are the value-added services. So, do you have any opinion on this?

Speaker 3: No, no, I totally agree. Yeah.

Srijon: So, yeah, I mean, in terms of my questions, usually I'm just trying to check through again like the evolution of the land use, current management system you have talked about a lot, and process of transformations. Have you ever seen any gentrification on Kulevarthe or any sort of...

Professor Maria: Probably, see, justify it in general. I mean, they are not needing, they don't need the Kulevarthe. It's not the High Line. In the High Line, you have so many papers speaking about the gentrification of the area around the High Line, because, I mean, the context was different. But here, you are in the center of Paris. You are in a, how can I say, middle class, in fact, a neighborhood. Yes, exactly. So, I don't think that the Kulevarthe was a reason for gentrification.

Srijon: There are so many other reasons. It comes from like city structure, basically, like how the city is being operated and that sort of things. So, Kulevarthe is an example, but not for this case. Okay, so, have you ever seen like community festivals or community activities on Kulevarthe?

Professor Maria: No, no, I didn't have the opportunity. Probably, they exist.

Srijon: Probably, they exist, because it looks like a place that can accommodate these kind of activities. And, okay, so finally, I would ask you about the evaluation of the project. Like, would you like to change anything of this project? In Kulevarthe? In Kulevarthe, I'm specifically asking.

Professor Maria: Well, the only thing that they would change is that they had the feeling that during the last years, it tends to become slightly more commercial. So, some of the newcomers are not exactly creatives.

Okay. Or the creative field opens up more and more. So, now there are, for example, how can I say, there is a place which makes frames. So, you will tell me, yeah, this can be creative. Yes, this can be creative, but it's not exactly a design activity. It's a rather commercial activity.

Commercial activity. So, I think this is important to make sure that the place is as inclusive as possible for young designers and people who are starting their work and associations of young designers and this kind of stuff. So, for me, this is the most important.

Srijon: And to be honest, like, I didn't know about the artisan policies of Kulevarthe and learning it from you is really, really helpful for me because now I find another policy of management and accessibility and overtime.

So, this is really helpful for me. So, you have seen some of the basics of my doctoral thesis and I would say like, I would ask some suggestions from you now. Like, how would you see this shaped or how could this be a doctoral thesis? I haven't already worked on it as a doctoral thesis. It is something.



Professor Maria: So, would you have any suggestions? No, I don't. I think this is an extremely interesting topic. And it's very, very interesting. I think that this issue of management in particular is really, really important. The issue of transformation is also interesting, but transformation is very much related to

management issues. What you were discussing about inclusivity, about appropriation by the locals, I think that these are really, really interesting questions.

So, nothing to say at this stage, except the fact that they find really the topic very interesting. Maybe a tip for a person that you could eventually meet a colleague from Brazil, from Sao Paulo. And to Sao Paulo, there is a viaduct, which is a kind of urban road, which was terribly and extremely intrusive when it was built, because it's an infrastructure of the 1960s.

So, I mean, just past of the city. And now, during some weekends and during nights, they totally close the circulation. So, it's not possible for cars to pass. So, you have these kind of alternative functions that are developing when they are not cars.

And this is really interesting. I can send you eventually a paper because Tiago, his name is Tiago Alice, he's a geographer. Tiago published a paper in a book that I edited, so I will send you.

Srijon: That would be so good for me, like, thank you. And the overall terminology of the theme I work on is basically, I used to call it post-infrastructure adaptation. But people find it difficult, what kind of infrastructure adaptation? Post-construction infrastructure adaptation is more suited, I guess. So, basically the terminology is infrastructure adaptation. So, do you think this terminology is, I mean, it works somehow? The word adaptation is here appropriate or?

Professor Maria: I think that you are tackling much more issues than adaptation in your field. You speak about much more things. So, infrastructure adaptation, yes, why not? But I think this is really limited in comparison to all these...

Srijon: Yes, it needs another sentence. Like, the land use management and strategies for the under-vired up spaces. Yes. Thank you so much. I'm not like finding what else questions to ask and it has been so enlightening for me. One thing I would ask you is, like, if you could connect me with any potential books or any potential information that could give me more information about Kulevat or any other case studies that is interesting management system, that has interesting management system, would be really helpful for me. And we will have a symposium very soon and I will inform you about that via email with Manchester.

We will be doing that. Itihar, Itihar Zurich, Manchester, Kyoto University and UCL Bartlett. That's what I'm trying to, like, the people I'm interviewing, I'm inviting them on that symposium and also potentially to write this book. It's one of my dream to write the book called Post-Infrastructural Adaptation and these stories of the seven cities, possibly more. I do not choose case studies which I cannot go myself because it's very important for me to see it by myself.

Professor Maria: I see them and to live them. Yes. I totally understand.

Srijon: And I have planned this whole trip ending with your interview, actually, because I was planning it from Zurich, like, okay, the first person who gives me time is on Brussels. Then I go to Brussels and Florence and... like this. So, yeah, today is kind of like the last day of the whole trip

Professor Maria: before I would turn this thing. So now you go back to where? Zurich. Zurich. And then you spend some time in Zurich.

Srijon: My visa is until 31st of October. Okay. So this month? Tokyo? Then I... no, no, then I go to London. Oh, okay. Then the research on the London viaducts. Okay. The UCL professor there, he will be facilitating me. And in between I might go to Berlin to see some cases because there's a group named Infrastructure Office. They are interested in my work and they invited me there. So I will go there and meet some... see some Berlin cases as well. I heard that Berlin also has interesting examples.

Professor Maria: Yes, very interesting. Great.

Srijon: Yeah. So if I have your permission, I would like to end the audio recording now. Thank you so much. Thank you. I will save it first.

**Interview of Derec Hickman, Guradian of
Arches, London , The UK
January 18-22, 2024**



Srijon: Hi derec, I would be grateful to know about the rent structure or the procedure they went through determining the Rent in the arches of London.

Derec Hickman: In this argument, you go to the Royal Institute of Chartered Surveyors and they can do arbitration to determine the rent, based on these rules.

Srijon: So, are these rules specifically catered for under-arch spaces or just a...

Derec Hickman: No, but the rules allow for specifically catering for location. So, in other words, when the rent on that shop over there, you can't quite see, but there are some commercial premises there, and then there's commercial premises here. So, if that one is 20 pounds a square foot, should this one be 20 pounds a square foot? And the answer is no, because this one leaks, and this one you have to move out for a structural inspection every now and then.

And this one has trains going over the top, which are noisy. And this one, you can't adapt it. You don't have the freedom to adapt the walls or anything. You're not allowed to screw holes

Srijon: in the walls. You are given a limited space and a limited... The biggest problem, of course, is the fact that it leaks water, and you have to move out for a structural inspection. So, this person, for example, would cost him about £150,000, and he has 20 staff that would all be laid off while they do the inspection. Yes.

Derec Hickman: And it would take three weeks. Three weeks. So, there's a big difference between that property and that property. So, when you do the valuation, you take it into account. So, you say, alright, so if that one's 20 pounds a square foot, we're going to have to say this one is 10, or this one is 15, and there you get

the debate. What is the percentage decrease? And then the professionals start to discuss, what is that percentage?

Srijon: What is that percentage? I'm going to ask you, Bruce.

Derec Hickman: And it's all about, and when it gets judged, it's all judged on evidence only. You don't take your opinion or my opinion. You have to put evidence on the table for the guy to look at, and he'll only look at that evidence. He's not allowed to go out and find his own evidence, and that evidence is used in the arbitration to decide what the new rent is, and when he decides what the new rent is, that's it. And that's what...

Srijon: That's arbitration. That's what the new rent is, arbitration. And the Ricks Rules, Royal Institute of Chartered Surveyors. This is black and white, no budging, Phil Curry can't say anything different, I can't say anything different, and we have to explain it to these poor people, because they receive a letter saying the rent is going up 300%, 400%, and they say, how is that possible? And it's because the landlord has got all of this data saying, I've got the evidence that the rent must go up.

Derec Hickman: Because they've got 4,000 properties. Yeah. And they've got the database, and they've got all the evidence of how much people are paying. But what they do is, they go to that guy down the road there, and they've got him to sign a lease saying that he's paying 30 pounders square foot. First square foot. But in actual fact, he only pays 20.

Yeah. And they give him a little, they say, hey, we'll just let you pay 20, but sign this. And then they went to everybody else and said, right, everybody, the new rent is 30, I've got the evidence.

Srijon: Yeah, this is what... You only need one evidence. You know Ian from Lascaux. He's the one also said the same thing.

Derec Hickman: Yeah, everybody says the same thing, because it's been going on since 2015. They didn't do this before. Mm-hmm. Everybody paid 8 pounders square foot. 8 pounders square foot.

Srijon: What was the basis for that? Do you know?

Derec Hickman: Because that's what everyone was paying. Everyone was paying for it. So the evidence was 8 pounders square foot. Yeah. And it would go up by about 5% a year. 5% a year. Approximately. Mm-hmm. Everybody's rents was linked to RPI. RPI is?

Speaker 3: Retail Price Index. Retail Price Index. Okay. Are you recording? Yeah, I mean it's recording. Okay.

Derec Hickman: Retail Price Index. So half the leases are linked to an annual increase with RPI. So all of the rents for the entire estate has been gradually going up steep at a higher rate than inflation. Because RPI is higher than inflation. So they were showing a good steady increase for decades. Decades. Right?

Yeah. Absolute decades. And that increase is a fair increase that should have just continued. However, there was a big upheaval in 2015. Because what happened was the government had spent the biggest investment in the railways since they were originally built in 1800.

1800, yeah. And that investment meant an increase in the footfall by 50%. Mm-hmm. So as you can imagine, if you're renting this cafe that we're sat in and there's 50% more people using

that railway station which is right next to us. Okay. You're going to get 50% more customers.

You're going to be able to pay 50% more rent. Mm-hmm. Yeah. So what they did was they went to this guy. And the guy here is named the proprietor of this place is called Ben. Mm-hmm. And this cafe is called the E5 Bakehouse.

Mm-hmm. So they went to him back in 2015 and they said, ah, your rent's got to go up. You can't pay £8 any more. You have to pay £20.

Okay. So he had to change all his, he's got three leases and they all became £20. £20. And two pounds was 15.

Okay. And then sure enough, they went to him the next time. He had to renew his rent review. Mm-hmm. And they said you have to pay £30 a square foot. Okay.

And that's the actual price he had to pay. Mm-hmm. Meanwhile, down the road, this is Arch 395. Mm-hmm. And down the road to Arch 408, he was paying £17 a square foot and they threatened him and they said he mustn't tell anybody.

Srijon: Yes, I heard that.

Speaker 3: And then. But it's fact. And they still do it. So you're talking about like 2015.

Derec Hickman: What happened in 2015 was the government made the decision of what was called the Henry report. Henry. Henry. Henry. The H-E-N-D-R-Y. The Henry report. Mm-hmm. That decided that they have to free up asset value to help plug a gap in their budget.

So they wanted to sell all the railway arches or lease them out and they did for £1.5 billion. Oh, yes. But the decision was made back in 2015.

Mm-hmm. They actually sold them. The actual transaction took place in February 2019. Thank you. Mm-hmm. You know this.

Srijon: Yeah, I mean, the thing is like when the railway became the public property, they cannot occur in depth. So they had to sell off all of these properties to. You can't hear what you said properly. So previously, government could, the network rail could borrow money from different organizations. But once they became public property, private property, public property, they cannot, they cannot, they cannot ask for depths or they cannot get depths. So at that time, they had to increase the property value. So they decided to sell it to this U.S. company. Did it go like that way or it's a bit different?

Derec Hickman: There was, there's some truth in what you're saying. But I don't think it's, it's, that statement is, is correct as, as you put it. Okay. What are the events that led it to, they did have problems with borrowing. Mm-hmm. Yeah. They, they, they were allowed to borrow 250 million pounds to spend on the estates to do it up.

Okay. And that was authorized. But they, they, they would have had problems borrowing more money. But what we're discussing at the moment is the estate. Mm-hmm. That's the portfolio of railways. The arches.

Yes. So that's, in this instance, they sold 5,300 arches, but they actually have about 9,000 arches. Arches. Yeah. But the, the lion share is this, this 5,300, which has got a name. It's called the Condor Portfolio. And it's still called the Condor Portfolio.

Okay. And the Condor Portfolio, they realized that they, that it's worth money and they could, they could get 1.5 billion or so by selling it. Mm-hmm. Yeah. By leasing it out.

Mm-hmm. And that was to, to, for them to bring in more money into the, into the government in order to spend more money in the future on the railway system. But what we're talking about there is the railway system, all of the entire railway system, the railway lines and everything, not the arches.



There was no money spent on the arches for doing up the arches. For the maintenance as well? So, I'll just repeat, yeah, to make it easy to understand.

Yeah. Network Rail is, is in charge of the entire railway system and the infrastructure of the railway system and all its franchises, running all the trains and everything. It is a huge, massive operation and it never runs at a profit, ever. The only country that ever made a profit out of the railways is Japan.

Because they went about this completely different. Mm-hmm. The only profit is in this, the railway arches.

Yes. You can rent out railway arches and you can make a profit from that. Everything else to do with the railways does not make a profit.

It's all subsidized by the taxpayer. Okay. You've with me so far?

Yes, I am with you. So the government says, hmm, I can't borrow billions of pounds to help with the... Maintenance. ...spend on the railway

infrastructure, but I can raise one and a half billion pounds... By selling.

...by selling a 150-year lease. Yep. So that's what they did and they took that one and a half billion pounds and they put it into the budget to spend on the railway system.

Yep. None of that money got spent on the arches at all. I know you're not asking me that question. But the Condor Portfolio didn't even get the original 250 million that was allocated it didn't get that. They took that back. They kept that within their budget to spend on the railways. Zero money got spent on the railway arches. So what they did was they took these railway arches that hadn't been looked after, had no money spent on them.

You can call it the landlord of these commercial properties did not invest any money on them at all, but went and had and sold them to the highest bidder. To the highest bidder. And that bid was 1.46 billion if I remember right.

Yep. Originally they thought it would be about one billion, but they inflated the price by going around and advertising arches for a 30 pounder square foot where we are now instead of eight pounder square foot, which is what they were doing. Network Rail just made this decision. They put an advert up and they advertised it for 30 pounds of square foot and they refused to rent any more out to eight pounds of square foot. And when people got their rent reviews, they refused to renew them at eight pounder square foot.

They told everybody that the new rate is now 30 pounds square foot. And we're sat here in what's called London Fields in Hackney in the east end of London. Everywhere was slightly different according to what the professionals decided they could get in the future. So in Bourdonsey where you visited, all across the entire Deatford, all

across the Louis Shamburra, they decided the new rate would be 16 pounds of square foot. But there they were also paying eight pounder square foot, same as us.

The network rail had kept it simple. The rate had been eight pounder square foot and that was fine for everybody. But they realized that here they could knock it up to 30. Over there in Deatford, knock it up to 16.

Also in Peckham Rye 16 and in Loughborough Junction 16. I don't know if you know any other areas but I can quote the prices of what they did. And this was in 2015, their Condor Portfolio project. They spent 20 million pounds on lawyers and professionals to come up with this master plan of how much they could rent out all of these places for. That was the new valuation and that was the valuation that was used to sell the estate. And that's why there was this big snowball in all the rents going up. Because they basically acted as a monopoly and instead of renting them out for the going rate, they just said we're not renting them out for that anymore.

The new rate is this. And if you wanted to rent one, you had no choice. Eventually they got somebody to go ahead and rent one for 30. And because of the red book says that the new rent is whoever moves in is what you have to pay, that's what they're quoted to everybody. But they didn't admit if anyone paid less, they kept it under wraps and they hid the evidence. And if anybody went to arbitration, they did everything that they could to prove that the new rent was the correct rent. The new rent which was made up figure on by professionals to sell the portfolio.

Srijon: And that was the time of like 2019 you're talking about?

Derec Hickman: The decision to sell was 2015 and that's when they started the project. They got

Rothschild, the big financial organization to oversee the project, which is called Project Condor. The name Blackstone doesn't come into it at this stage.

It was the highest bidder. In 2015 they start the project but they don't tell the tenants. The first thing they do is they stop spending money on the arches and instead they just do a one in every area to rent out one in every area for the new inflated amount. Just one arch. And they do it up really beautiful and they went out for the maximum amount and they say right, we're proving it now.

Srijon: This is the new rent and they did that in every single area in the whole of London. They went to Leeds and they went to Manchester and they went to Sheffield and they tried to do something similar. But the only thing that really mattered was London because of 80% of their profit is from London.

Derec Hickman: The rest of it is hardly worth the maintenance of running the portfolio.

Srijon: I visited Newcastlefield in Manchester. That one is by National Trust and I think they are not... That's a regeneration project of landscape and they don't have any... They're running on non-profit as they say.

Derec Hickman: Hascastlefield got a large portfolio of arches there?

Srijon: Not really, not very big. Actually I was working on it today. It's just 330 metres of the viaduct that is converted into a sky garden and a community place where people go there.

Derec Hickman: I studied the plans for that. Is it part of the Arch Co-Portfolio? No. I don't think it is. Network Rail had something like 9000 arches. They only put 5300 into the Condor

portfolio and everything else they selected for themselves or for other projects.

Srijon: Okay, I see. I think I should just go into the questions myself. This can stay. You are on the floor and it's better. In this timeline, could you illustrate what was the time and the need to form the Guardian of the Arches in this story? When does the Blackstone come?

Derec Hickman: Okay, so 2015 the decision is made to sell the arches. The next thing that happened is they went into planning mode and they didn't tell anybody what was going on. Then they selected Network Rail like I say. They made a plan called Project Condor and that was 2016 and 2017 they started to implement it.

So they had a 20 million pound expenditure on professionals and they went around using their professionals to target each area with the new inflated price. Okay. And suddenly the first thing that we noticed was that nobody was able to rent a railway arch. It all stopped.

It all stopped. There was no new tenants moving in and if you tried to rent one you hit a blank wall. And then the next thing that happened was suddenly there was this really immaculate one in every area put on the market for this ridiculous new rate.

New rent. So that would have been 2017. You start seeing adverts and railway arches and they publicized them and did massive marketing on them. Which they'd never done before. They weren't marketing the estate at all. They didn't make any effort to rent out the arches until now.

Just these few at an inflated price. And then the next stage after that, so we're moving into 2018, they brought out a policy that they wanted to withdraw security of tenure. That is the protection of the 1954 Act. The landlord and

tenants. Landlords, plural and tenant act 1954. They made a policy decision that they were going to stop allowing that in all of their leases and that they wanted everybody contracted out of that protection to renew the lease. So all new leases they started telling people they couldn't have this protection. And whenever somebody was up for renewal, they started tricking them into signing the new lease contracted out. And this was taking place in 2016, 2017 and 2018.

It was especially painful for the ethnic minorities whose first language wasn't English, such as Bangladeshi people. There was whole streets where the property managers would walk down the street to these people and tell them this is the new rent. Not the new rent, but the new contract. And you have no choice but to sign it.

And I'll briefly explain why that is such a big impact. First of all, if you have such a contract, you must keep it. You mustn't sign a new one and give up those rights because of those leases or lifetime leases that allows you to stay into your property forever.

When you contract out and your lease is up for renewal, you have no right to renew. And they would just tell you get out. They would say, that's it, get out. They would say, pay the new rent of £30 a square foot or we won't renew your lease. And you no longer have any protection of law.

Full stop. And so they tricked these people. They're not allowed to take these leases off them. But by tricking them into signing new leases, they managed to increase the value of the portfolio. Because when you have somebody in a railway arch say as a garage, like the first one I showed you today, his lease says that he's allowed to be a garage and he's been there 40 years. And when the lease says it's only allowed to be a garage, it can only be valued as a garage.



It can't be valued as a cafe. So to trick people out of those leases and give them a standard lease, whether you're allowed to be anything, that inflates the value of the portfolio. So that was the first thing that started to happen, that we noticed that people were being tricked out of their original leases.

And we didn't know what was going on, we didn't properly understand. The next thing that happened was the arrival of what is called a rent notice. This is the legal letter sent by recorded delivery to tell you that your rent is going up, according to the rent review, and it's covered by the rules of the Royal Institute of Chartered Surveillance.

And the first thing you have to do when you receive, these letters were going out and most people hadn't received one before. Most people, if the rents were going up, RPI linked every year and that had been sufficient. And a few people that had to increase their rents because they didn't have the RPI increase rents, some people would have to have a rent review every three years to just keep it in line with the others. They would just get like a 10% increase, something like that.

And it would be signed off over a cup of tea and there would be no conflict. But these letters, they were sent out to selected tenants. And these letters said, your old rent is £8 a square foot, your new rent is going to be £30 a square foot. The first pitfall was if you didn't respond with what's called a counter notice within 28 days, you would be deemed, in other words, that rent would automatically apply and you would no longer be able to contest it in court.

And this was terrible and it happened to lots of people. And what would happen is people would receive these letters and they would go to a solicitor and they would go to a rick surveyor and they would seek advice. And a lot of the professionals would turn around and say, well, this is the government. This is the biggest portfolio of property in the country and it's your government.

There's not a great deal you can do about it. It's the same government and the same department. It's the Ministry of Transport that operates this. They also, the ones that set the prices for the MOT stations, what they can charge. It's illegal for them to charge more. But they were receiving these letters to say that the rent was being put up threefold. But the same department of the government is saying that it's illegal to put your prices up. It's worse than that as well because a lot of these letters would arrive after the event. They would say, we're putting your rent up 300% backdated by 12 months.

Well, that's obviously impossible. So what that meant was these businesses had to move out. They couldn't afford professionals and the professionals were really nervous to try and help anybody because of the powers of Network Rail and the intelligence that they'd applied into planning this project. They had made evidence to make it really difficult to prove your case that these isolated one-off rents that they had created

were abuse of a monopoly applying techniques to artificially increase the rents. They'd used the rules in an abusive manner and an unfair manner and this wasn't the application of a standard market force. It wasn't a question of supply and demand. They had withheld supply and they just introduced a very small, tiny amount of their property to be let out. Yes. The apple cart was hidden and they just put one apple on the table.

Srijon: One apple on the table and whoever buys it...

Derec Hickman: That's how they inflated artificially. Perfect. You do understand. I think it's well put actually.

Srijon: Yeah, what you say it makes so much sense now. And that led to the formation of the Guardian Cart?

Derec Hickman: Well, these letters were going out so various people would get together with their neighbours and there was one particular powerful group of people in Brixton and they formed a group because they were hit very early on. They were all told that they have to move out for redevelopment because another technique to get people out of their leases is to tell them that they were going to redevelop.

Yeah. Now, at the time the law was that you could just say you were going to redevelop and you could use that as an excuse to kick them out of the lease. The only improvement to the law at all in the last 20, 30, 40 years is that they've outlawed that. Now the only way you can use the redevelopment clause is if there actually is a genuine redevelopment and then you're allowed to break the lease and kick somebody out of a secure tenancy and pay statutory compensation, which is a small amount of money not worth mentioning. But in Brixton they were all moved out.

They did receive a small amount of compensation and there was some redevelopment. But the Brixton group got together and formed a very well-organised group. A network rail fought them, kicked them all out and they failed. So when I was asked here at London Fields to do something about it, after attending meetings with lawyers and rick surveyors with the tenants and being told that you have no hope, I realised that we needed to act as a group. So I am the person who actually invented the concept of having a group here and then I went on to invent the concept that that would fail because as one group we would be struck down by a more powerful organisation and that's actually what happened.

The group here in London Fields are 40 arches. 10 of us had rent reviews due and all 10 of us as a group joined forces with a local trade association called the Eastern Traders Guild and a professional who ran it called Chrissy Nicholson and she supported us to negotiate directly with Network Rail. So we went to the Network Rail head office and as a group of 10 of us we tried to negotiate why our rent was going up 300%. And they said it's tough, it has to go up and we said we believe these are artificially inflated rents because you intend to sell the portfolio and these are artificially inflated rents so that you can get a higher inflation. And they answered that they're not selling the portfolio and this was in 2018 where it was already down. They're not selling this aid. Their answer to our organised group and to Chrissy Nicholson and all of our professionals who were in their head office meeting was that they're not selling the railway arches and that it's not an artificial inflation and that it is just business as normal. They lied to us as a group and this is the behaviour that they were applying to beat small groups. And then every single one of us, all 10 of us, received a letter called the Calderbank

offer to say that if we did not agree the rent we would have to pay all of the legal costs if we lost in court.

All of us. We were all offered, instead of 30 pounds a square foot, that we could have, we have to agree to 30 pound a square foot and there would be a stepped rent going up to 30 pound a square foot and if we didn't agree to this one-off offer by a certain deadline we would all be taken to court and would have to pay the costs if we lost. And as a result, most of these 10 tenants have moved out and I've walked you along this row of 40 arches and there's something like seven of them that have gone from this, from what occurred. But while this was going on I realised that every small local group fails in this way because they get picked off and isolated.

So I realised that the only way it could succeed against something the size of Network Rail is if these trade groups were a national group. So I'm the one that came up with the concept I was asked to create a national group and I invented the name myself, Guardians of the Archers. And I asked Kristine Nicholson to assist with setting this up and she did.

The only thing I asked for is that the name Guardians of the Archers that I had chosen had to be used. And it has been used and it still is to this day. It's been ran by several different people over the last six years. There's one person in particular who's been the managing director for the bulk of the period called Lenny Jones.

And Lenny Jones had done a terrific job. The problem is that eventually the sale did go through. The organisation did try and block the sale but there was no hope in that. The big money players basically had already made decisions on this.

And Lenny Jones as the managing director has been run into the grounds trying to battle what has turned out to be worse than Network Rail. And that is the new buyer. The new buyer, Archco, Tellerall and Trillion and Blackstone, a combined operation.



Well Blackstone is the biggest landlord in the world and they're here in the UK having the biggest portfolio in the UK. So we've ended up with going from trying to deal with an organisation called Network Rail which is at the time we didn't know about the post office scandal which is in the newspapers at the moment. But we were dealing with a scandal of the same scale as the post office scandal in terms of a government institution that was basically screwing all of the tenants and abusing all of the tenants and actually focusing on purpose on people whose first language wasn't English who had less chance of defending themselves.

This abusive behaviour and the shutting down of businesses across the board for the sake of bonuses for the staff. Because everybody involved in the transaction, all of the managers of the portfolio, they all got bonuses for this thing. When the property was sold for 1.1 .5 billion almost, there was a huge gravy train of

people that received money from it and all of the people involved all got benefited from it. At the cost of all of these fantastic people that had to shut down their businesses or move elsewhere.

Timeline, February 2019 the sale was completed. We were already in existence by then. And because we were already in existence by then as an organised national group and we had become recognised as an organised national group, the team that had been working on Guardians of the Arches had been so successful that we had been recognised at government level and we had met with the Secretary of State in charge of the Ministry of Transport. We had met with the chap, at the time I think it was Boris Johnson's brother who was in charge of the Ministry of Transport at the time. We had met with him and we managed to influence the sale but not stop the sale. So when the sale went through, a public inquiry headed by Meg Hillier took place and it was ordered that the new landlord had to write up a tenants charter and had to put in some protection for the tenants. And that was written into the agreement.

And that has happened. And you will constantly hear Archco claiming that they have a very good tenants charter. And they did write up their tenants charter in a series of meetings with Guardians of the Arches.

The two organisations worked together to write up the tenants charter. I personally stopped after the first meeting because in the first meeting the then CEO Adam Dankin said that he would not share all the comparables at a rent review, which means that the disgusting behaviour that we have been witnessing could carry on. They could use their monopoly position with the control of all of the data of all the rents to carry on inflating the rents. And that is exactly what they have done and are still doing to the state.

So that, shall I carry on a little bit? The timeline, that was February 2019, Blackstone or Archco took over and we negotiated the tenants charter with them. They have been, we are now in the year 2024, just started and they have just released their accounts, Archco have.

And at the moment I have chosen not to do any negotiating with Archco at all. I have given them up as a dead dog and their portfolio has seen a decrease in numbers year on year from the moment that they took on their portfolio. They claim that the decrease is reducing from what it was with Network Rail and that is true. The churn rate and the last year with Network Rail was 11% and the churn rate now is 8% both of which is disgusting.

And it is simply because of the artificial inflation of rents and the abuse of the market. And added to that is the fact that they have not spent a penny on the arches. None of these arches have had any investment in it whatsoever. On this particular row if you looked around you would see that Network Rail has replaced the bridges. So yeah, they are one and a half billion pounds has been spent. But the actual arches haven't seen any improvements.

The only thing that has happened is all the Network Rail signs have been taken down and Archco signs have been put up. I will stop. I will tell you what their version is saying.

Srijon: SME. So they want to promote small business and like industry. They are the landlord of small businesses. So in this timeline I have understood the formation of the guardians right now.

Derec Hickman: Were you talking to the inventor?

Speaker 3: I don't know if you didn't know that before you came. So don't get it wrong. Although I invented it, the bulk of the work has been by all these different professional organisations that are brought in. It is impossible to do it by yourself. It is impossible. It has to be a large massive group.

Srijon: At one point you said that then Covid happened and it changed a lot of things. It broke the business model.

Derec Hickman: How? The business model was that the footfall had increased by 50%. So they could kick out all the industrial businesses in places like where we are now. And they could move in all the restaurants and the cafes and the retail shops and breweries and pubs and clubs. All of those things for the increase in footfall, the increase in people. As we sit here, look how many people are walking up and down. That number of people increasing. If you kick out the mechanics

Srijon: and the guys making wood and that kind of thing, then you would be able to put in more of these places and these places can pay 30 pounds a square foot. The cafe that was sat in can easily afford 30 pounds a square foot. It might have a turnover of a million pounds a year. But the industrial premises can't afford the same amount of people that are selling alcohol and possum and coffees. So they're forced out. What's the original question? The question is how did Covid impacted and then...

Derec Hickman: So naturally this business model that they have would have actually probably have worked much to our detriment. But there was a stumble and that is when Covid hit, every single one of these businesses we're referring to were compulsory closed. And if you went up and down this road during Covid, which I did, it was a ghost town. Ghost town. All of

these businesses were closed and they've never come back to the same level. So for example, the retail, the Post-It's Retail Shop is just the other side of this London Field Station. He tried to reopen after Covid, but the football just wasn't there anymore.

And all of them reported the same thing. Not just here at London Fields, but the Gardens of the Archers Network, which is national, was getting the feedback from everywhere that the return to the cafes and the restaurants and the clubs and the pubs, it just never occurred. It never went back to what it was. But the worst thing is that Archco didn't meet the tenants halfway with the rents during that period. They said they would, but they re-forced them to give three months rent free right at the beginning. And most tenants never got anything else but that. And to this day, they're all sitting on massive debts caused during the Covid period. Who? Archco?

Speaker 3: The tenants? Archco's on their books are still showing huge debts owed to them by their tenants.

Srijon: They're still showing that? Yes. Even though they are not in the business or anything?

Derec Hickman: The ones that aren't in business anymore, that they're able to track down, still have to pay those rents. If you give up the railway arch, you still have to pay the rent.

Speaker 3: Some of the ones I've shown you, like the one at the very end that's been there for 90 years, they say that EO is 250,000 during that period. The black cab industry really got clobbered really hard. They weren't compulsory closed, but

Derec Hickman: they just lost all their business because when all the people stopped coming into London and going to work, the black cabs didn't

get any work. And this massive debt is hanging over the head of Archco and hanging over the head of all of these tenants. And they're unable to invest in their businesses or get out of this debt trap. And Archco have this debt owed to them, which is their default rate is constantly increasing. So their business model isn't looking so shiny. They borrowed money to buy this portfolio based on this business model that they were going to get all of these rents. And it stumbled and failed.

The first fail was obviously us. The Guardians of the Arch has stopped the rent increases being applied quite as aggressively and as quickly as they expected. And they bit the bullets and they admitted the fact. And they've said that they didn't quite achieve the rent increases that they wanted to, but they're going to be okay. That's in the realms of Adam Duncan, the CEO said this.

But the current CEO is faced with a problem that the Reds are never going to achieve what they said they would. And that we're never going to return to the same levels as we did before because of the world has changed somewhat. And normally, even in this weather, we wouldn't be able to sit where we're sitting right now before COVID. But now we can. And we're not even being told to buy a coffee. Yeah, I was thinking about that.

Srijon: Well, we should go and buy a coffee, but we're not being told to buy a coffee and they're not being upset with us for taking this table because it's not that busy. It's not as busy as it was. So that's the change that the COVID has caused. It's a bedette and a reduction in footfall.

Srijon: And around this time, I've seen the email you write yourself like tenant advisor. So what are the scopes that you have right now or what kind of advices you provide to the tenants who are like the first language probably is not

English. So what kind of things or kind of factors because this is something I wish I could show you why I am. I have the motivation for working. I've got to change your question. OK.

Derec Hickman: So I have news for you that I am starting to pack it in. I've made the decision that I, as I've been a help, I'll answer the question first and then I'll explain the change. So the scope is that I have been the number one for giving people advice on how to deal with their rent reviews. And also obviously the strategy and guardians of the arches and how to combat the landlord.

It was Network Rail and then it became Blackstone. And I've always been behind the scenes operating the strategy on how to deal with them, which I'm more than happy to discuss on the techniques that we used and what have you. But that's not answering the question. Day to day I would have a tenant coming to me saying, hey I've received this letter saying their rent's going up, what should I do?

What should I do? And over the six years or seven years I've been doing it, I've gotten really, really good at it. And working with all the different rick surveyors and lawyers, I have picked up and also my own self-training, I've picked up all the ins and outs of how it needs to be done, the royalty-charted surveyors own rules, the laws on contract and the laws on statutory laws that are in place with the Landlord and Tenants Act 54, all combined. And it's too complicated to teach tenants all of these complex laws. They just need to be told how do they stand, what should they do?

What should they do? Now there's a little bit of luck comes in here. And that is that there is a software called Horizon. Now it's a total coincidence that Network Rail used a software

called Horizon and the post office scandal used a software system called Horizon.

It is total coincidence, it is not Fujitsu, it's not the same software, just got posted out. But they use this software to write up the leases and it's a rent software to process the transactions for this massive portfolio. As a result, the template for the leases are the same. So all I had to do was learn the four basic leases that are used on the 3800 tenants, I only had to learn four leases. So all I had to do was take a look at your lease and straight away, once I identified which of the four it is, I could tell you exactly where you stand. In that lease, there's been key dates, like the dates that the lease started. Most of the leases do not have an end date. They're a lifetime lease. They last until you die if you're protected by the act. Or if it's a company, they last forever, like the one I showed you that's been going for 90 years.

And I know from experience that you don't know this. So the first thing I do is I sit your town and I tell you the good news. And if you're Bangladeshi, I would get your son or somebody in your family who's born in this country and they've picked up English as their first language. And I would sit with your English speaking helper and I would discuss it in English. If I have to, I bring in another 10 and 2 springs Bengali or Vietnamese or whatever nationality I'm talking to. And we would talk to you in your natural language so you'd be able to understand the complexity of what we're discussing.

Because it's really crucial that you would need to know something. You would need to know that you've got a fantastic lease and you mustn't give it up and you've got something. And that your landlord hasn't told you this. They want you to give up this lease. You've actually got a lease that lasts forever.

Written in the lease it says they can give you 6 months notice to kick you out. But that's not true because the statutory law overrides it. Statutory law means that they can't use that clause against you. They can't use that clause to kick you out with 6 months notice. In actual fact, your lease lasts for your entire natural life.

Amazing. So it is worth investing in it. It is worth keeping it going. It is worth spending money on it because they can't kick you out with 6 months notice. And your rent is not what they say it is. If you've received this letter to say your rent's going up, the rent is set according to what other people have agreed when they moved in at the same time as your rent review.

So this is important information which is really basic which I have to explain to people. And I just look at the lease and I tell you the dates involved. I would say your rent review is February last year. Who moved in at February last year in your street?

Find out what they paid and then find out what secret deals they struck. Yeah? Yeah. And then you look at the evidence that Archco is showing you and you find where they've been lying. Ah. Okay.

Srijon: I mean, that's really helpful for the people who actually don't know ins and outs of these things.

Derec Hickman: The mistake that the other professionals are still doing, the other support groups, they're trying to teach these people all of the complexity of the rules. Which scares people out. What I did and what was really useful was I gave down the dumb down what you need to know version. What you need to know version. Yeah. But then of course the network which is Guardians of the Arches, we ended up with so much intelligence that we started to find out

what was going on in all different states. And we had to try and get all the different estates to hook up with each other as separate groups so they could share the local information. And in local language. Yeah.

Because everywhere there's different groups of ethnic minorities. Yes. Yeah. And they don't stick together. They're like a wild pack of dogs but not the same pack.

Yeah. Just because one guy's banged all he doesn't mean he's going to be friends with the other guy who's banged all he and the same with Vietnamese and the African communities that we have up here. In fact, quite often the rivalry is even higher.

So the secret of Guardians of the Arches was you get someone like me who's an innocent third party who could walk into every single arch and be friends with them all even though their enemies were with each other. Okay. Yeah.

And that's what was required. Network Rail and Archco they have the policy to turn all the tenants against each other. They don't want them to team up together. That's why, yeah. Yeah. It's really important for them to make sure that we don't form a cohesive group and we allow the natural hostility of competition and rivalry to be amongst us.

And that's what they would work on. Pick them off one by one. Yeah. So my role, we try and form organized local groups, hook you together. I would say to you, oh yeah, have you, do you know the Bengali guy who does the same business as you at such and such a railway arch? And if you said no, I would introduce you. Yeah. I'd get permission and then I would introduce you. And then the two of you would join forces.

Srijon: Okay. At this point. There's another aspect.

Derec Hickman: Yeah. You might be having a nervous breakdown. Who, me? Yeah. Why? Because of what you're going through.

Speaker 3: No, no, no. I would have to introduce you to the groups that I'm talking to. Yeah, they would. They could, they could, sometimes they cry. Oh yeah. Because. And then I'd have to start bringing in other people because if I don't do emotional support, I only do the business.

Derec Hickman: And then I'd have to bring in other people to try and make them feel like they're not alone. And they're there, not to give up. They couldn't be united. They're not to give up and that there is some hope. Yeah. Because of the, the sad things that we've experienced in the last seven years, it's overwhelming. They're lost just on this one street alone.

It's terrible. Now the change is that they become increasingly difficult to deal with to the point that I've given up. Now if you come to me and you say, I need to renew my lease with Archko, how should I go about it?

What normally happens is I would stick with you the whole process and help you do it. Yeah. But it's become so difficult that I've had to give up. I see.

My last lease, the last person that I helped still isn't completed. It's a Bengali business, city tires just down the road. Mm-hmm. And there are seven or eight months into negotiating a lease renewal and every single term has been changed and the goalpost changed by Archko because of their been going through financial difficulties and they've been changing the rules of what they want on their leases and what terms they want. And the change of management has been

sending down changes in rules and strictness to do with debts and payments and terms that I haven't been able to deal with it in a timely fashion.

Yeah. With my seven years experience, a simple three-year rent renewal of a simple standard contract has taken me over seven months. So I've now gone to them and say, there's no fees or contributions to guidance of the arches. You do it for non-profit. We forfeit all of our income now and I no longer do it and I'm not going to be helping any of them with any more renewals and I only give one advice. Do not take Archko as a landlord. That's the current situation.

And the accounts that have just been released last week show a half a billion pound loss in a devaluation of their portfolio. Okay. Half a billion. You know how big half a billion is? Of course. That's a big devaluation and that's why their accounts were late.

Srijon: So as the situation is now, not all the arches have been signed by the owners yet. Like they still have the original leases and they're just...

Derec Hickman: There's 3,800 leases. Yeah. Well, now there's 3,774. So it's gone down. Okay. Yeah. But of that, more than half still have the old leases. More than half still have the old leases. Much more than half.

Originally it was 80%. So listen to me. Okay. I have sent you an email with a website with all the files on it. And in one of those files is the independent audit by the Public Accounts Committee.

Okay. It's a PAC report. The report on the national...the sale of... Network Rail's sale of the railway arches. And in there is all of the data of

all of the railway arches. It tells you that there's 3,800 tenants. There's 5,300 leases.

Yeah. It's not 5,300 arches. It's 5,300 leases. Leases. One lease could be 20 arches.

20 arches. And it's all...and it has a lot of the data that I refer to as in there. And you need to flick through it yourself.

It's a big report. And it basically says that the government failed to think about the tenants' interests. And that there must be this tenants' charter. But it also gives all of the data on who the tenants are. It also, I think it's page 34, gives you a breakdown of the four different leases and how many of each one there is.

And you will find that over 80% of them still have security of tenure. Oh. Yeah? So the truth, you know, that a lot of... Some people have the railway arches for longer than... Technically longer than Archco. Yeah, obviously. And there are some people out there that have the arches on a thousand leases. At this level. Yeah, in Sheffield. In Sheffield. Yeah. And the whole streets where there are a thousand leases. Wow.

Srijon: And that cannot be changed even if...

Derec Hickman: No, you can't change the contract. Contract is black and white. My alarm went off because I've got to go to another meeting. So do you see, talking to me, we could keep going for 10 hours?

Srijon: I understand. But, well, I will just show you one picture here. Why am I... Like, how long do you have? Like, it's three-six now. I have to go. You have to go? Yeah. Okay. So, one last question?

Derec Hickman: I've just, I've got another appointment. Okay, okay. But I'm willing to carry on.

Srijon: Okay, so... I've got to be now. I mean, I'm willing to... You're probably going to have more questions and think about what I've told you. Yeah. But you're going to have questions. And if I put the answers in writing, it's more powerful, isn't it? I think it is. Yeah, you can.

Derec Hickman: And, well... There's nothing I'm saying that you can't look in these reports that I've sent to you. Yeah. And back up the facts. Yeah. Yeah. So... And when I refer to, say, the CEO of Archipelago saying something, you could ask them and they would have to answer. You could say, Derek Hickman tells me you said this, they wouldn't be able to say, oh, well, he's lying.

Srijon: Will they? Oh my God. I'm happy that I found you somehow.

Derec Hickman: That's what the tenants say when they meet me.

Srijon: Yeah, and me too, because the picture I'm showing you is in Bangladesh. I've seen this one. Oh yeah, you've seen this one, but have you seen this one? Is that a fire? Yeah, it's been burned down and they have to move from there. Is that burned down on purpose or...? It's called beautification. And... Is the answer yes? Yes. I mean, I cannot directly say yes, but...

Derec Hickman: Was it accidentally, officially was it accident?

Srijon: In consecutive three weeks, three span had three fires. In a consecutive three weeks...

Speaker 3: And hold on, what year did that occur? It's this year, last year, sorry.

Derec Hickman: In 2011, a fire occurred next to one of our bridges. Yeah? And I've included a 2011 fire audit report in my research. Okay, okay. And what I believe is somebody set the thing on fire on purpose to help to kick us out of the railway arches.

Yeah. And sure enough, that's exactly what happened. In the fire audit report, they go ahead and say, we want to get these people out of the arches and it's going to add value and we're going to make a profit from it. In a fire report, when somebody set fire on purpose, it was Arsene set fire to underneath a bridge.

Srijon: Well, I was working with the government at that time and I tried to come up with solutions. What they wanted to do was that they remove these places, underneath spaces and make shops there. And I came up with a solution in which you don't have to move these places, but rather you utilize them and still earn the money utilizing the local businessmen by renting out the surface of the viaducts. Renting out the surface? Renting out the surfaces at advertisement billboard.

Speaker 3: So this is my last work. Usually I start with my big presentation where I start like 10 years before, but I just showed you this because...

Speaker 3: Do you want to meet again before you leave?

Srijon: I leave on 29th and then I can meet another time next week.

Derec Hickman: That's what I'm thinking. Why not? Because we're both enjoying this.

Srijon: Yes, of course. I want to give my presentation to you as well.

Derec Hickman: You can come to my house and do it. I mean, next time we have to be indoors.



Srijon: This is a Japanese example I worked on that I will also show you as an art curator. They have an interesting lease policy in which they renovate their area. Why don't you send that to me before you talk to me? When are we going to meet again? Okay, so I have... In the 25th I have to make a presentation. Basically I'll be presenting what you said and also the other perspectives. And then 25th, I cannot... 26, 24. I think 24. Do you have time on 24?

Derec Hickman: Yeah, I've got an appointment at 12 over the night. We'll see each other.

Srijon: Okay, how about I email you tonight and then we fix a date?

Speaker 3: And also email me the questions I didn't answer.

Srijon: Only this part. This part. This is more about the future. How can we come up with management process? Actually, last four months I've been travelling around all over Europe.

Derec Hickman: I've written a plan for the future.

Srijon: Okay, fine. Perfect. I think we need to sit and... These are the things I did with the community people there. I want to...

Because I'm rushing.

Derec Hickman: Yeah, let's go. Your work, I... I think it's disrespectful for me to spend five minutes looking at it.

Srijon: Yeah, obviously. I'm just giving you this...

Derec Hickman: It's like the work I've done.

Srijon: Yeah, it's passion. For me it's also... I don't want to look at this in five minutes. Thank you so much. I want to talk to you about this. Thank you so much. Okay, let me email you again for a time and we have... I will meet somewhere warm. Yeah, obviously. Yeah, obviously. Let's... Oh my God, thank you so much.

Derec Hickman: I'm so happy to know you.

Speaker 3: Can I leave you here? Oh, we have to take a picture first. Yeah. Like, is it okay if it's okay together? Then that's the last thing I will do.



**Interview of Phill Curry, The Arch Company,
London , The UK
January 16-17, 2024**



Srijon: Okay, so I think it has started. Thank you so much. You can start from whatever you want to say to me or then start. Sure.

Phill Curry: Well, the record, my name is Phil Curry, I'm the head of communications and corporate affairs at the Arch Company. I've worked here for about three and a half years. Okay. And in total the Arch Company is about five years old. So, five years old. That's me. Previously I used to work for a railway company and before that I used to work for a lobby group that represents small businesses. So, I'm very interested in economic activity and railway infrastructure and Arch Company is a good blend of those two interests for me. So, I thought I might start with just picking up on your themes of management, time and access. If I do a bit of plotted history of the railway arches in London, would that from Victorian period till now, would you find that helpful?

Srijon: That is actually helpful because one of the things is like I'm trying to make this infra

land use timeline to see how it was being managed from the time it was being built and how do you come in in the recent times. That would be really helpful. Sure.

Phill Curry: So, the Victorians built the railways and in London the first railway was built in 1840s and then there was a period of quite intense building 1840s, 1850s, right up until Marlborough was the last railway terminus in 1890. There was all run by private companies and these private companies were competing against each other. So, if the railway system in London doesn't always make sense, that's because you have different private railway companies trying to compete with one another to get the quickest route for their passengers to get more patronage. But from the very beginning they were building in urban areas and whenever they wanted to build a railway they'd have to apply to Parliament in order to get permission to build a railway in the first place. And in the 1830s, 1840s the companies pretty much had free reign and could do whatever they wanted. There was a lot of displacement. Towards the 1860s and 1870s and 1880s there was much more regulation and that meant that railway companies had to be created so they would build a railway by-products and that enabled the street pattern to continue so people could still travel from one part of the south part of Bermondsey to the north part of Bermondsey and a viaduct would allow the traffic to flow through. So we call that in the public policy speak, we call that permeability.

So the answer is permeable in that sense. But these railway structures were very expensive for these private railway companies to build and so from the very beginning they were always looking at ways to lease these spaces in order to recoup some of their original costs of building these viaducts in the third place. So there's not been very much historical enquiry into this so

there's not much data of what I've heard from people who work here and people who work in the railway is that from the very outset these were intended and they were used as commercial space. Now the nature of how they were used was really different today. So if you think in the Victorian era you had steam engines, it was a very noisy environment.

Very polluted environment, lots of smoke. So what you could do in a railway arch was very limited. So it was really kind of storage, possibly like a low-industrial type workshop. But really these were very low-grade spaces. And at the time in London there was plenty of other choice of land for you to use.

And it's always been, because of our history, it's always been a relatively formal use. That said, there has been this history of informal use of the arches and there was always a slight tension between the railway companies who own the land and own the arches and people squatting and using it for various purposes, perhaps even criminal activities. So in the 1920s the railway companies were amalgamated and then there were four big railway companies. And then the railway companies were nationalised after World War II in the 1940s.

So at that stage all of the railway that Fyde were publicly owned by the British Rail as it was called in time. And up until that point again the kind of use of those spaces was relatively low-grade. It was simple activities, light industrial storage etc.

And then there was a beginning of a change in the 1970s. So an example would be the railway by that there's from the Bermondsey London Bridge through Southwark and even to Waterloo and then even to Charing Cross. So that area at SE1 postcode is really kind of valuable real estate and that area gentrified. So it went from

an industrial area to quite different type of use, so more residential. There was the Southbank Centre that was built in the 1950s and that meant that it became more of an arts and cultural destination.

So it was the kind of 1970s where we began to see some element of change in that particular area. Railway arches have always been, well ever since the 1950s, popular with car mechanics. So we still have a lot of car mechanics in Railway Arches today. And in terms of spaces to work on vehicles, they're fantastic.

You can make a lot of noise, people generally won't interfere with you. You've got the road outside so you can use that road for the car parks. But as I said, in the 1970s we began to get changes in use away from that kind of breakers yard, car mechanic, vehicle service and repair usage towards more interesting things like leisure, bars, restaurants. And that trend is still quite limited but it continued.

Phill Curry: The British Rail period came to an end, so the nationalisation period came to an end in the early 1990s. And then it was the infrastructure arm was privatised and then that was the case for a number of years and then it was re-nationalised in the early 2000s. And then it became a few years after that Network Rail. Network Rail is the infrastructure owner today and they own the Viaduct. And so the Viaduct structures that used to be owned by the private railway companies were now back in public ownership, having gone through quite a lot of cycles. And this is another sort of trend of railway arches. We've got some customers who are in our spaces, like car mechanics, who've been there 40 years.

Srijon: They might have had several owners, so they might have seen British Rail, then the

privatised outfit rail, I think they were called Railtrack. Then there was like Network Rail, now there's up. So in that period they would have had like four different managing agents.

Okay, various different guys at this point. And in the sort of period from 2010, we saw these two changes. First change is intense urbanisation, the rest of people moving out of London, that changed and people were moving back in, which put more pressure on residential land. And because of that, changes in consumer spending, so people are more likely to do their shopping online. There was a kind of big growth in the logistics sector in particular, so light industrial and logistics. That industry doubled in London over the period of 2010 to today.

So much more pressure on being able to get from A to B, but do it quickly, because you need that kind of just in time, last model logistics type model. So these twin forces of urbanisation and changing consumer and societal habits meant there was much more interest in railway arches. Because the price of industrial land went up and therefore the desirability of these kind of railway arches basis, again returning to kind of Southern, is really, really well located. You've got to deal with the noise above you and there's quite a lot of, you know, there's quite a lot of sort of, in terms of land use, quite an intensive area. Because quite often railway arches are right next to residential land use rooms.

Phill Curry: Exactly. So, you know, they're probably not the first choice for most businesses, but in terms of logistics, it's becoming much more desirable. So Network Rail realised they had a real kind of commercial asset on their hands. But the primary role of Network Rail is to invest in the railway.

That's what they're measured on. So their sole responsibility and objective is to make sure that

the infrastructure is maintained properly, so the train companies can run their trains on top of it. So the railway that was kind of a bit of a distraction to that core goal, core role that they had. They also had a change in status in legal status in 2014. So they used to be able to borrow money, because they were kind of quasi public sector organisations. They used to be able to go to the financial markets and get money. But once they became public sector and the government at the time, the coalition government, didn't want the public sector to be borrowing money because that would increase the debt. So back in austerity, and same today, they don't want the public debt to be increasing, and cost them more on interest payments. So they looked at ways to sell the portfolio, and they also wanted to get investment in, because they needed to borrow money to bring in the investment, and they also needed to raise cash in the short term as well. So for the two reasons of raising cash to cover a shortfall in that moment of time, but also to get additional private sector money in, they sold the railway arches in February 2019, it's when the deal happened.

We are a company owned by two owners, so we have Teddyville Trillium, who is one of the biggest private sector real estate investors in the UK, and Blackstone, who are one of the biggest private equity companies in the world. So that has enabled us to invest hundreds of millions of pounds into the railway by and by, making fit for purpose, improve those spaces. And now we're seeing a kind of, once they're waterproof, once they're improved, we're getting a very different mixture of customers in there now. So it's no longer a kind of space of sort of, quote unquote, last resort. It's apt to be desired, it's close to railway station, it's quite close to railway station, so we've got quite high end industrial, so we've got robotics companies moving into railway arches. What do you mean by that? We've got

cafes, theatres, bars, we've got all sorts of people,



Speaker 3: all sorts of entrepreneurs and all businesses, who've got all these fantastic ideas, and you can still rent a railway arch in central-ish London, zone two for 40,000, 50,000 pounds a year, which is incredibly competitive compared to comparable commercial space within that area. I would say like very quick plotted history.

Srijon: This is exactly what I was looking for, and I'm so happy to see that you have taken Viaduct seriously, because I don't see that often.

Speaker 3: People don't take it seriously, they're not taking it seriously. They're not taking it seriously. That's the advantage of art companies. So we manage 5,000 assets across the country in England and Wales, 3,000 of those are in London.

It's a big portfolio, each kind of ecosystem, we call it an ecosystem, is very different. A run of arches in SE1, zone one, is really different to a run of arches in Wolfenstow, for example. The nature of the customers and the businesses in those Viaducts, again, shapes the nature of that type of place. In terms of scale, we're a big player in London.

Srijon: That's amazing, it makes me happy to see that you're managing different sort of arches and

have probably different strategies for different areas. I'm very interested to know more about this.

Phill Curry: So I think historically, under Network Rail, the kind of, we call it kind of asset management approach. The asset management approach is probably quite passive. So businesses would come, be willing to pay for a certain space, for a certain price, as it's still quite competitive. Our leases tend to be kind of 6 years in length with a 3 year break clause. But we have leases that are much longer than that, we have leases that are much shorter than that.

So it's variable, but a sort of typical lease is about 6 years. We've got some customers that have been around for many, many years. We've got some people that use railway arches almost as like a kind of stepping stone to other things. So the Burmese beer mart that you showed me earlier is a good example of that. So historically, lots of car mechanics, lots of kind of storage use, it's a relatively kind of low grade, low value, low intensity. And then I think that's probably 10 or 15 years ago when breweries, you had that kind of micro brewery revolution. So nobody at Arch company of Network Rail thought, right, we're going to turn this into the Burmese beer mart.

It was a good organic. And somebody identified the, you know, railway arches are cheap, they're big, they're very tall, they're very spacious, they've got a big floor area. So actually, if you're looking at a process like distilling or brewing, you know, you need to have the tanks in there, I know it's a technical expert, but you know, you need a lot of equipment, you're going to do it in a certain scale.

And so railway arches were cheap affordable, big space, very high. So one or two starters to go in there, to distill beer, brew beer, I should say. And then over time, you had more people

because you had a kind of organic cluster. So, you know, there's a lot of, you know, that kind of industry requires quite a lot of knowledge sharing. And then the same way you get, you know, clusters of economic activity.

Srijon: Also, they interested space. Yeah, that's happened with brewing. And, you know, they're competitors, but they're also collaborators as well as a kind of friendly competition. Then some of them started to kind of use the front part of their art as a taproom, so people would sort of come and visit. And, you know, 90% of the business would still be brewing the beer, but then maybe 10% of the income comes from selling the beer to consumers passing by. That attracted more visitors. That meant that maybe that equation then turned into maybe 50% of income comes from distilling brewing.

50% comes from taproom. But the rents have gone up because the demand has gone up. And that's meant that actually it's more expensive type, you know, in terms of using it for brewing. It's more expensive to do that now. So some operators are now actually moving their operations to the edge of London or even into the countryside.

And then, you know, the opposite of just 100% of the taproom. So, you know, there's a relatively short period of time I've just described here as 10, 15 years. But this all kind of evolved and our kind of role as a space provider is not to pick winners and losers. You know, it's so difficult for us to predict these kind of changes that are happening in London.

It's like one of me. Things kind of like we had a big increase in demand for last mile logistics. During the pandemic, there was a prediction that nobody would go to shops anymore. And people would just buy everything online. So you needed to kind of

Speaker 3: storage warehouses in railway arches near the city. So that when they bought things, you know, they could get it very quickly. But that was a huge kind of demand around our space in 2020, 2021. And then the markets consolidated consumer habits. People still like to go to shops. They still like that kind of brick and mortar experience.

And so, you know, a lot of those companies have now kind of withdrawn from the market. So London's economy is always changing. It's very fluid.



It's very unpredictable. And so our role as a space provider is to provide a good quality space and easy enough experience. And everyone should benefit because if people kind of use our spaces, they're paying us rent. We benefit from that. We also get certainty around a long term customer being in that space. So we're quite hands off. That said, we will be kind of active in some areas.

So we'll think, OK, well, we're doing we're doing a project in Hackney, for example, at the moment where there's an Aerocorp Bohemia place, which under Network Rail, there was a kind of intermediary landlord. So we didn't have kind of control because we there was a kind of run of 15 or so arches. An intermediary landlord managed it.

So we had no direct control. And that landlord went bust in effect. And we took repossession of the site.

And now we have direct control. We're thinking along the lines of, OK, well, at one end of the run, it would be nice to have a kind of destination customer who can draw crowds down that way. And then that will make the other spaces more valuable.

Srijon: That's interesting. So we do actively manage our spaces, but it's relatively light touch. Our role is not to say, you know, this row of artists is going to be consumer or this row of artists is going to be industrial. Like it's in the planning process as well. It's interesting. Like I do have a question at this moment, which is like, is there any set land use criteria that you follow? For example, like, as you said, like there's a robotic company coming up. And then now just you're saying with the example that you don't exactly control too much on what kind of land use is coming as long as they're paying the rent or something like that. So do you have any restriction on land use? Or do you operate in that scale or not?

Phill Curry: Yeah. So there's probably two external stakeholders that have an involvement here. So the first is network rail. So the arrangement we have on network rail is they sold the portfolio for 1.5 billion. But we don't own it outright. We own the lease. Yes, 150 years.

150 years. So we are governed by a head lease. So for example under that head lease, nobody is allowed to live in a row of art. So residential uses is banned. Okay. That's interesting. You're not allowed to drill into the line art. Obviously.

Srijon: Obviously. Because in Japan we don't. Network rail, don't want the rail to... And also every for a certain period of frequency. So

sometimes it's eight years, sometimes it's 15 years, it can vary. Network rail, we need access to the railway arch. They do something called a railway arch examination. And they would check to see that the structure is safe. Okay.

There's nothing that means it might fall down. In addition to that, we also, and again this additional head lease, we do annual checks, health and safety checks. Okay. Just make sure that structures... It's less destruction inspection. It's more the customers than doing anything that could hurt the structure in danger. I see. So it's storing chemicals or gases that it shouldn't be storing.

So there's a kind of, you know, as I said, network rail is banned in residential use. So there's a kind of a relationship there. There's also a relationship with local authorities for the planning process.

And this can be quite tricky for us. So as I said, the kind of structures themselves, quite often they're... We built them way before the planning process developed. It was really the kind of 1940s, you know, that was when we started to get active use of how land was used up until the 1930s. If you wanted to build something in the UK you could pretty much just build it. But there's much more planning over the kind of 19th, 19th, the oldies, 1950s.

Phill Curry: And that meant that our structures predate the planning system. And so the exact planning status is kind of a bit blurred. Again, you know, there's a lot of historical path dependency here. Nobody sat down with a grand plan and

Speaker 3: said, this is going to be industrial, this is going to be, it was all very, yeah, so again, you know, Burmese bin Mars really goes on. It's kind of, is what I just described earlier, is that an

industrial use if it's brewing beer, but they're also,

Srijon: it's not always easy to tell what, you know, what planning status it should be. But vast majority are kind of classified as industrial. So that's like class B, class B8, or class B2. I'm not a planning person, but I think, yes, I understand that. That brings to the next question, which is about the rent structure and how do you determine the rents for each land you stay in. So if you can illustrate some points.

Phill Curry: Yeah, I get asked this question about a lot. So it's not necessarily our role to say the rents are this. Really, it's what people are willing to pay. It's the same in Rezzi. We don't set the rent. The rent is what somebody is willing to pay for that space. So if they don't think the rent is, if the thing rent is too high, they'll vote on their feet and they'll leave, or they won't take the space from the first place. So it's a market force whereby we look at what the space is in that area, and the demand going by.

Srijon: Planning does have an influence. So it has a retail space, probably more valuable than an industrial space. An occupied can apply for a change of use for the local authority. So it's not a big problem, but that's additional time, additional expense.

People don't often want that kind of hassle. So it's really a very, absolutely a typical kind of railway arch in Zone 1, Zone 2, or Zone 2, more likely. It's £40,000. In terms of a bandwidth, most of our spaces in London are between £15,000 a year and £50,000 a year. So it's really that kind of low end.

And if you think about the cost of an employee, you're talking about a cost of one employee basically. This is just to understand this hypothesis that I have that should arch space,

which is a residual space of an infrastructure, also have the same value, land value as a prime commercial space that is found nearby spaces or something like that. It's an important question because to determine what would be the policies to manage these spaces, should we consider this as equal to a prime space or something like that?

Phill Curry: I would describe it as inherently affordable because it's never going to be, you know, if you've got an industrial estate and a kind of white box in an industrial estate, it's kind of tucked away, it's way away from residents, you've probably got parking, planning is all very clear. It's going to be a relatively expensive space, whereas in a railway arch, you're going to have inconveniences, you're going to have noise over your head, you're going to have...

Srijon: Probably the main road or something like that. Road, you know, it's probably, you might have neighbours near you, you're going to have to deal with that. You're obviously restricted by, you can't extend space, right? In a way that if you had a unit or an industrial estate unit, maybe, you know, if you wanted to expand on that particular site, you can't do an provider. You have to make a vision for service entries and like the trucks coming in from the things and stuff like this.

Phill Curry: Exactly, the railway office weren't designed to be industrial.

Srijon: Exactly. They've been utilised in that way, but servicing, vehicle access, so there are kind of inconveniences. So that's why railway arches will always be cheaper. Cheaper, always be cheaper. Comparable, prime commercial space within that area. It really depends what your business model is. There's a company who...

I'll kind of show a few examples, it illustrates how railworks is used. So there's a company

called Rooker Hair. They're a first black-owned business to sell their products in selfages. And they're a really fast-growing, entrepreneurial business.

Okay. And they had, obviously with cosmetics, they need to kind of... There's a lot of health and safety and testing required. So they had a kind of an area where they used a sort of office that they used for sort of testing. And then they also had a kind of HQ-based office. So the locations were separate. And the thing about a railway viaduct is they're able to bring those two functions into one space. So they're on the ground floor. They use it for the testing part. And there's lots of space.

It's quite cheap. And then above, they use that as their office. Installed a mezzanine, because it's very tall.

Installed a mezzanine. And they use that as an office. And that means it's quite good for visitors, because the visitors, like, perspective, perspective clients, people like self-procures, they can see how... As well as visiting the head office, they also get to see how the product is made and tested as well. And that's the same as what Recycline, who are kind of high-end robotics company have done as well.

So they use the ground floor of their arch for testing robots. Okay. Very cool stuff.

Interesting. And then they use the above as their office. But their workforce is kind of high-end people from Imperial College.

Okay. And PhDs and incredibly brainy. And those kind of... That kind of labor force. They don't want to be tracking out to an industrial estate in Surrey or wherever. Right.

Exactly. They want to live in London. They want the London lifestyle. And their railway arch is very close to Waterloo Station. So their people can get to Waterloo, which is very different to the kind of the way railway arch was used 40 years ago, where you had quite a bit of low-skilled, low-value labor. You've now got like very highly skilled, very high-value labor utilizing those spaces. They approach to you like we want to use it for robotics purpose and our university research and other things. Fascinating. It's only possible in London, I guess. So... And...

Phill Curry: They get that organic. That's not us saying that. This area is going to be... It's the best part. Somebody has spotted a space and approached us about it. And then... We just give them...

It's a lined arch. We just give them a fit of purpose, dry, safe space with electricity and water and a toilet. And then they do all sorts of creative things.

Srijon: We get it to fit their purposes. And that would have the ripple effect of changing the area as well, which is the best part, like the organic things that's happening. Last few questions. Do you have some challenges of managing all of these spaces altogether? Because once it's a very big company and big portfolio, you end up creating standards for all the places and sort of challenges. So just roughly if you can tell some of the challenges that you face on doing these things.

Phill Curry: The scale, as you alluded to, is a challenge. If we were just selling houses or renting industrial spaces, or if we just had one product... Yeah, it's easier.

Srijon: It's easier. Yeah, obviously. So we have to have a kind of myriad of different strategies in

different areas. So the scale is probably the challenge. And the other thing as part of that is the kind of value. So if we're going to get a customer in, there's transaction costs for us involved in that. We have to manage the space to make sure it's safe.

And if we're talking very low volumes of value as a rent, one £2,000 a year, it's just not worth of money. So the quality of the stock is another kind of challenge. Yes. I think some of the...

Phill Curry: Which I alluded to earlier, there are some of the friction between the customers and residential people who live nearby. Yes. Particularly if there's greater utilization of that space, I mean more traffic or more noise or more people. And so that can create some friction. And then that falls out into the planning process as well. So Burmese BMR is another example where there's been a lot of change.

Speaker 3: Some of the residents don't quite understandably like the fact that a lot of more visitors are going on their street and they're drinking. So social behavior is an issue. So that is a challenge. But also the underutilization of space is another challenge. So if you have a railway arch that looks empty and derelict or is empty and derelict, sometimes people break in.

Srijon: And then you squat the space that again can lead to kind of friction and localism. Because these areas are based on connectivity. We actually have a big problem with illegal rates. So and this was happening during the pandemic, but it's also happening now. Where quite professional, but illegal event organizers will kind of break into a railway arch. Text everybody about the party and they will make an absolute mess of the arch. And the police will come and close the event down. So that kind of in that sort of, I don't know, as well as a problem. We've run out of time. Oh my God.

The meeting room is in the building. We can continue outside if you want. Just some more minutes. Yeah, sure.

Let me just pause it. So the challenges. And there were a lot of arches which are not even managed. Like they're just like that. And at the same time the illegal, maybe the part that you were saying about the programs that were happening. Yeah.

Phill Curry: So in terms of roles and responsibilities, Network Rail still are responsible for the viaduct structure itself. So if there's no kind of business.

Speaker 3: Oh, business. So Network Rail are responsible for the tunnels that go through. So in terms of picture behind you. Network Rail is responsible for all of the viaducts.

Phill Curry: Network Rail are responsible for the tunnel.

Srijon: We are just responsible for viaducts. And then the viaduct structure. So that's all. Interesting. And is there any provision for public use? For example, all of these are commercial users that we are talking about. Do you think like there should be some ratio of public space rental? For example, this party or a music festival, for example. Maybe you could also rent formally to some organizers. Like, okay, you can have this small party here, but you have to pay for the rent for one day or two days. Is that a possibility?

Phill Curry: So we've got about 70 spaces across England and Wales that are rented to local authorities. Ah, interesting. And they use that for all sorts of different purposes. Some of them, let's just use it for storage.

Some of them use it for more kind of affordable workspace and creative use. So I think we're a kind of commercial company. We're investing in the art. We expect a kind of return on that. Obviously. But that's not to restrict this kind of others out there who've got much better running music festivals and art festivals than we could possibly be able to. To kind of take a space and create that. So 70, as you say, like 70.

Srijon: 70 of 5200. So it's relatively small and they're not all kind of used for affordable workspace. Some of them are just used for storage or low grade, low value. But we certainly have people with quite creative minds putting the Rally Archers to kind of different uses. Different sort of uses. We've got nightclubs in Rally Archers.

We've got offices in Rally Archers. It's really diverse. And people, as I said earlier, are doing really interesting creative things in them. Some of them anyway.

Some of them just using it to store scaffold boards. So it's really, really varied. This is the last question. And it's also connected with the previous question because I'm trying to understand like what would be the ratio of public and commercial users. And the last question is that do you believe that, how do you make a better sustainable management structure for the cities that are going to face all of these things that London has faced so long ago? And one of my hypotheses is that there should be a good ratio of public use, right to public claim and also commercial setup. So this is where the question comes is that how would it be a better management system combining all of these users' types? And how would you proceed to this problem if it was starting from the scratch in the management systems like that?

Phill Curry: Yeah, it's a good question. And hopefully I've been sort of paying to the picture.

Srijon: Yeah, obviously. Every city is a different. Yeah. Each city is a different. There's no right or wrong with questions after this. It's definitely been quite piecemeal and over a kind of 150, 160 year period. It's kind of lots of incremental changes over time.

In terms of your first question in terms of mix. So I'm talking about England and Wales together here, not just London, but 70% of our customers are industrial. So about 25% of that 70% is storage and distribution and logistics. I think if you look at how London's economy is changing, that demand will always be there.

Just a slight tangent and then I'll come back. So another really good example of an interesting customer doing interesting things is St John's Bakery. So they have a railway arch in Bourbonzie again on Druid Street and they use their arch to, and again it's got mezzanine. So their office is there. They have a counter at the front. They sell to local residents, but the vast majority of the space and the utilization is baking cakes and baking bread and baking croissants. So it's a food production area. And they have very kind of high end restaurants. I think we've got three locations in central London.

And there aren't many spaces or arguably any spaces that they, food production, you need to be near to the sites that you're actually selling the product. So a railway arch is just perfect. They've just put in a lot more investment in their railway arch as a kind of reflection of their kind of long term desire to kind of stay and grow as a business. So I think there will always be a kind of, you know, to serve central London's economy where you've got, you know, particularly food and leisure, you need kind of spaces where economic activity can happen to help supply

central London's economy, if that makes sense. So I think commercial space will always be.

But you can see it's all interlinked. So even though, as I said, 70% is industrial, indirectly that process is supporting a kind of leisure retail type offer. But it just so happens that that offer is not from our spaces. It's from central London. So we're part of, we're really sort of intertwined, you know,

Phill Curry: it's a bit cliché, but we're kind of, you know, in the way that the railway, the railway. Widex are kind of arteries in and out of London for people to get across and move where the kind of back office function of a lot of London's economy.

Srijon: So without our spaces, you know, London's kind of vibrancy, you know, you wouldn't be able to operate as good. So I, my kind of recommendation would be look at, look at railway arch spaces as part of the wider regional economy. And rather than looking at the split of kind of this, you know, this percentage is 70% is industrial 20% is leisure retail. So it's kind of in the mix. And I think in terms of your second question, recommendations to kind of policymakers. That's probably the hardest question. I mean, I understand. I'm just trying to see the

Speaker 3: perspective like what are your, what would make your job easier?

Phill Curry: We're really kind of responding to changes in London's economy. And it's very unpredictable. I explained earlier the kind of big surge in last model logistics and then that kind of fell away.

There's probably no, it's okay. How can we get, no, so, you know, the two organizations I described earlier, so network rail and with local

authorities and us, you know, how do you get that working as smoothly as possible? So local authorities, for example, will have like targets not to allow industrial space to decrease. And that means sometimes when we have change of use requests, the local authority will say, absolutely no, you can't do that. That's against our planning policy framework. Or they will have at the same time, they're quite schizophrenic sometimes don't quote me on that in the report, but, you know, they'll also want kind of promote leisure retail and railway artists. But then they're another part of the council, their planning process will say no to anything that's like a conversion from industrial.

So I think a kind of greater appreciation of the opportunity that railway art viaduct structures provides in terms of economic and social activity and providing us with that kind of maximum flexibility to be able to respond to those changes in London's economy and societal changes and changes in consumer habits and spending. That will probably be my key ask.

Srijon: So they're rambling, but maximum flexibility is why we ask. It makes sense. And I would like to conclude with some of my comments, which is kind of like a takeaway for me and probably could be for ArchGo as well, is that I've seen some cases in which there are brand companies like Dior or some other big companies are competing for the ArchSpaces. The best part about the London Arch management that I've seen and also you've told that I don't see that kind of posh thing, brands coming in competing for those spaces.

You are rather allowing the natural growth to flourish and also enabling small companies to go in and do their business, which is so appropriate. I think especially for London because yeah, it's a lot of viaducts running around the whole city and probably there were like needs to thoroughfare and also sometimes the London itself was flooding. So we needed viaducts and

everything. So this viaduct has set up from the time in many reasons and many other things. So for serving the community people as well, this is how it has been managed very naturally, I think, like not doing too much restrictions or just looking into the economy and see what is going on and then allowing what is done. So I haven't seen any Dior or any other big brands under the arches and I think it's a good thing. It's enabling the local entrepreneurs or others to use those spaces. So I think it's a good takeaway for me as well and I don't know how. As you have said, it was on your policy as well so it's amazing.

Phill Curry: Yeah, there's a kind of, if you Google Hackney Walk. Hackney Walk, yeah. So yeah, that was an example of like Hackney Council, very big, you know, they wanted to get Speaker 3: Dior and those kind of brands in and local people don't shop in Dior.

Srijon: Yeah, exactly. They want coffee shops, they want bars, they want, you know, obviously the Hackney economy is not Dior and Burgary. I highly recommend you to look into the Zurich case. I am Viaduct, Marthal and also the Paris case.

There is something that London avoided, I think, successfully. So it's nice. Okay, alright. Thank you so much. Great, alright. If you have the permission, I would like to stop the audio now and I would like to...

