BECOMING NAIROBI

CODIFYING PUBLIC SPACE FOR AN ARRIVALS' CITY

BECOMING NAIROBI
CODIFYING PUBLIC SPACE FOR AN ARRIVALS' CITY

MASTER THESIS **I** P5 REPORT

Department of Urbanism
Faculty of Architecture and the Built Environment
TU Delft

RESEARCH GROUP	**DESIGN AS POLITICS**
STUDENT	**GEREON ROLVERING**
STUDENT NO.	**4598237**
1ST MENTOR	**WOUTER VANSTIPHOUT**
2ND MENTOR	**LEO VAN DEN BURG**
DATE	**28.06.2018**

TU Delft

DESIGN AS POLITICS

PREFACE

Drawing back on my experience of living in Nairobi, this thesis explores the city's dynamic system of public space and tries to improve its legibility by establishing a framework for its use and design.

Exploring Nairobi as a city of arrival, my personal process in the development of this project was quite similar to that of coming to Nairobi as a migrant, continuously learning to understand, use and finally appropriate the city.

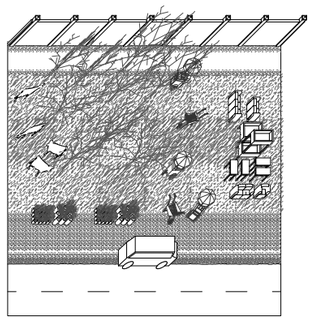
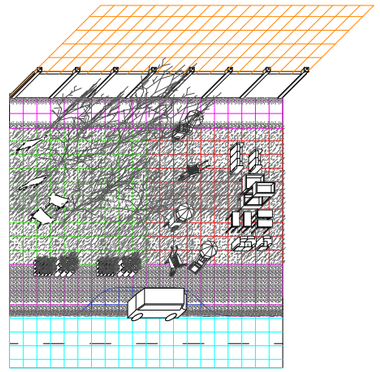
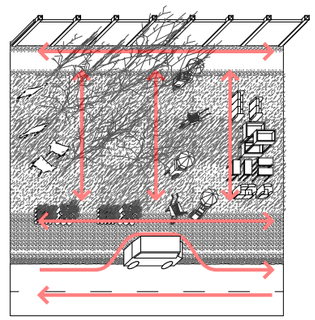
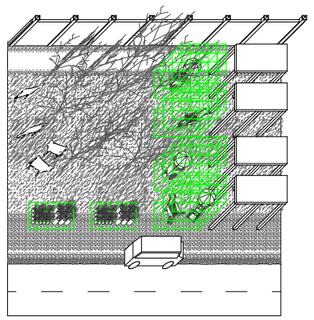
This report is therefore similarly structured into four chapters, each representing both a specific phase of my project and a stage of an arrival's interaction with Nairobi, as explained in the diagram on the following page.

As a colonial foundation closed off to the native population, Nairobi, the urban epicentre for East Africa, has always been a city of constant coming and going rather than a point of identification for the Kenyan population. By consequence, Nairobi's metropolitan system in general and its public space in particular is optimized to flexibly absorb the masses of migrants that make up its population. However, the lack of codification of public space, its dynamics and use side-lines minorities and arrivals and inhibits the 'becoming' of Nairobians, disenfranchising them with their own city.

This research will therefore commence by trying to get an understanding of how Nairobi has developed into a city of comings and goings over the past 100 years since its foundation. Exploring the historical development of the city and its residents, I will argue that the notion of public realm in Nairobi is radically different from the ideals of public space discussed in traditional planning practice, mostly reflecting the European city.

I will in a second step systematically analyse the spatial dimension of the public realm in Nairobi coming to the conclusion that in spite of its illegibility to arrivals, the city works by a set of clear spatial rules.

Based on this research, I will firstly try to establish how digitalisation and the mobile economy will codify the dynamics of public space and life in Nairobi. Trying to mediate between the city's duality between integration and identity, this project will secondly propose a framework of soft and hard public spaces based on existing structural and spatial typologies found along Nairobi's Ngong Road. Using a set of site specific indicators, these elements will be synthesised in designs for key sections of Ngong Road and its vicinity.

	I I CHAOS	II I PATTERNS	III I INTUITION	IV I BECOMING
CHAPTER				
KNOWLEDGE NEEDED	✓ You have just arrived in Nairobi ✓ You have started exploring the city but find it somewhat difficult to grasp ✓ You want to know more about the city	✓ You have stayed in Nairobi for a while ✓ You have started to recognise patterns in the public space of the city ✓ You want to improve your understanding of Nairobi's public space	✓ You have grown accustomed to the huste and bustle of Nairobi ✓ You are increasingly able to use the city intuitively ✓ However, this has brought you into conflict with other Nairobians or even the law?	✓ You have settled in Nairobi and feel local to the city ✓ You want to profit from and contribute to the challenges and opportunities Nairobi offers ✓ You feel that public space has to change for you to be able to identify with it on the long run
LEARNING AIMS	✓ You will understand what makes Nairobi different from other cities ✓ You will get a grasp of the cultural and historic development of Nairobi	✓ You will understand how public space in Nairobi works as a system. from the metropolitan down to the local scale ✓ You will know how to navigate the city based on your newly gained spatial knowledge	✓ You will understand how the intuitive, customary use of nairobi has historically led to conflict ✓ You will learn how to make the most of your intuitive knowledge with the support of digital gadgets	✓ You will learn how to appropriate public space in Nairobi. ✓ You will be able to differentiate between hard and soft public spaces and gain an understanding of how they can be relevant to you personally.

CONTENTS

chaos	**Nairobi as an arrivals' city**	
1	motivation	16
2	hypohesis	36
3	problem field	38
4	problem statement	54
5	project aims	54
6	research question	55
7	methodology	56
patterns	**how to read Nairobi's streetscape**	
1	XL **I** the network	60
2	L **I** the perpendicular	68
3	M **I** the longitudinal	76
4	S **I** the local	82
5	conclusion	86
6	vision	88
intuition	**codifying Nairobi's informal sector**	
1	codifying the Jua Kali	92
2	the New Formal	94
3	typologies of the New Formal	96
becoming	**Nairobi as an African metropolis**	
1	concept **I** hard and soft space	120
2	case studies	148
3	design process	150
4	a **I** adams	154
5	b **I** junction	186
6	c **I** riruta	216
7	materiality	244
8	implentation	256
9	digital space	262
10	coming to a New Nairobi	270
appendix		
1	reflection	282
2	theory paper	286
3	references	294

CHAPTER I:

CHAOS

or

how to contextualise Nairobi as an arrival's city



Africa **I** Kenya



Kenya **I** Nairobi



Nairobi **I** Ngong Road

images retrieved from Google Earth



data retrieved from: https://nairobigismaps.wikischolars.columbia.edu/; drawing by the author

1 0 1 2 3 km

DAGORETTI
DENSIFICATION

KIBERA
RECONSTRUCTION

LANG'ATA
SUBURBANISATION

MOWLEM
INFORMAL GROWTH

NGONG FOREST
INFRASTRUCTURE

SYOKIMAU
URBAN SPRAWL

2001

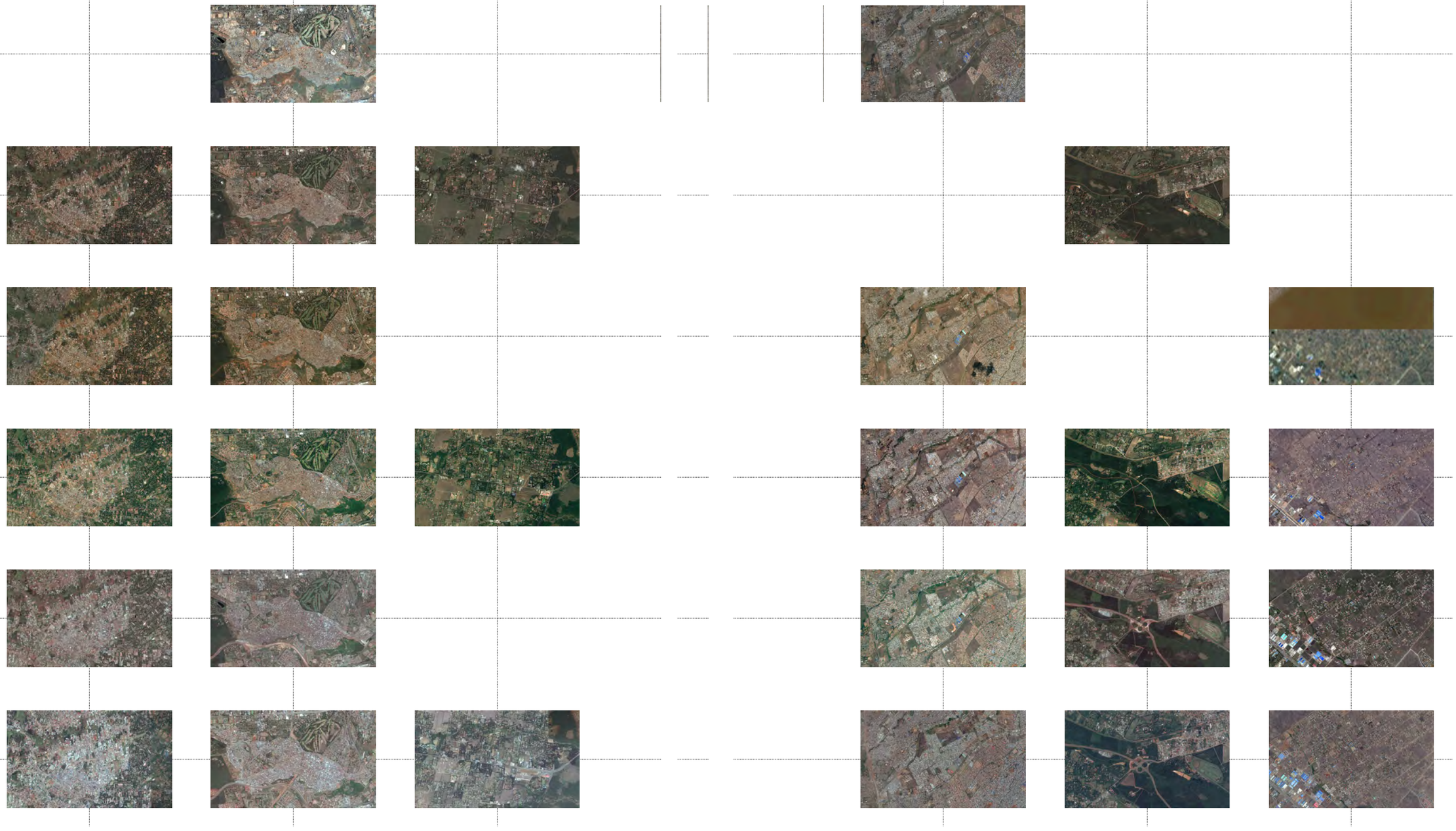
2004

2007

2010

2013

2017



imagery retrieved from Google Earth

MOTIVATION **I** AN ARRIVAL IN NAIROBI

1 **I** ROMANTICISED MEMORIES OF A MIGRANTS' CITY

I came to Nairobi for the first time in the summer of 2010, freshly graduated from highschool , starting a gap year to work at a school in the suburbs of the city not knowing what to expect.

At first, there was chaos. For weeks, so it seems to me now, I was both fascinated and intimidated by the sheer diversity and dynamics of the city: More than three million people living together in an unfathomable, yet working pandemonimum.

Getting a grasp of this semmingly disorganised city became a fascination, and ultimately the motivation for this thesis.

Interestingly enough, a large part of my memories of the city and my fascination for Nairobi have a concrete site. Ngong Road, one of the main corridors linking the rural suburbs with the urban core of the city encompasses, to me, what Nairobi is all about.

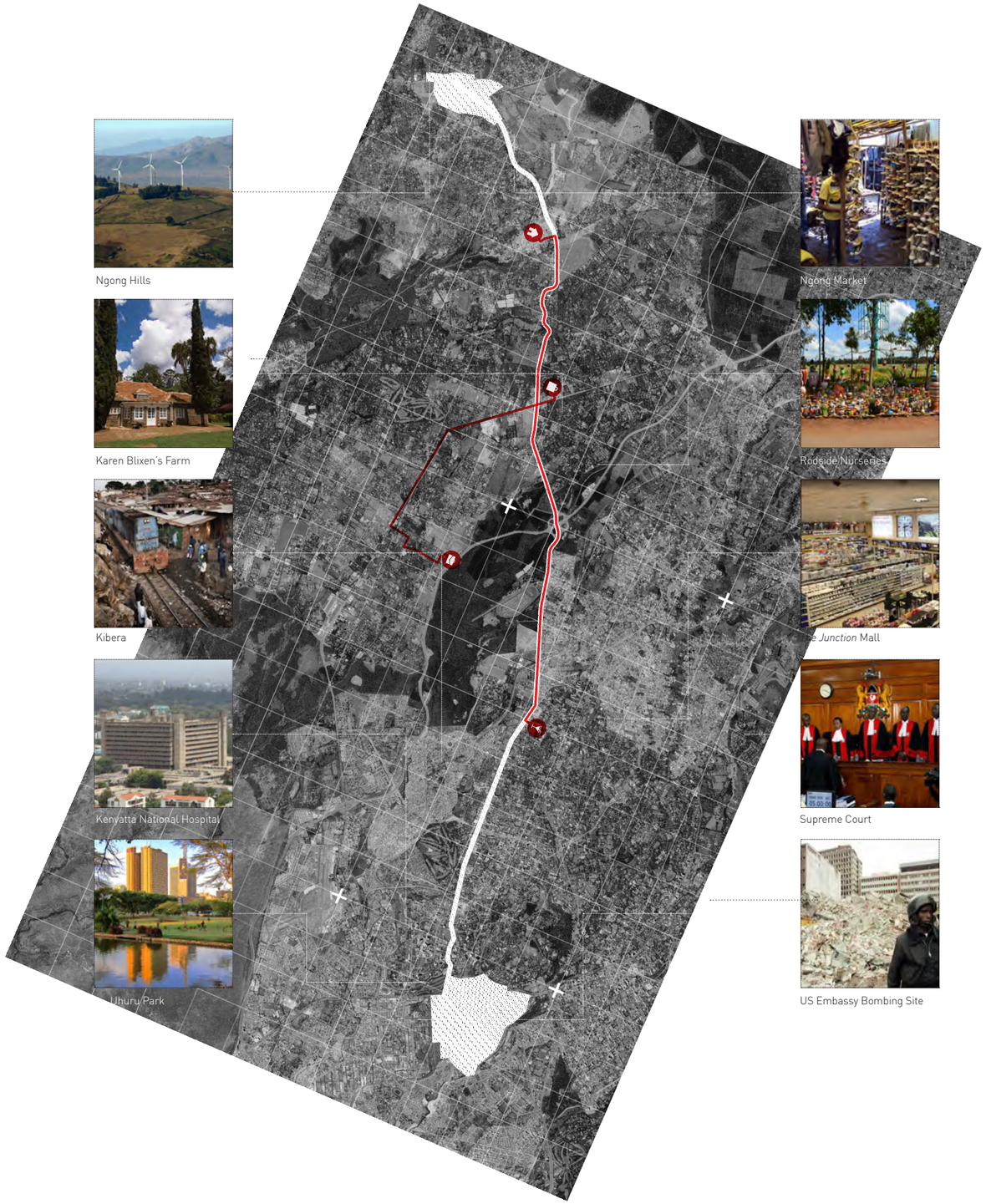
If Nevada's Route 91, more famously known as The Strip and immortalised by Denise Scott-Brown and Robert Venturi's *Learning from Las Vegas,* is the archetype of the American commercial road, then Ngong Road is its Kenyan, if not African equal. Stretching over 23-odd kilometres, this two-lane road connects Downtown Nairobi with Ngong, a village-turned-suburb in the rural outskirts of the city.

Within this simple stretch of road however, are united the vast urban contrasts that Nairobi encompasses. From the post-independence brutalist urbanism in the centre to mud-and-wood huts with cowsheds, from vast colonial estates to the density of one of the continent's largest informal settlements, from golf course to a landfill-turned-football-pitch the areas adjacent to Ngong Road provide a cross section through the extremes of modern Kenyan society.

More importantly however, Ngong Road is a case in point of what defines public space in Nairobi. As one of the city's main commuter routes, thousands of Nairobians will pilgrimage to work, school or church on the infamous matatus, cars, motorbikes or simply on their own feet. It is notoriously congested, with trips from downtown to Ngong town taking anything between 20 minutes at 4:00 a.m., in a taxi with a driver high on miraa, and 3 hours and 40 minutes on Fridays during the rainy season around 4.30 p.m. in a Cityhoppa bus.

The roads infrastructural shortcomings however, turn the road into one of the most actively used spaces in the city, in many ways reminiscent of Rem Koolhaas' description of the highway system of Lagos (Koolhaas, Lavalou et al. 2000). The streetscape is thus an attractor for all kinds of economic activity beyond the hypermalls, markets and car dealerships lining the road like a pearl necklace. Simple hawkers as much as craftsmen selling custom made furniture, makeshift nurseries selling Bougainvillea or mobile banking agents occupy the space in-between traffic and private, taking advantage of the thousands of daily passers-by.

By consequence, Ngong Road and the areas adjacent to it are an ideal testing ground for an analysis of the spatial characteristics of the public realm in the city of Nairobi.

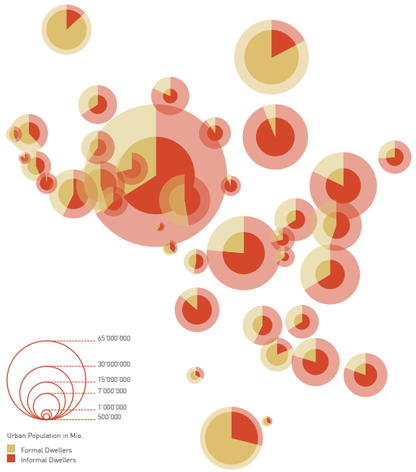


Impressions of Ngong Road from Downtown (bottom) to the Ngong Hills (top) **I** Drawing by the author.

images retrieved from: Bonn, G. and N. Ysenburg (2010). 24Nairobi. Nairobi, Kwani Trust.
and: Mboya, J. and J. Ogana (2008). Kenya Burning. Nairobi, Kwani Trust.

2 I THE MODERN ARRIVAL TO NAIROBI

In the course of this research I became increasingly aware that I am not alone in my perception of chaos in Nairobi. The city's peculiar and short history means that it has always been a point of arrival, not only for foreigners like me, but more importantly for the scores of Kenyans that transformed the site of a humble train depot into a bustling city of more than four million inhabitants in less than 100 years.
What unites all of these arrivals is there utter lack of knowledge or understanding of the complexities at work in Nairobi.



Development of Africa's Urban Population 2015 - 2050

Researchers at the United Nations estimate that by 2050 African cities will be home to more than 1 billion people, up from 471 million in 2015 (United Nations 2014). Kenya is no exception in this development. Currently having among the lowest rates of urbanisation on the continent (United Nations 2014), East African nations will undergo some of the most radical transformations over the next decades.

However, these abstract figures of course fail to grasp the complexities of migration to Nairobi. Today, arrivals come to Kenya's capital for a wide variety of motivations, with diverse cultural, ethnical and religious backgrounds and with a wide range of financial means. These arrivals however, can be clustered into seven main typologies of arrivals. The following personas, abstracted from myself, personal friends in Nairobi, characters in Kenyan literature and interviewees in research papers will give a glimpse of the diversity that makes up a large part of the migrant population of modern-day Nairobi.



THE RURAL MIGRANT



THE REFUGEE



THE IDP



THE EXPAT



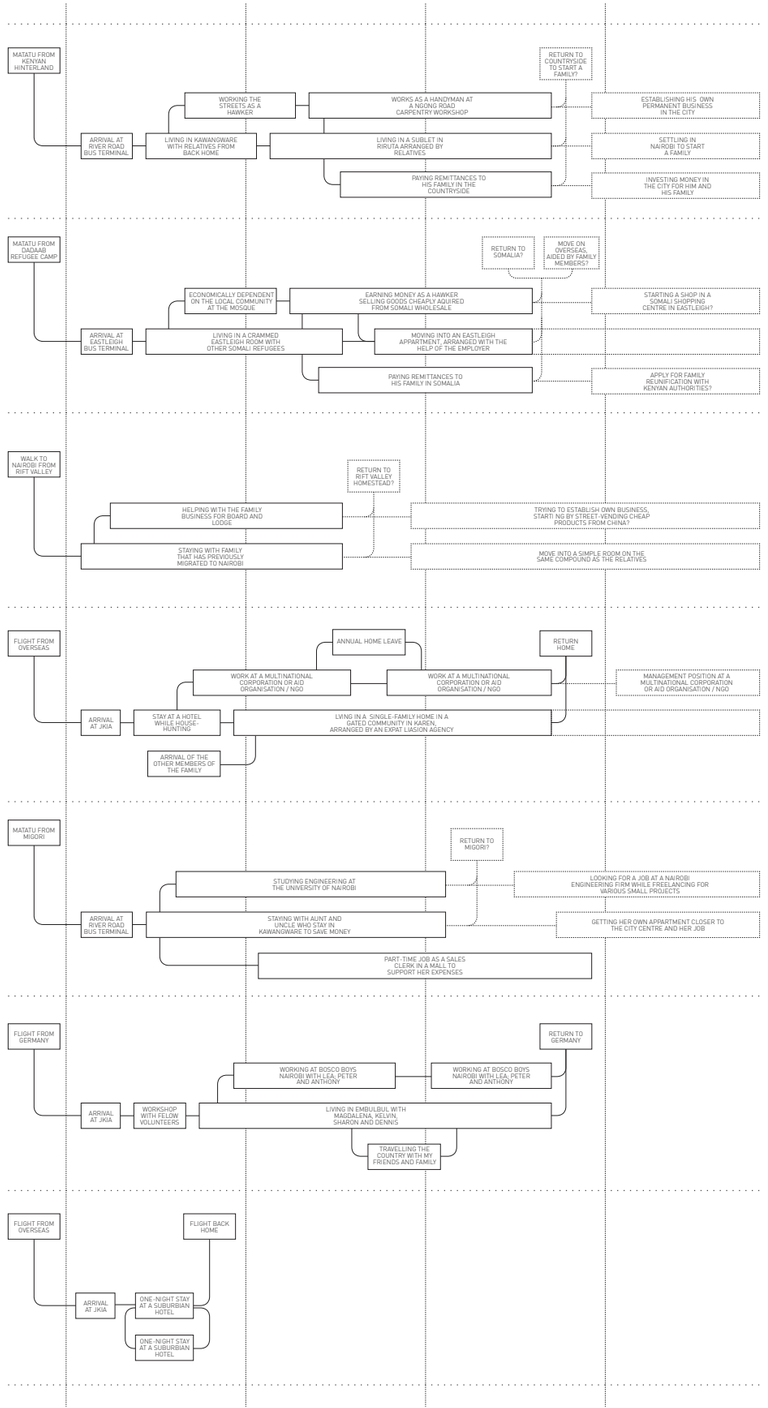
THE STUDENT



THE VOLUNTEER



THE TOURIST



data retrieved from UN Habitat; visualisation based on map by UN Habitat

1 **I** THE RURAL MIGRANT

With the income from his family's farm in a village near Kitui dropping due to increasing competition from industrial agriculture, Joseph K. (24) decides to move to Nairobi in search of better income to support his aging parents.

2 **I** THE REFUGEE

After a battle between al-Shabaab and Somali forces destroyed his native town of Kismayo, Hassan A. (21) fled to Dadaab refugee camp in Kenya in search of a secure life. Unable to settle, he hitchhikes to Nairobi to profit from the economic power of the Somali diaspora.

3 **I** THE INTERNALLY DISPLACED PERSON

In the wake of the last election Judy M. (38, from Naivasha), a single mother, was looted out of her Rift Valley home by violent, ethnically motivated protest. Unable to go back she embarks on a week long journey to Nairobi in search of shelter and safety.

4 **I** THE EXPAT

Having made a living in upper management of various global corporations, Micahel J. (56, from London) is now offered to head the research & development department of a large Kenyan telecom provider. Married for 20 years, he moves to Nairobi with his family.

5 **I** THE STUDENT

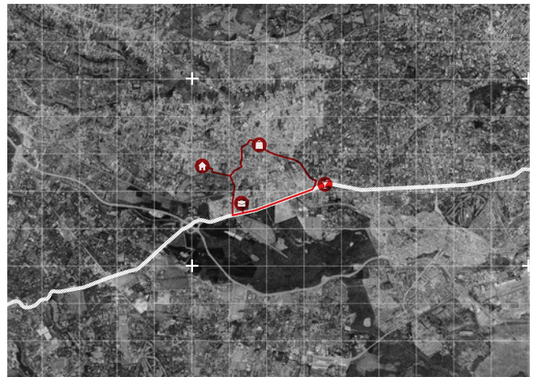
Having just finished secondary school, scoring one of the top KCSEs in the county, Faith M. (21, from Migori) has been granted a scholarship to study at the University of Nairobi by the national government. To save money, she stays with her aunt and uncle in Kawangware.

6 **I** THE VOLUNTEER

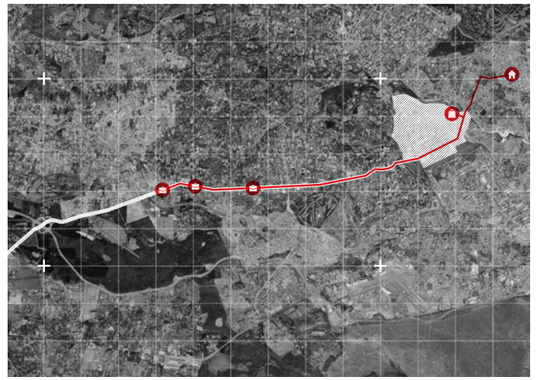
After finishing high school, Gereon (19, from Stuttgart) decides to use his civilian service as an opportunity to spend time abroad. Initially planning to go to Latin America, he is being sent to Nairobi to help out as an assistant teacher and IT-administrator in a Nairobi school.

7 **I** THE TOURIST

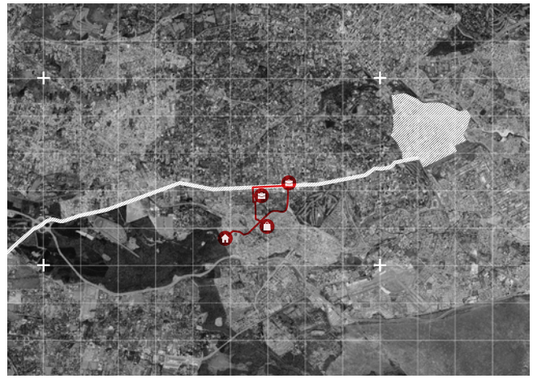
Ever since watching *Daktari* as a kid, coming to Kenya to watch the big five has been a dream for Angela S. (43, from Manchester). However, before she can start her safari with a group of other European tourists she has to spend a day in Nairobi waiting for her tour guide.



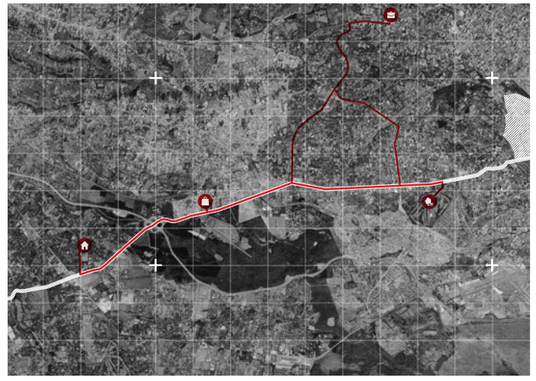
Daily Routine **I** The Rural Migrant



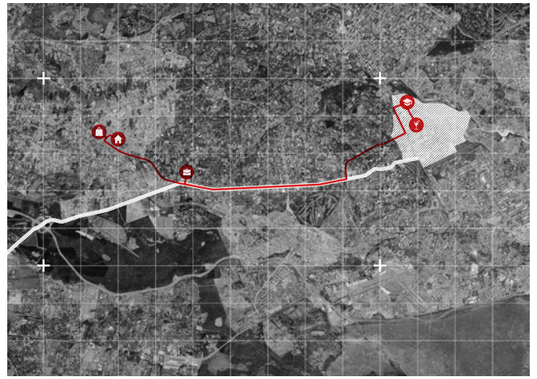
Daily Routine **I** The Refugee



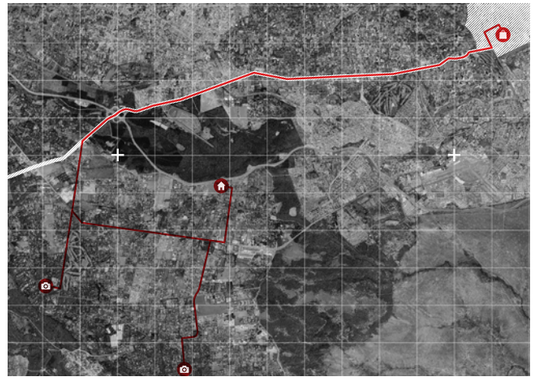
Daily Routine **I** The Internally Displaced Person



Daily Routine **I** The Expat

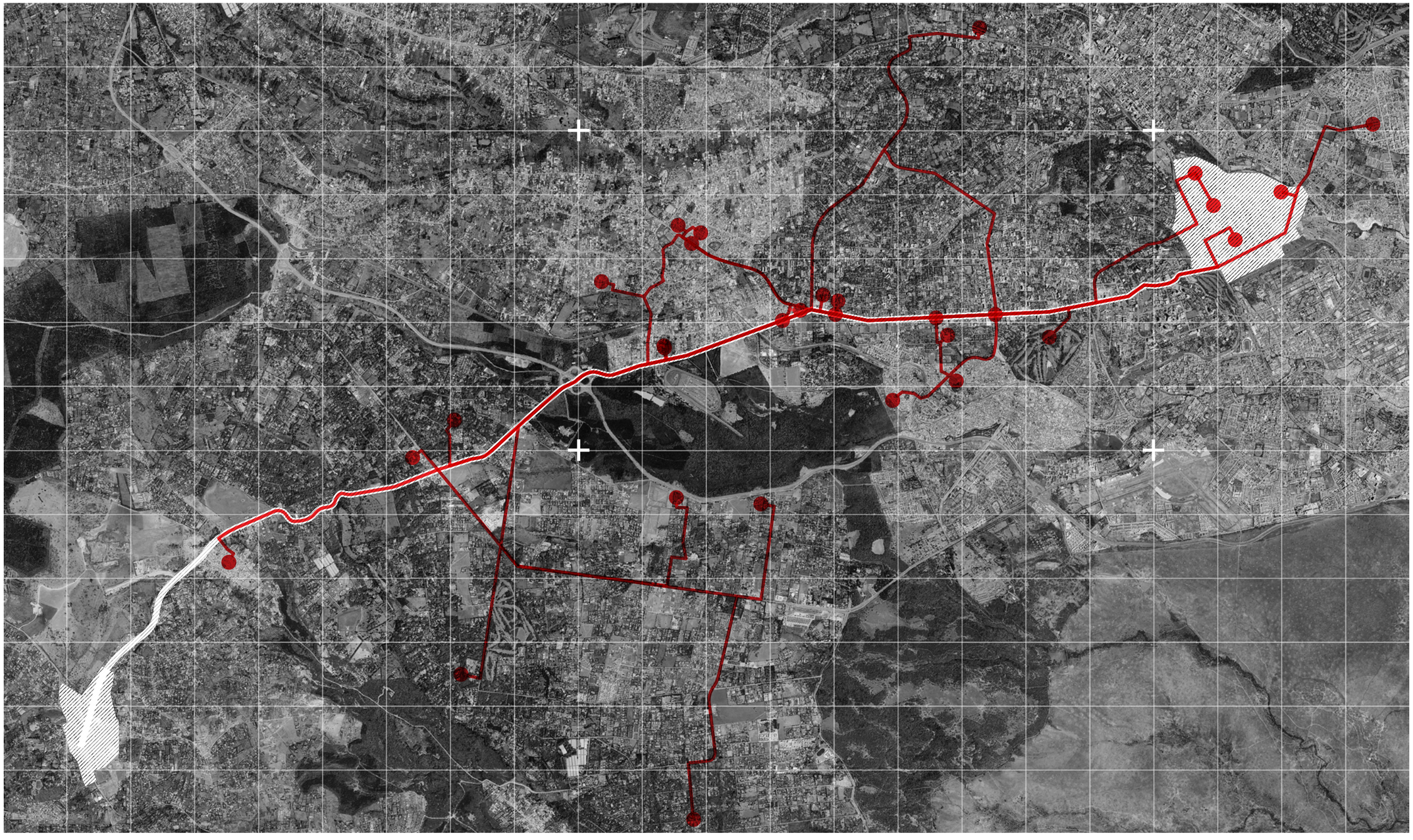


Daily Routine **I** The Student



Daily Routine **I** The Tourist

base imagery retrieved from Google Earth Pro



base imagery retrieved from Google Earth Pro

CONTEXT | NAIROBI AS *COMINGS AND GOINGS*

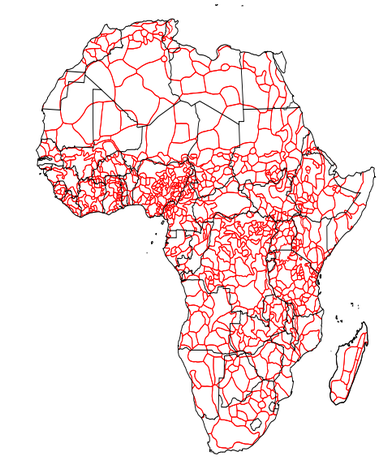
While migration to Nairobi is today as relevant a topic as it has been ever, historically speaking, Nairobi has always been a migrants' city. The following section will therefore give a brief introduction into the genesis and migratory history of Nairobi and explain how it developed into a veritable city of comings and goings that still proposes a challenge to any new arrival.

Introduction | A Heteronomous Continent?

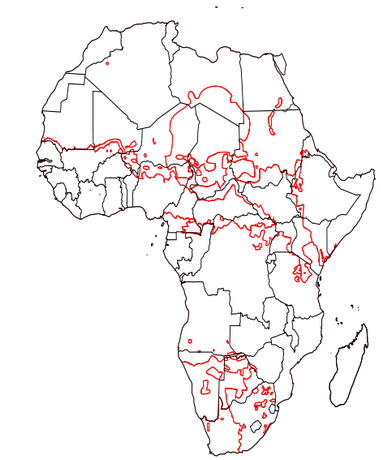
From a Kenyan perspective, modern migration and urbanisation in Africa has a precise starting date. On the 26 of February 1885 the European colonial powers passed the General Act of the Berlin Conference, the document effectively regulating the distribution of Africa among themselves and determining large parts of the continents borders that delimited colonies and later the independent African nations. Due to their history however, the borders of these new states defied all logic and for that matter, African interest, as an overlay of national borders with ethnical, linguistic and religious boundaries on the continent clearly reveals. One of the major consequences persisting until the present day is the large population of refugees that African nations host as a result internal conflict, which is all too often the result of ethnical misunderstandings.

In this context, Kenya has always been in a particularly tricky geopolitical position. Its territory unites people of Bantu, Nilotic and Cushitic origin, people of Islamic, Christian and traditional faith. Linguists estimate that Kenya alone is home to 68 languages. In this framework of multiculturalism, the colonisation of the country was without a doubt the single most disruptive force inducing migration. In three steps, that unfolded over the 70-year long history of the colony and protectorate of Kenya, Africans were first alienated from their homeland through a series of expropriations, then crammed into 'native reserves' segregated by ethnicity and massively over-populated (Syagga 2006).

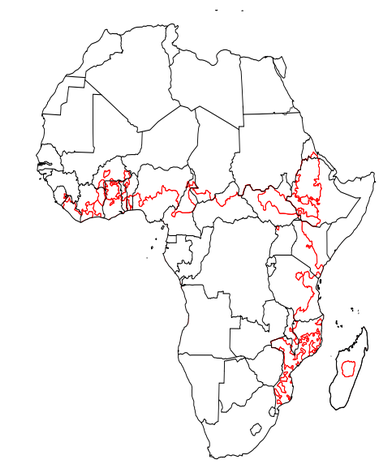
Finally, in the transition towards independence, the same land that was taken from the population half a century earlier, was resold to them on a first-come-first-served basis, ignoring the framework of customary law that was used before colonisation. The aftermath of this development can still be felt today. While ethnical segregation in Nairobi has largely disappeared, ethnical clashes in town and country remain normality. This is perhaps most visible in the amount of internally displaced people (IDPs) that have started to occur after every free election in Kenya since 1992. On a more obscure level however, ethnical clashes and inequality continue to have a great influence of the development of modern day Nairobi (Obala and Mattingly 2014).



Nationality vs. Ethnicity

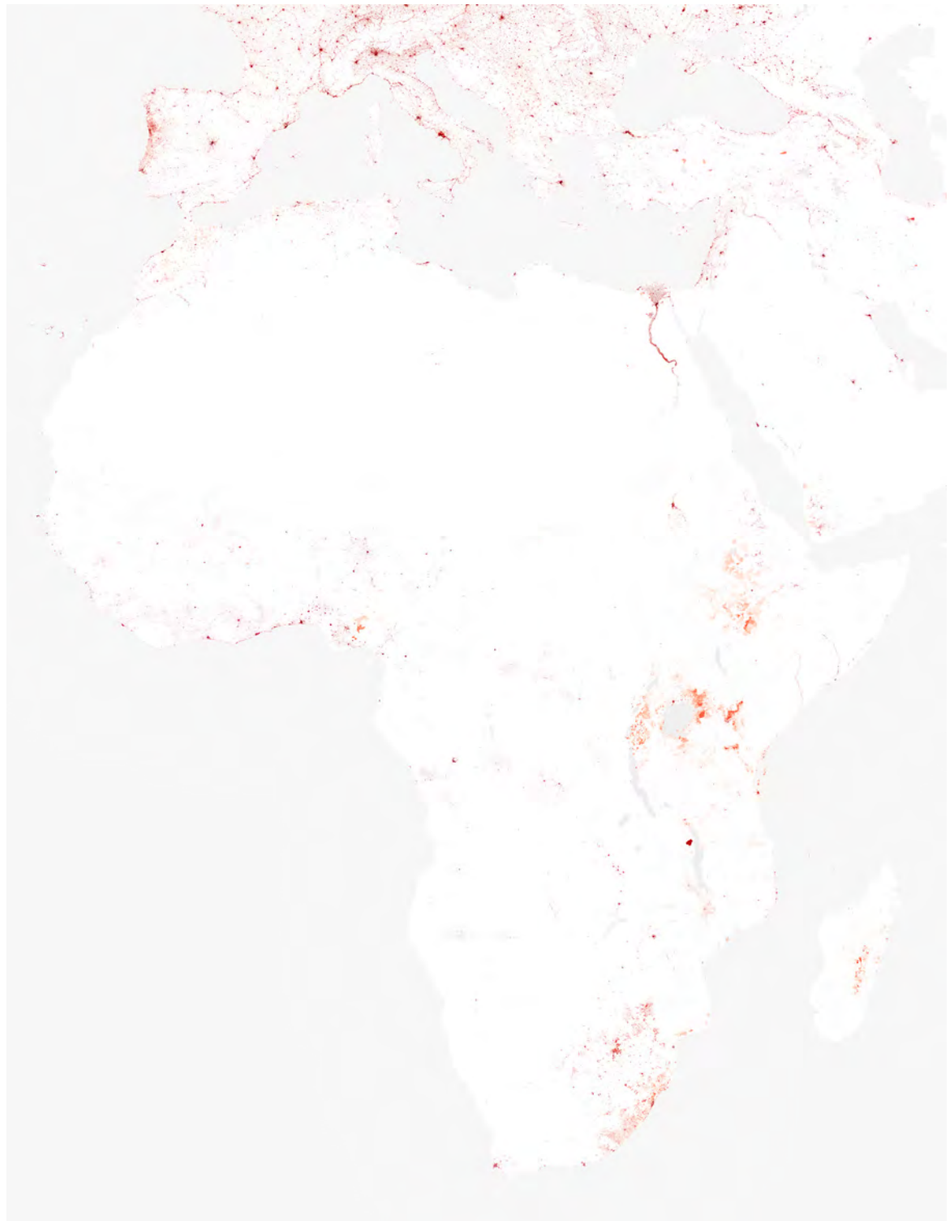


Nationality vs. Language

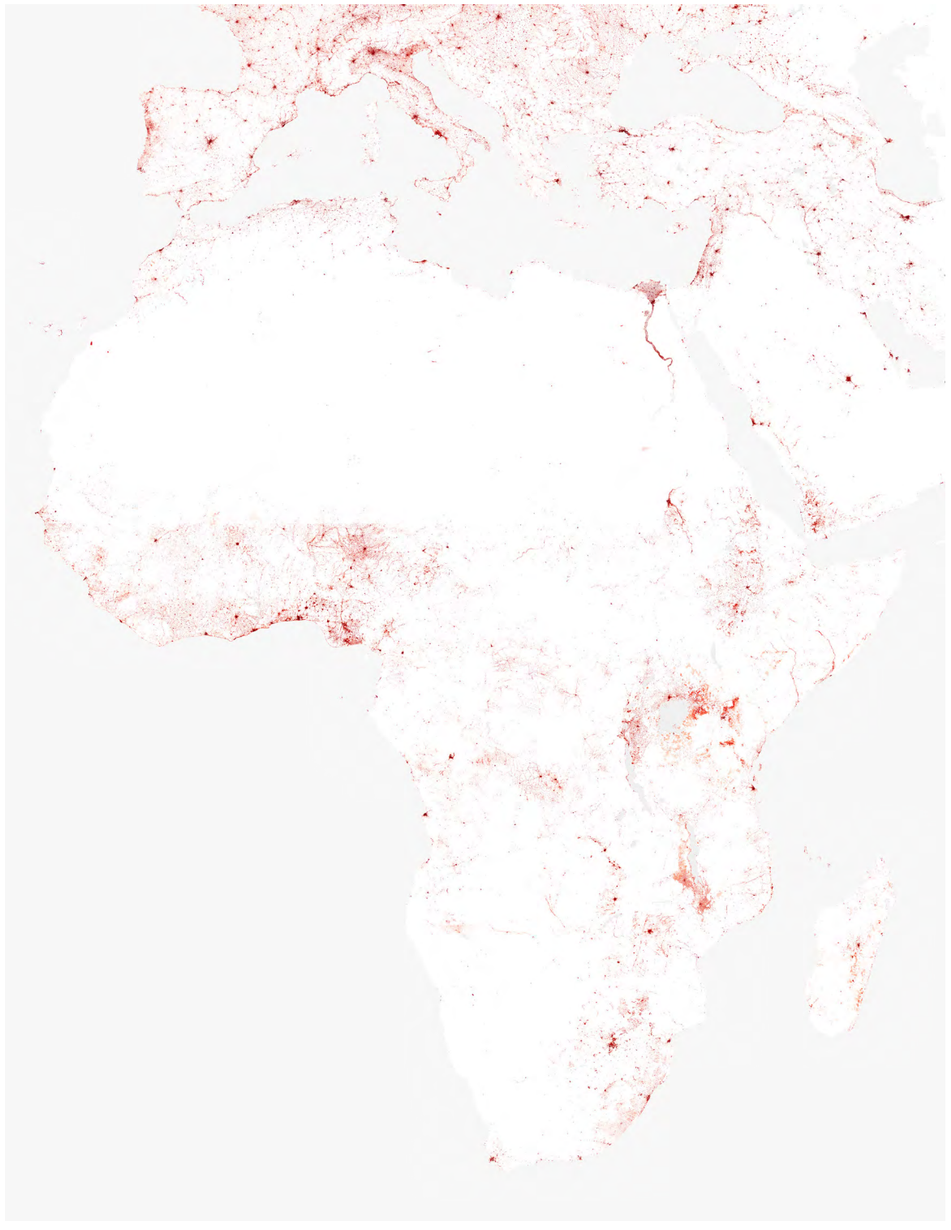


Nationality vs. Religion

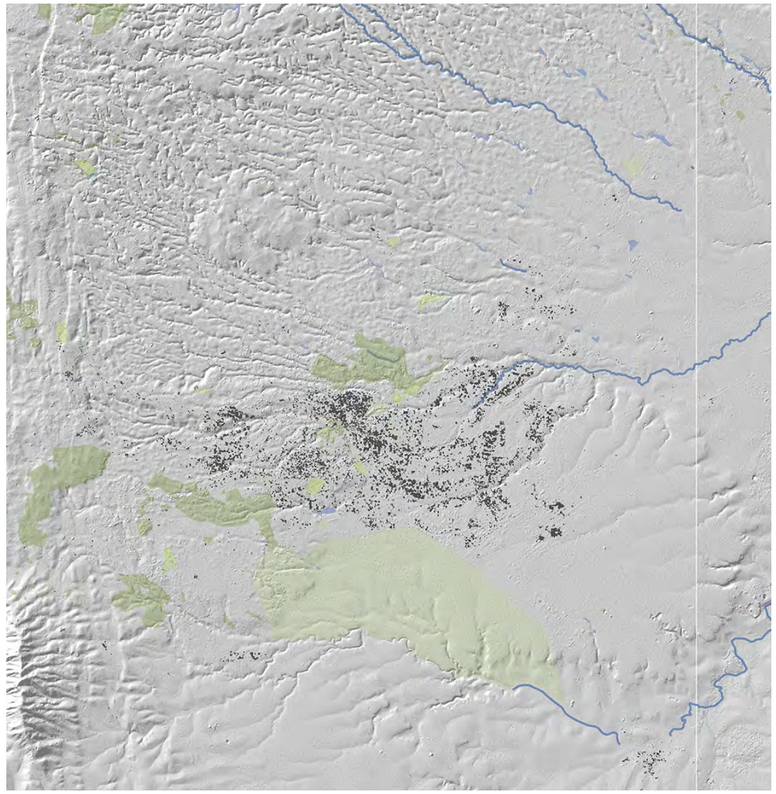
data retrieved from Murdoch et al., visualisation by he author



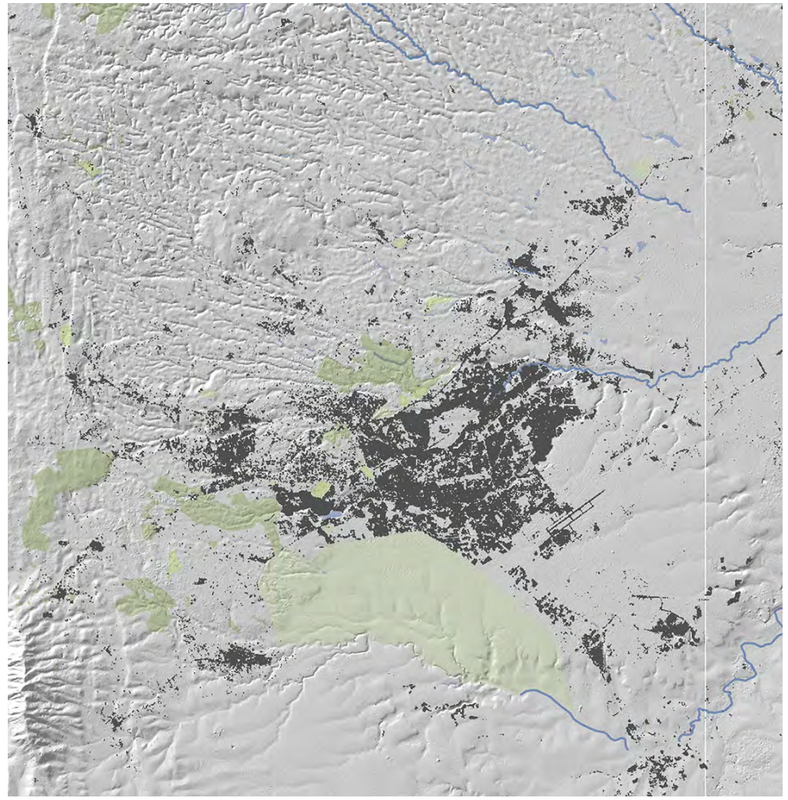
data retrieved from the European Commission; drawing by the author



data retrieved from the European Commission; drawing by the author



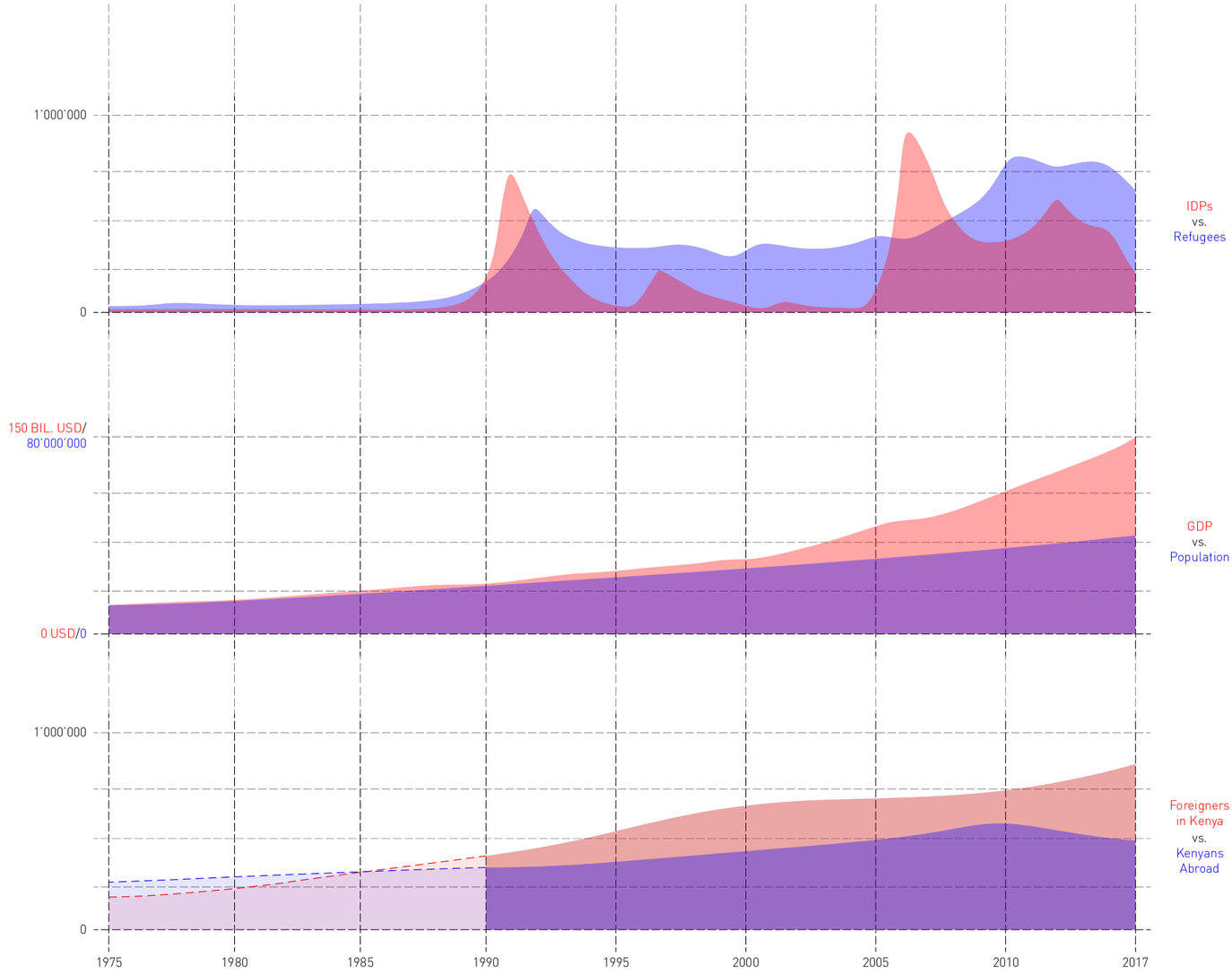
data retrieved from the European Commission; drawing by the author



data retrieved from the European Commission; drawing by the author

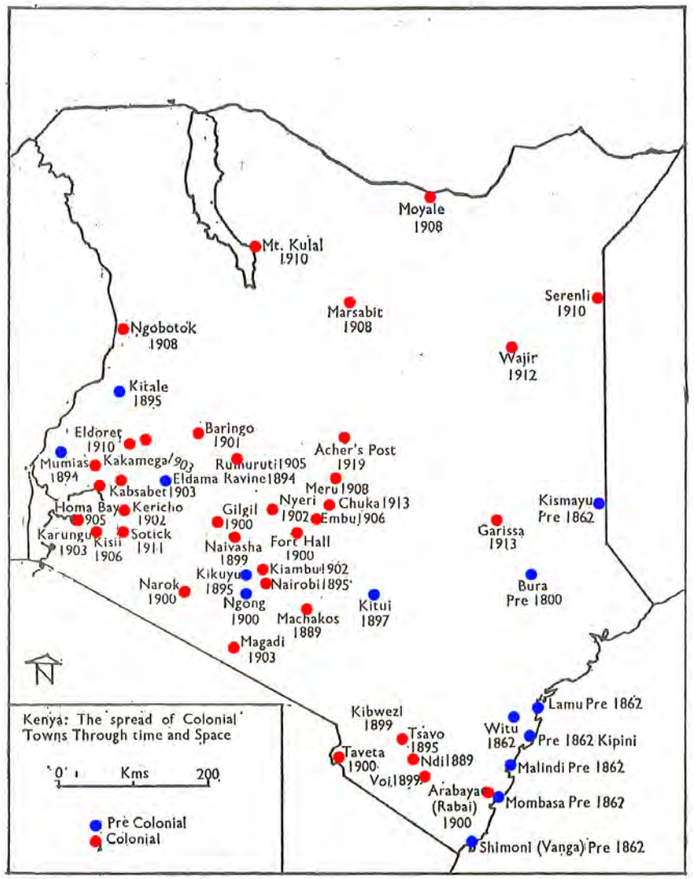
KENYA | MIGRATION TRENDS





data retrieved from World Bank; visualisation by author

Figure 2:3 Kenya: The Spread of Colonial Towns through time and Space



Source: Based on data gathered from *Kenya National Archives Records*.1895 to 1925.

~~A~~ The Brief History of Kenyan Urbanism

While migration as a consequence of ethnical clashes over the continent has, and continues to affect the dynamics of Nairobi, it is its peculiar urban history that has most definingly shaped the city's urban structure. In contrast to Nigeria which had already developed cities prior to its colonisation, Kenya as whole lacks what one might call a veritable urban history. In fact, prior to its colonisation, the land that makes up modern Kenya was quintessentially rural. With the exception of Muslim towns along the coast such as Mombasa or Lamu, the country was basically devoid of settlements considered 'urban' by western standards (Obudho 1979). The few settlements that did exist were marketplaces and had little relevance as places of residence as people would return to their homesteads after having traded their produce (1979). These homesteads, small collections of huts built on communal land in a framework of customary law, would be inhabited by the individual, extended families of a tribal clan.

The forceful occupation of East Africa by the British at the turn of the 20th century radically disrupted this traditional form of life. The large-scale appropriation and conversion of ground into 'Crown Land' as well as the spatial segregation of the native population in reserves eradicated most of the traditional forms of live and made way for the foundation of new settlements. Hence, most of the towns that have developed in Kenya over the past 100-odd years are colonial foundations. Established as trade posts, military camps or rail depots, these new settlements were exclusive to new white settlers and Indian administration workforce (Charton-Bigot and Rodriguez-Torres 2006, Syagga 2006).

By consequence, the only access to the city the black population was as domestic or menial labour (Syagga 2006), meaning that large parts of the Kenyan population felt disenfranchised even after Kenya's independence in 1963.

By the same token, particularly in the first decades after the independence, people would move to Nairobi for a fixed period, but would eventually return to their homelands (Charton-Bigot and Rodriguez-Torres 2006).

The disconnect of the urban population with their city has in many ways continued into the 21st century. As a reflection of their strong connection with their rural roots most Nairobeans will insist on being buried in their ancestral land hundreds of kilometres away from the city (Dohrenbusch 2008). This paradigm clearly mirrors the issue of belonging, described as one of the essential characters

map retrieved from Obudho

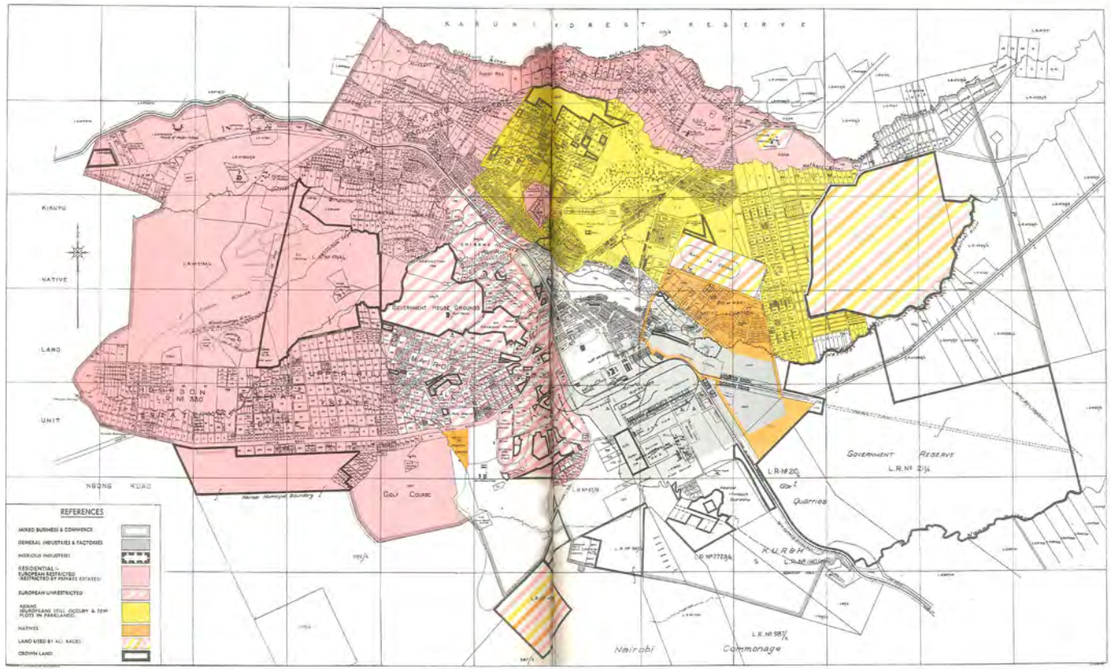
of the African city by AbdouMaliq Simone. The disruption of tradition and segregation of space introduced by the British has, on one hand, generated a population that, in large parts, does not identify with the city and as a consequence, fails to take responsibility for it. On the other hand, forms of self-organisation through cooperatives or more prominently the tradition of Harambeenote have emerged in post-colonial Kenya as a means of strengthening Kenyans' sense of belonging. Introduced by first president Jomo Kenyatta after the independence, these community self-help events, in which neighbours, friends or colleagues come together to support each other, have become an essential part of Kenyan culture and are even reflected in the country's national motto.

But what are the spatial consequences of this disconnect with the city? The segregationist policies of the colonial administration meant that there was no land legally available for the development by the Kenyans themselves. By consequence, the settlements that did start to sprawl eventually, reflected not the notions of European town planning but replicated the patterns of settlements known to Kenyans for centuries. The homestead and its principles were applied in the city and gradually adapted to fit the new urban condition after Kenya's independence. The homestead itself was replaced by an (il)legally occupied plot, its thorn tree protection transformed into brick walls with iron gates and mud huts evolved into humble sheds of corrugated iron or lavish villas of brick and Chinese marble.

At the same time the streets, forming the only part of the urban structure not affected by segregation during the colonial period, developed into Nairobi's only true public realm. In lack of space to express themselves, trade, meet or protest, Nairobeans have appropriated the streetscape and created the public inverse of the isolated, private, urban homestead.

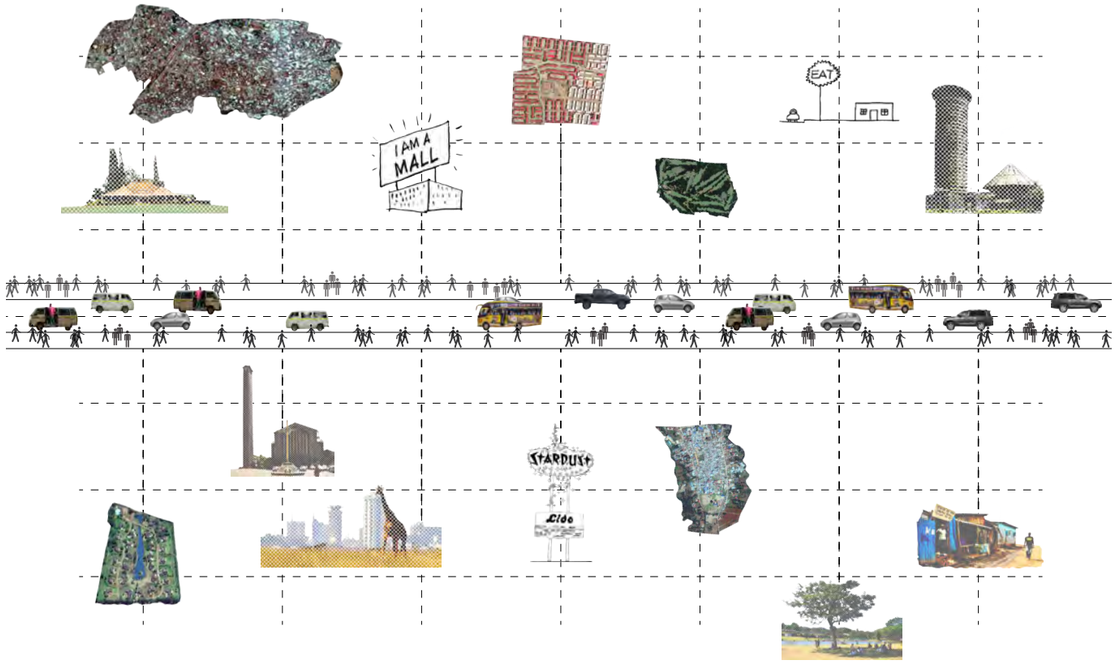
The development of the city as a direct translation of the rural to the urban, the stark contrast between what is considered public and private and the strong importance of the street are characteristics equally reflected in Rem Koolhaas' reflections on Lagos. It seems that although the history of both city and country are fundamentally different, they share certain structural patterns.

More importantly however, the analysis of the city of Nairobi confirms its status as a dynamic city in which space and structure are constantly renegotiated. Nairobi is thus not only on a theoretical level a radical incarnation of a *City of Comings and Goings*.



Existing (and expected) racial segregation of Nairobi in the 1948 Masterplan

drawing retrieved from White, Silberman et al.



HYPOTHESIS | A CITY OF COMINGS AND GOINGS

Kenya's multi-faceted history of migration and urbanisation has led to a capital city that offers extreme diversity. While this diversity bears strong potential for conflict, it is the main driver for the city's socio-economic energy, being constantly fuelled by ever-changing streams of migration. This raison-d'être is maintained through a system of enclaves, that cater exclusively to certain parts of society. However, since none of these enclaves can exist in complete autonomy there is a need for all residents of the city to a common 'marketplace', where social, cultural and economic exchange can take place.

This marketplace will most likely not be a physical market: Since markets, in contrast to western nations, cater exclusively to niches they are enclaves in their own right. Thus, these metaphorical marketplaces occur in realms in which exchange is unavoidable or even necessary: It is stretches of infrastructure and most predominantly roads that allow casual, on-the-go, elusive interactions among all members of society, which are otherwise avoided. But it is also increasingly exchanges made through the internet, as smartphones become commonplace in the city, that function as a common of sorts.

In this fragile system of the radically private and the fundamentally public, the sprawling growth, constant streams of migration and ethno-political volatility mean that streets form the true public realm of the city. In its scarcity, it constantly reinvents, reconfigures and rearranges its spatial and structural composition. It is not so much a fixed framework but a mechanism driven by the dynamics of the city. It is a model in which the informal is not a problem of urban development, but rather acts as one of its key components.

In other words, it is the culmination of a City of Comings and Goings.

'Urban Africans [...] appear increasingly uncertain how to spatialise an assesment of their life chances - that is, questions such as where they will secure livelihood, where they can feel protected and looked after, and where they wil acquire the critical skills and capacities to do so.

[...] The urban envionment is increasingly one where it is difficult to ascertain just what social practices , alliances and knowledge can be mobilised sufficiently enough to produce probable outcomes conceived in advance.'

AbdouMaliq Simone in *For the City Yet to Come*

PROBLEM FIELD I BECOMING NAIROBI

It would be both naive and romanticising to believe that Nairobi's metropolitan system of comings and goings, described in the previous section, works without flaw. In fact, one can argue that it is indeed the very core of the challenges that Nairobi faces.

In his introduction to *For the City yet to Come*, a passionate manifesto for the African city, AbdouMaliq Simone, highlights two crucial issues, that bring the flaws of Nairobi's urban system to the point. Firstly, he hints at the challenges facing every arrival to a city like Nairobi. Because of the individualised, fragmented social and spatial practices shaping the city is essentially illegible to anyone unfamiliar with it.,

Secondly and perhaps more obviously, Simone describes how the African city inhibits what he describes as the becoming of urban Africans: Spatial dynamics and uncertainty make it increasingly difficult for them to make a stable livelihood for themselves, ultimately disenfranchising them with the cities they live in.

While Simone uses four West African cities to expand on his hypothesis, he argues that it is essentially true for the African city at large. Hence, the following chapter will describe what precisely about Nairobi's urban system creates the sense of illegibility Simone describes and how its dynamics inhabit the becoming of its citizens.

In the specific case of Nairobi, one can essentially break down the most crucial issues into three specific problems of accessibility.

1. Access to Space
2. Access to Markets
3. Access to Services

In other words, this means that the main issue in the city of Nairobi is first and foremost not inequality as one might assume when observing it through the lens of European urban theory. It is not mainly issue that there is extreme wealth right next no extreme poverty, but rather the fact that through this extreme difference of status, its inhabitants have a different power and right to the city. By consequence, both the illegibility of the city and its inability to create stability for all its citizens is the result of extreme inequality of access to the city of Nairobi. The next sections will therefore explore the three issues of accessibility listed above.

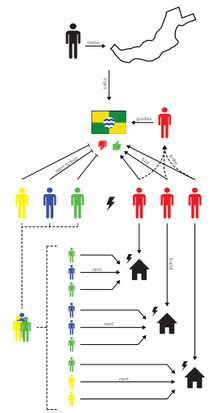
1 **I** Access to Space

As stated earlier, one essential character to the city of Nairobi is its constant renegotiation of space, how it is used and who can access it. While this system certainly leads to an increased efficiency and intensity of public space, it is a process prone to violent conflict. In fact, land grabbing has a long and tragic history in Kenya reaching back to the colonial occupation and the inequalities caused by the introduction of individual property in disregard of ownership history during the transition from colony to independent national states: After the expropriation of locals by the British, ownership was not restored into its pre-colonial state at the dawn of independence, but sold to the highest bidder (ref). The inequalities created through this system have thus created tensions that are perpetuated until the present day.

By the same token, the rapid transition from a society dominated by customary law to individual ownership means that the process of occupying unused land irrespective of its property status is still deep-seated culturally. Consequently, the mix of ethnical, political and cultural roots of land injustice mean that it remains a sensitive topic in Kenya. While the sell-out of public land in Nairobi under Daniel arap Moi in the nineties has led to an increase of resistance against corrupt government practices, land grabbing on a smaller scale is an issue of equal concern. Due to little research on the explicit nature and geographic disposition of this sort of land grabbing, its dimensions largely unknown. We can however get a good idea of the of some of the processes that take place through the research of Luke Obala with Matthew Mattingly who have traced the transformation of four different sites in metropolitan Nairobi. While the income level of their cases varies from poor to upper middle class, the general process always consists of the occupation of land in absence of protection, the quick construction of both residential structures as well as fencing, preventing the mostly powerless proprietor from evacuating the plot and finally, some sort of litigation normally leading to either the sale of the property or a building lease.

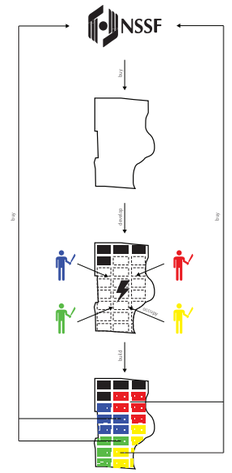
While in the interstice between customary law and western property right this process almost seems like a workable precedent for land development in the urban model of Nairobi, it is the individual aspects of the process that create a framework of unequal opportunity. Violence during the occupation of the unbuilt land, corruption of police and local government and ethnically motivated distribution of the occupied land mean that the urban weak, in this case particularly ethnical minorities are subject to an inequality of opportunities.

1. LEGAL PURCHASE, CORRUPT DISTRIBUTION



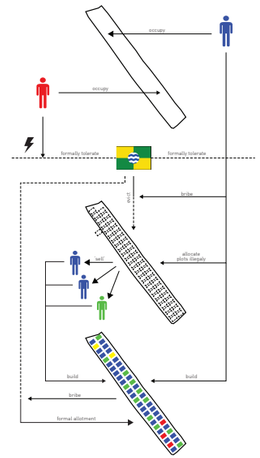
MATHARE NORTH
Density
Income Level
KSh KSh KSh KSh KSh KSh KSh KSh

2. FORCEFUL & VIOLENT OCCUPATION



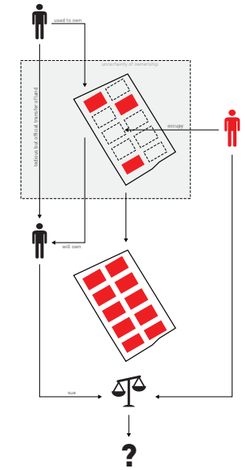
TASSIA
Density
Income Level
KSh KSh KSh KSh KSh KSh KSh KSh

3. OBSCURE POLITICAL PROCESS

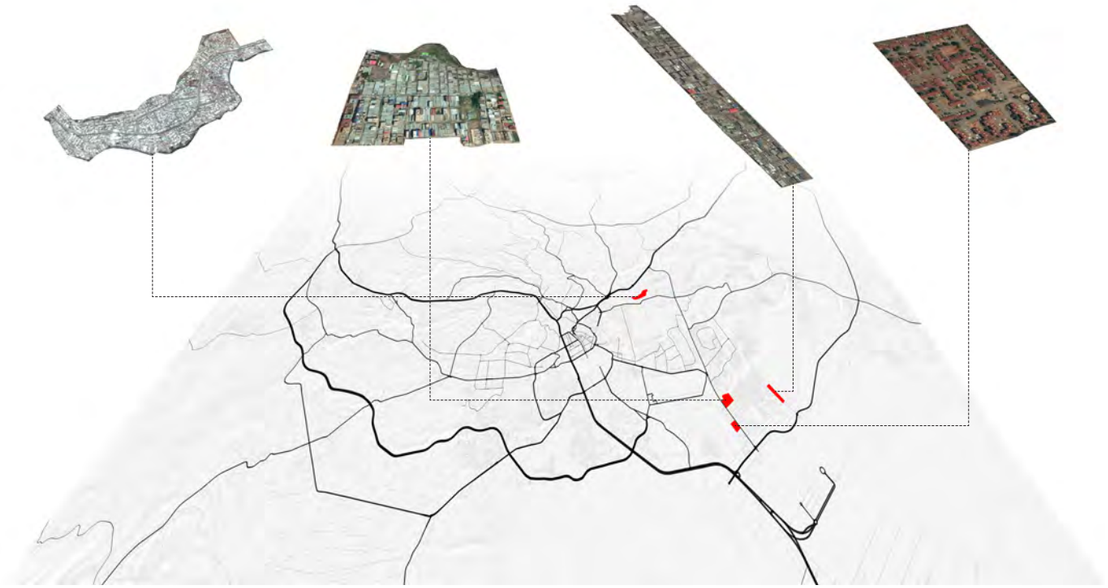


JUA KALI
Density
Income Level
KSh KSh KSh KSh KSh KSh KSh KSh

4. STRATEGIC NON-VIOLENT OCCUPATION



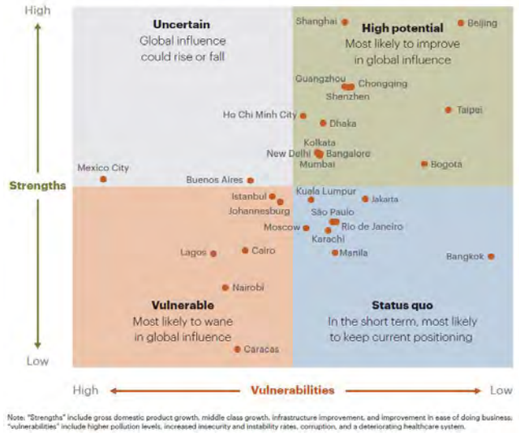
PIPELINE
Density
Income Level
KSh KSh KSh KSh KSh KSh KSh KSh



data retrieved from Obala and Mattingly; visualisation by author

2 I ACCESS TO MARKETS

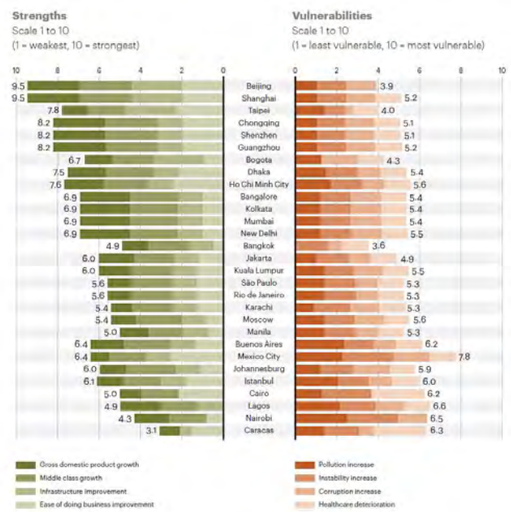
For several of years now the American management consultancy ATKearney has published an annual 'Global Cities Index', ranking the world's biggest and most influential cities according to their performance in economic, social, political and cultural dimensions (Hales and Pena 2012). And while one can clearly disagree on the value of such rankings, tainted by western, neo-liberal ideology, they clearly show a global divide on the level of cites: Irrespective of the recently heralded Decade of Africa (Perry 2012, August 2013), none of the first 50 cities in the ranking are located on the continent. Even worse, all African metropolises mentioned in the report perform poorly, to say the least, in terms of strengths and vulnerabilities for future development. Nairobi, in particular is at risk, mostly due to increase of pollution, corruption and instability in general.



SWOT-analysis of global cities in AT Kearney's Emerging Cities Outlook

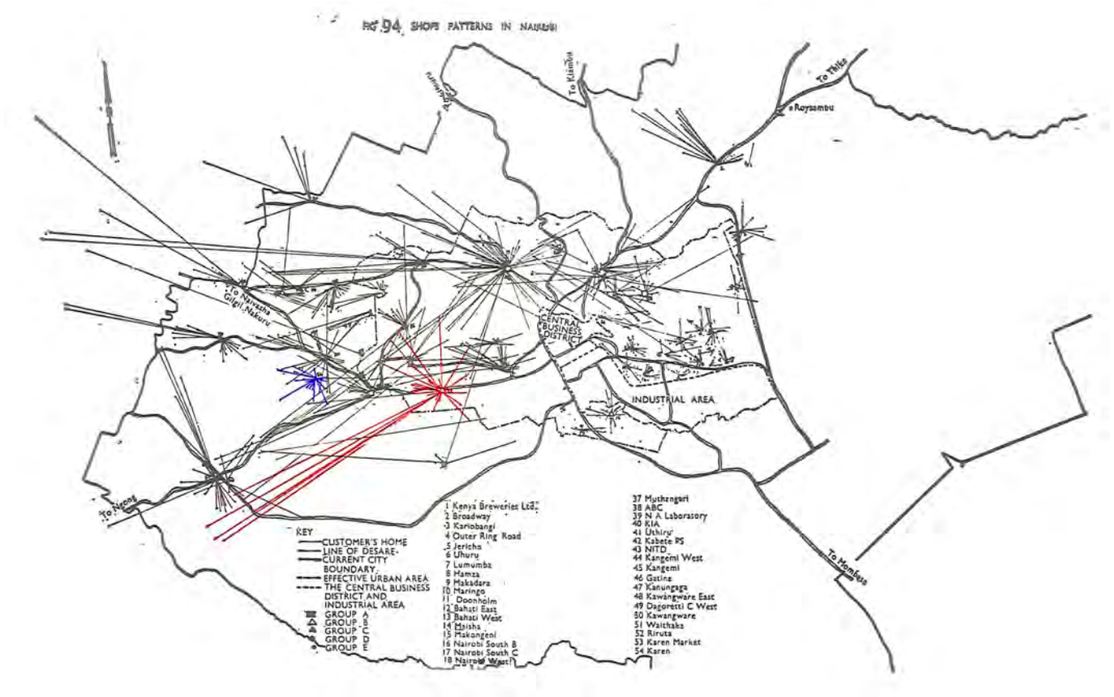
But what is the relevance of such a report for the urban development of a city like Nairobi? Over the past decades multiple authors and scholars have heralded the age of the city (Friedmann 1986, Sassen 2001, Glaeser 2011, Barber 2013). Saskia Sassen is clearly one of the proponents of this notion, particularly through her concept of the Global City (2001).
Embedded in the context of Globalisation in general, she describes the increasing power of cities as the result the distribution of production chains on a global scale leading to a disconnect of the cities and their hinterland and secondly, a concentration of power over in these global cities or rather in the network they form. In this context the integration of the city on a global scale and the creation of conditions optimal for the (specialised) service sector become important factors in the ranking of a city's global valour.
This, obviously implies a competition among cities for global power. And as the evaluation of ATKearney shows, African cities, and Nairobi in particular are at the brink of losing their already weak position on this market for global influence.

African scholars describe the influence of the internationalising economy from a different vantage point. According to AbdulMaliq Simone, Globalisation has throttled the continent as a whole (2004). He attributes this development to the continent's failure to adjust to the increasing international division of labour. By consequence, real incomes have fallen and the amount of jobs needed to reduce poverty levels hasn't been reached. This implies that Africa's inability to properly integrate within the global economic systems is directly linked to its inability to create a formal economy and vice-versa.



Challenges for emerging cities in AT Kearney's Emerging Cities Outlook

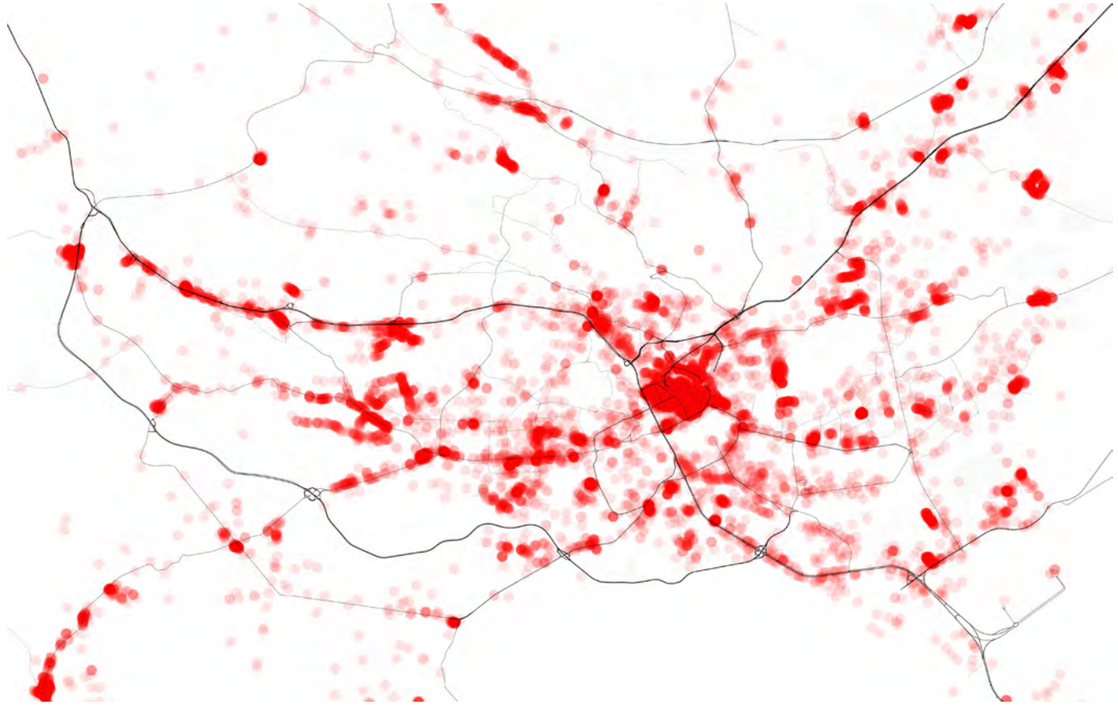
By consequence, in a context in which the competitiveness of a city has increasing relevance, the focus of any policy affecting the city has to be on improving or at least stabilising its position on the global market. Unfortunately, the most recent political events in Kenya raise doubts about whether the political class of the country is aware of the consequences of their actions.
The situation is, however not all doom and gloom. The Kenyan private sector has developed relatively well over the past years and the middle class is continuously growing (Pieterse 2014, McKinsey Golbal Institute 2016). In addition, Nairobi is increasingly becoming an innovation hub for the continent.
Kenyan inventions like M-Pesa, a mobile-based money transfer system have led to a growing creative IT community, inspiring tech giants like Google and IBM to open their first African research hubs in Nairobi (Veras 2017). The great upside of this development however, is the fact that a lot of the innovation in the ICT sector is of direct impact to the local population. With mobile phone and more importantly mobile data subscriptions rising (Mbiti and Weil 2011, Cleeve and Yiheyis 2014, Safaricom 2017), the country is projected to have most of its population connected to the internet by 2020 (GSM Association 2016).



Research on the location and users of markets in Nairobi (1974). Markets along main roads (red) outperform those in informal settlements (blue)

2 0 2 4 6 km

map retrieved from Obudho

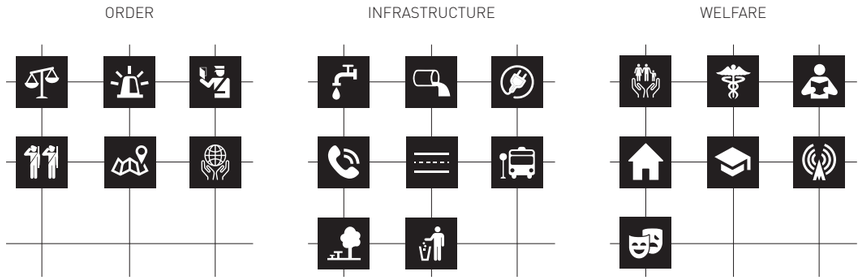


number of commercial establishments listed on Google Places: 15'684, with concenrations in the centre and along the main axes

2 0 2 4 6 km

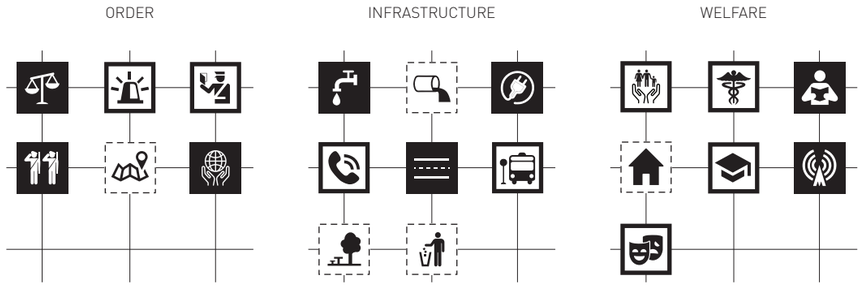
data scraped from Google LLC; drawing and analysis by the author

ACCESS TO SERVICE **I** PUBLIC SERVICE IN GERMANY



public services traditionally provided by western welfare states. PPPs under government control are considered to be provided by the authorities

ACCESS TO SERVICE **I** PUBLIC SERVICE IN KENYA



public services in Kenya; while all services exist on paper, many are provided by private businesses (solid outline) or not available at all (dashed outline)

3 **I** ACCESS TO SERVICES

One thing easily forgotten when living in the comfort of a western welfare state is the luxury of the wide amount of services provided to citizens by public authorities. From large scale issues such as territorial defence down to the support of the arts, large parts of the life of citizens in the welfare state continues to be provided by what one could summarise as public services.

In Kenya, much like in many other African nations ironically modelled by the example of the European nation state, the state of public service is desolate. While frameworks for the provision of most services necessary in an urban context exist on paper, they are unavailable to wide parts of the population. The reasons for this discrepancy of course vary widely. While the police forces have to struggle with a lack of funding and corruption (reference), urban planning often fails due to a lack of political will (reference) and parks dilapidate as a result of mismanagement (reference).

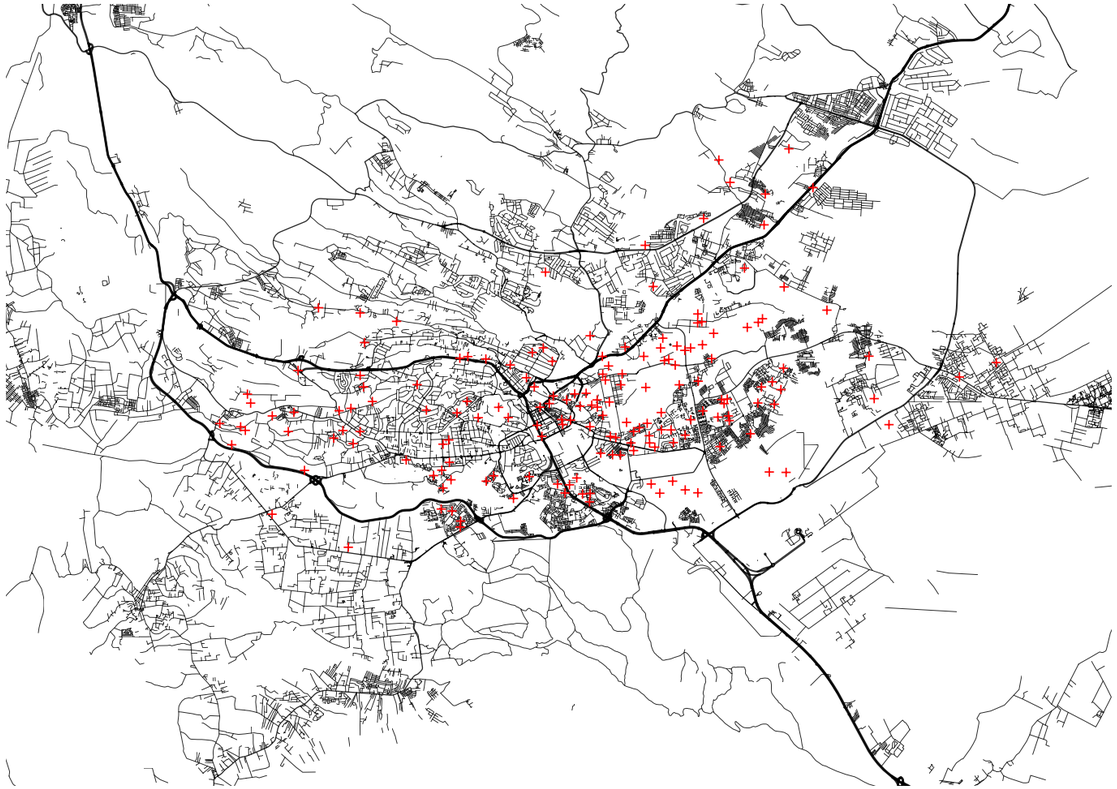
Those particularly suffering from this discrepancy between pretence and reality are first and foremost those living outside of the regulations of this overburdened system. This particularly visible in terms of infrastructure such as electricity, running water and most importantly sanitation, which are still widely unavailable in informal settlements.

In this vacuum of state intervention, a process of bottom-up privatisation driven by entrepreneurship, ranging from the lone hawker to corporations in size and from menial, manual labour to high-tech service providers in expertise take on the role of public service providers. By consequence, services actually do manage to reach ample parts of the population. In some cases, take primary education as an example, there might even be an oversaturation of service providers.

However, the reach of these services does not necessarily mean equal accessibility, as the example of drinking water demonstrates. Water is transported to households not connected to the town water by means of trucks, motorcycles and wheelbarrows and thus requires extensive manual labour. By consequence the price of water differs from neighbourhood, leading to the absurd situation of water being most expensive in Kibera, one of the oldest and densest slums of the city, while it is cheapest in the richest neighbourhoods.

It becomes clear that the issue of services is a structural one when looking at the development internet usage in Nairobi. As smartphone adaptation in Kenya is set to reach 54% by 2020 (reference), with urban cores reaching significantly higher saturations, connectivity to the internet is increasingly becoming an issue of equal opportunity. However, access to the internet remains an issue of high cost for many, especially when needed in high quantity for business. In fact, the spread of landline fibre connections, available in Nairobi since 2012, is yet again limited to the formal, wealthy neighbourhoods of the city, thereby perpetuating the stigma of segregation between the formal and the informal city.

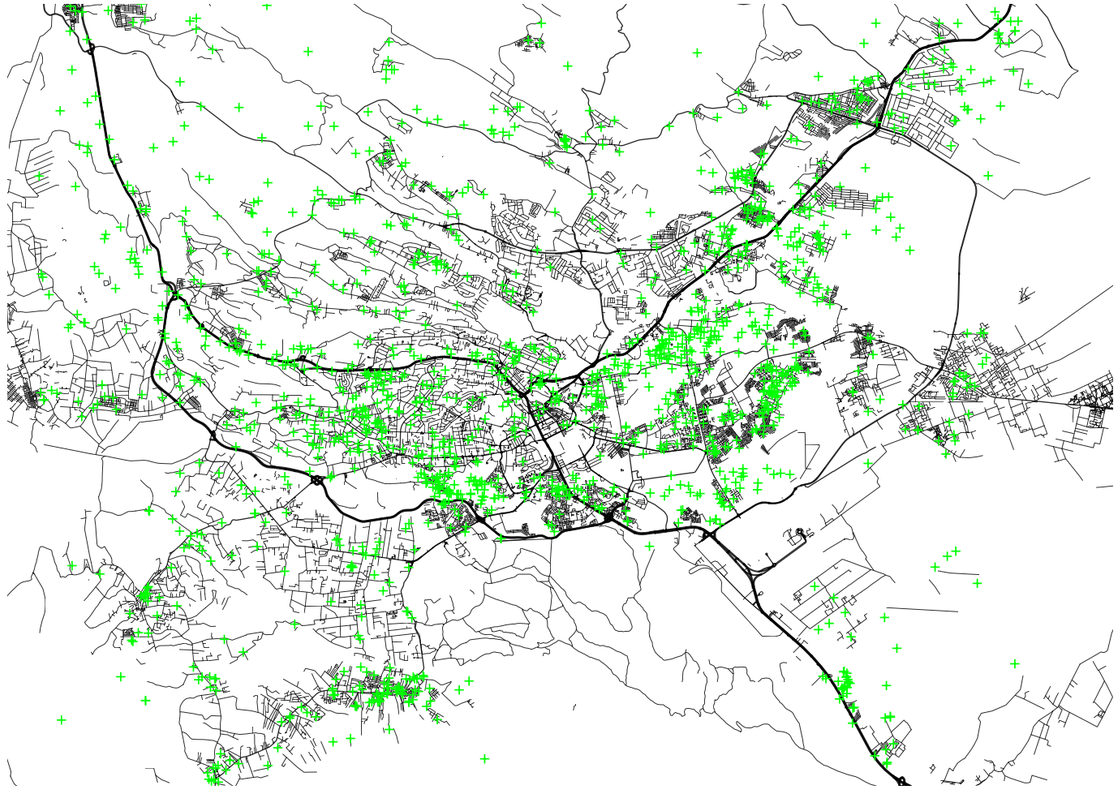
ACCESS TO SERVICES **I** PRIMARY SCHOOLS LISTED BY THE NAIROBI CITY COUNCIL



number of schools listed by the Nairobi City Council: 173

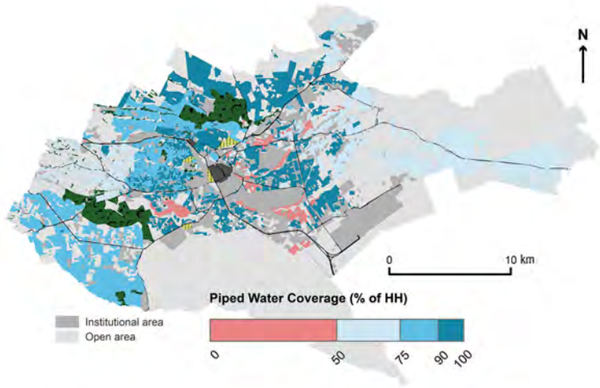
data retrieved from the Nairobi Board of Education; drawing by the author

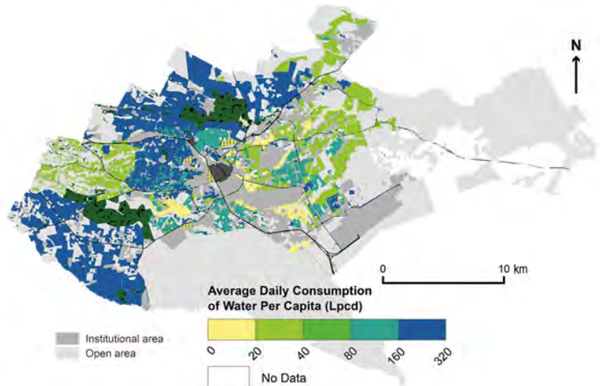
ACCESS TO SERVICES **I** PRIMARY SCHOOLS LISTED ON GOOGLE PLACES

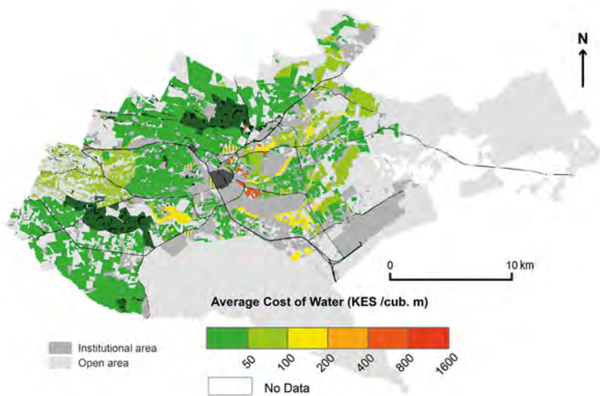


number of schools listed on Google Places: 1'536

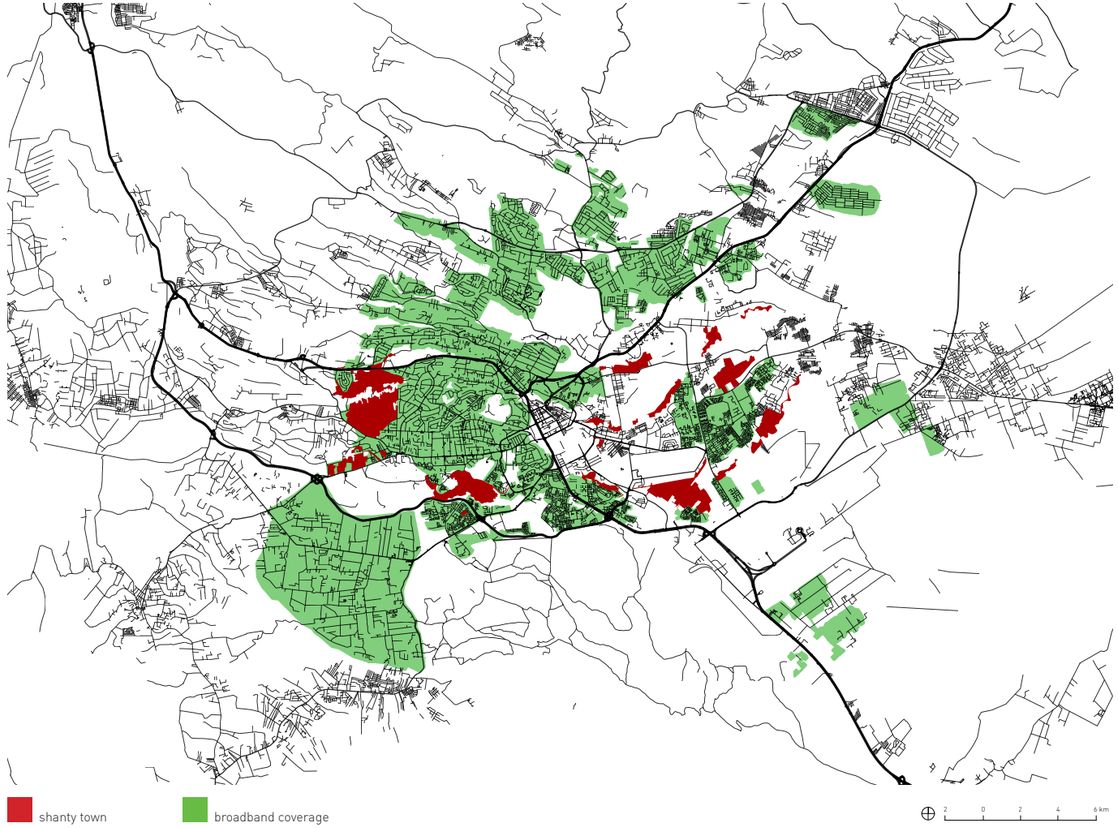
data retrieved from Google LLC; drawing by the author





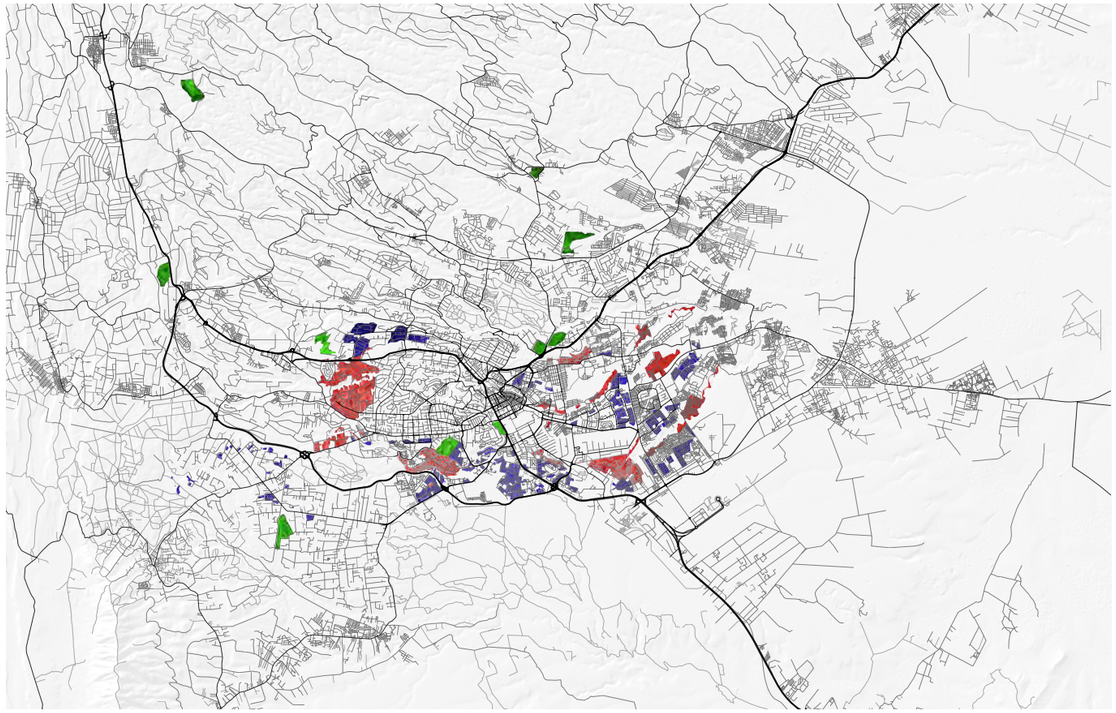


drawings retrieved from http://access-to-water-in-nairobi.gwopa.org/



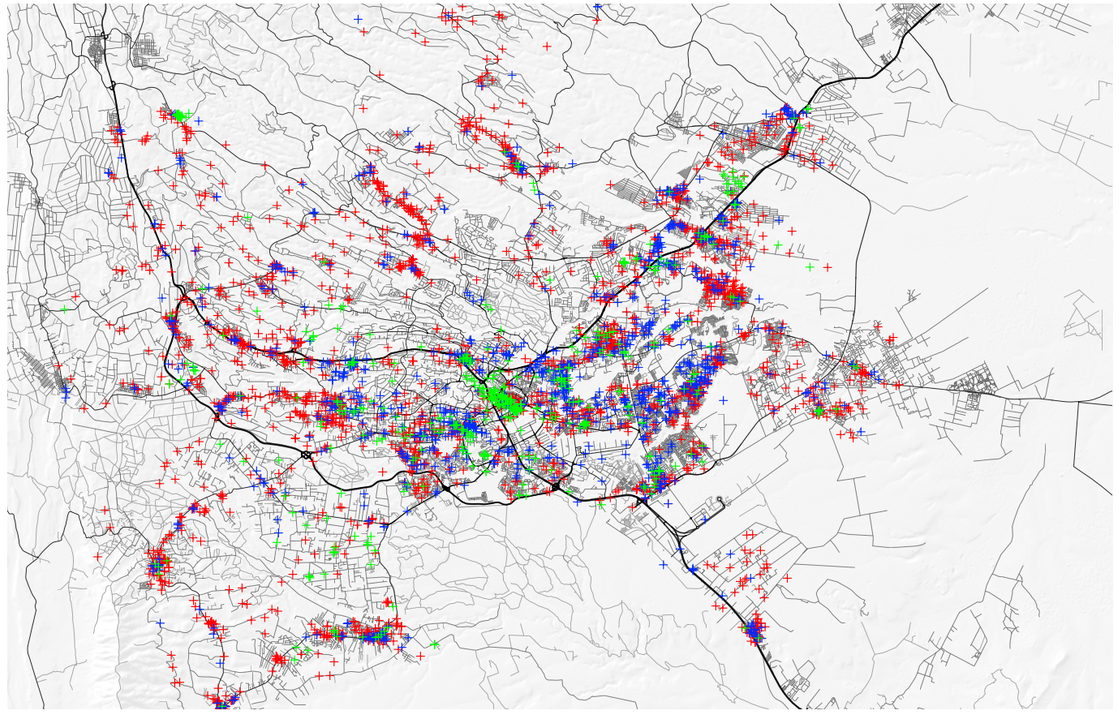
data retrieved from Zuku Fiber; drawing by the author

ENCLAVES **I** SPATIAL



data retrieved from: https://www.openstreetmap.org/; drawing by the author

ENCLAVES **I** NODAL



data retrieved from: https://www.google.com/maps/; drawing by the author

BECOMING NAIROBI

1 **I** PROJECT AIMS

This project will aim at establishing a **framework for the design of mediating public space** in Nairobi, hereafter referred to as **soft and hard public space**, thus championing economic empowerment, creation of spatial stability and preservation of temporary spatial appropriation.

2 **I** PROBLEM STATEMENT

The **lack of legibility and codification** of public space in Nairobi sidelines minorities as well as arrivals and **inhibits the long-term integration** of dwellers in the Kenyan capital, disenfranchising them with their own city.

3 **I** RESEARCH QUESTION

How can public space in Nairobi mediate between the short- and long-term integration of arrivals in Nairobi?

I SUB RESEARCH QUESTIONS

1. What is the nature of public space in Nairobi and how can it be codified?
2. How is public space being used in Nairobi and how can this activity be codified?
3. What action in terms of urban design and planning should be taken in order to address these challenges?

4 **I** METHODOLOGY

Considering the limited availability of recent literature and precedents on the city of Nairobi in particular but also African urbanism in general, the first key challenge was to establish a solid theoretical framework, resulting in the 'model' for the city of Nairobi described earlier.

The basis for this model is a review of some of the recent writing on the African city in general. A case study on the city of Nairobi, based in an analysis of historic primary and secondary sources. On a metropolitan, national and continental level conventional statistical analysis will further substantiate the results of the literature review. A comparison of my findings from this research will allow me to establish a model of Nairobi as the theoretical backdrop for all subsequent research.

The analysis of the challenges evident in the city and its model will of course have to be addressed through statistical research and mapping on all metropolitan scales. The main methodological challenge here is getting a hold of the data required. As in many non-western countries the reliability of official statistical data, if it is available, is questionable at best. In Nairobi, census data, while available for decades has been improperly digitalised, fails to take into account changes in the administrative division and most drastically, fails to take into account large parts of the informal city. In this context, web scraping of mapping applications such as Google Maps, the social media and the digital economy are valuable potential data resources in a country increasingly penetrated by the use of (mobile) internet. Covering very particular, individual aspects of urban life, they can support conventional means of mapping and data, particularly because they increasingly tend to include both formal and informal characteristics of the city.

In the spatial analysis of the public realm, which I will refer to as the streetscape, mapping alone is not fine enough a tool anymore in grasping its dynamic. A topological analysis in the sense of Christopher Alexander's 'Pattern Language' seems like a fitting approach in understanding space that experiences constant renegotiations.

The lack of suitable (urban) design precedents has forced me to follow a strong link between research and design As I elaborated in the previous section, there is a fundamental lack of comprehensive research on African cities, creating a strong sense of urgency to address the issue. It shouldn't come as a surprise then, that there is an equal lack of design precedents on cities like Nairobi, particular on an urban scale. With the exception of some plans developed by post-war modernists in the wake of African independence and the recent expansions of Chinese investment in wide parts of the continent there is little reference to draw back on when designing public space in Nairobi.

For me personally this proposed a particular challenge since my conservative architectural training has – up to now – forced me to put the analysis of references at the beginning of every design project. In addition, the issue of romanticisation described earlier made it quite impossible for me to start designing from a spell of pure intuition. By consequence, connecting research and design was quite essential to my project both as a means of informing and inspiring the design and as a tool to evaluate and justify it. This is perhaps most clearly visible in the vision for the future influence of the mobile phone that I use as a means of legitimising and codifying the existing socio-economic structures within the city. Each one of the typologies developed is the direct result of socio-economic research combined with precedents already existing in throughout the continent. While not spatial or even architectural, they thus directly make use of my research to inform a design.

In a more conventional sense, there is an essential link between research and design in the spatial distribution of the hard and soft typologies at the core of my design proposal. Intended as a spatial representation of the socio-economic structures at play in Nairobi's public realm, the layout and design of public space on my sites by definition has to be closely linked to my research these same structures. By consequence, my statistical research, represented in several maps analysing Nairobi in terms of morphology, accessibility and activity has directly shaped my final design proposal.

CHAPTER II:

PATTERNS

or

how to read Nairobi's streetscape

PATTERNS I CODIFYING PUBLIC SPACE

In the previous section I have tried to establish one of the core issues in the metropolitan system of Nairobi is an almost complete lack of legibility of public space to an arrival. With increasing knowledge of the city's development and an experience of moving about Nairobi, every arrival is increasingly able to see patterns in its public realm. This part of the thesis will there try to codify this spatial knowledge.

When conducting an analysis of public space in a European city the focus is conventionally on its green spaces, squares and since the 1960s, its pedestrian areas. The same approach has been used by UN Habitat in a recent analysis of the state of the city's public space. An inventory of the city's public green, it largely ignores

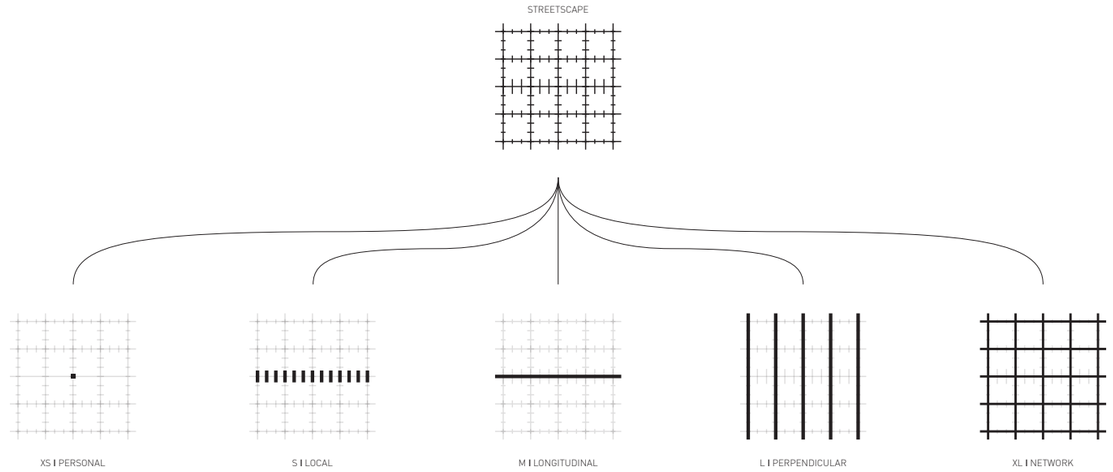


depiction of public space in Nairobi by UN Habitat (2016)



depiction of public space in *La Nuova Topografia di Roma* (1748)

the most actively used public space of he city. Its streetscape. By consequence the following section will provide an alternative approach to reading public space that understands public space in the more general terms graphically epitomised in Nolli's Nuova Topografía di Roma. Seeing the street as more than a mere means of thoroughfare, this means analysing the streetscape on different scales, highlighting its different aspects of its use and character.

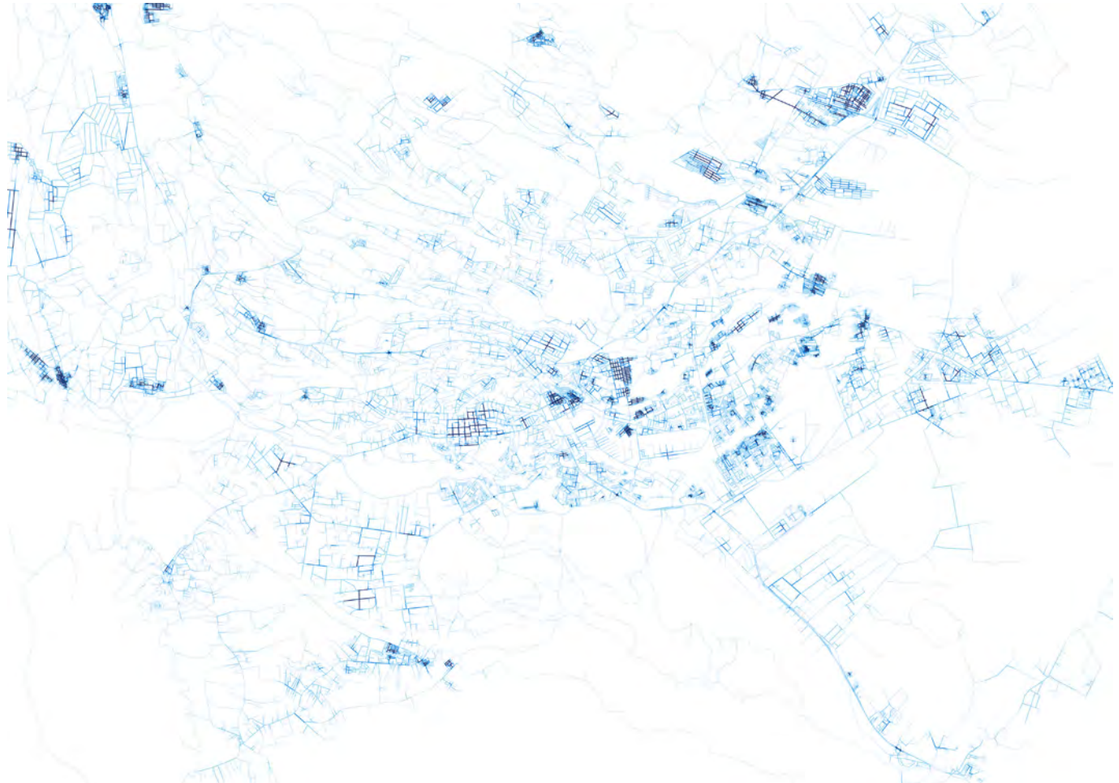


top image retrieved from UN Habitat
bottom image retrieved from https://www.andreaskohne.ch



global network integration I space syntax (angular integration R7)

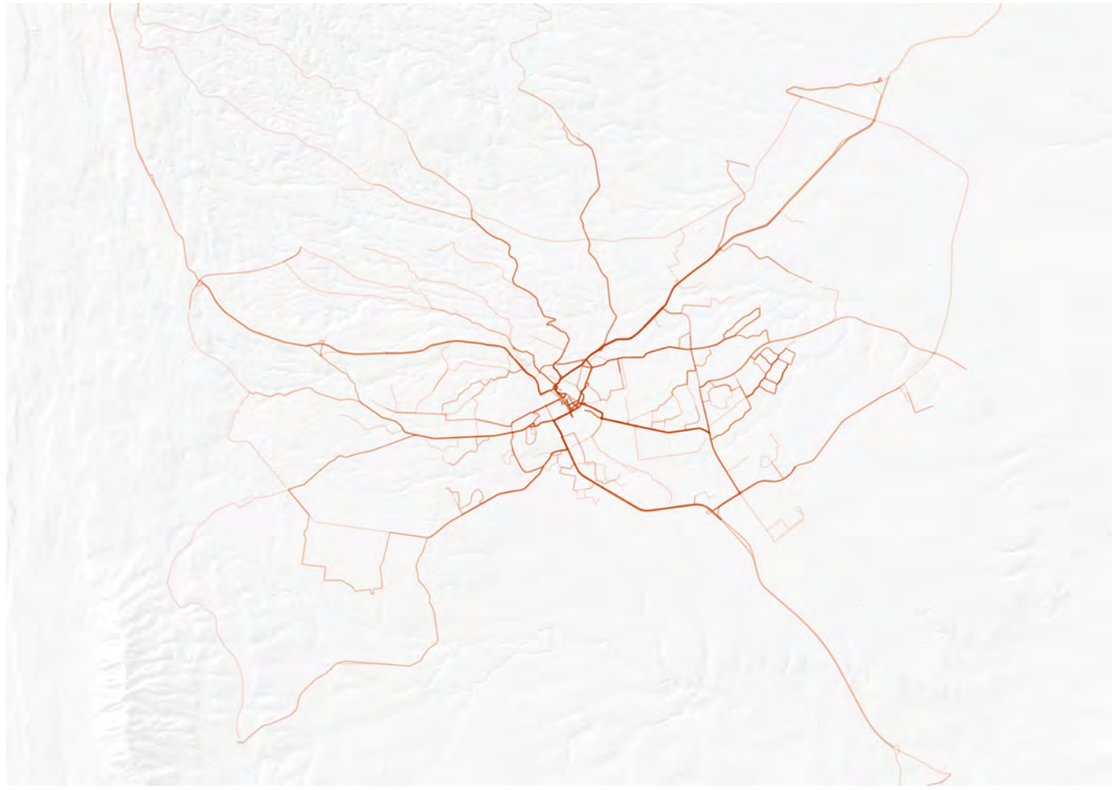
the analysis reveals the strongly centralised, yet 'centreless' nature of Nairobi's metropolitan structure. The main radials, such as Ngong Road are of central importance, however, the isolation of the central business district makes the network inefficient and congested.



global network integration I space syntax (axial integration R3)

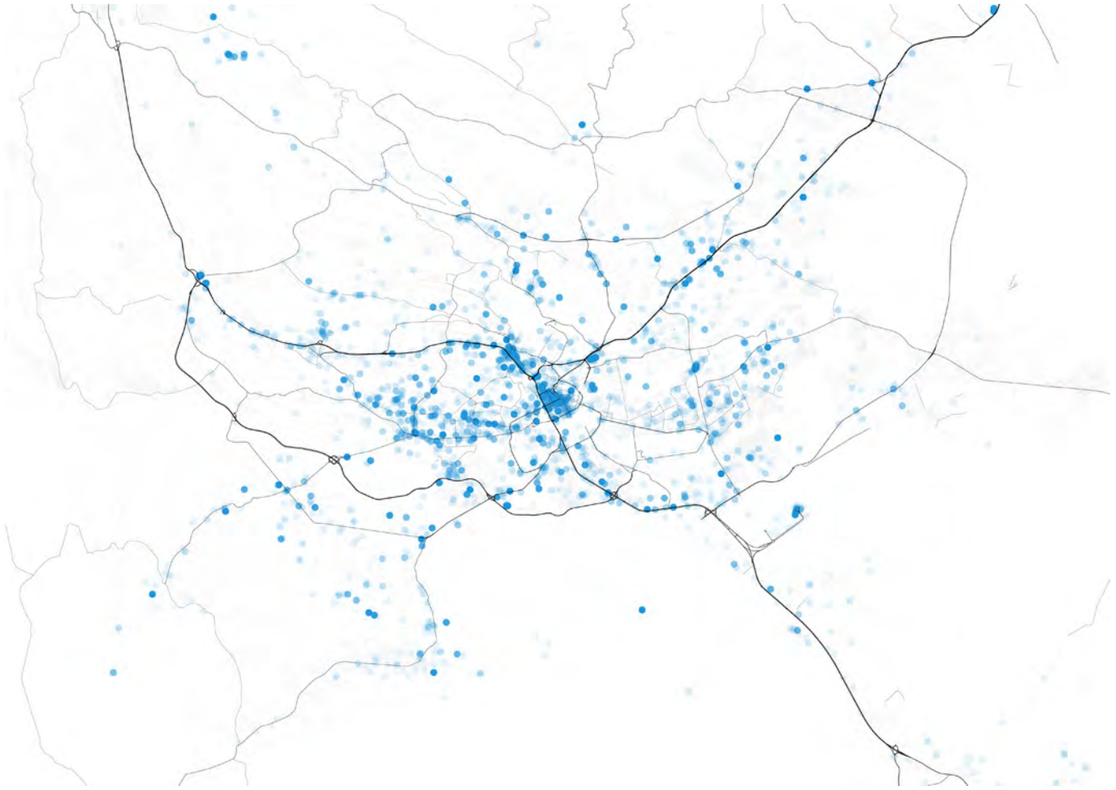
On a local scale, the unplanned neighbourhoods lack accessibility: The old, planned parts of the city are also the ones with the best integration into the urban fabric.

analysis in space syntax using data from OpenStreetMaps; drawing by the author



public transport I matatu route density

The density of matatu routes in the city corresponds with the centralised character of its morphology. However, the overly strong emphasis on the centre create botteneck situations the city's infrastructure is not able to sustain on the long run.



social media activity I tweets sent in Nairobi in December 2017

Surprisingly, an analysis of social media activity in Nairobi reveals a more diverse picture than that of an overly centralised city. While still compartively strongest in the centre, the activity on social infrastructure is considerably more distributed than its physical infrastructure would suggest. This indicates a discrepancy between the city's morphology and its actual use.

following page I breakup of twitter activity over the course of one day

data retrieved from the Digital Matatu Project; drawing by the author



06.00 - 07.00 | 415 Tweets



07.00 - 08.00 | 513 Tweets



08.00 - 09.00 | 613 Tweets



09.00 - 10.00 | 643 Tweets



10.00 - 11.00 | 668 Tweets



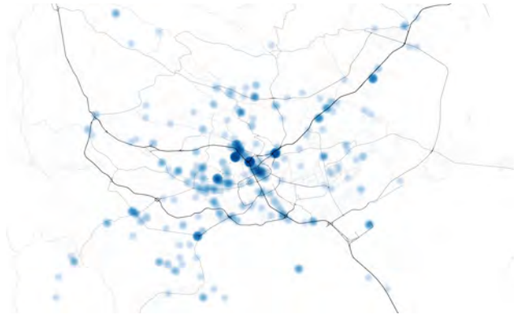
11.00 - 12.00 | 570 Tweets



12.00 - 13.00 | 674 Tweets



13.00 - 14.00 | 620 Tweets



14.00 - 15.00 | 589 Tweets



15.00 - 16.00 | 593 Tweets



16.00 - 17.00 | 635 Tweets



17.00 - 18.00 | 641 Tweets



18.00 - 19.00 | 510 Tweets



19.00 - 20.00 | 386 Tweets



20.00 - 21.00 | 306 Tweets



21.00 - 22.00 | 284 Tweets

data scraped from Twitter; drawing by the author

L | MORPHOLOGY

FIGURE-GROUND PLAN OF NGING ROAD'S PERIMETER



data retrieved from: https://nairobigismaps.wikischolars.columbia.edu/; drawing by the author; data not available for hatched regions

1 0 1 2 3 km

L I MORPHOLOGY

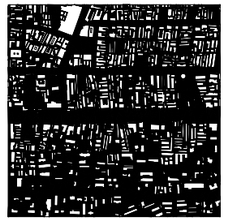
DENSITIES ALONG THE PERIMETER



KIBERA
FAR: 0.55
population: 700 per ha.



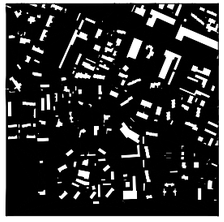
CBD
FAR: 0.40
population: 500 per ha.



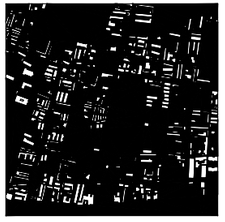
KAWANGWARE
FAR: 0.32
population: 300 per ha.



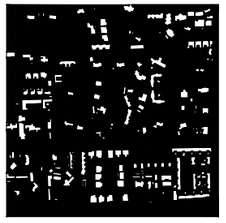
NGUMO
FAR: 0.22
population: 70 per ha.



HURLINGHAM
FAR: 0.19
population: 70 per ha.



RIRUTA
FAR: 0.16
population: 100 per ha.

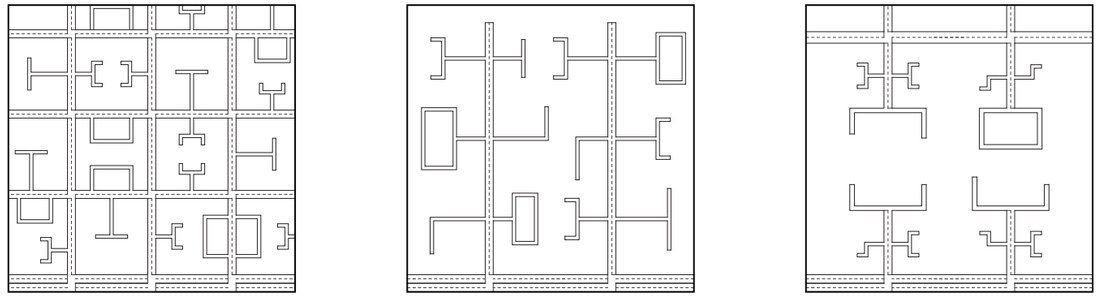


THOMPSON
FAR: 0.14
population: 30 per ha.



KAREN
FAR: 0.08
population: 5 per ha.

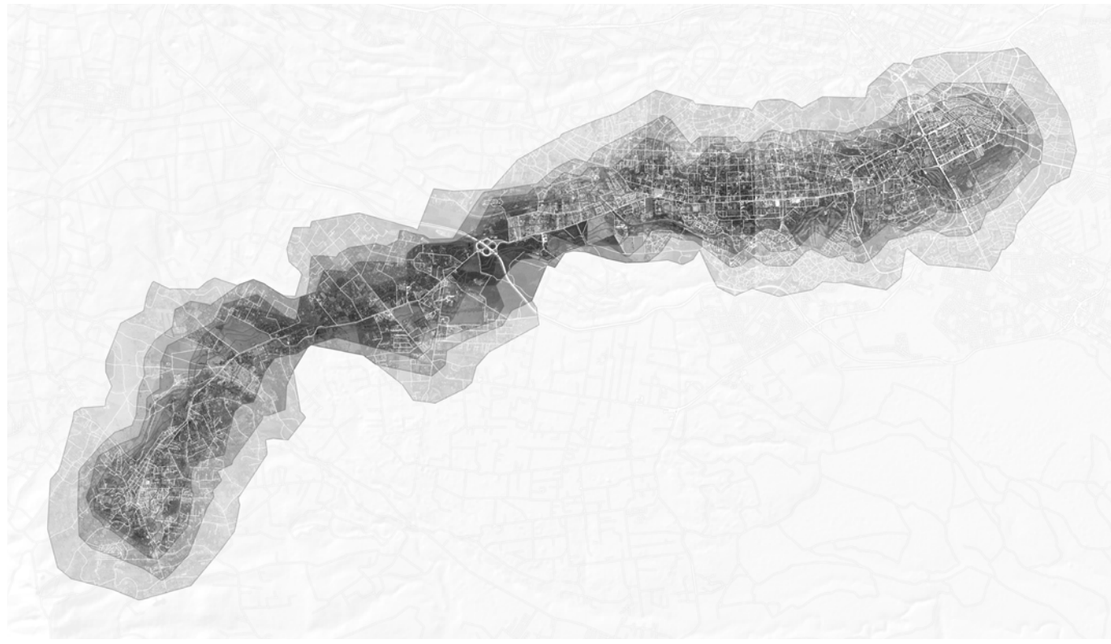
In addition to its relevance as a common denominator for arrivals, Ngong Road is particularly interesting because of the urban diversity it unites in its direct periphery. Its morphological variation (see above and previous page) is reflected in its socio-economic diversity.



typologies of perpendicular access I high, medium and low

The issues of accessibility visible on the metropolitan scale are reflected in its local morphology. In some cases it actually seems as if an urban integration has been actively prohibited.

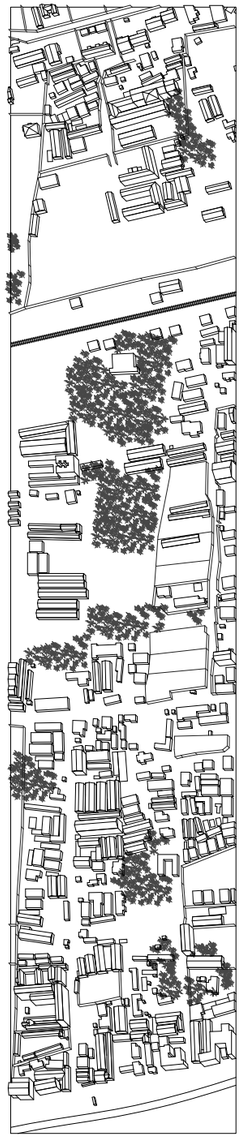
L I ACCESSIBILITY OF NGONG ROAD

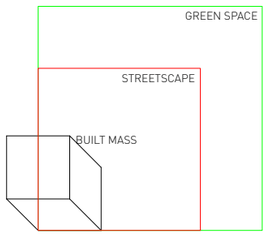


isocrone accessibility of Ngong Road I each shade represents a distance of ten minutes

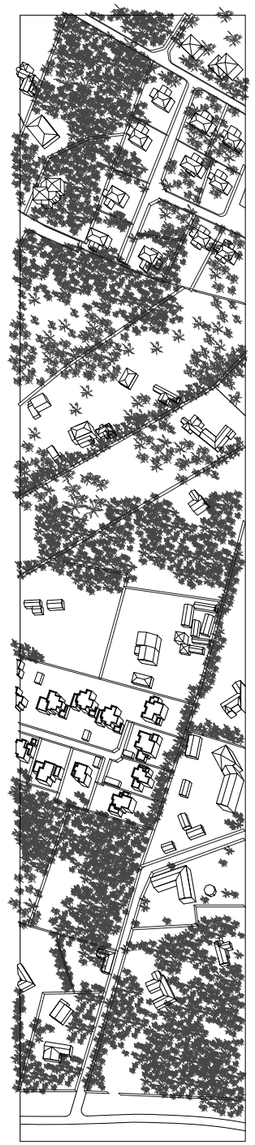
An isochrone analysis of Ngong Roads vincinity reveals some of the radical differences in accessibility of the central public spaces (i.e. Ngong Road) to parts of the population. This results in a partly stark contrast of morphology between areas right next to the road and those further away. However, as a closer look at Ngong Road reveals, when accessibility is good, the morphology of the neighbourhood tends to be more homogenous.

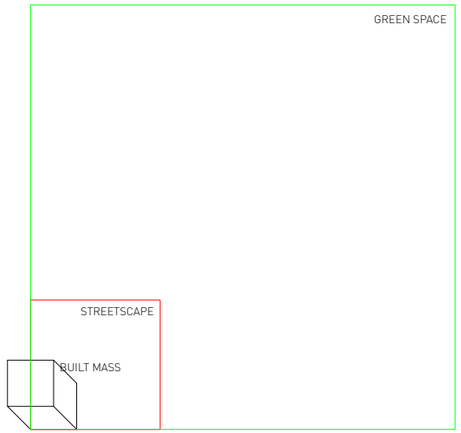
TERRITORIAL AXONOMETRY I RIRUTA





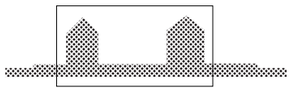
TERRITORIAL AXONOMETRY I KAREN





M I THE LONGITUDINAL

NGONG ROAD I LAND USE AT VARIOUS DEPTHS



3 I BLOCK

KEY

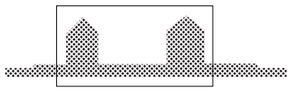
- commercial
- government use
- mixed and offices
- hospitals
- formal housing
- culture & religion
- universities
- informal housing
- leisure & entertainment
- public space
- unbuilt private land

PROPORTIONAL DISTRIBUTION

The accessibility of Ngong Road is of course not without consequence for its use, both in public space and right next to it. Consequently, the unplanned neighbourhoods adjacent to the street are dominated by commercial and light industrial uses, thus making most economic value of public space. In disconnected areas however, simple front gardens and walls dominate the streetscape, inhibiting the interaction between public and private. Interestingly however, none of this diversity is reflected in the actual design of public space: Street sections are, if planned, conventional with little regard for use of space or lack intentional design beyond the pavement of the road surface.

M I THE LONGITUDINAL

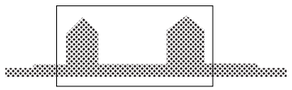
NGONG ROAD I LAND USE AT VARIOUS DEPTHS



3 I BLOCK

M I THE LONGITUDINAL

NGONG ROAD I LAND USE AT VARIOUS DEPTHS



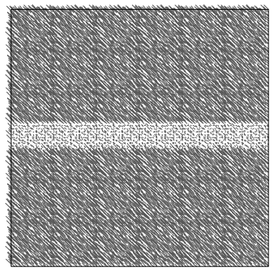
3 I BLOCK

KEY

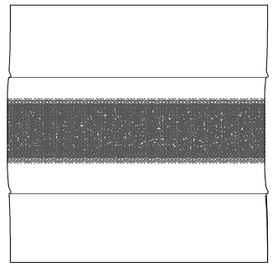
- formal housing
- informal housing
- unbuilt private land
- hospitals
- universities
- public space
- culture & religion
- leisure & entertainment

PROPORTIONAL DISTRIBUTION

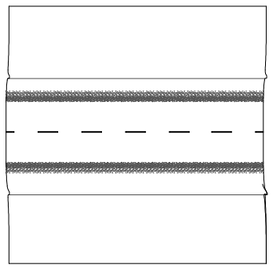
TYPOLOGIES OF THOROUGHFARE



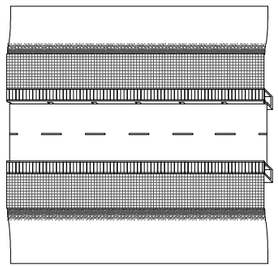
a | footpath



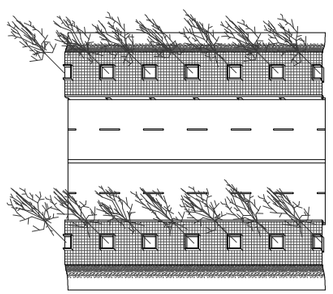
b | dirt track



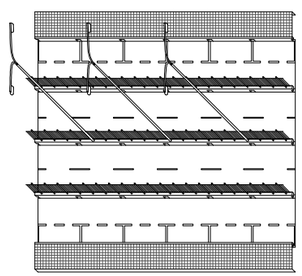
c | paved road



d | road with sewer



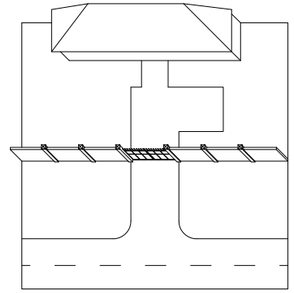
e | paved road with landscaped sidewalks



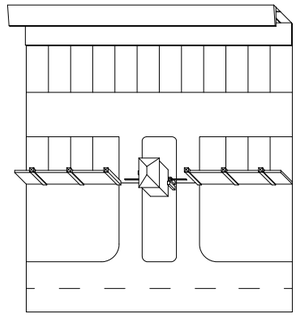
f | trunk road with parking lanes

On a local scale Ngong Road and its perpendiculars show a wide variety of spatial uses. Apart from its function as thoroughfare space, the buffer space towards the private plots and the thresholds towards private space itself reveal a wide variety of uses and creativity of appropriation for all kinds of interaction.

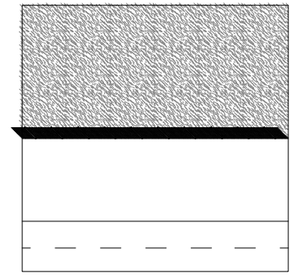
TYPOLOGIES OF THRESHOLDS



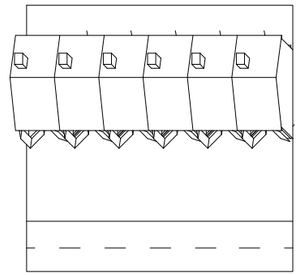
a | private property



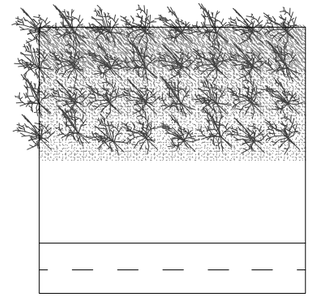
b | gated mall



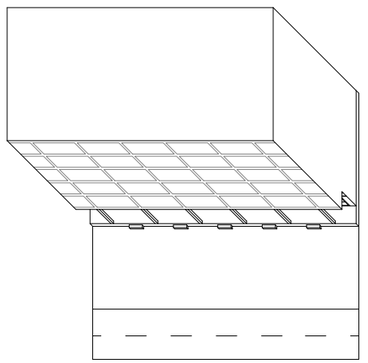
c | open fence



d | makeshift shopfrontsr

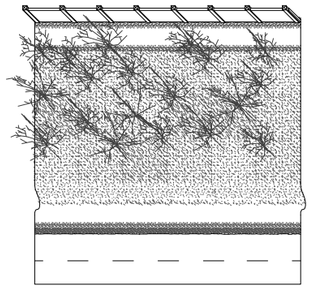


e | unused forest

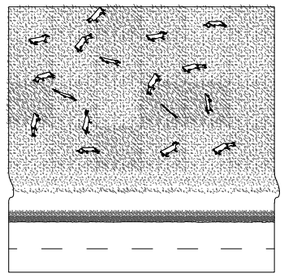


f | commercial building with arcade

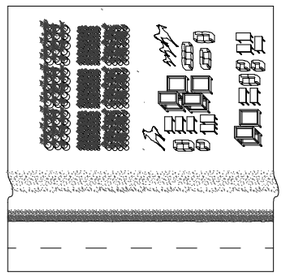
TYPOLOGIES OF SPACE



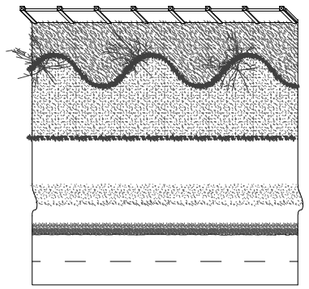
a | footpath



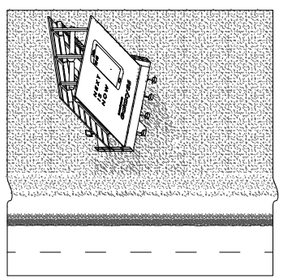
b | dirt track



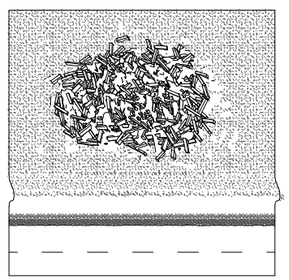
c | paved road



d | road with sewer

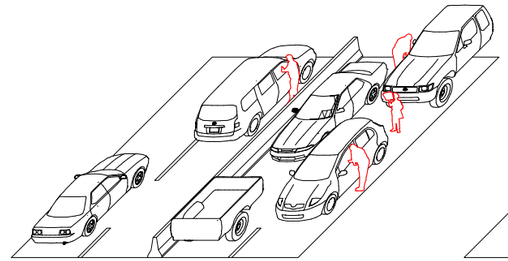


e | paved road with landscaped sidewalks

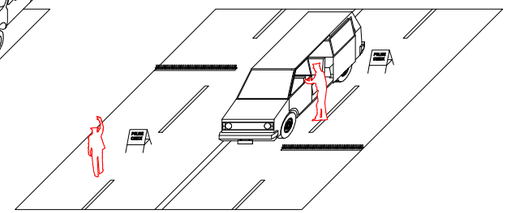


f | trunk road with parking lanes

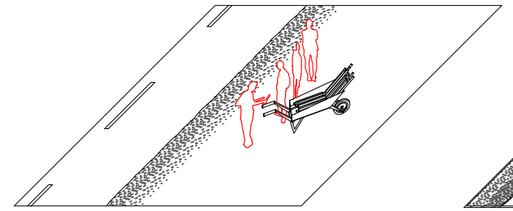
TYPOLOGIES OF INTERACTION



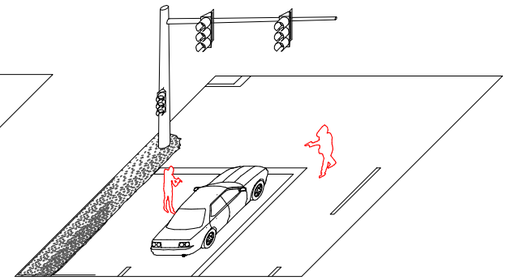
a | private property



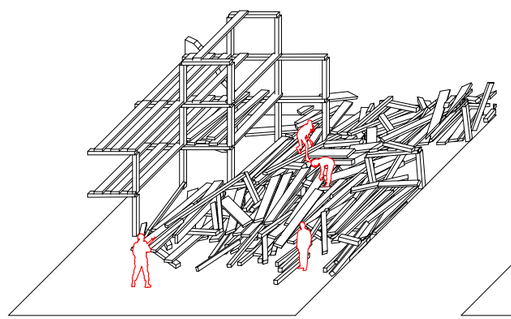
b | gated mall



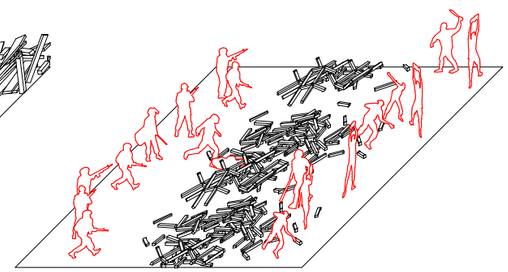
c | open fence



d | makeshift shopfrontsr



e | unused forest



f | commercial building with arcade



CECI N'EST PAS UNE ROUTE.

CONCLUSION | NGONG ROAD IS NOT A ROAD

If this analysis of Nairobi's streetscape has shown us one thing it is this: Ngong Road, and the streets of Nairobi in general, are not merely roads. Ethymologically speaking, the word road has its origins in the middle english word *rode*, meaning ride or journey. However, thoroughfare is, if anything, only a component from a group of needs and uses that make up a space such as Ngong Road. Rather than transit facilitating trade, production and cultural exchange, Ngong Road is a realm in which the different primal functions of public space are in constant renegotiation.

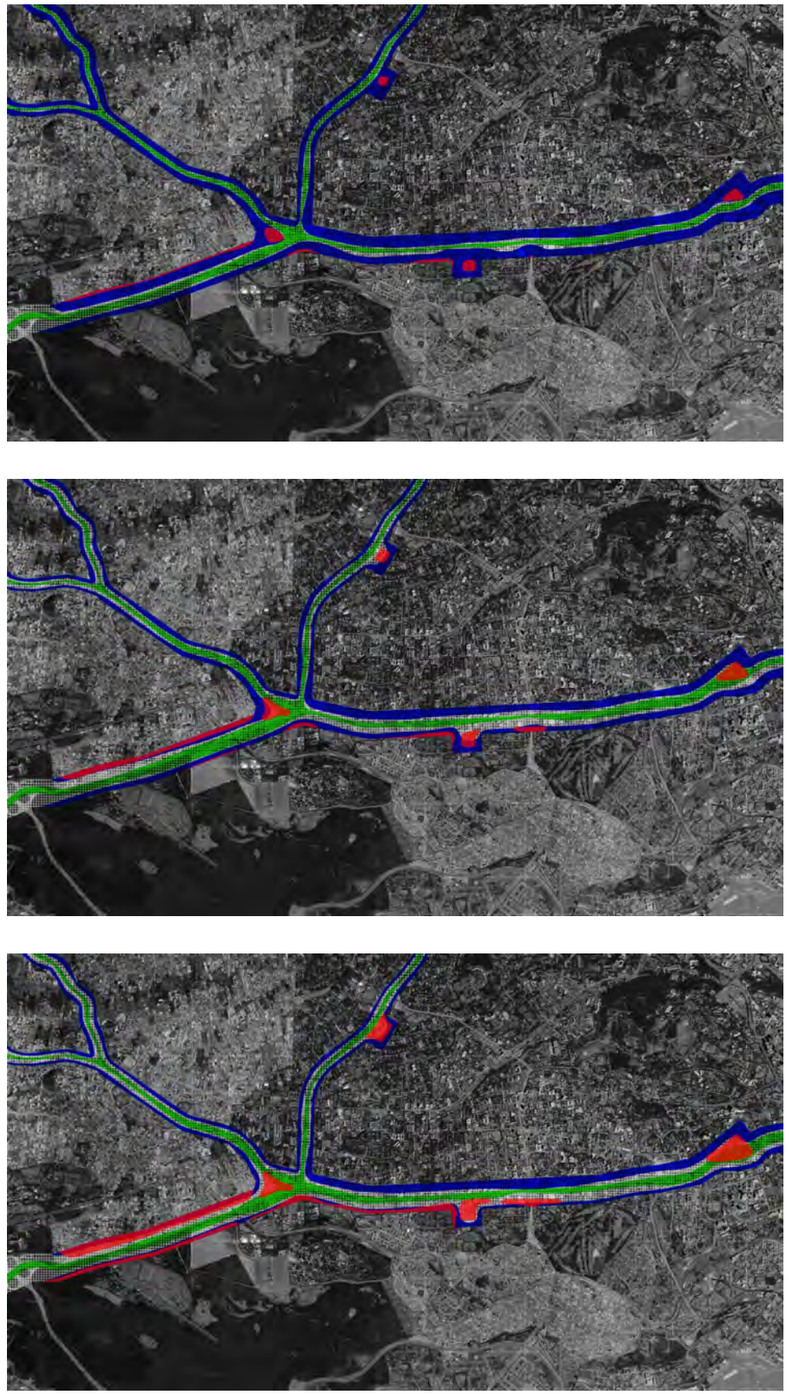
At the same time a glarge proportion of these negotiations is not only manifested in space. It is the actions of Nairobi's population in this space, that are often considered informal, that contribute greatly to the character of public space in the city. The next chapter explains how the digitalisation of Kenyan society can catalyse this utilisation of space and how it can increase the need for adaptive, appropriable public space.

image retrieved from https://www.kura.go.ke

VISION | TOWARDS DYNAMIC PUBLIC SPACE

In Nairobi public space is incarnated in its streetscape. By consequence, its streets, roads and paths are not spaces of thoroughfare in the original sense of the word but rather linear spaces in constant renegotiation of the public, somewhere between a common need for cultural and economic exchange, transit, and leisure. This structural status quo is currently being fuelled by a continuous digitalisation of Kenyan society, reducing the need for centralised organisation and control, but also for local determinacy and regulation of urban life.

By consequence, every design intervention in the public realm of Nairobi has to have this specific dynamic of appropriation at the core of its reasoning. My interventions will therefore aim at creating dynamic zoning and adaptive design of Nairobi's streetscape that mediates between the strengths of ultimately flexible urban space and the need for long-term identification with the city.



Vision for public space capable of absorbing its inherent spatial dynamics

CHAPTER III:

INTUITION

or

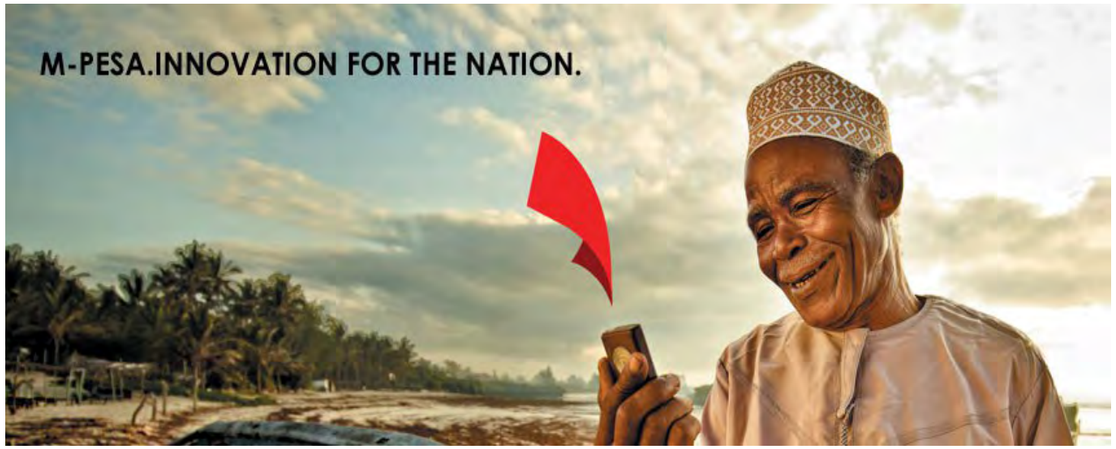
how digitalisation will codify Kenya's informal sector

CODIFYING THE JUA KALI

1 I THE END OF INFORMALITY AS WE KNOW IT

With public space codified, an arrival to Nairobi can now better understand the spatial concept of Nairobi. However, the actual use of space is not directly linked to its form and layout. Modern Nairobi is still what most would call an informal city.
The structures of how the majority of the city works, travels, and quite essentially lives are not determined by physical infrastructure and space, but by tacit knowledge and an individuals' social network. In fact, to an external observer it might seem as if the city worked on a complex mechanism of intuitive uses.
By consequence, it has long been difficult to get a grasp of how the city is being used. Historically, the resulting lack of codification of processes has been the reason for all kinds of conflict of interest, ranging from land grabbing and police corruption to the precariousness of hawkers and the notorious insecurity of the city's matatus.

However, times are changing. Over the past years Nairobi has become known internationally as Silicon Savannah, the tech hub of Africa.
It all started a little over ten years ago when the country's largest telecommunications provider, a subsidiary of Vodafone, launched M-Pesa, one of the world's first mobile banking solutions. Allowing millions of Kenyans without a bank account to transfer money to their relatives in the countryside, the system radically changed the relationship between Nairobi and rural Kenya.



innovation as a matter of national pride I Safaricom billboard advertising M-Pesa

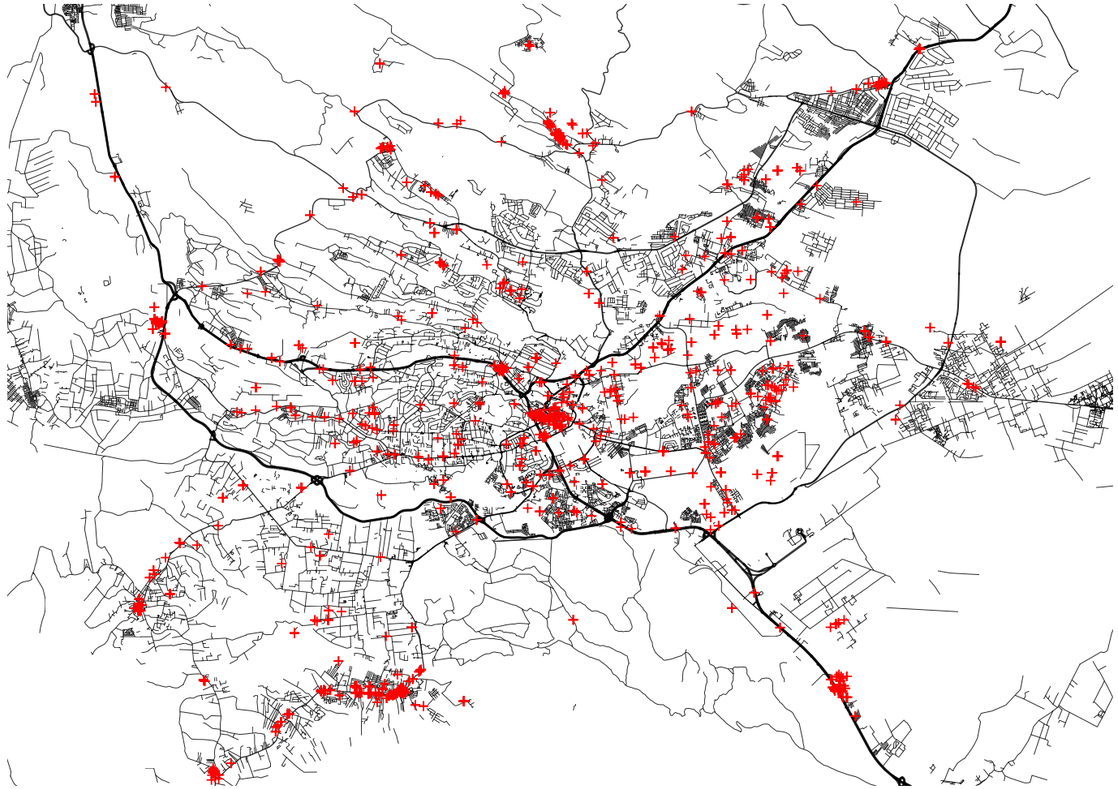
image retrieved from https://i2.wp.com/techmoran.com/wp-content/uploads/2014/03/1528757_10153627744390084_1931178876_n.jpg

Or in other words, it codified an existing, intuitive, informal mechanism and turned into a driver for national development.
The GSM association estimates that by 2022 54% of the East African population will own a smartphone by 2020. In fact, experts at IBM and Safaricom believe that Nairobi will reach full saturation before 2030.
The amount of data these users produce simply by using their smartphones is already influencing the way businesses operate in Kenya. Users of mobile money services can now get loans because algorithms estimate a credit rating based on their spending habits and citizens can estimate travel times based on Google's traffic data monitoring.
The masses of start-ups of the Silicon Savannah movement are now capitalizing on this development. And through their work, they are starting to codify the informal city.

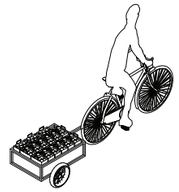
2 | THE NEW FORMAL

Of course, the progress and success of Silicon Savannah is still slow and small. However, it doesn't take much imagination to envision how digitalisation could change the face of the Nairobi. So how could the city work, transformed by the disruptive power of the smartphone?
The next chapter will give a speculative indication of how Nairobi's Jua Kali might work ten years from now. These digital typologies are however not mere pipe dreams but based in technology already existing and being used, either in Africa or elsewhere around the world.

DIGITALISATION IN SPACE | THE 10% OF M-PESA AGENTS CURRENTLY LISTED ON GOOGLE



number of schools listed on Google Places: 1'536



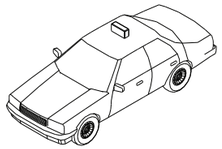
L_1 | THE MOBILE DUKA

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●○○○	●●●●○



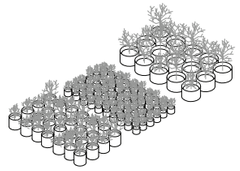
L_2 | THE DIGITAL HOTELI

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●●○○	●●●○○



L_6 | THE DIGITAL TEKSI

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●○○○○	●●○○○	●●●●●



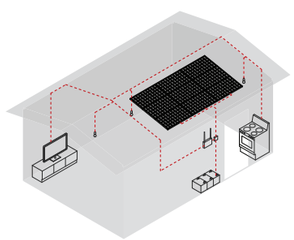
L_7 | THE DIGITAL BUSTANI

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●●○○	●●○○○



I_2 | THE DIGITAL ADDRESS

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●○○○	●●●●●	●●●○○



I_3 | THE DISTRIBUTED POWER PLANT

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●●●○	●●●●○



S_1 | THE DIGITAL EMERGENCY RESPONSE

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●●●○	●●○○○



S_2 | THE DIGITAL HARAMBEE

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
○○○○○	●●●●●	●●●○○



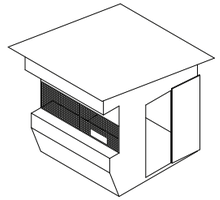
L_3 | THE DIGITAL MUUZA

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●○○○	●●○○○	●●●○○



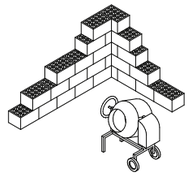
L_4 | THE DIGITAL BODABODA

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●○○○○	●○○○○	●●●●●



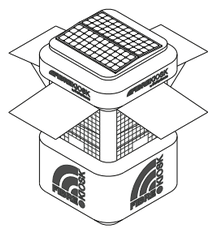
L_8 | THE DIGITAL DUKA

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●●○○	●●○○○



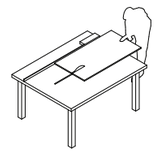
L_9 | THE DIGITAL MFUNDI

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●○○○○	●●○○○	●●○○○



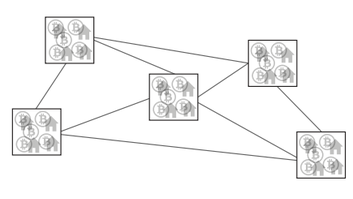
I_4 | THE FIBRE KIOSK

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●●○	●●●●○	●●●○○



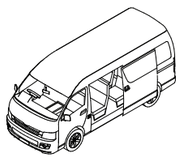
I_5 | THE DIGITAL MSANAA

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●●○	●●●○○	●●●○○



S_3 | THE DIGITAL LAND LEDGER

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●○○	●●●●●	●○○○○



S_4 | THE DIGITAL MATATU

SPATIAL IMPACT	DISRUPTION	MARKETABILITY
●●●●○	●●●●●	●●○○○

1 **I** THE DIGITAL MATATU

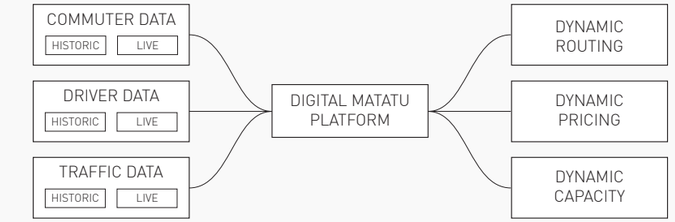
Like in many other cities in emerging economies, public transport in Nairobi is dominated by paratransit. The city's notorious matatus are essential in keeping the lifeblood of Kenya's capital flowing from day to day. While these small minivans and busses, operated privately through cooperatives, still operate according to the remainders of the early post-colonial public bus network, neither schedule nor route prevent the dreivers from choosing the most cost-efficient way to arrive at their destination.

By consequence, the operational structure of Nairobi's matatus is far from being formalised into a conventional transit system. In fact, Uber's UberPOOL service comes closer to how mataus operate: customers share a ride, going roughly in the same direction and the service is provided by an individual on demand rather than by a central entity and according to a fixed schedule.

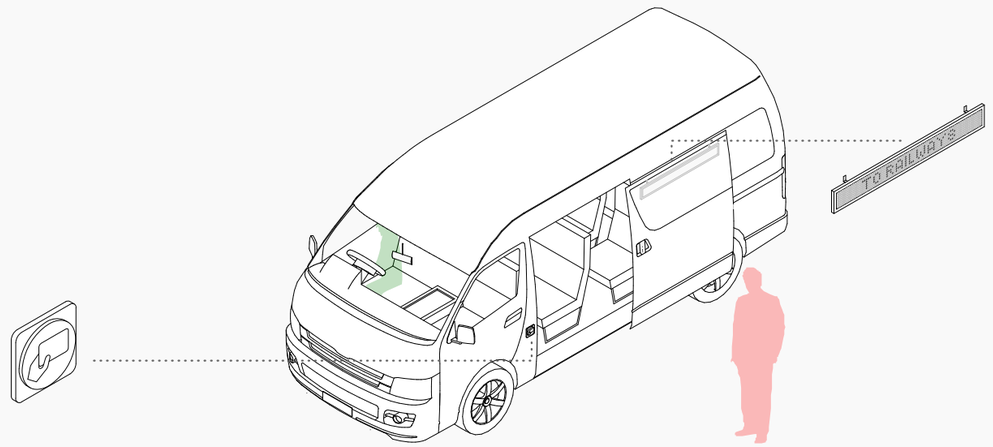
The digital matatu prosed here thus takes the opposite direction from what MIT's similarly named program proposes. Instead of pressing its dynamic system into a centralised, top-down network, it is a lean, dynamic and demand oriented system that capitalises on the city's changing dynamic.

I_1 **THE DIGITAL MATATU** OPERATION SCHEME

PLATFORM ARCHITECTURE



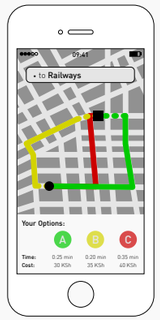
HARDWARE COMPONENTS



FRONT-END OPERATOR



FRONT-END COMMUTER



SPATIAL IMPLICATIONS

- ☐ decentralised transit network
- ☐ grid-type road network to be reinforced
- ☐ termini and bus terminals become obsolete
- ☐ bus stops and other infrastructure is not provided by central agency

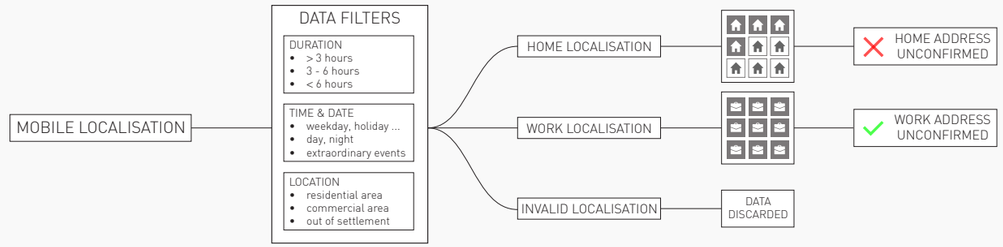
2 **I** THE DIGITAL ADDRESS

A physical address is one simple aspect of the formal city that is easily taken for granted in the western world. However, the majority of Nairobi's residents does not posess an officially recognised address. this poses a problem for both the state and the resident: the government is unable to communicate with the resident in matters of security or taxes. The resident on the other hand will have difficulties in getting bank loans, can't take delivery of mail or packages and is difficult to find for friends and relatives who haven't visited them before.

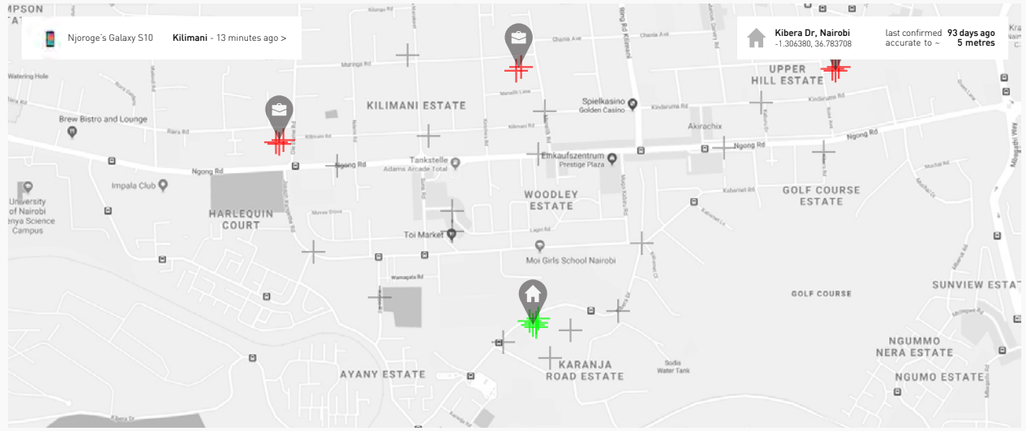
OKhi, a Kenyan strtup has already started to use the tracking functionality of smartphones to connect Nairobians to friends and their favourite restaurants. from here, it is only a small step to actually defining a resident's physical address by analysing their GPS tracking data.

I_2 THE DIGITAL ADDRESS | OPERATION SCHEME

PLATFORM ARCHITECTURE



TRACKING RESULT



FRONT-END USER



SPATIAL IMPLICATIONS

- ☐ decreased need for public signage etc.
- ☐ decentralisation of delivery systems and infrastructure
- ☐ increased need for physical accessibility to informal neigbourhoods
- ☐ increased managability of informal settlements will improve formalisati

3 I THE DIGITAL FIRST RESPONSE

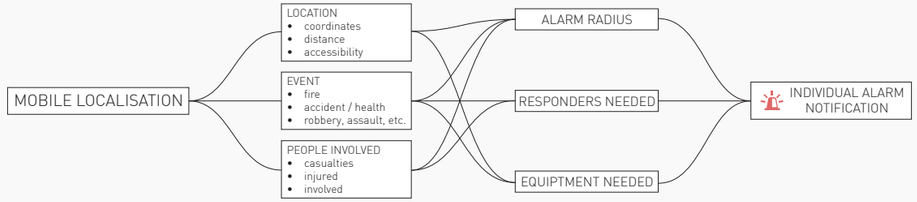
As of 2018 there are no less than three fire station city of Nairobi, including a station at th city's international airport.
By consequence, in all of Nairobi's densely populated shanty towns emergency response is one of the most crucial issues in terms of individual and community security.

While community self-help already provides help in case of many emergencies, communication often still relies on word-of-mouth. But as the example of WhatsApp Buurtpreventie used in the Netherlands shows, social media can be a part in improving the security in aneighbourhood.

In the case of Nairobi, applications might include additional applications, since the organised emergency response is likely to not provide suppot in most cases of emergency.

S_1 THE DIGITAL FIRST RESPONSE | OPERATION SCHEME

PLATFORM ARCHITECTURE



HARDWARE COMPONENTS



FRONT-END RESPONDER



FRONT-END VICTIM



SPATIAL IMPLICATIONS

- ☐ decreased need for full 'formalisation' of informal settlements
- ☐ infrastructure upgrades in the path network for easy access by first res
- ☐ roads with pick-up locations for emergency vehicles
- ☐ storage for emergency response equiptment

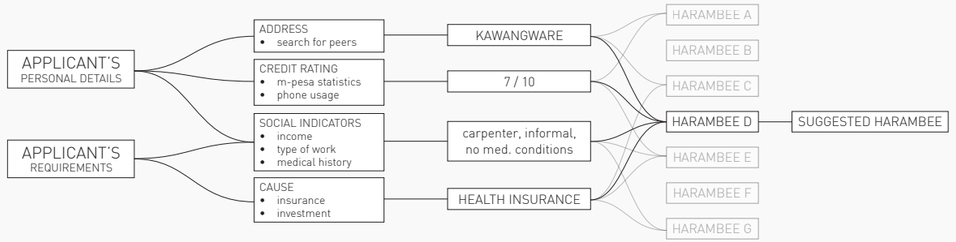
4 **I** THE DIGITAL HARAMBEE

Community self-help has a long-standing tradition in Kenya as means of social security. Iniciated by teh country's first president Jomo Kenyatta after independence, Harambees are self-help events and groups in local communities that can aim at anything from supprting a member's medical bills improving a neighbourhood's physical infrastructure. Often Kenyans are members of several of these groups, making adminstration and accountability a challenge. In addition, the increasing social dynamics in Nairobi make it more and more difficult to actually get together a Harambee.

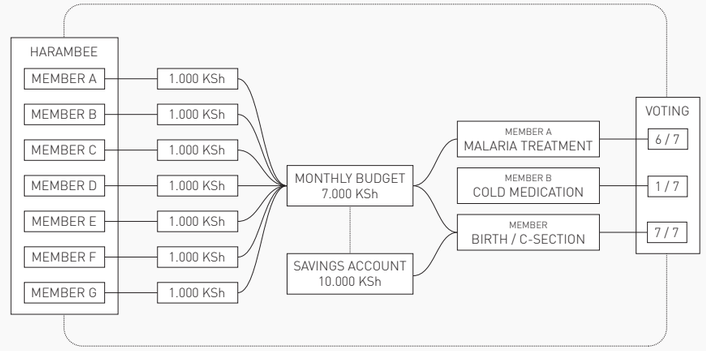
In South Africa, wehre the equivalent system is called a stokvel, people already come together through their smartphones to pay for burials, throw parties or jointly invest money. StokFella, the company behind the App provides communication and transaction functionalities, making the concept attractive again for a more mobile, dynamic generation.

S_2 THE DIGITAL HARAMBEE | OPERATION SCHEME

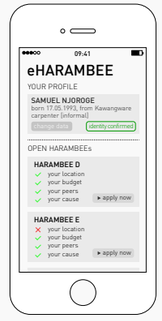
PLATFORM ARCHITECTURE **I** FORMATION



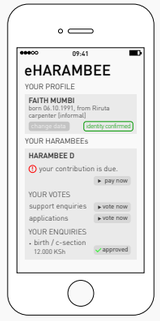
PLATFORM ARCHITECTURE **I** OPERATION



FRONT-END APPLICANT



FRONT-END MEMBER



SPATIAL IMPLICATIONS

☐ Communities are encouraged to invest in their neighbourhoods again and might create infrastructure without intervention of the state

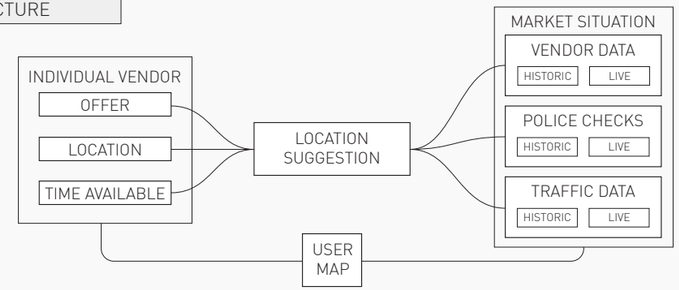
5 I THE DIGITAL HOTELI

Food vendors, like in most other cities, are a common sight in Nairobi Especially along the busy main roads one can buy a chicken sausage, a samosa or a mandazi at practically every corner.

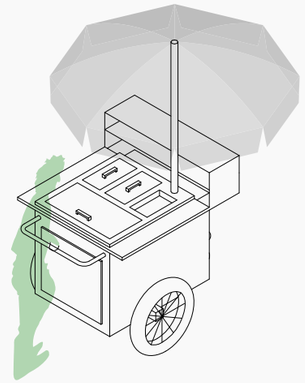
However, vendors could take advantage of the stong daily dynamics in public space by shifting locations. At the same time, customers could profit from more transparency and a wider choice of products throughout the day.

L_2 THE DIGITAL HOTELI | OPERATION SCHEME

PLATFORM ARCHITECTURE

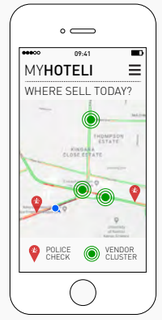


HARDWARE COMPONENTS

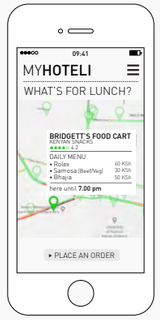




FRONT-END VENDOR



FRONT-END CUSTOMER



SPATIAL IMPLICATIONS

- ☐ increased need for 'borrowable' and 'appropriable' space
- ☐ secure public spaces and streets
- ☐ easy access to unplanned neighbourhoods
- ☐ better spaces in highly used areas

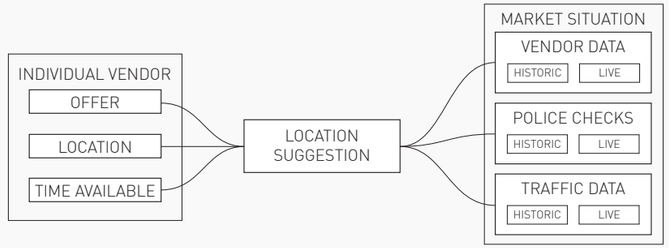
6 **I** THE DIGITAL MUUZA

In a city as notoriously congested as Nairobi, hawking in traffic jams is big business. while daily newspapers, fresh fruit and peanuts are the staple of the Nairobi hawker, digitalisation could enable these vendors do diversify their product range or even take orders from commuters on their way home.

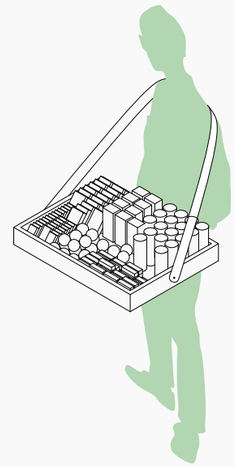
At the same time, these hawkers make their living on a temporary phenomenon. As traffic congestion can now be tracked in real time, hawkers can improve their income by shifting their location over te course of the day.

L_3 THE DIGITAL MUUZA | OPERATION SCHEME

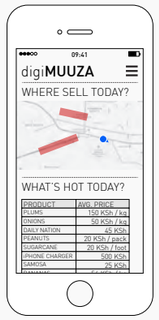
PLATFORM ARCHITECTURE



HARDWARE COMPONENTS



FRONT-END VENDOR



FRONT-END CUSTOMER

SPATIAL IMPLICATIONS

- ☐ increased need for 'borrowable' and 'appropriable' space
- ☐ secure public spaces and streets
- ☐ easy access to unplanned neighbourhoods
- ☐ better spaces in highly used areas

7 | THE DIGITAL ENERGY PRODUCTION

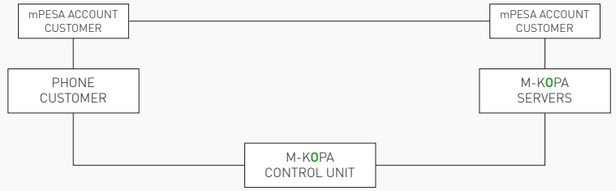
In modern Nairobi there is still a substantial amount of households not connected to electricity. And even those that are connected are subject to constant power shortages, particularly during the dry months of the year.

Enter M-Kopa. This Kenyan start-up set out to provide remoe parts of the country with electricity and a connection to the rest of the country. They developed a system combining Kenyan-made solar panels, batteries, a flat screen TV and LED lights. A communication unit ensures that the customer can only use the power produced by the solar cells if they made their monthly payment on the lease for the high-tech equiptment. Once they have paid the full value of the system, they fully own the system.

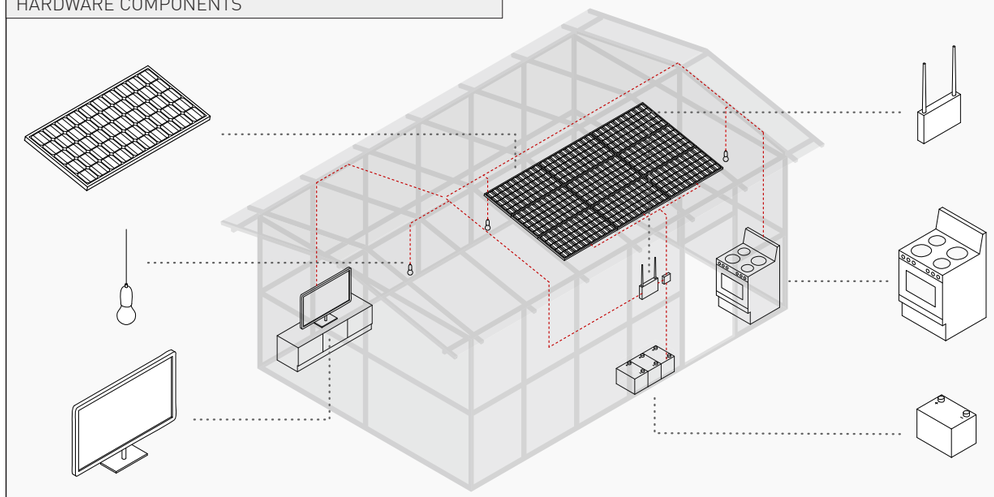
Still underrepresented in cities, this system might be an alternative to the tedious process of infrastructural expansion in the remote parts of Nairobi.

I_3 DISTRIBUTED ENERGY PRODUCTION | OPERATION SCHEME

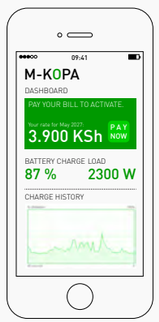
PLATFORM ARCHITECTURE



HARDWARE COMPONENTS



FRONT-END USER



SPATIAL IMPLICATIONS

- ☐ decreased need for full 'formalisation' of informal settlements
- ☐ independence from power cuts can improve security
- ☐ less space needed for large overground electrical infrastructure

8 **I** THE FIBRE KIOSK

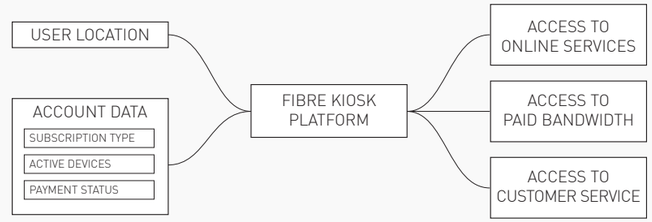
In a digitalising city, access to the internet is becoming an infrastructural requirement as important as electricity and water. While all of Nairobi does now have 4G coverage, mobile data is still too expensive as an alternative to local fibre, only available in parts of the city. In addition, acceess to cheap, unlimited bandwidth is increasingly important for even small businesses.

In Nigeria, iROKO, the local equivalent of Netflix, has set up kiosks in some major cities where their customers can download videos using wifi for free. A similar subscription-based system might be interesting not only as a means of providing entertainment, but fast wifi access in general.

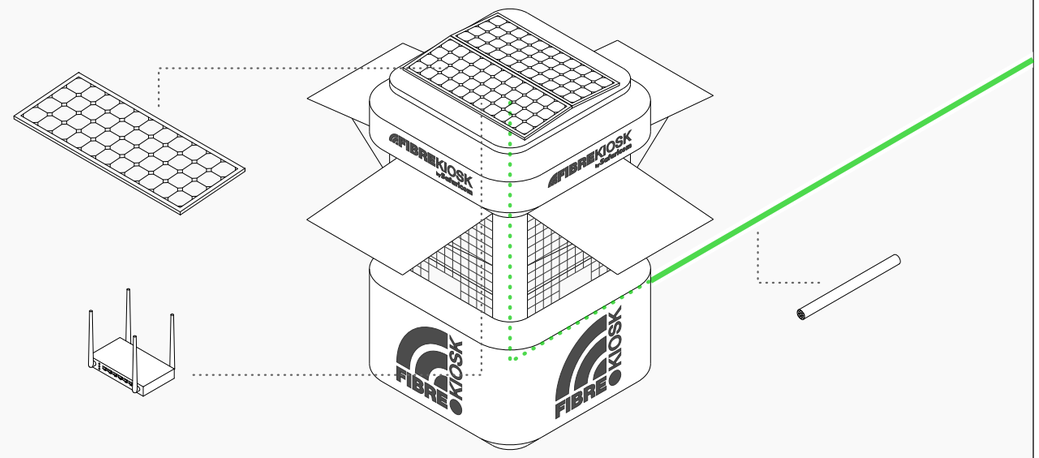
From an urban perspective, these locations might then develop into catalysts of development, concentrating small businesses around its periphery.

L$_2$ THE FIBRE KIOSK OPERATION SCHEME

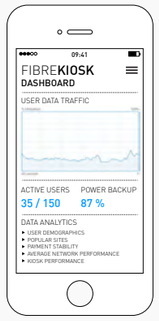
PLATFORM ARCHITECTURE



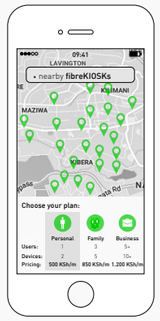
HARDWARE COMPONENTS



FRONT-END OPERATOR



FRONT-END CONSUMER



SPATIAL IMPLICATIONS

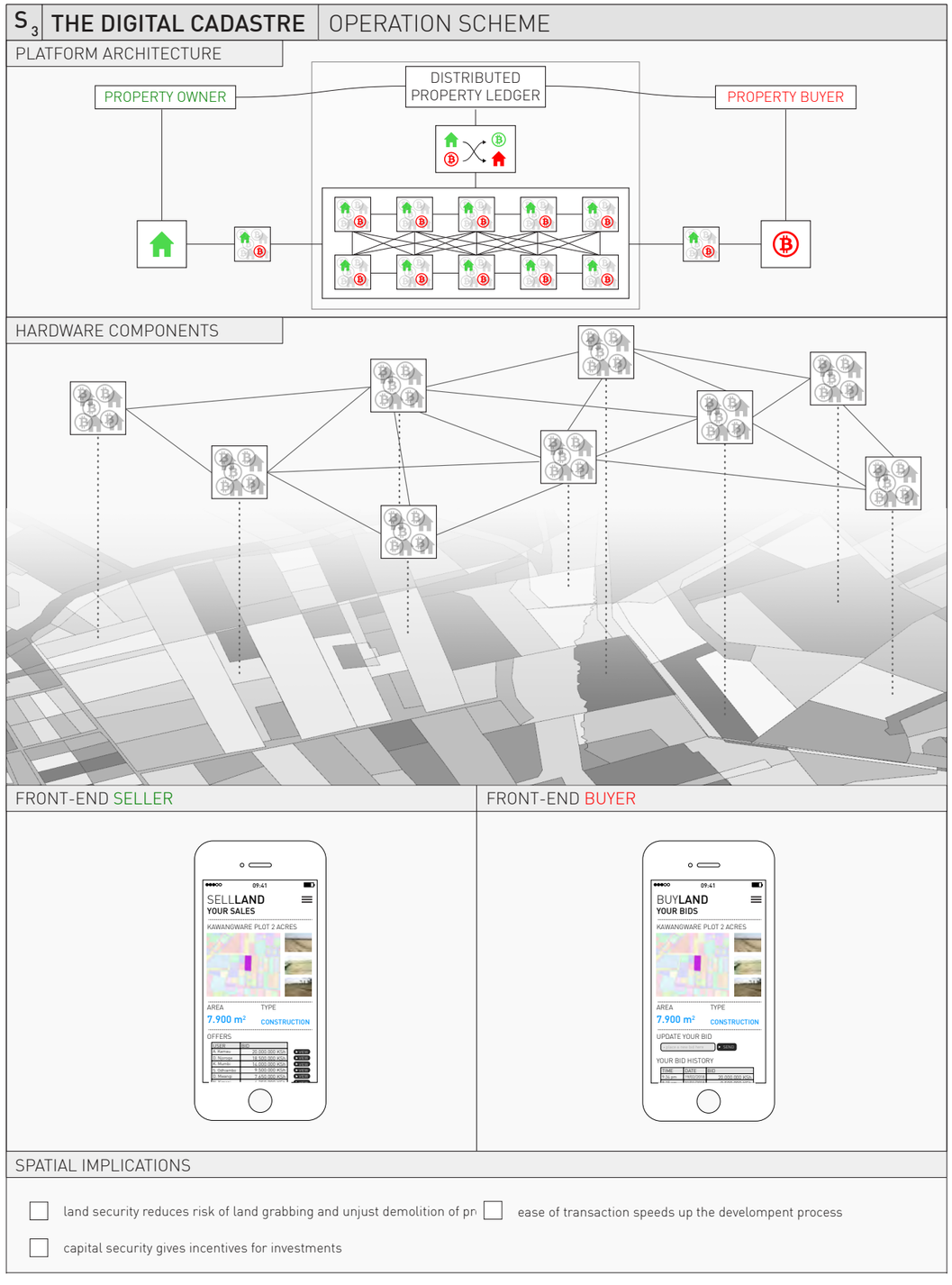
- ☐ basic infrastructurak grid for provision with fibre
- ☐ no direct penetration of households in areas with informal structure
- ☐ clustering of small scale businesses around kiosks
- ☐ increased property development activity in direct vicinity

9 | THE DIGITAL CADASTRE

Land grabbing and insecurity of land ownership is probably the most crucial issue in the urban development of many African nations including Kenya. At the heart of the issue is quite often the corruption of city officials and the police, making it almost impossible to irradicate in countries that, like Kenya, have a history of lack in political will.

Ghana is currently at the forefront of combatting this issue. In cooperation with the start-up bitland, the West African nation is using blockchain technology to transfer its cadastre into a peer-to-peer system. By distributing the virtual cadastre amongst many peers, where it automatically updates itself, third parties are eliminated from the process and fraud is rendered virtually impossible.

As a result, corruption as an essential component of land grabbing practices is taken out of the equation, thus drastically reducing issues of land security.



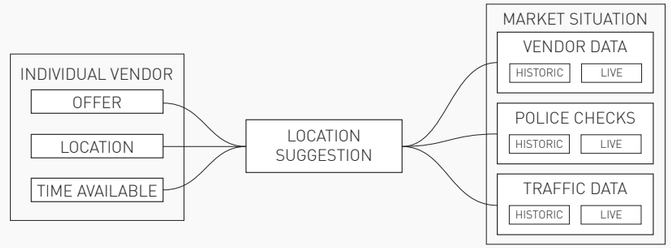
10 **I** THE MOBILE DUKA

In Nairobi fresh produce is still predominantly traded in converntional markets. Increasingly however, the middle class is making use of the supermarkets sprouting up all over the city. Access to the internet could mean the preservation of their livelihood for market vendors.

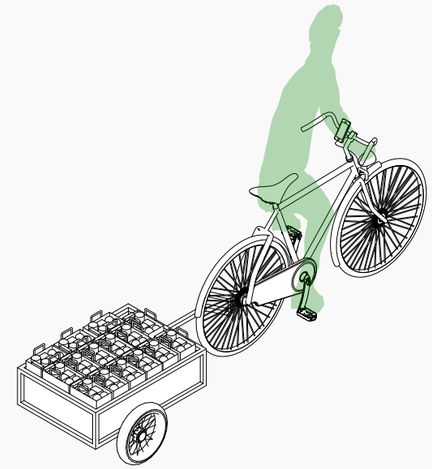
By getting in touch directly with their customers, they can offer customised products and service , meaning not only an enduring income base, but also potential economic growth.

L$_1$ **THE MOBILE DUKA** OPERATION SCHEME

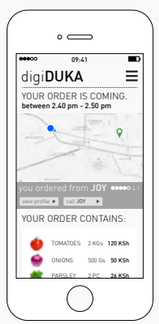
PLATFORM ARCHITECTURE



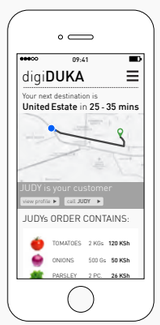
HARDWARE COMPONENTS



FRONT-END VENDOR



FRONT-END CUSTOMER



SPATIAL IMPLICATIONS

- ☐ slow traffic mobility infrastructure
- ☐ secure public spaces and streets
- ☐ easy access to unplanned neighbourhoods
- ☐ increased need for 'borrowable' and 'appropriable' space

CHAPTER IV:

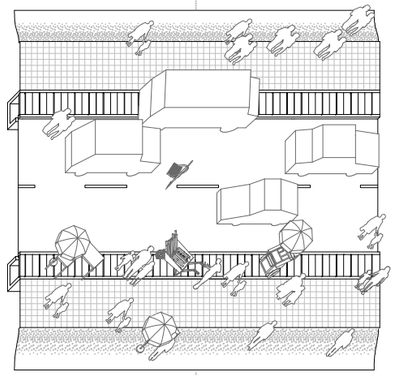
BECOMING

or

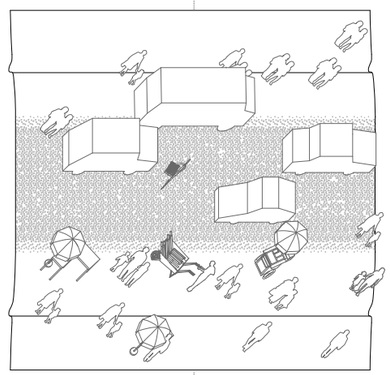
how to reinterpret Nairobi as an African metropolis







OVER-DETERMINATION



ANARCHY

image retrieved from https://www.kura.go.ke

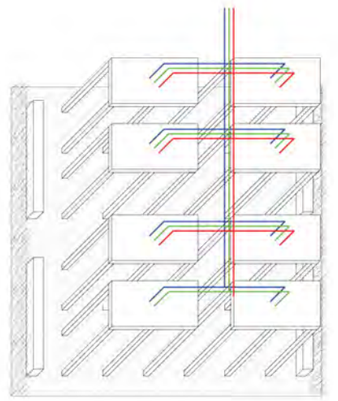
DESIGN FRAMEWORK | HARD & SOFT SPACE

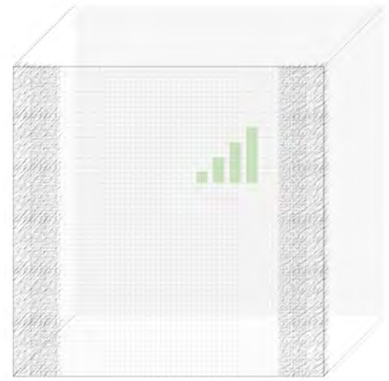
In a framework of non-deterministic, dynamic zoning, conventional design approaches cannot do justice to the complexities of its daily use. Even worse, public space in Nairobi is currently dominated by either a complete over-determinacy of the streetscape, segregating it according to conventional patterns of use or by a complete lack thereof in the unplanned parts of the city. Obviously neither one is an answer to the spatial challenges of the city.
Instead this project proposes a set of typologies capable of mediating between the need for both dynamics in appropriation and stability of use. Every use of public space in the city is therefore not translated into a single spatial response but into a range of solutions, dependant on specific local indicators. The one end of this range is defined by hard space. These iterations of space are applied in conditions where pressure on space is particularly high. Soft space is the flexible counterpart to hard space and applied in situations where the public realm needs less regulation.

DIGITAL SPACE AND PHYSICAL SPACE

The differentiation between hard and soft space would usually imply the contrast of a strongly defined space with an anonymous, ultimately flexible open space. However, in light of the continuing digitalisation of cities, this physical duality is contested by non-physical, digital space, codified through data, algorithms and apps. With the advent of augmented reality technology, this information is increasingly spatialised creating opportunity for the creation of digital space, distributed to the public through services like Google Maps, Streetview etc. Drawing on this development, each typology includes elements of digital space, creating affordances that would normally only be apparent to long-term, intuitive users of public space in Nairobi. By consequence, the legibility of space is increased in the whole streetscape without sacrificing its dynamic capacity.

HARD SPACE vs. **SOFT SPACE**





PHYSICAL SPACE vs. **DIGITAL SPACE**

ORDER vs. **LAISSEZ-FAIRE**

TOP DOWN vs. **BOTTOM UP**

STREETS

TRAFFIC

BUFFER

THRESHOLD

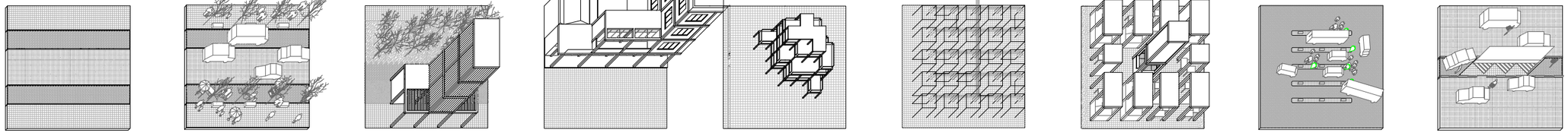
NODES

INFRASTRUCTURE

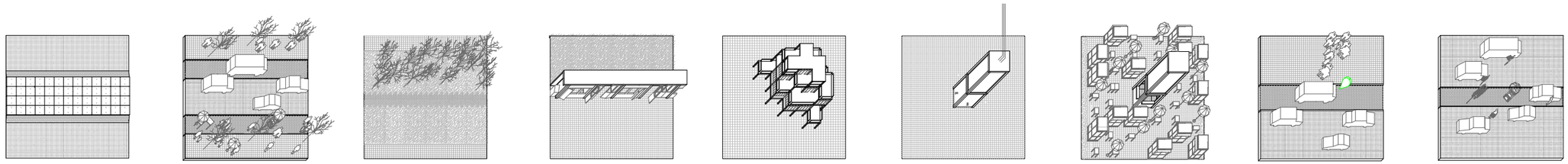
MARKETS

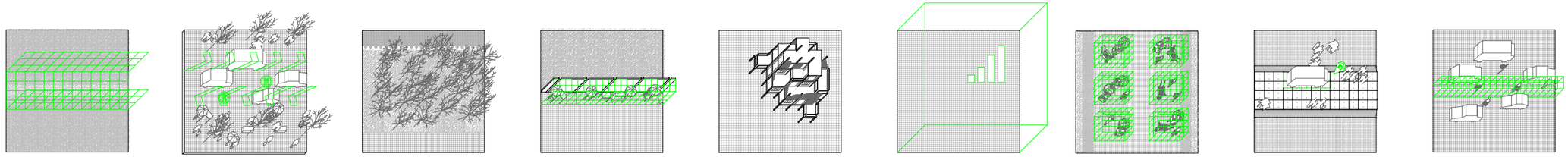
TRANSIT

HAWKERS



SOFT SPACE





HARD SPACE

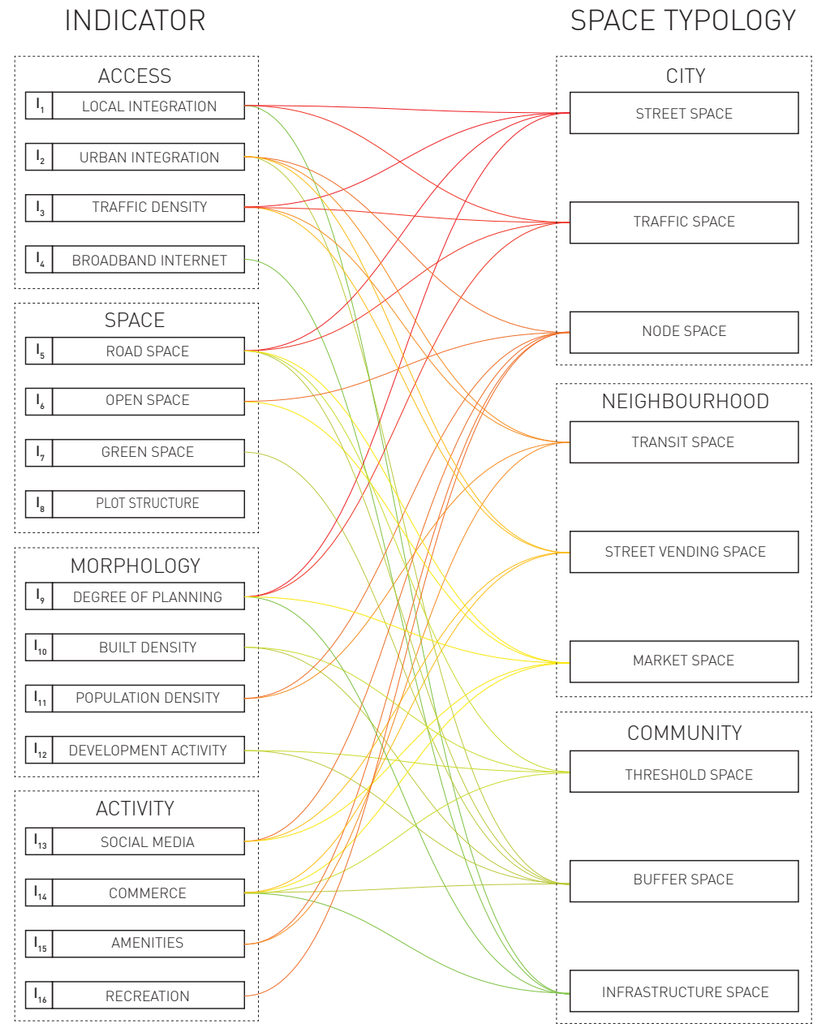
LARGE SCALE

SMALL SCALE

ALLOCATING PATTERNS

In the existing framework of public space, Nairobians use space based on their intuition. This intuition is of course founded in common knowledge that every arrival has to first acquire for themselves. While this circumstance is first and foremost a problem for arrivals to Nairobi, it also proposes challenges for any designer attempting to address the dynamic use of public space in the Kenyan capital.

Again, it is the process of digitalisation that saves the day. Crowdsourced data, global geocoding projects and big data now make it possible to reconstruct the tacid knowledge used by every vendor, matatu driver and commuter using data. At the same time, this statistical knowledge makes it easier to allocate the typologies determined over the last chapter to a precise situation. The diagram on the opposite page gives an indication of the relations between statistical indicators and spatial typologies. The following spread gives an overview of the indicators used in the design process.



ACCESS



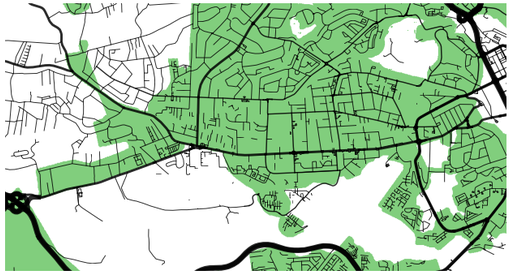
Global Integration | Space Syntax



Local Integration | Space Syntax



Traffic Density | Google Maps



Broadband Internet | Safaricom

SPACE



Road Space | Columbia University



Open Space | Google Earth



Green Space | Google Earth

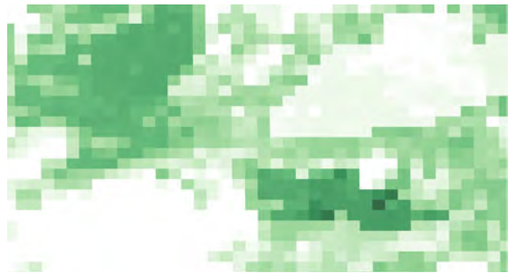


Plot Structure | Columbia University

MORPHOLOGY



Built Density | Columbia University



Population Density | Global Human Settlements Layer

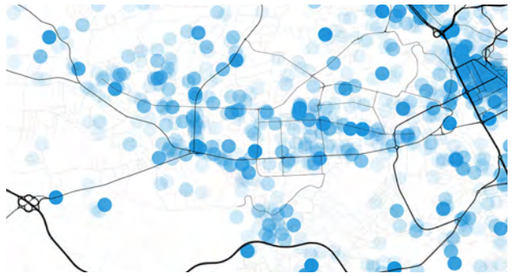


Development Activity | Global Human Settlements Layer



Degree of Planning | Githara et al.

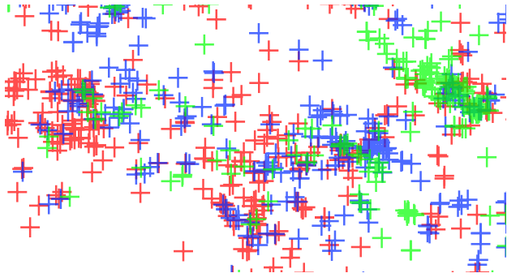
ACTIVITY



Social Media | Twitter



Commercial Activity | Google Places



Amenities | Google Places



Recreation | UN Habitat

STREET SPACE

In the most general sense, a street in Nairobi is not necessarily a street, even it terms of form. In fact, today a large proportion of streets in the city remain unpaved, creating issues during the biannual rainy season. Other 'streets' are not more than tracks driven regularly by commuters trying to avoid congestion. Of course, this wide spectrum needs to be accounted for.

SOFT

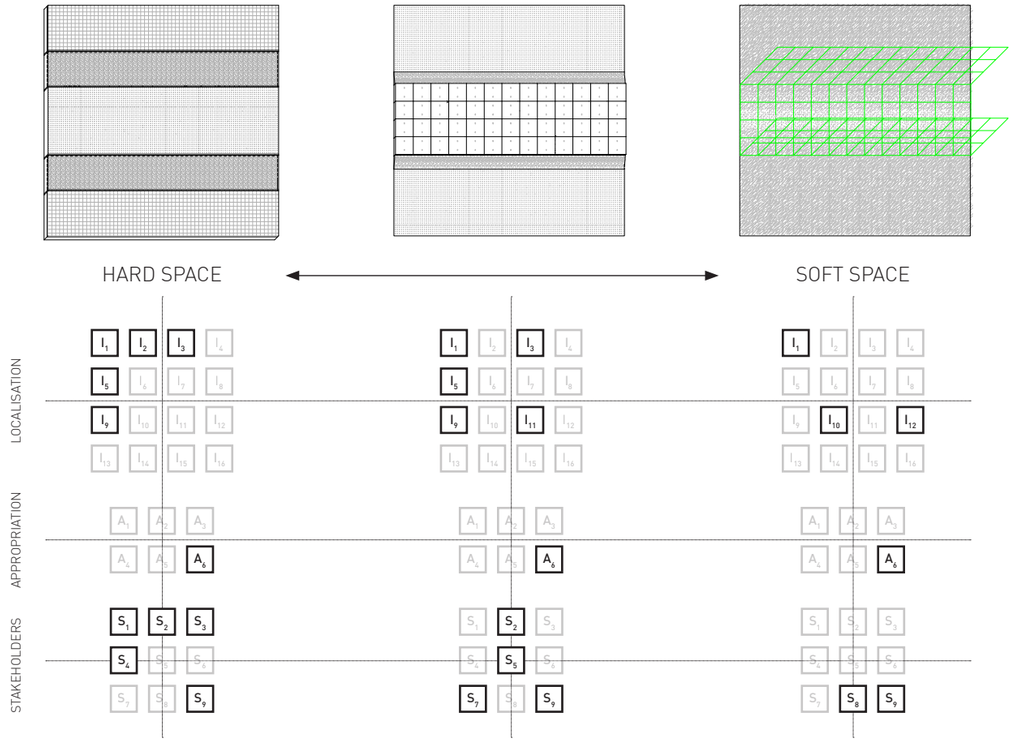
While not streets in the most conventional sense, simple tracks form a considerable part of Nairobi's infrastructure. However, as they change over time, they are not used to their full potential. Adaptive tracking of these paths and their visualisation in augmented reality codify the tacit knowledge on these infrastructures for the general public.

MEDIUM

The chance of infrastructural upgrades in areas not directly linked to the main arteries remains a problem for many communities in the lower middle class. While the construction of paved streets is an expansive issue that is difficult to tackle without government intervention, prefab concrete slabs, used as temporary roads in construction, can give communities ignored by government spending the opportunity to upgrade their infrastructure by private initiative.

HARD

Making up the core of Nairobi's streetscape, these streets are fully planned and built by the government, in some instances in partnership with private companies. The spatial development is based on the street's individual need and capacity to absorb local spatial dynamics (see traffic space).



TRAFFIC SPACE

Even though most of Nairobi's main arteries have now been formalised into conventional streets, most Nairobians still use it in complete disregard for curbs, markings and signage. A one-lane road will turn into a four-lane highway during rush hour and traffic lights are only effective with the assistance of a real-life cop. By consequence, traffic space in Nairobi has to be more adaptable to its dynamic use.

SOFT

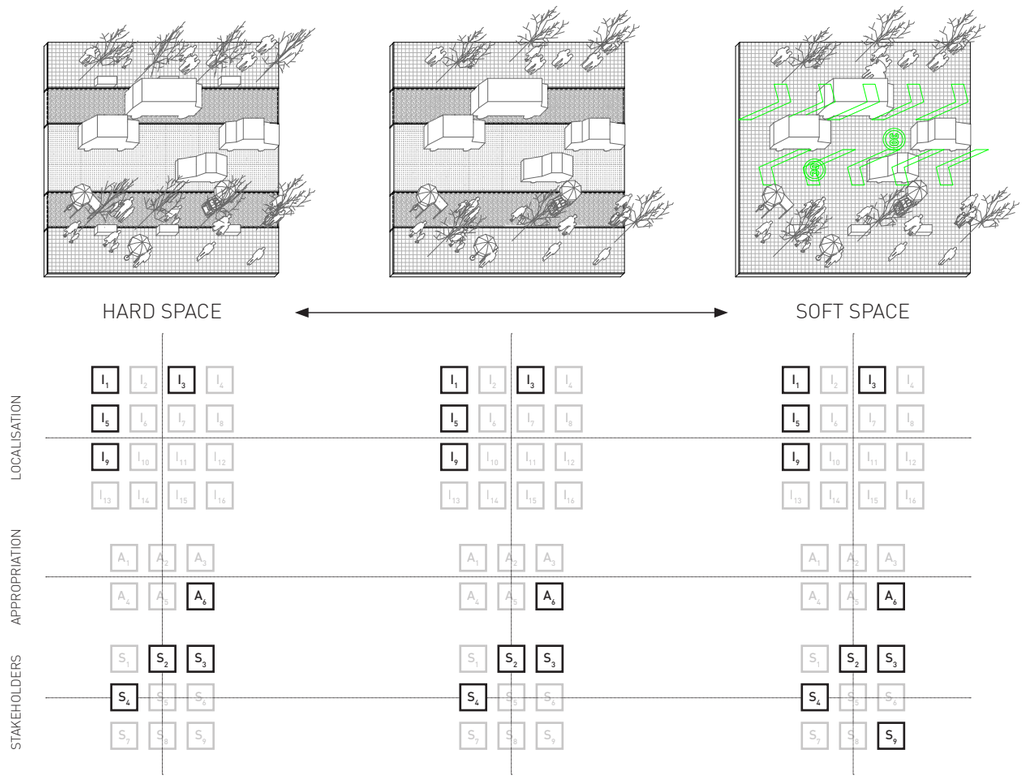
In a wide majority of streets in Nairobi there is still no separation between the different streams of traffic, resulting in an open, fully flexible street layout. Augmented reality, informed by traffic data and other factors, can guide traffic in situations that would otherwise seem unclear while driving in this kind of space.

MEDIUM

In wider roads with average traffic density a buffer space between motorised traffic and pedestrians improves the adaptive capacity of space, while creating a safe distance between pedestrians and cars. The open pavers additionally replace the storm drainage, which are currently designed as ditches collecting garbage and posing a security threat to bikers and pedestrians alike.

HARD

In areas of particularly high pressure in terms of traffic, physical barriers between the buffer space and the pedestrian space prevent an over-spilling of motorised traffic. Not merely curbs, these objects simultaneously work as urban furniture. Trees and other vegetation can also serve as one of these elements.



THRESHOLD SPACE

The demarcation of private land by fencing it is an integral part of Nairobi's urban tradition. However, the value of a barrier facing high-intensity space is not being used to full potential. By consequence, there is different ways of activating the threshold, based on both the character of private and public space in the specific location.

SOFT

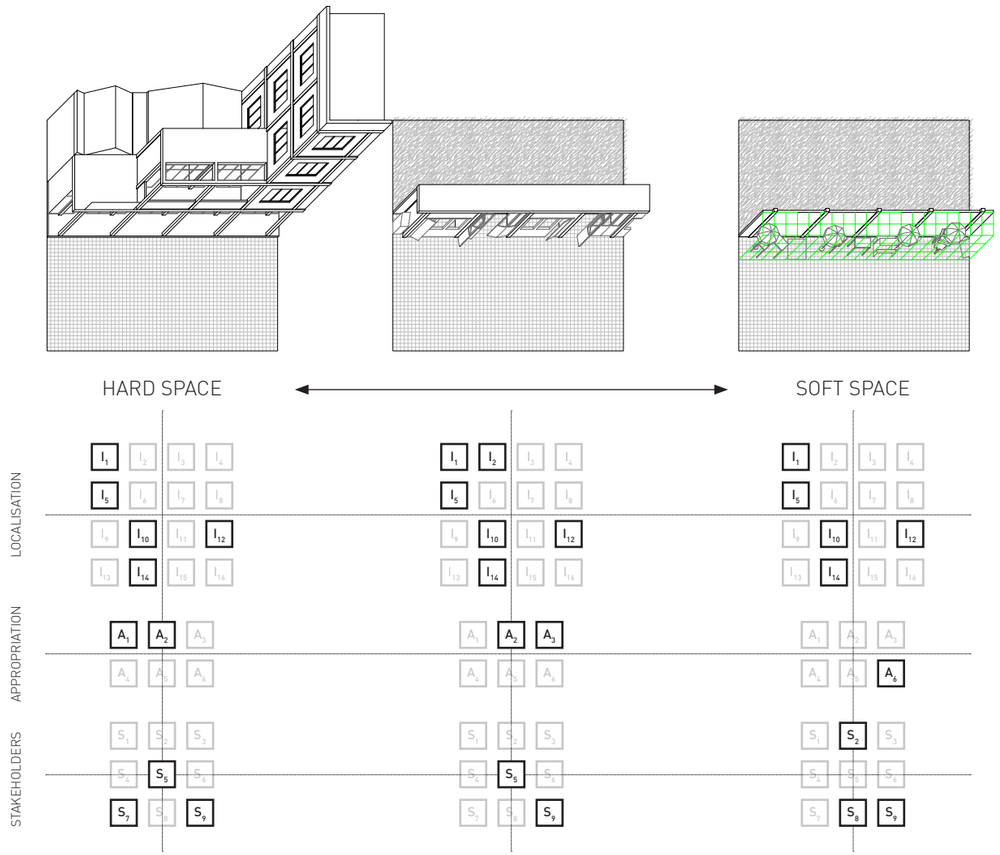
In areas of low usage intensity and little means of investment a simple wall, as opposed to hedges or fences, provide the most flexible and simple means of providing appropriable space. Unless the owner of the property can provide valid arguments to the contrary, an area must be demarked digitally for temporary, free use by individuals.

MEDIUM

In areas of low built density and high use of public space owners of property shall build a double wall, allowing the creation of small shops and offices facing public space. Provided to individuals though a lease, they provide an additional income for the landowner while activating public space. Owners may choose whether to provide a mere shell for individual appropriation by the user or a fully finished stall.

HARD

In areas of both high built and usage density, it is most profitable to connect private estates and public space. The extension of the wall into an arcade is the ideal archetype of creating a permeable threshold between the public and the private. The construction of an arcade may allow the owner of the property to encroach on public space, giving them more room for development. At the same time, it provides a transition between an unplanned use of land and conventional construction.



BUFFER SPACE

In the ample streetscape of Nairobi, land grabbing is an issue also in the context of public space. Private developers tend to encroach on public space while redeveloping plots, thus making public space unusable for the general public. By consequence, a range of buffer typologies can prevent encroachment in areas of high pressure, while giving space for public appropriation.

SOFT

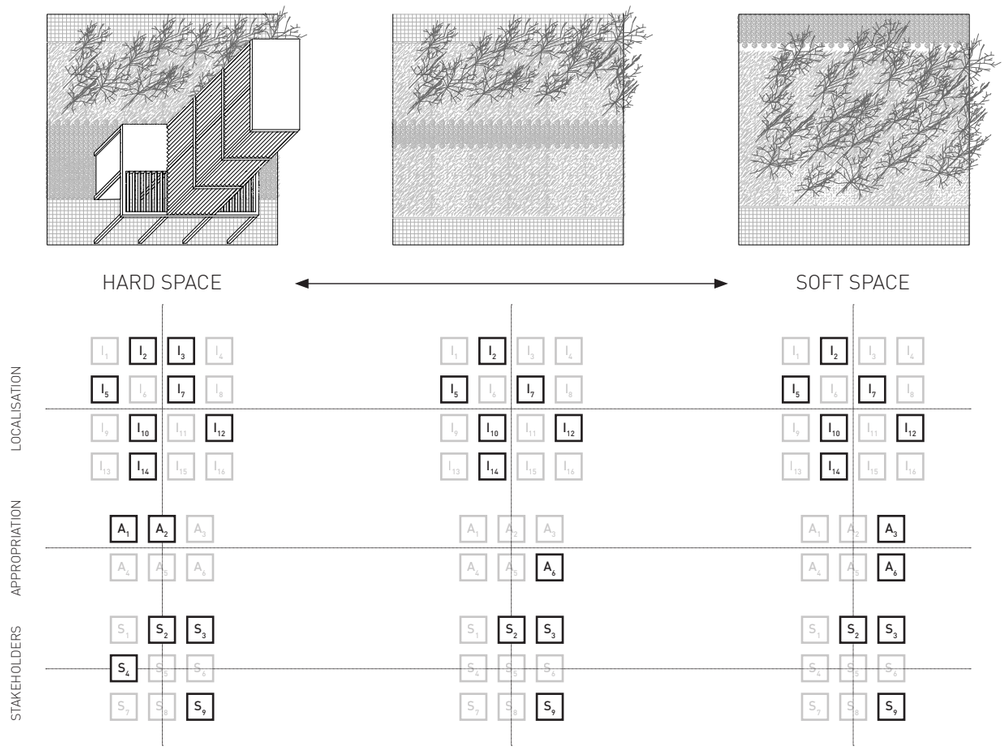
In areas of low usage and little risk of private development space can be left open. Leases to roadside nurseries can support the maintenance of green and little investment in space is needed on part of the public.

MEDIUM

In areas of higher usage and with higher risk of land grabbing, a fragmentation of buffer space into commercially appropriable areas and green areas will make the land less attractive for private investors. In turn, government has to invest more to create pedestrian paths and appropriable space.

HARD

Where pressure on public space is highest, fragmentation is not enough to prevent permanent appropriation. Commercial activation, making public space more profitable will decrease pressure on space. Through a land lease, private investors are allowed to build on space close to (pedestrian) traffic by means of a leasehold. The shape of the typology allows not only commercial use but can also be used as advertising space, which is a profitable source of income along major traffic corridors.



TRANSIT SPACE

The prevailing and growing use of matatus in the city of Nairobi makes the question of dedicated transit space depart from global conventions. Because of their flexibility, matatus have to be able to unload and pick up passengers at virtually any spot in the streetscape by consequence, it is not bus stops that have to be designed, but public space appropriable by matatus.

SOFT

In areas of low traffic density and lack of differentiation between pedestrian and road space, stops will be announced digitally to passengers and users of public space. The location will be published to digital space through data provided by the digital matatu application.

MEDIUM

In areas of higher density of use, matatus will use the buffer zone between road and pedestrian space for loading and unloading. The pavers used in this buffer space are structured to prevent its use as road space at anything higher than walking pace, leaving it free for appropriation unless there is congestion. The buffer space is part of the public investment in roads.

HARD

Even in Nairobi some locations work as central nodes in the decentralised transit system. In these locations, used by urban, regional and long-distance services alike a simple physical structure guides bus driver while at the same time leaving it open for appropriation during events or times of low usage. The terminal space is part of the public investment in roads.



NODE SPACE

While public space in Nairobi is expansive, it is limited. Especially because of its decentralised nature, this means that in central locations appropriable space can be a rare commodity. By consequence, densified, vertical appropriable space at central nodes is an essential component in making dynamic public space work in the city. However, one can still differentiate in degrees of flexibility and appropriability depending on the node's location and hierarchy.

SOFT

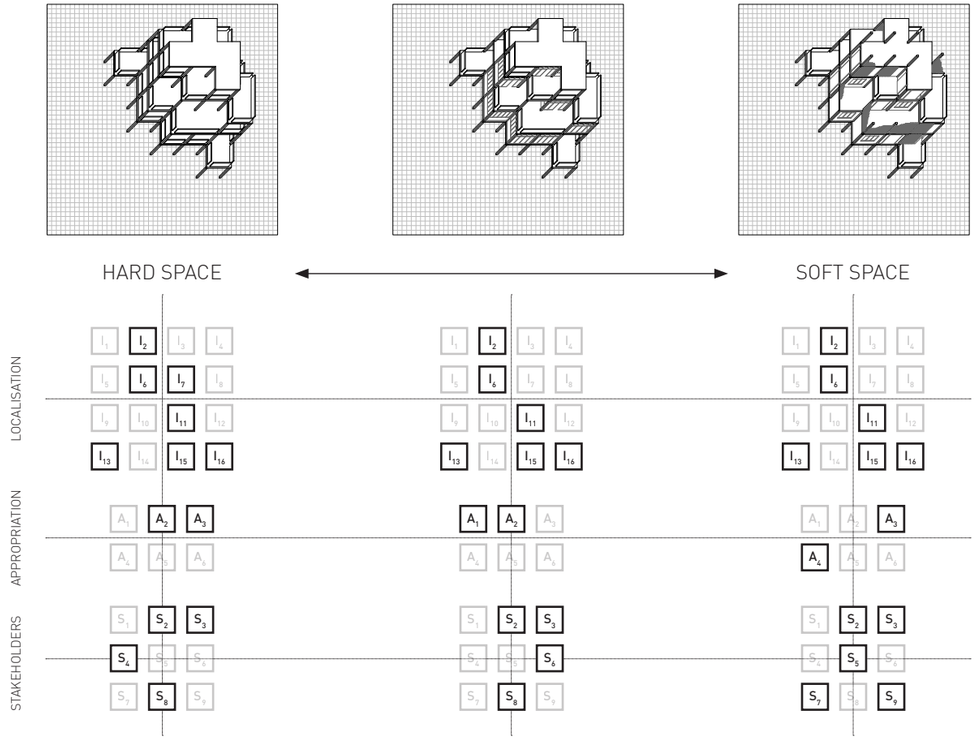
In less central, less planned contexts, commercial activity is usually characterised by a strong dynamic. Hence, nodal space in these areas has to be flexibly appropriable to account for these dynamics. A spatial frame is provided through government investment and administered by an elected local board. Space in the structure can then be temporarily used by the residents in the area.

MEDIUM

In these contexts, demand for space will be higher demanding more stability in its use. Occupants may erect permanent structures in the node in dialogue with the other occupants. As the chances for high ROI are comparatively higher here, locals can come together in SACCOs (Kenyan cooperatives) to construct and operate the space in exchange with the local authorities.

HARD

In the most central of locations the degree of definition in the node is also the highest. Occupants rent readily-made stalls or shops which they may then modify to suit their individual needs. Due to the size of these nodes, PPPs of larger private companies and local government could operate these nodes at both high profitability and in coherence with public standards.



INFRASTRUCTURE SPACE

Access to services is one of the main inhibitors of growth in using public space productively. The introduction of the smartphone is currently already challenging this limitation. However, businesses need access not only to social media and messaging, but also to water, electricity and perhaps most importantly, cheap broadband. By consequence, infrastructure has to be provided in public space, in relation to demand and pressure on public space.

SOFT

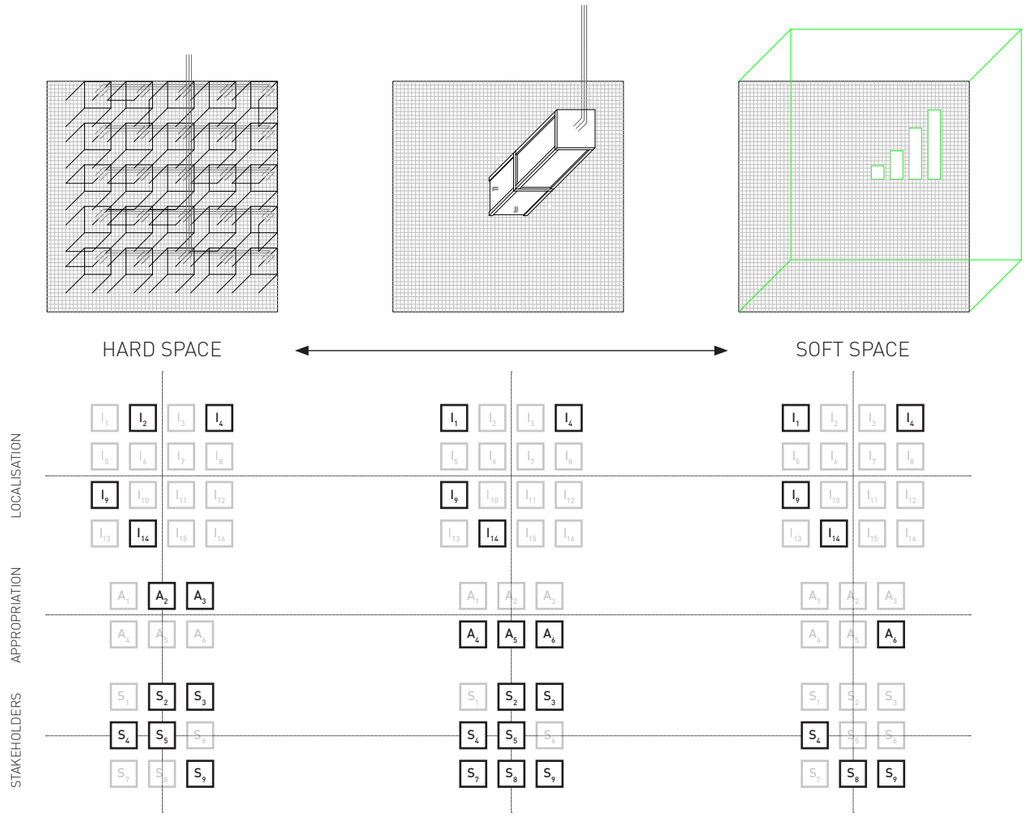
In soft infrastructural space, services are provided on an ad-hoc basis. Due to a lack of usage intensity it is most efficient for the individual to provide for themselves, meaning a reliance on mobile data, water tanks and portable solar cells.

MEDIUM

Here, there is sufficient demand for an investment into services. A central kiosk, built and operated though a franchise model provides Wi-Fi, water and electricity to users through a subscription model. A subscription gives the user access to services at all locations throughout the city and gives privileged access to the appropriable areas surrounding the kiosk. The development is financed by the franchisee.

HARD

Where permanent physical structures are provided for appropriation, the developer may choose to provide individual access to services.



MARKET SPACE

One of the core functions of Nairobi's streetscape is trade. Whether it is fresh tomatoes, newspapers or leather jackets, there is virtually nothing that could not be bought from the city's ubiquitous vendors. However, most of them still rely on improvised, unstable infrastructure and a lack of access to services. Codifying these small markets int space will therefore crate opportunities of becoming for an important part of Nairobi's Jua Kali sector.

SOFT

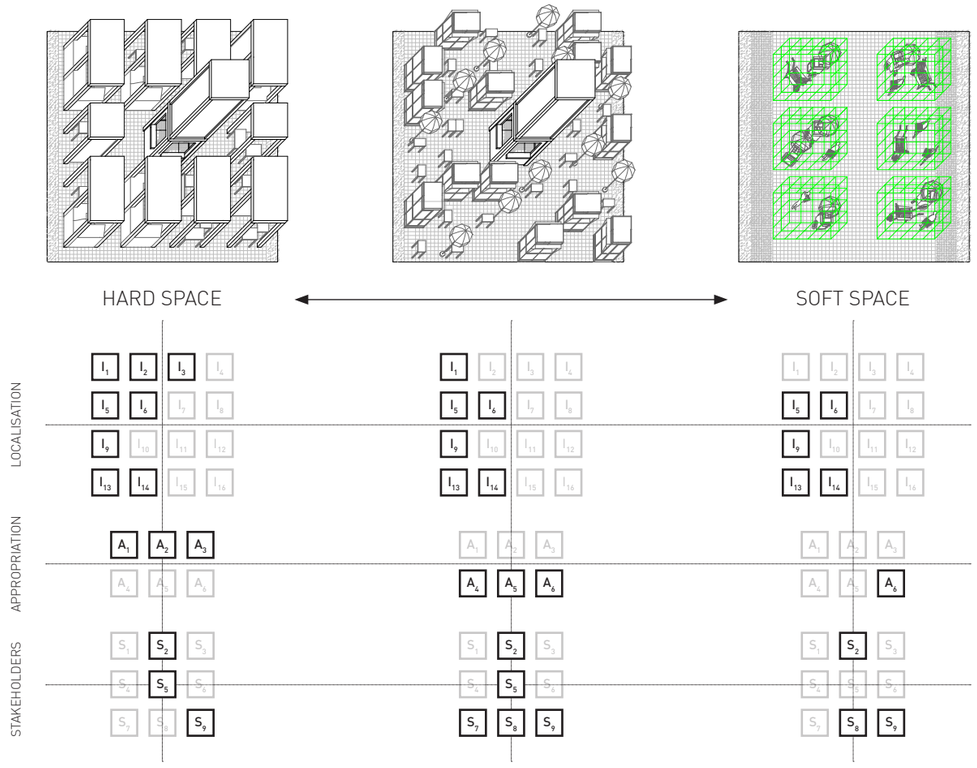
Representing the existing framework of vending, soft market space addresses those needing flexibility in location. Services are provided on an ad-hoc basis. Data from fellow vendors advises the user on optimising their location to maximise profit.

MEDIUM

Here, there is sufficient demand for an investment into services. A central kiosk, built and operated though a franchise model provides Wi-Fi, water and electricity to users through a subscription model. A subscription gives the user access to services at all locations throughout the city and gives privileged access to the appropriable areas surrounding the kiosk. The development is financed by the franchisee.

HARD

In addition to the services provided in medium-hard space vendors can lease and appropriate a permanent stall, giving them enhanced business prospects.



VENDING SPACE

Street vending is an interaction between motorized traffic and its surroundings that is highly dynamic. Because it depends on the low velocity of a traffic jam, it can occur at any place in streetscape and at almost any time. But as there is patterns in the dynamics of traffic, one can easily differentiate between public space in need of hard and soft street vending space.

SOFT

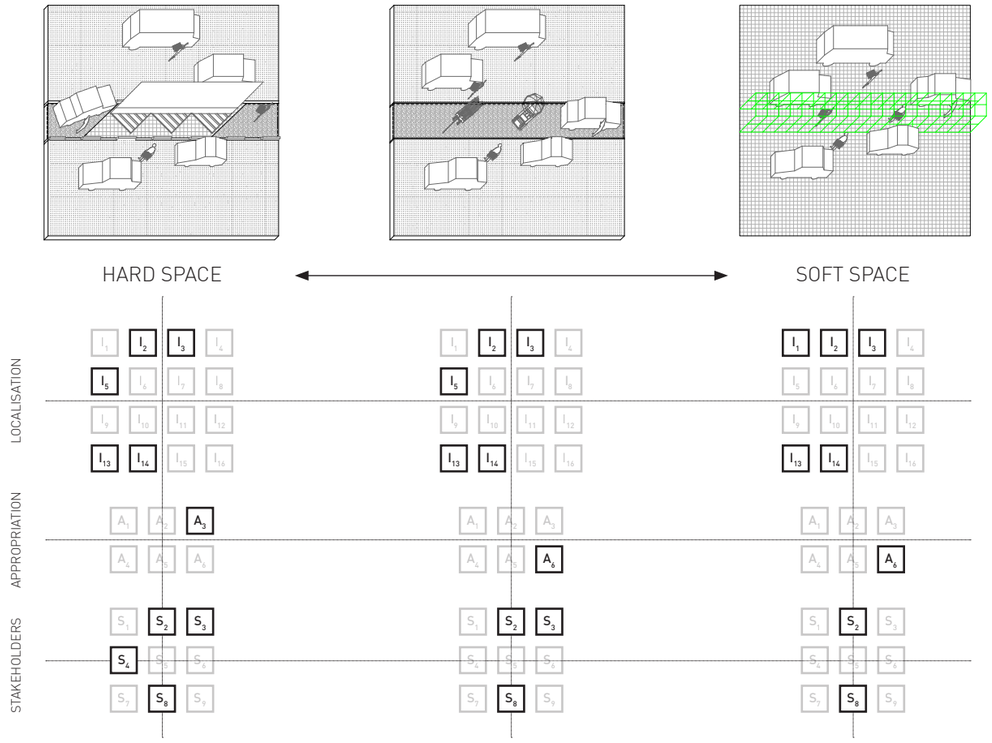
Can occur at any point in the streetscape occasionally showing signs of congestion and particularly in areas with soft traffic space. Digital space is provided based on data collected by fellow street vendors using smartphones.

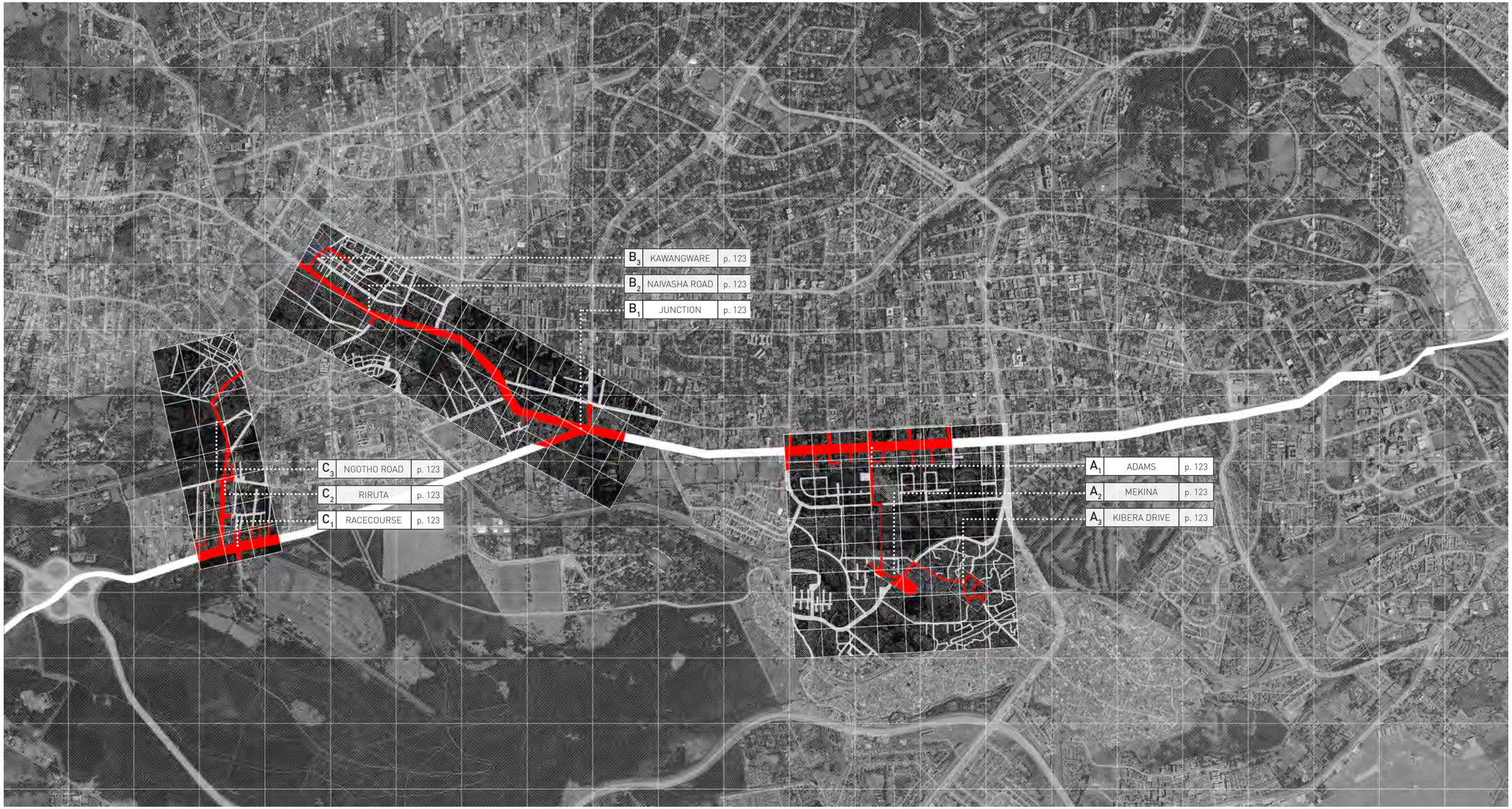
MEDIUM

Intended for areas of high traffic density, requiring dedicated traffic space. Slow-speed pavers in the centre of the streetscape can be appropriated not only by conventional hawkers, but also by small, mobile shops. Space is freely appropriable and developed as part of the government infrastructural spending. Commuters may use the space to halt in traffic while collecting their merchandise.

HARD

In areas of not only high traffic density but also constant congestion, stalls, filled on a daily basis may be constructed to provide commuters with a larger selection of goods en passant. Structures are built by private companies who may use the structure to advertise and are operated by private individuals through a lease. The adjacent space can be used for short-term stopping to restock and pick up ordered goods.




B3 KAWANGWARE p. 123
B2 NAIVASHA ROAD p. 123
B1 JUNCTION p. 123
C3 NGOTHO ROAD p. 123
C2 RIRUTA p. 123
C1 RACECOURSE p. 123
A1 ADAMS p. 123
A2 MEKINA p. 123
A3 KIBERA DRIVE p. 123

DESIGN PROCESS

In a city in which spatial continuity is the exception rather than the rule it is difficult to fall back on proven methods of reading and reshaping space, as they, while all leading to proficient spatial interventions, would eventually fail to capture Nairobi's essential characteristics. This project therefore uses a process combining a variety of methodologies, planning and design approaches to ultimately result in a coherent plan for the chosen case sites. While the opposite page sums up the process, the drawings of the following chapter will expand on both the design process and the resulting plans for each of the case sites outlined on the previous page:.

The case sites for this project were chosen based on two core indices. Firstly, they had to be relevant points of orientation for the wide variety of arrivals coming to Nairobi. Secondly, and perhaps more importantly, they had to somewhat reflect the wide variety of urban realities existing along Ngong Road and Nairobi in general. The cases thus consist of three main sites on Ngong Road each featuring two subsites, expanding on the variety of the site's adjacent neighbourhoods.

TABULA RASA

The first step means looking at public space, or the areas intended to work as such, as void space without any spatial or non-physical constraints to its use. In certain cases, this step has to be preceded by a redefinition of the plot structure and the cadastre, as land ownership remains contested, particularly in the unplanned parts of the city. For ease of process, in these cases assumptions based on the physical structure of the site and the existing plot structure determine the basis for the designation of public space.



1 | status quo



2 | tabula rasa



3 | free flow analysis



4 | dynamic zoning

FREE FLOW ANALYSIS

In a second step the void public space on site is analysed in terms of movement based on its morphology. By taking into consideration environmental factors, such as uses, points of attraction or traffic flow the optimal use for each of the main uses of public space – pedestrian use, traffic use, appropriation for commercial activation and green space – are determined ceteris paribus and then layered, creating an overlapping zoning.

MANIPULATING MOVEMENT

In most cases, the result of the free flow analysis will not match the spatial needs of the site. While less central areas might ask for a more dispersed use of space, central nodes might require a certain amount of bundling and compression to make it usable under real conditions. At the same time, some locations might be under pressure of irreconcilable conflicts of use, requiring manipulation of the natural patterns of appropriation. By adding barriers into the void space, the projected spatial dynamic is therefore manipulated to fit to the specific character of the site in question.

ALLOCATING HARD-SOFT SPACE

Based on this newly established, dynamic zoning, the public realm can now be designed according to the principles and patterns of hard and soft public space. Making use of the data indicators introduced in the previous section and an in-depth analysis of the conditions on the ground, space is shaped according to the demand for contesting and dynamic use of space, space typology by space typology. The result is a definite plan proposing ideal conditions for a dynamic appropriation and negotiation of space.

SCENARIO TESTING

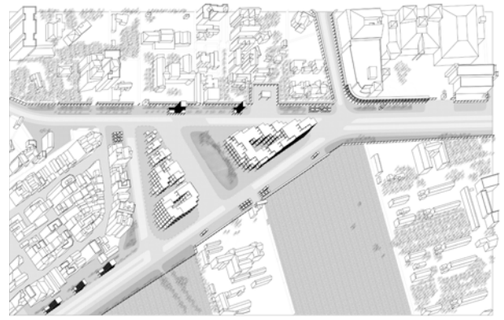
To evaluate the quality of the design in terms of dynamics of appropriation and negotiability different usage scenarios are applied to space. Optimally, the planned space is capable not only of absorbing the daily dynamics of traffic, commercial activity and pedestrian use, but is also capable of transforming its main purpose in favour of other public functions.



5 I determining hard-soft space



6 I master plan



6 I allocating typologies



7 I scenario testing



image retrieved from Google Earth

SITE A | ADAMS | LINKING ECONOMIC STRATA

Named after the city's oldest mall, Adams is essentially located at Ngong Road's threshold between the posh, old neighbourhoods of Kilimani and Hurlingham on one side, and Kibera, the city's biggest and most notorious shanty town on the other. This contrast is mostly visible in streetlife which is dominated by vendors selling anything from mangoes and charcoal to socks and suitcases and the city's famous roadside nurseries. Apart from these vendors, nothing will give the passer-by the impression that a shanty town of more than one million inhabitants is less than 500 metres to one's south.

By consequence, the design focus for this site is on making Ngong Road itself more accessible to vendors from Kibera and on improving the connection to the shanty town on the other. The first of the sub-sites is Mekina, an area currently squatted and used by a series of open air garages. The second sub-site is an intersection at the heart of Kibera, where the settlement patterns change on an annual basis.

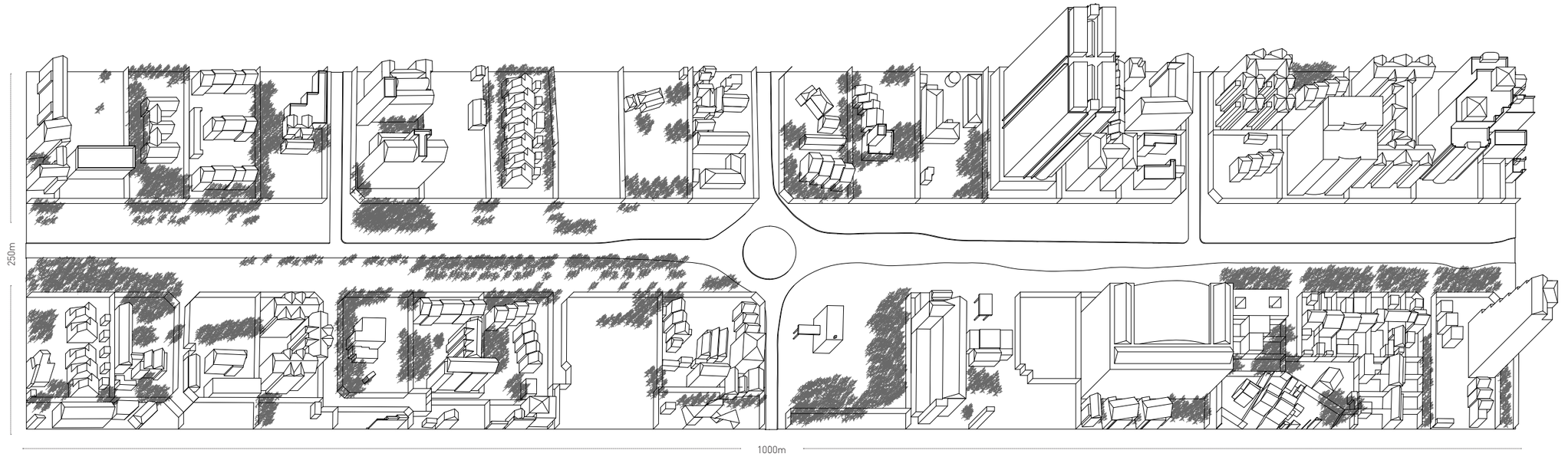


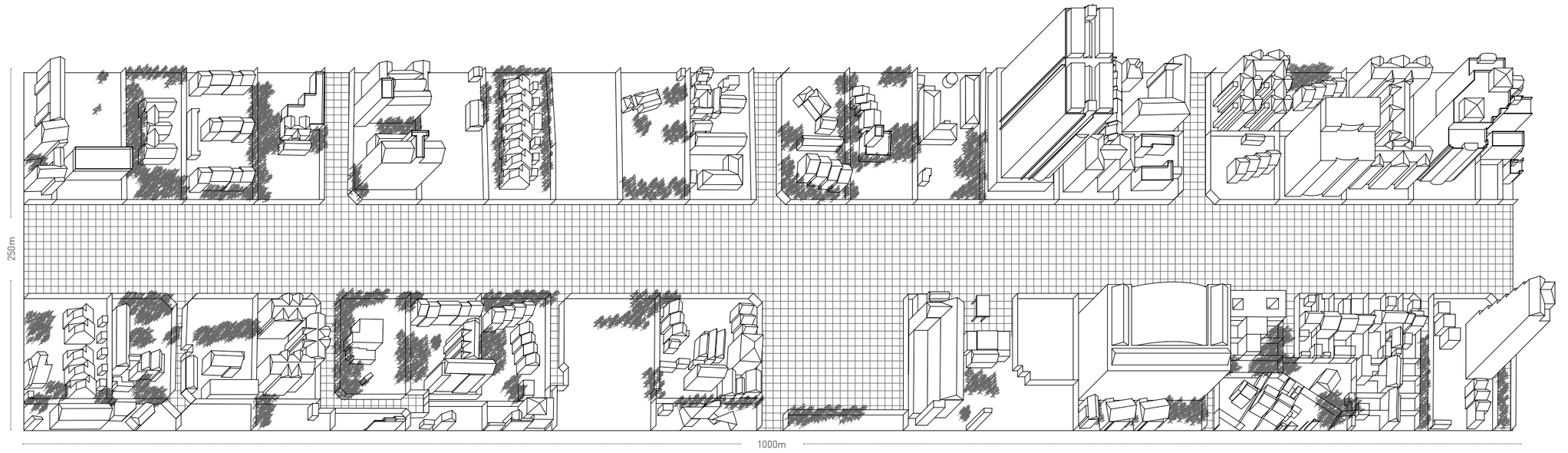
Adams | view towads central Nairobi; open space has ben cleared of vendors for construction

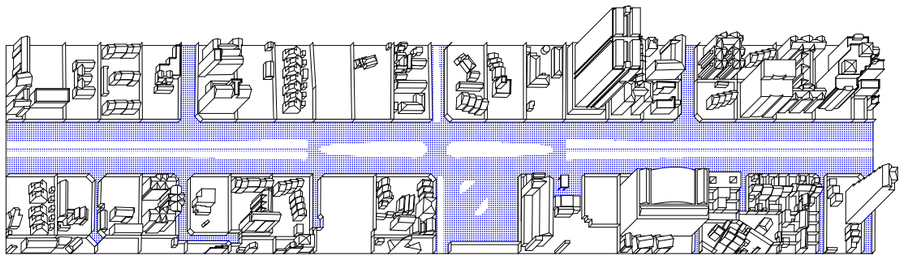


Mekina | open air garage and squatter shacks

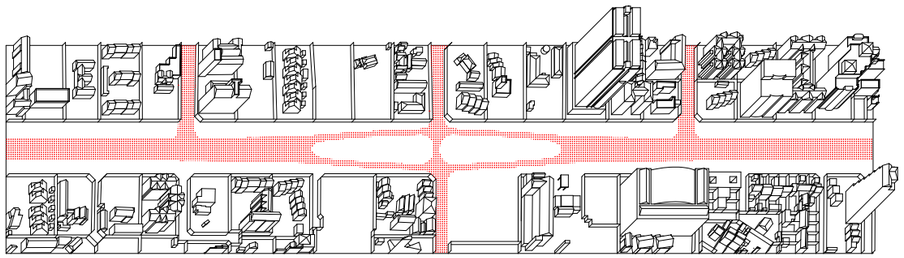
A$_1$ I ADAMS I STATUS QUO AND TABULA RASA





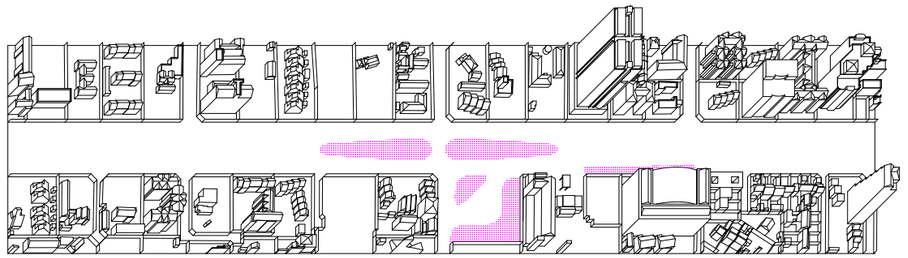


dynamic zoning | pedestrian space

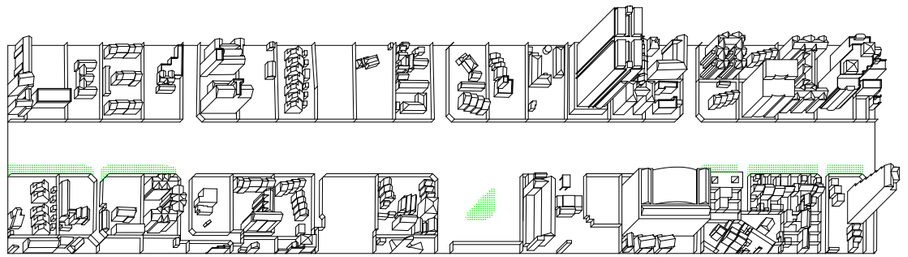


dynamic zoning | traffic space

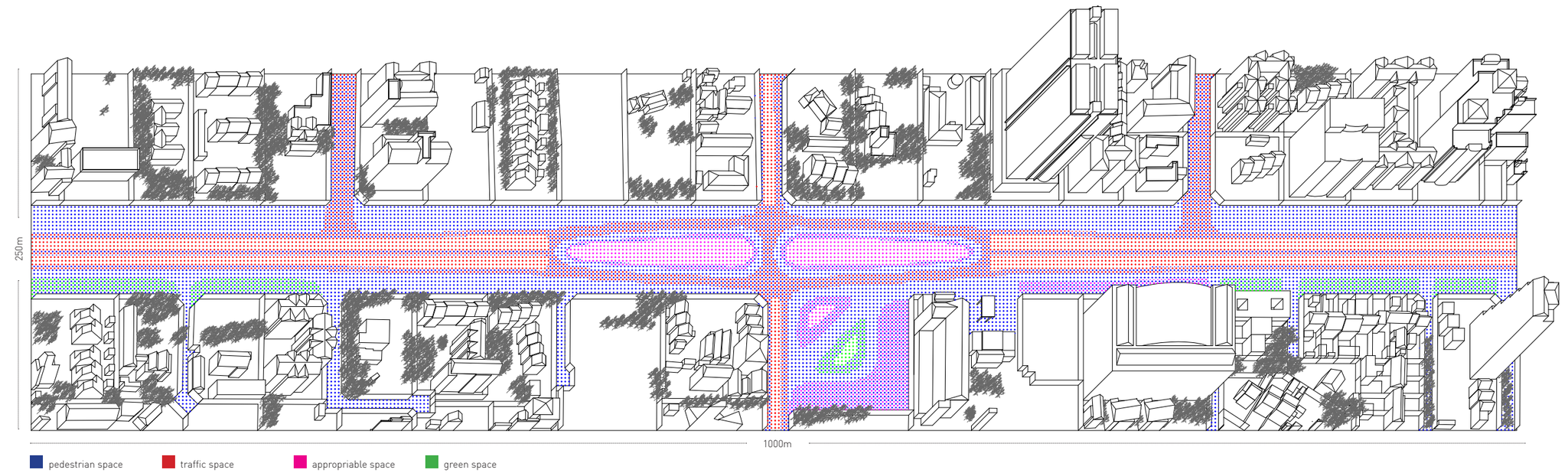
A$_1$ | ADAMS | DYNAMIC ZONING



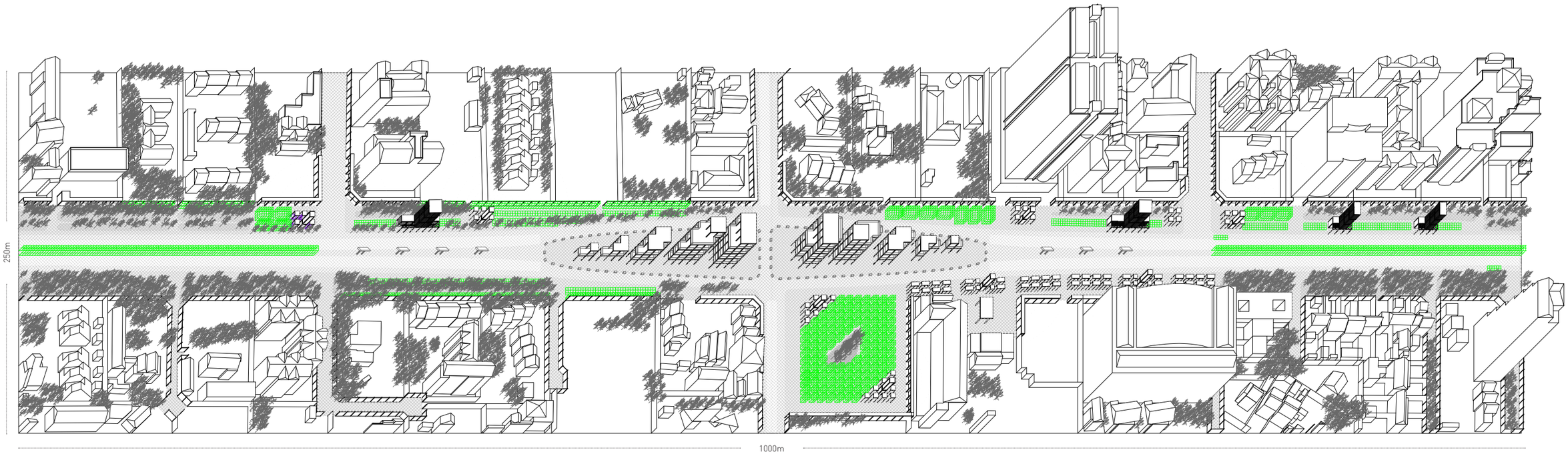
dynamic zoning | appropriable space



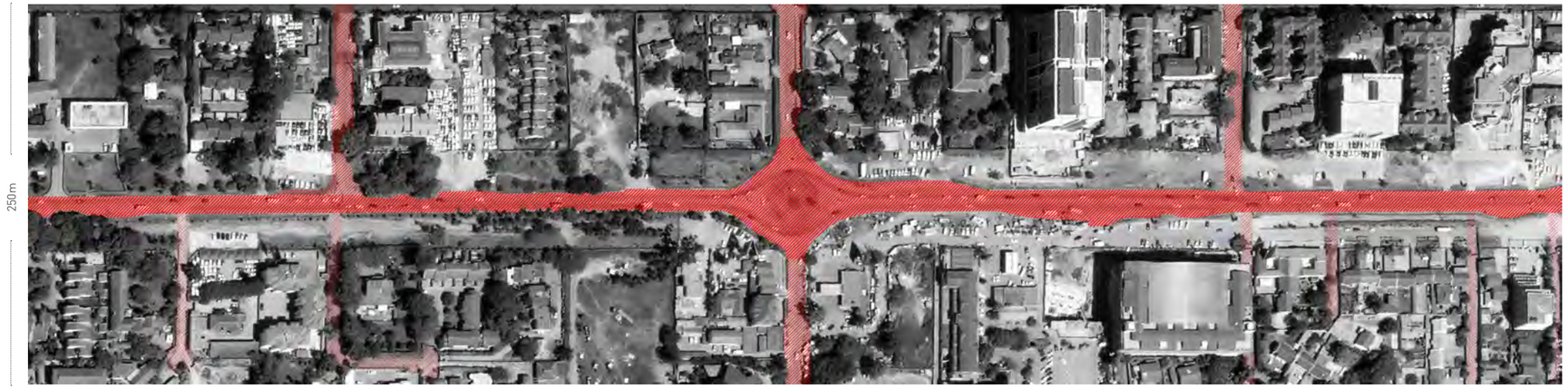
dynamic zoning | green space

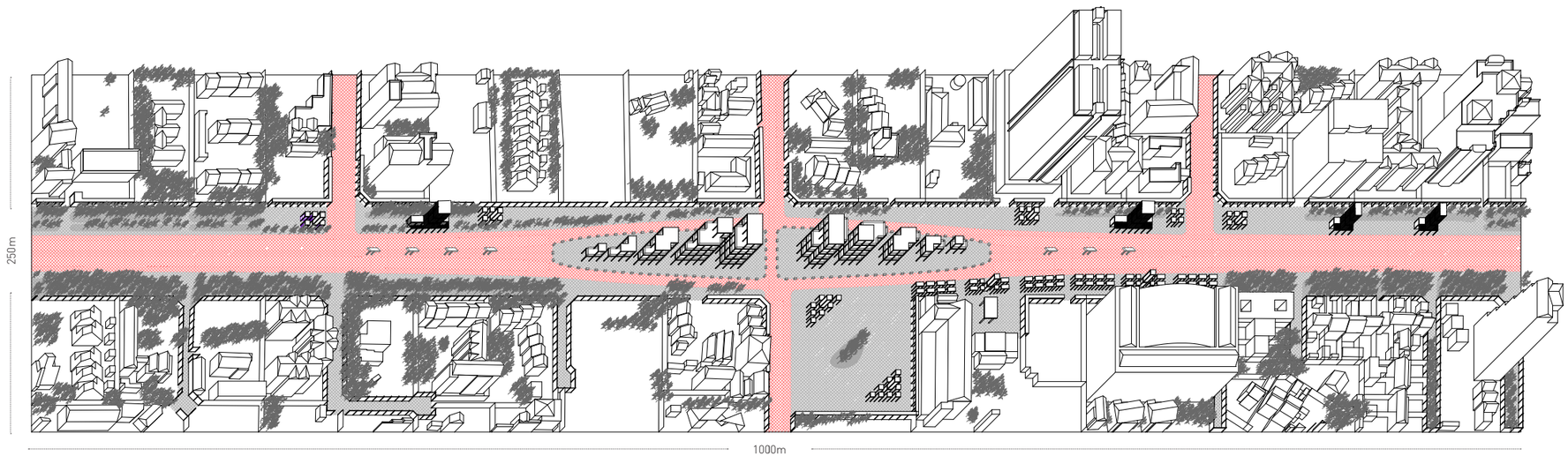


A$_1$ I ADAMS I MASTER PLAN



A$_1$ I ADAMS I TRAFFIC SPACE





A$_1$ I ADAMS I BUFFER SPACE



hard buffer space
based on local indicators

medium buffer space
based on local indicators

soft buffer space
based on local indicators

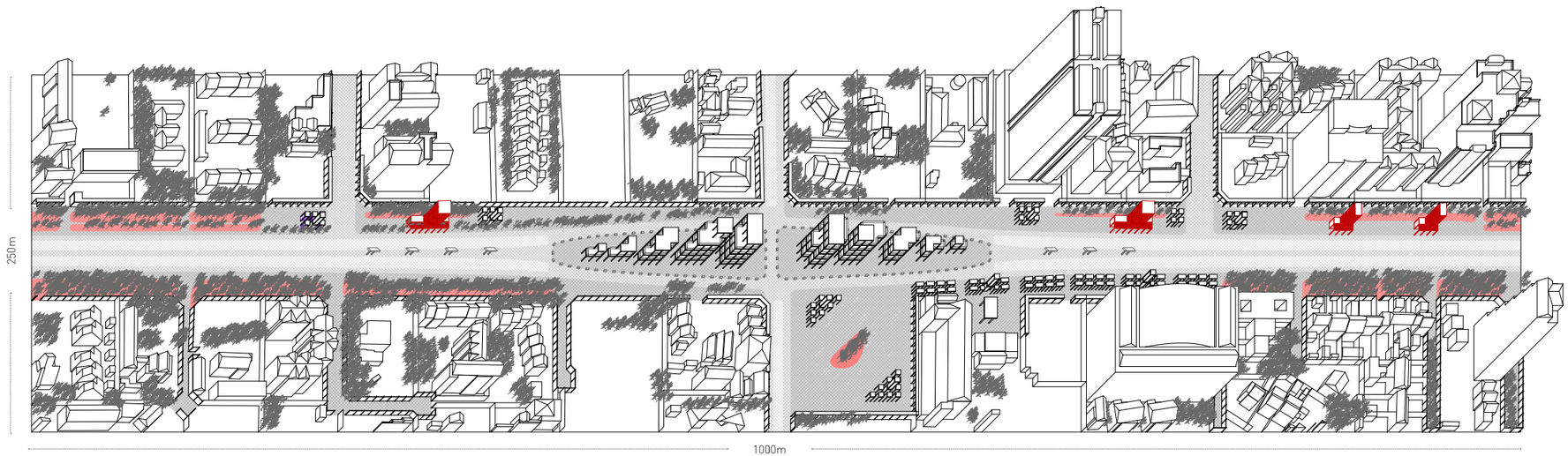


image retrieved from Google Earth Pro

A$_1$ I ADAMS I THRESHOLD SPACE



hard threshold space
based on local indicators

medium threshold space
based on local indicators

soft threshold space
based on local indicators

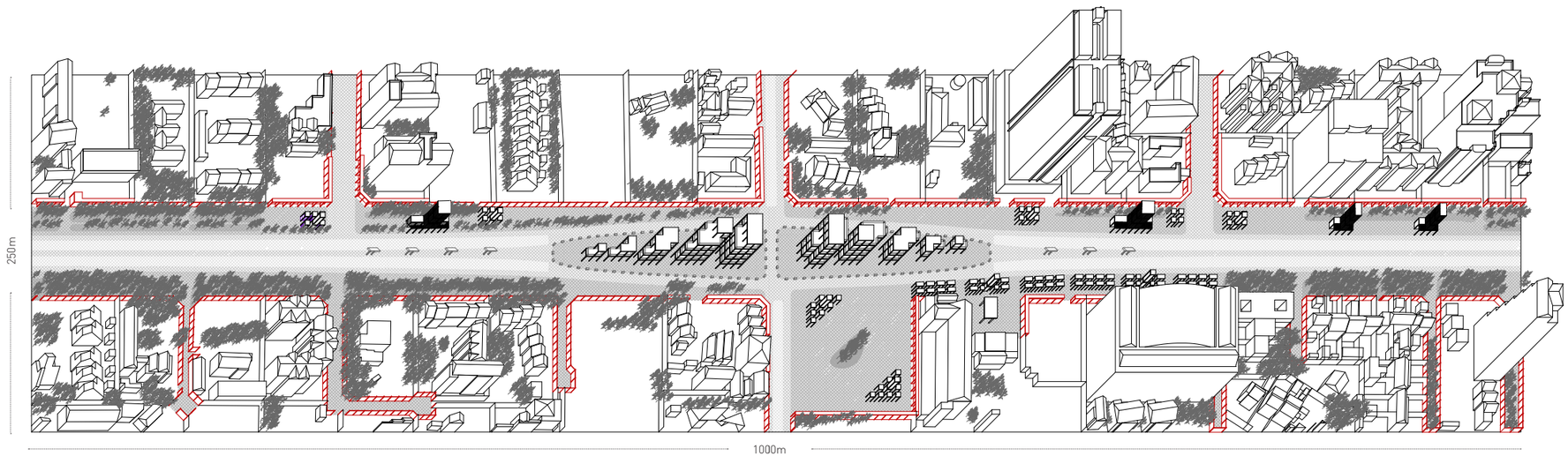


image retrieved from Google Earth Pro

A$_1$ I ADAMS I MARKET SPACE



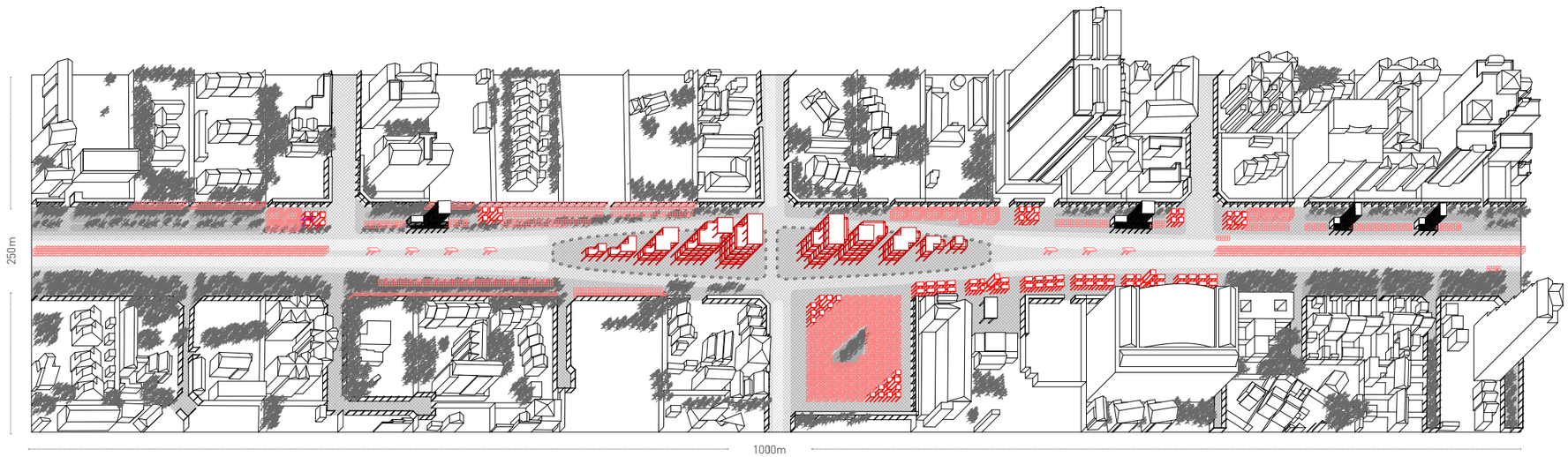
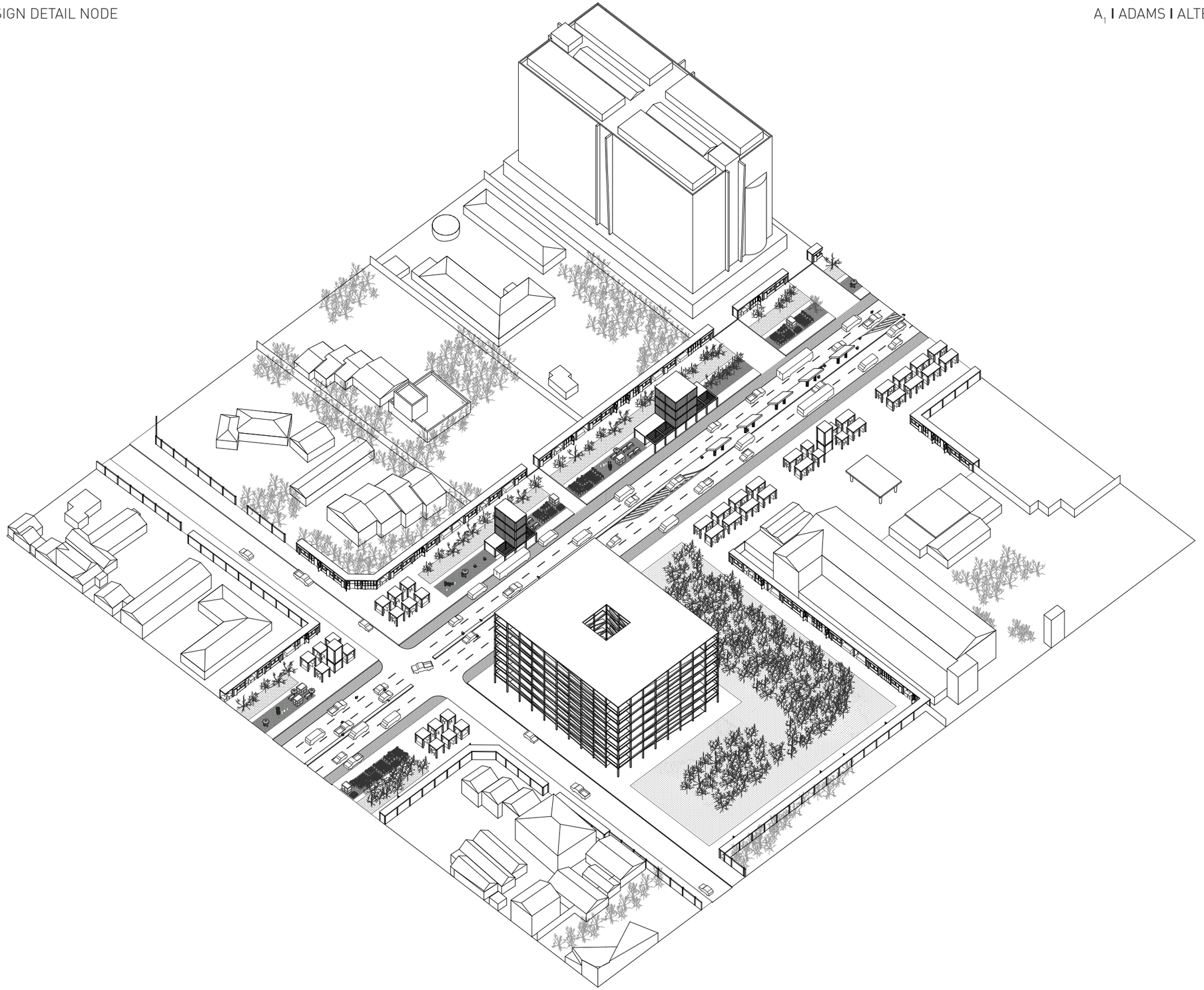
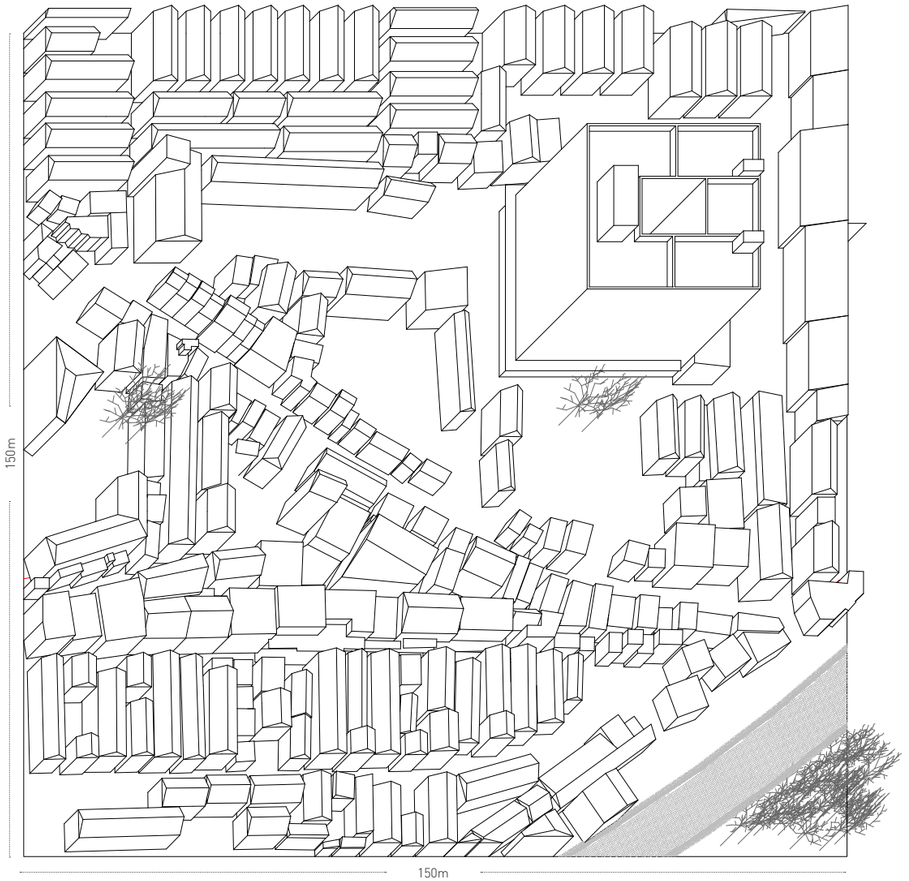


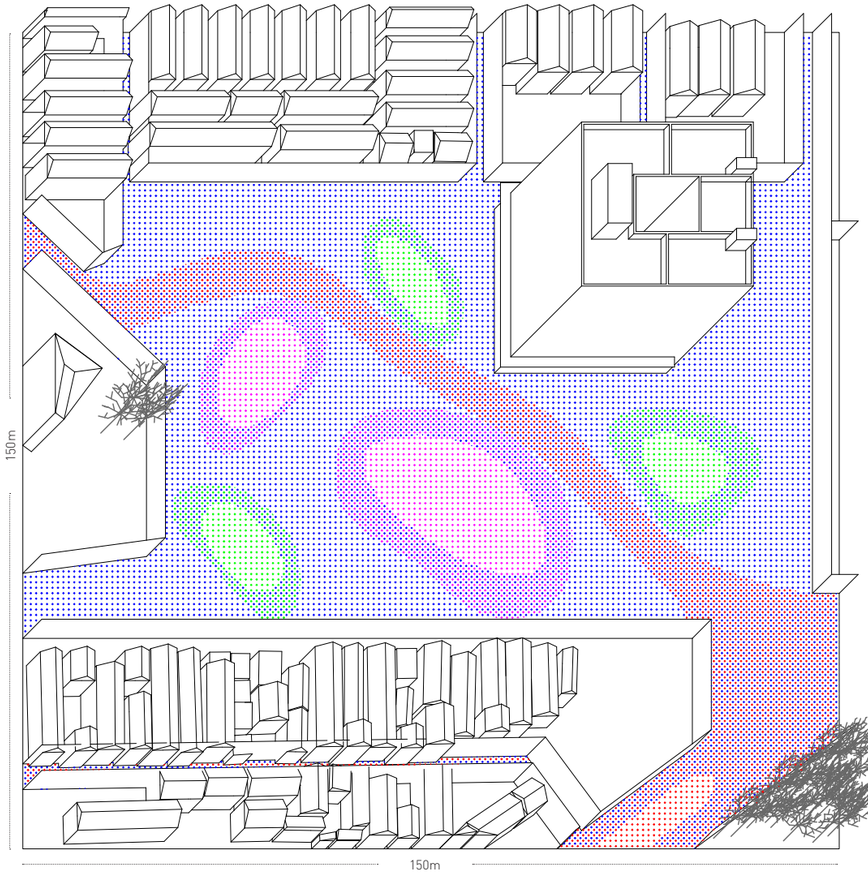
image retrieved from Google Earth Pro

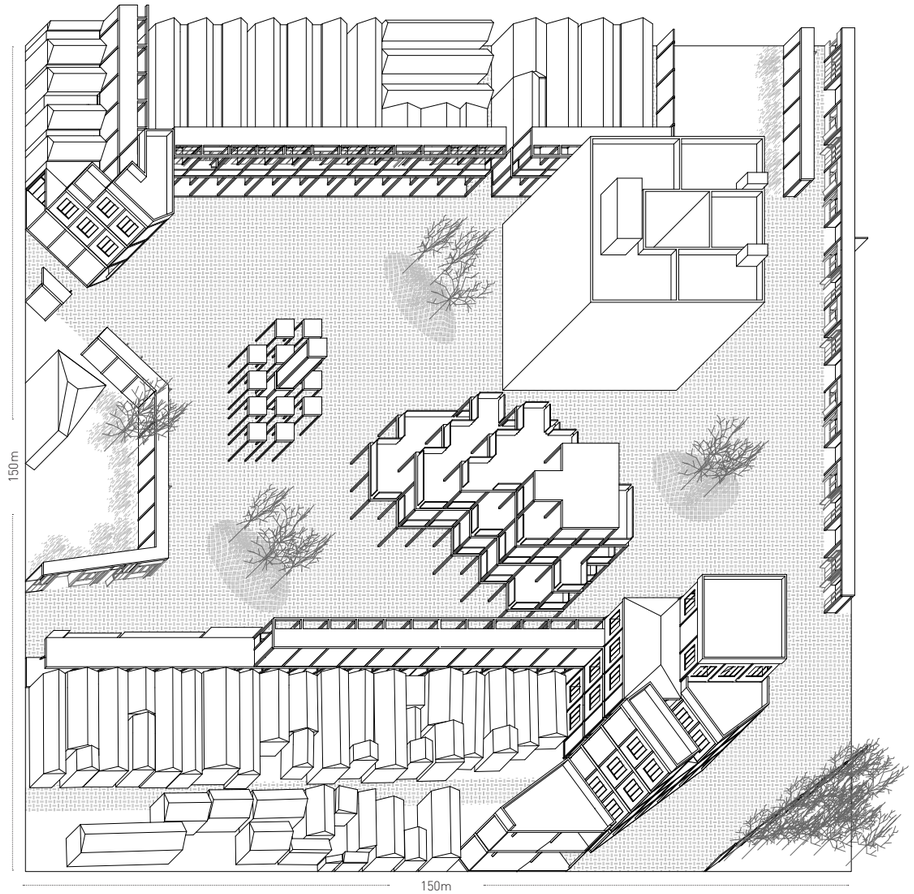
A$_1$ I ADAMS I ALTERNATIVE DESIGN DETAIL NODE




150m
150m


150m
150m


150m
150m
pedestrian space
traffic space
appropriable space
green space


150m
150m

A$_2$ I MEKINA I USAGE SCENARIO OPEN AIR GARAGE



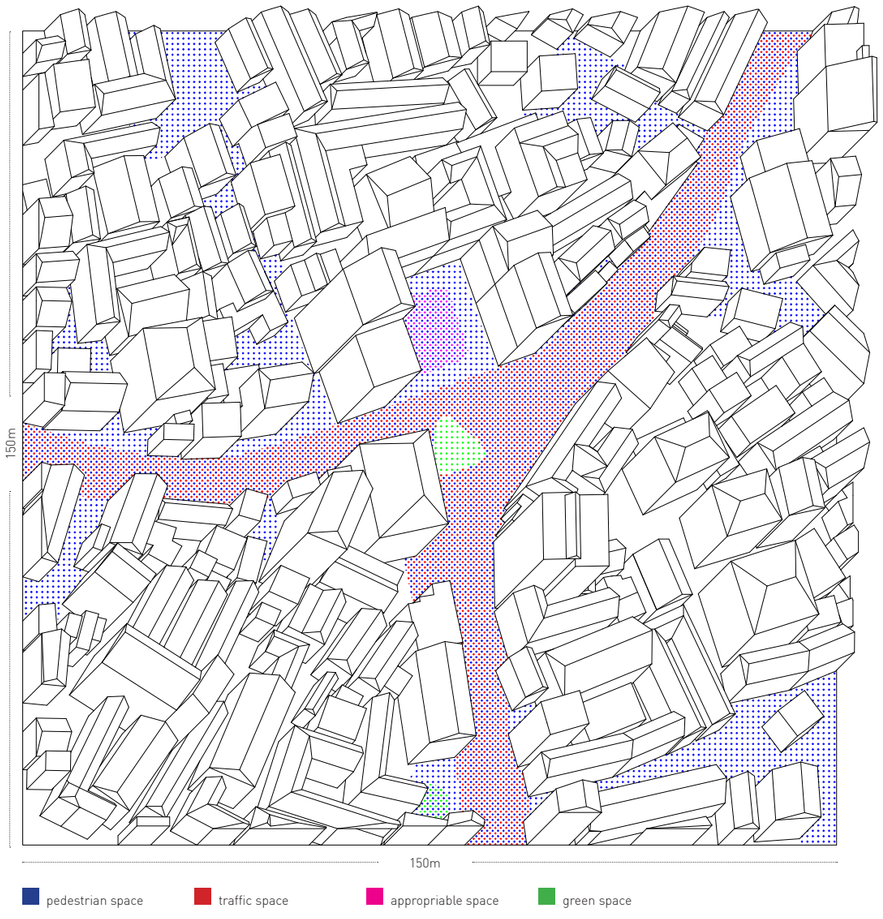
A$_2$ I MEKINA I USAGE SCENARIO MARKET





A3 I KIBERA DRIVE I STATUS QUO





ADAMS - KIBERA B | INTERVENTION



B | JUNCTION



image retrieved from Ramani Geo

SITE B | JUNCTION | A REGIONAL INTERCHANGE

Junction, as its name suggests an intersection of two main traffic arteries in the city has high relevance in the city as a point of interchange, but also as a centrality, as it is located at the threshold between the planned and the unplanned city. By consequence, pressure on public space is extraordinarily high in the area. An expansion of the public realm to include sites currently underused will ease this pressure, at the same time, the dynamics of in space have to be bundled to keep space usable regardless of its density of use.

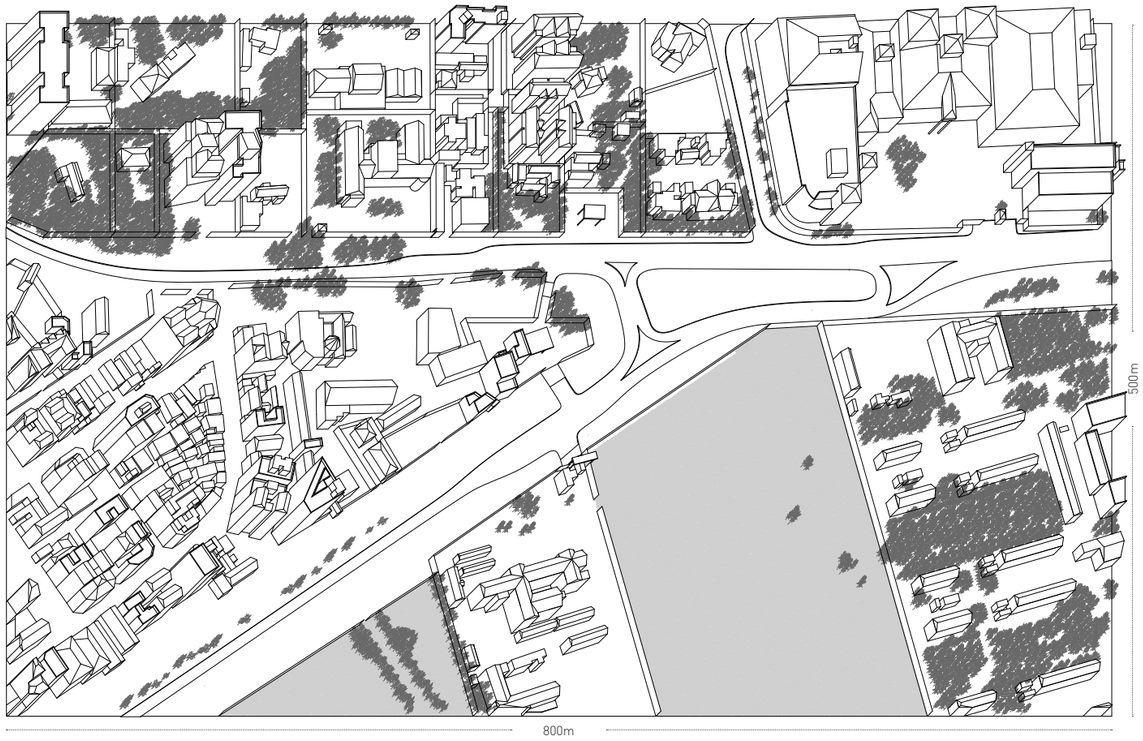
The adjacent subsites, located justoutside of the former city borders are exemplary of the massive sprawl of Nairobi after independence. Initially a shanty town, Kawangware is now increasingly turning into a lower middle class neighbourhood shaped by constant construction, bustling street markets and congested streets. The designs for the sub-sites thus highlight the diversity of Naivasha Road, its main thoroughfare and the diversity of one of its open markets.

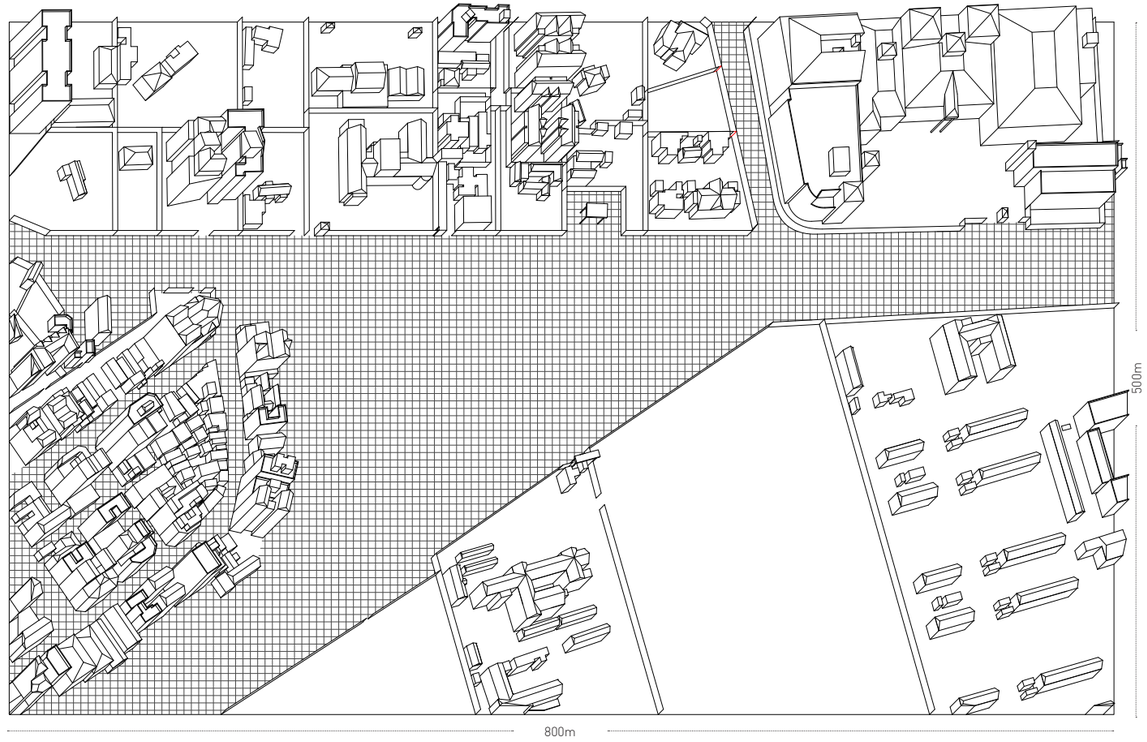


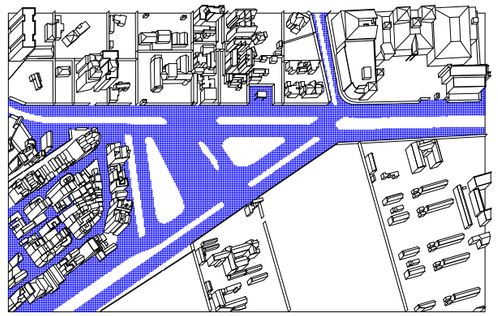
Junction | view towads central Nairobi



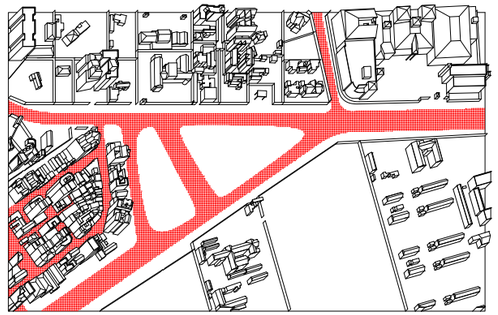
Junction | view towads Dagoretti


500m
800m

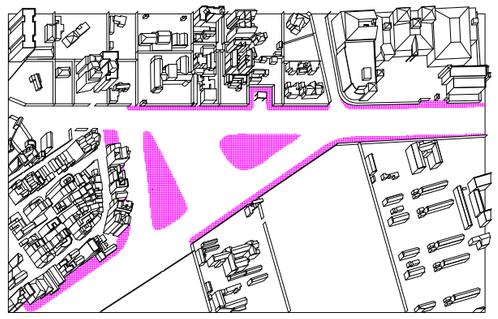

500m
800m



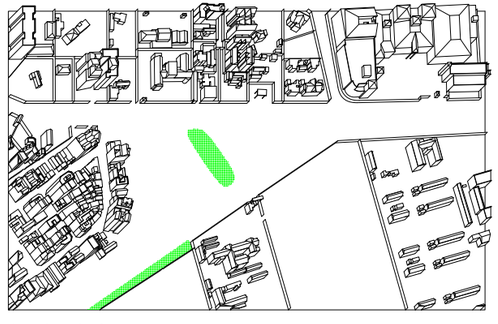
dynamic zoning I pedestrian space



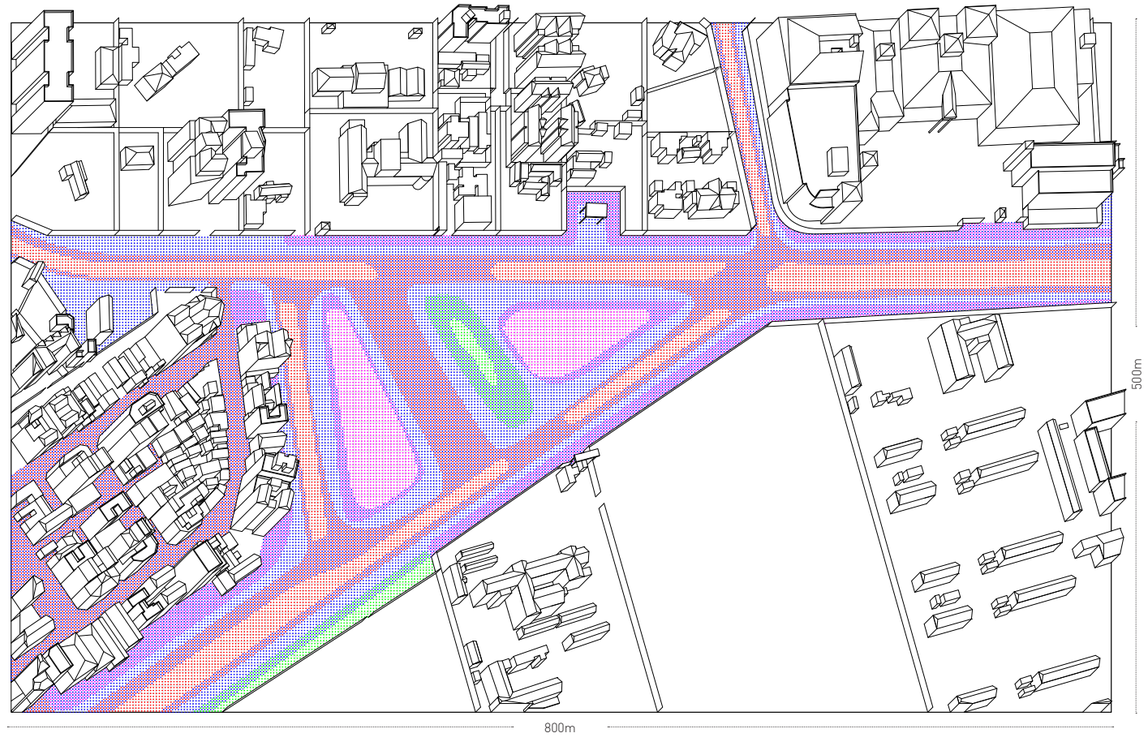
dynamic zoning I traffic space



dynamic zoning I appropriable space



dynamic zoning I green space



B$_1$ I JUNCTION I MASTER PLAN





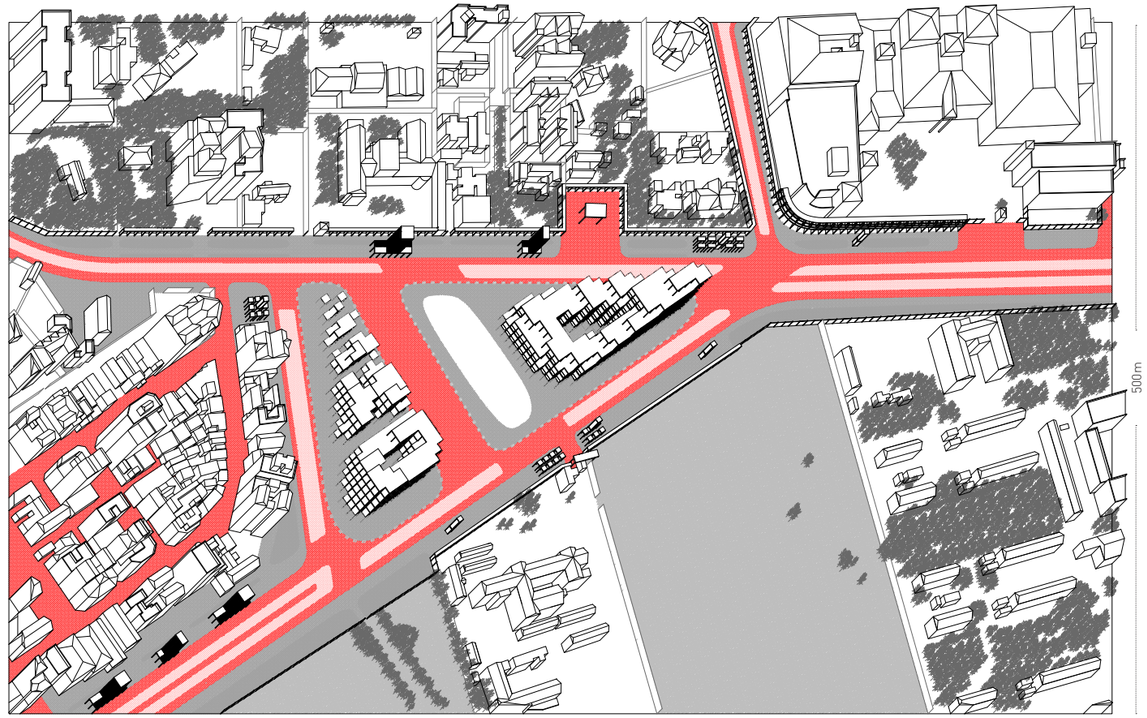
hard traffic space
based on local indicators

medium traffic space
based on local indicators

soft traffic space
based on local indicators

image base retrieved from Ramani Geosystems

B$_1$ I JUNCTION I TRAFFIC SPACE





hard buffer space
based on local indicators

medium buffer space
based on local indicators

soft buffer space
based on local indicators

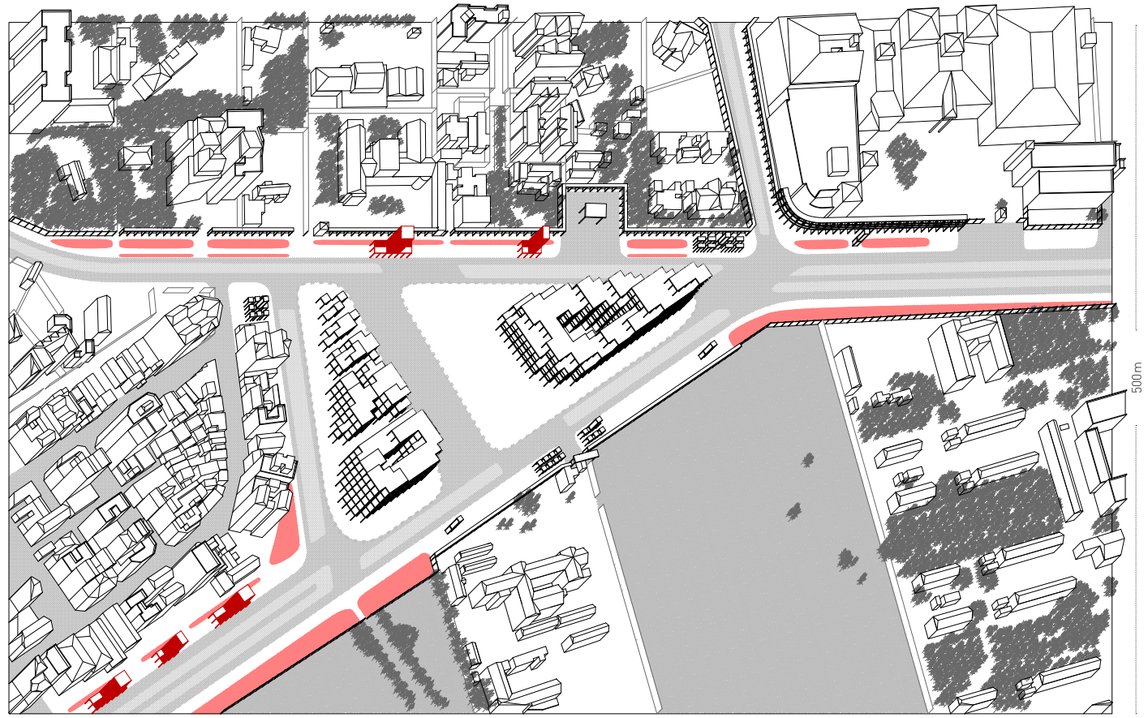


image base retrieved from Ramani Geosystems

B_1 I JUNCTION I BUFFER SPACE



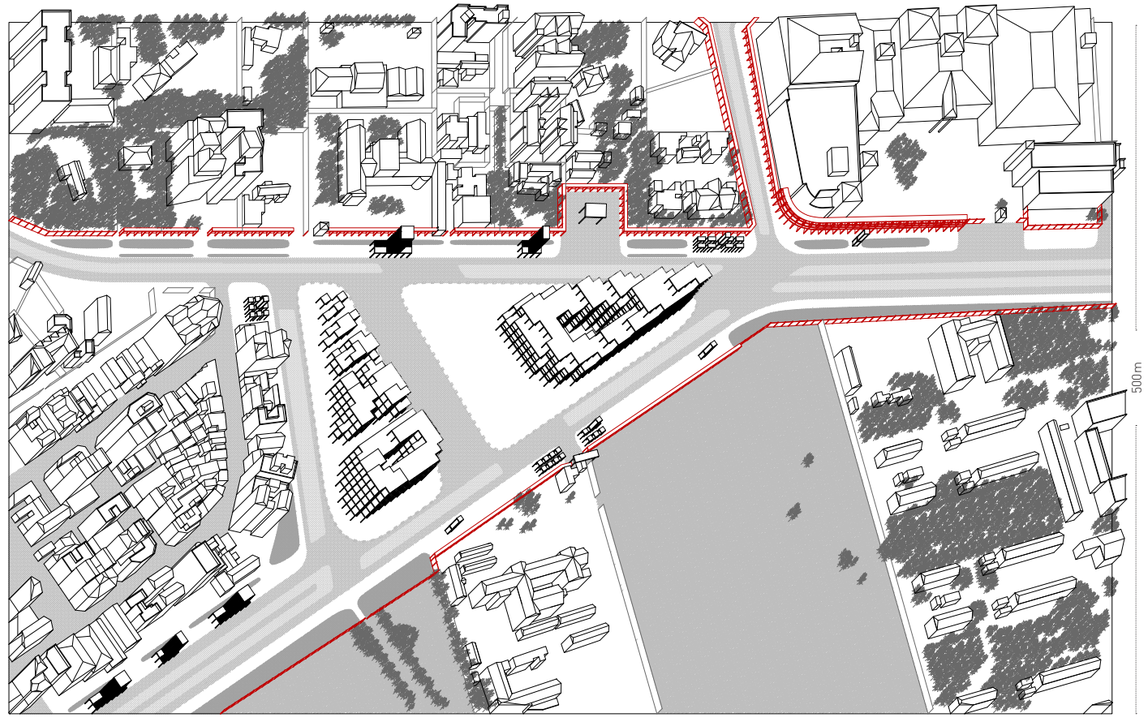
hard threshold space
based on local indicators

medium threshold space
based on local indicators

soft threshold space
based on local indicators

image base retrieved from Ramani Geosystems

B$_1$ I JUNCTION I THRESHOLD SPACE





hard market space
based on local indicators

medium market space
based on local indicators

soft market space
based on local indicators

B_1 I JUNCTION I MARKET SPACE

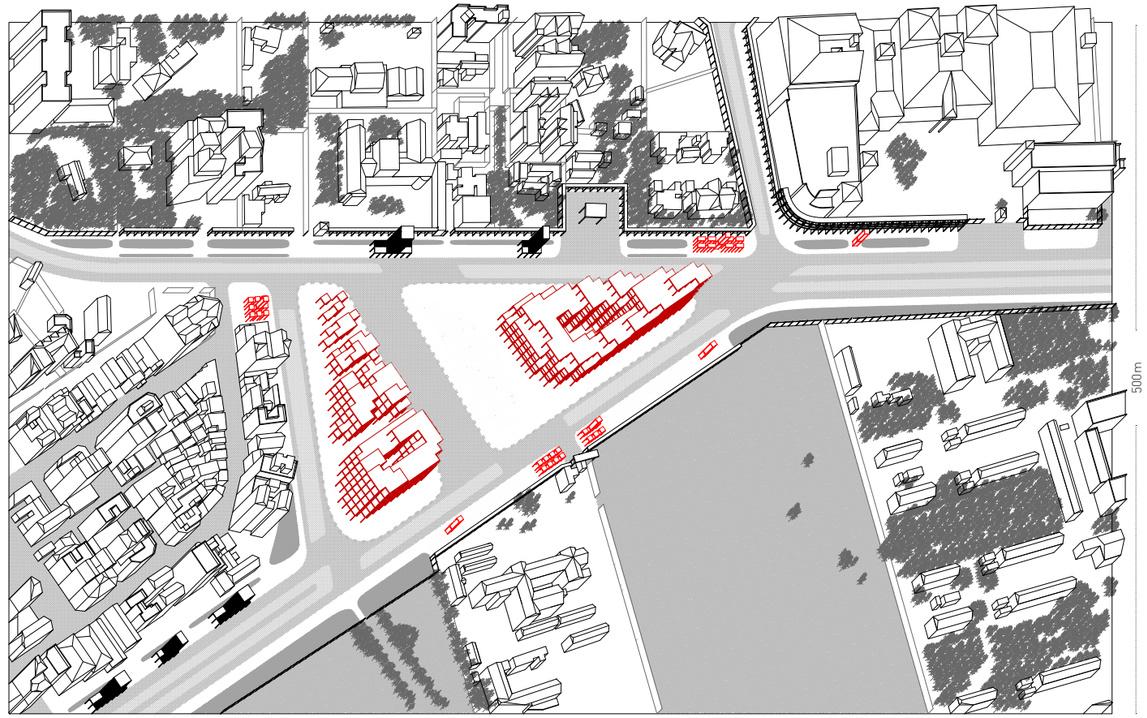
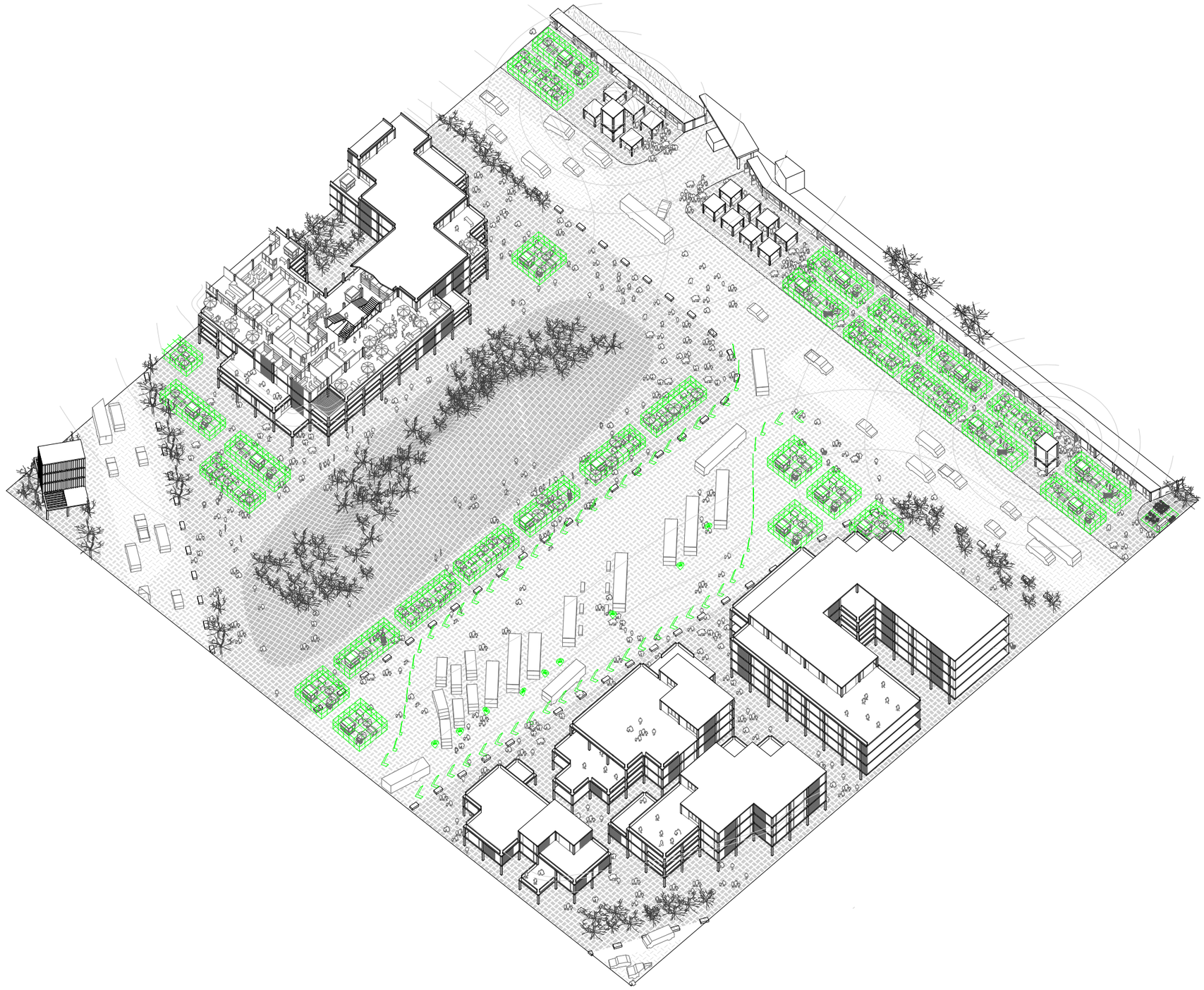
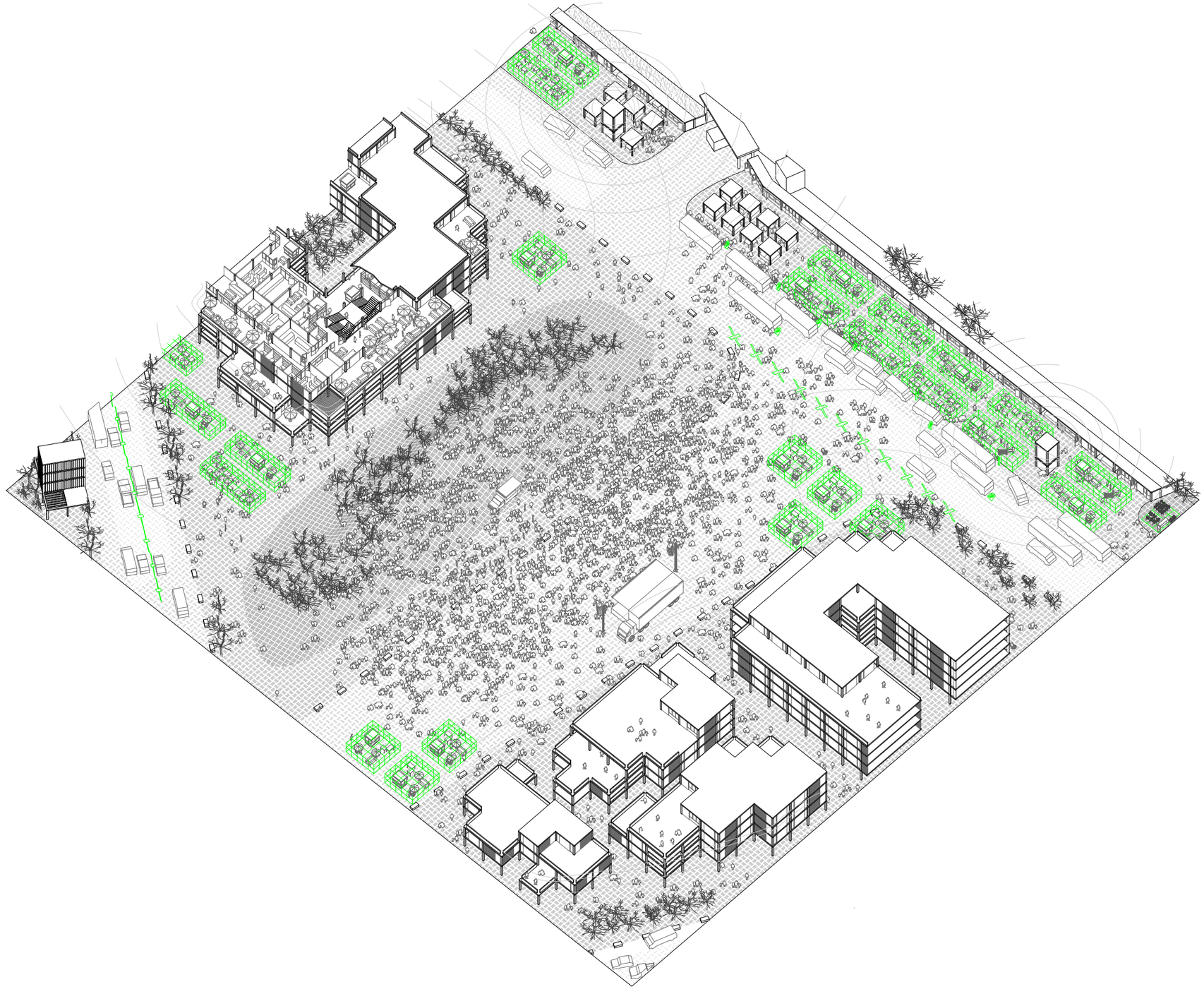


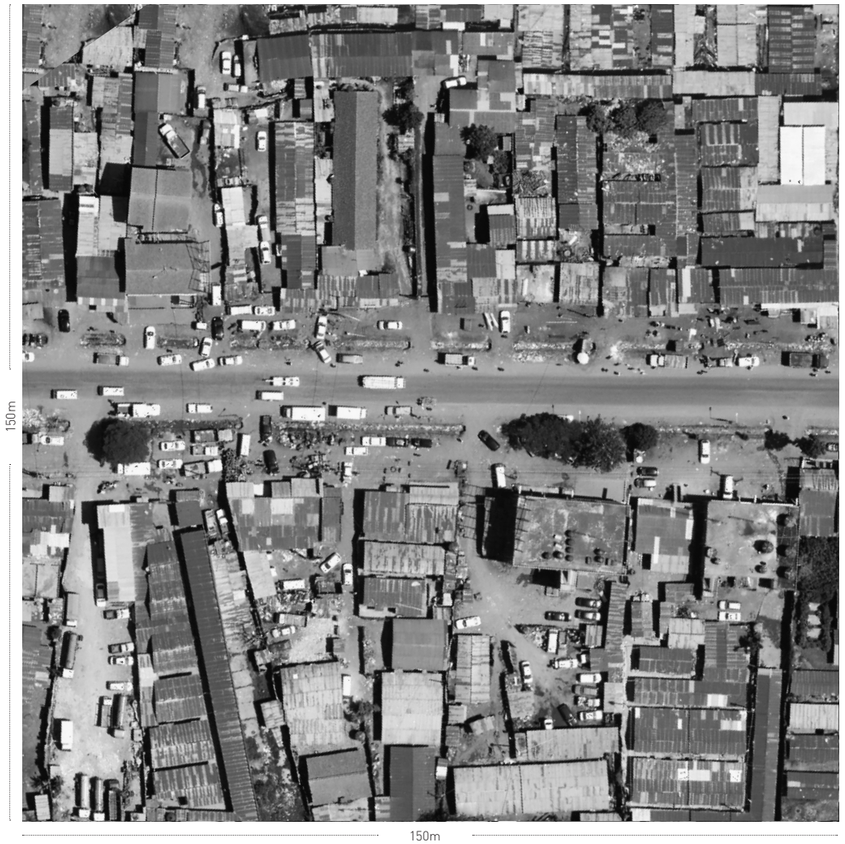
image base retrieved from Ramani Geosystems

B$_1$ I JUNCTION I USAGE SCENARIO BUS TERMINAL



B$_1$ I JUNCTION I USAGE SCENARIO LARGE EVENT





B_2 I NAIVASHA ROAD I STATUS QUO

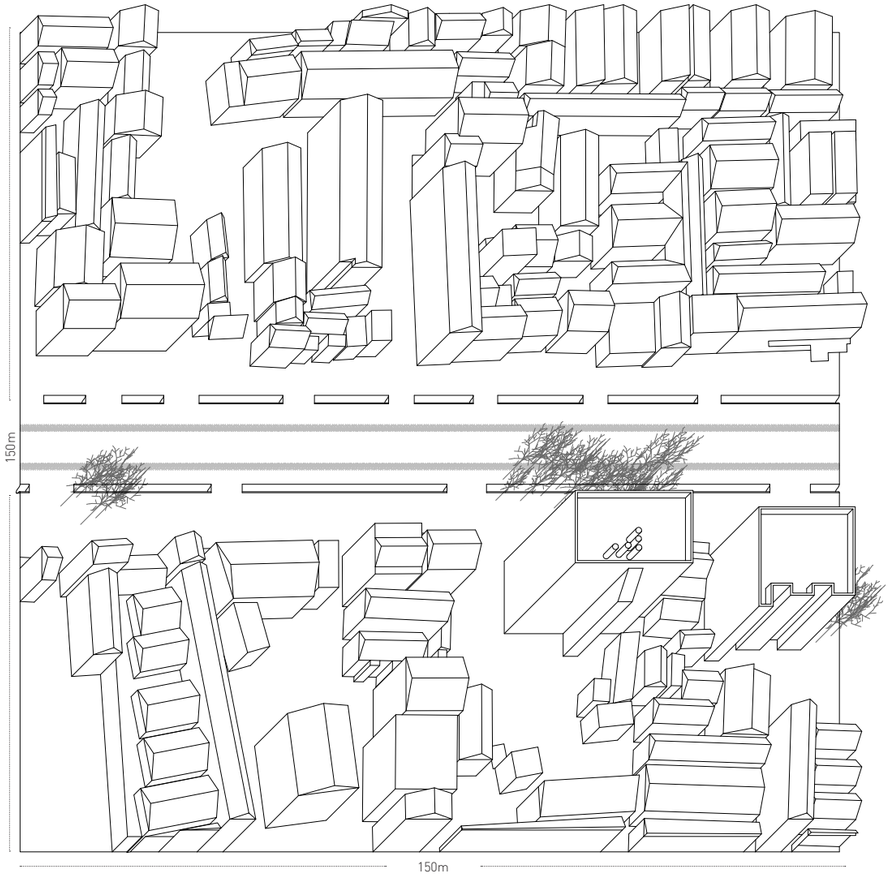
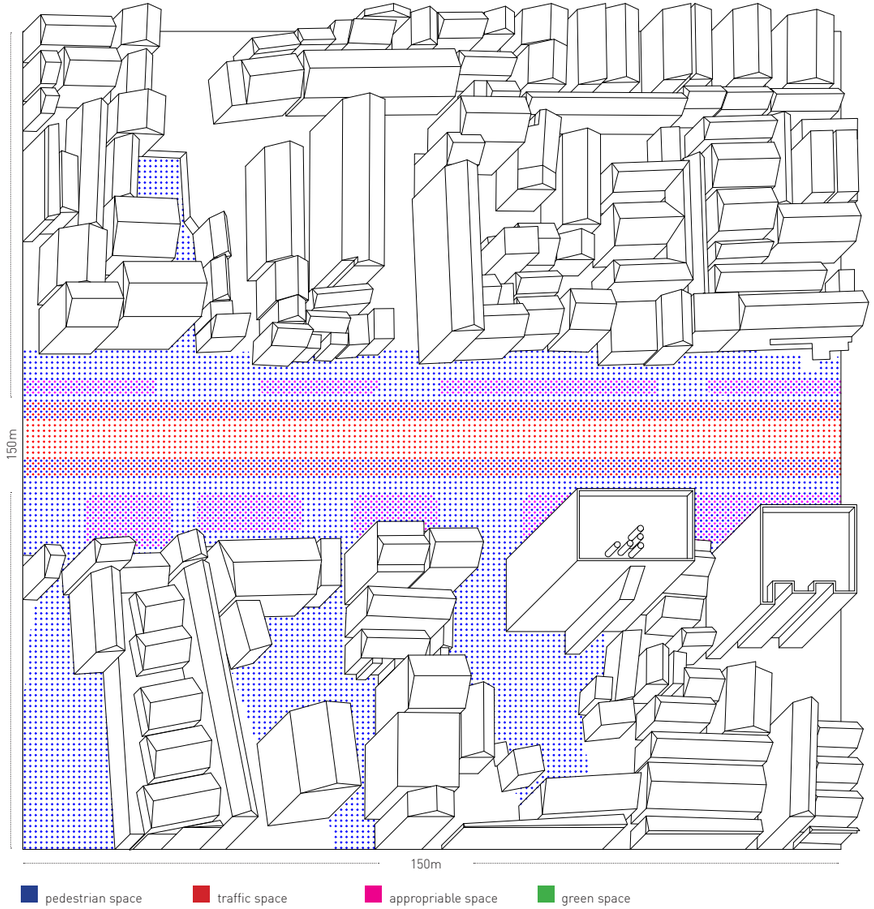
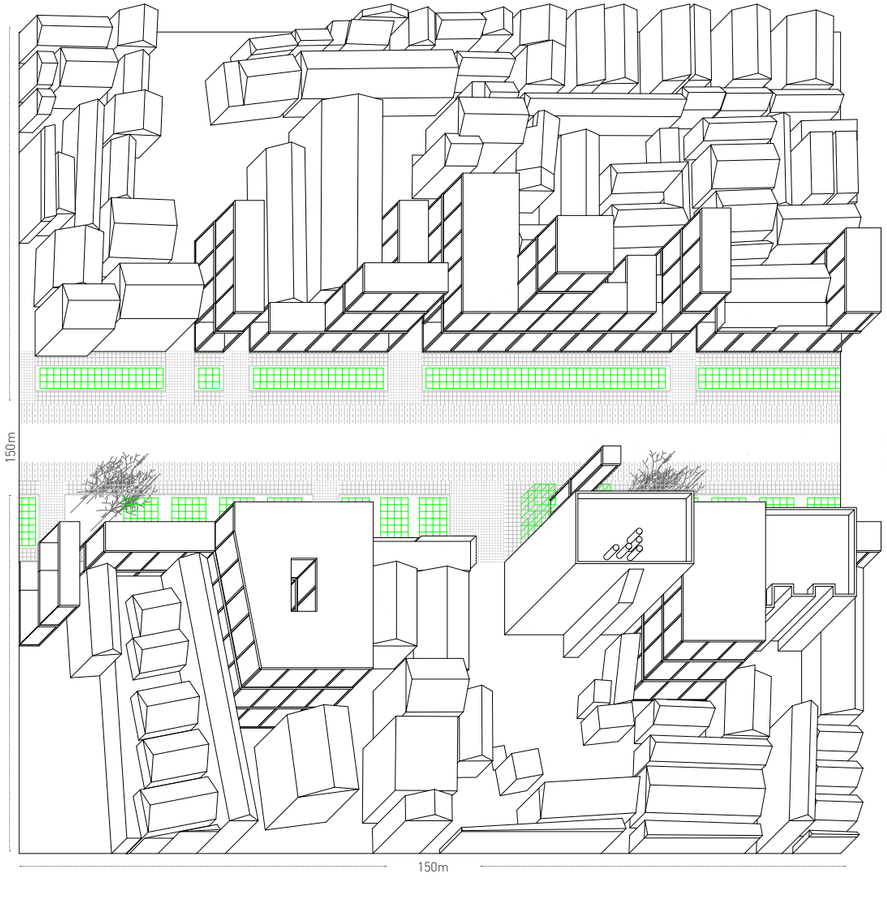
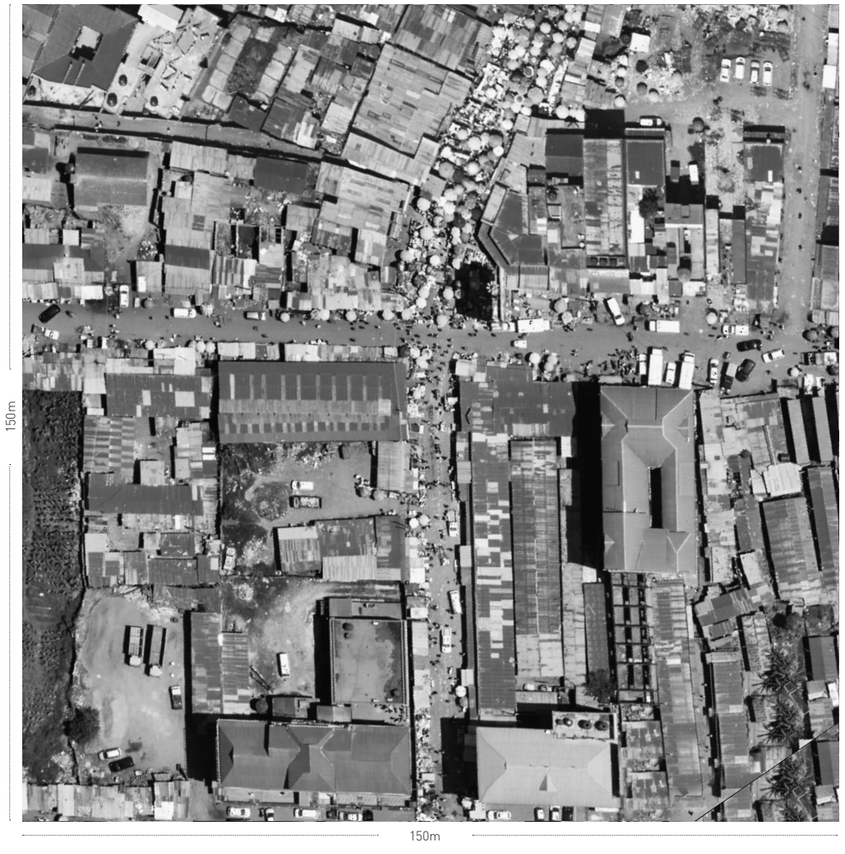


image base retrieved from Ramani Geosystems


150m
150m
pedestrian space
traffic space
appropriable space
green space


150m
150m



B_3 I KAWANGWARE I STATUS QUO

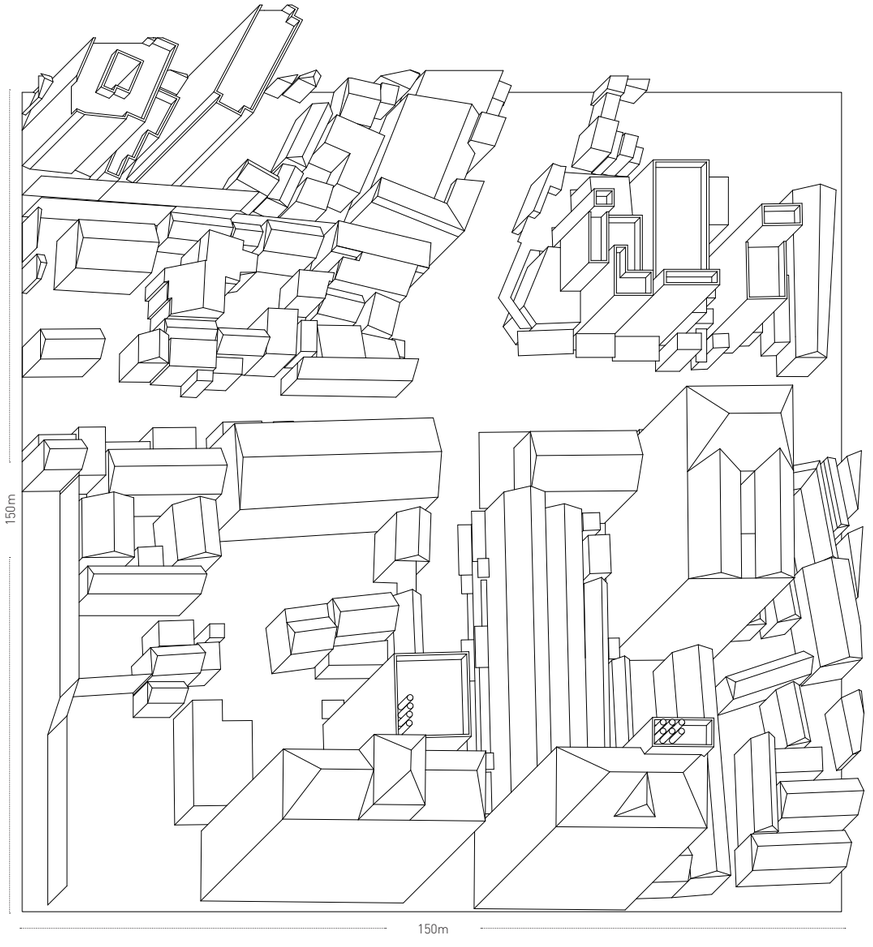
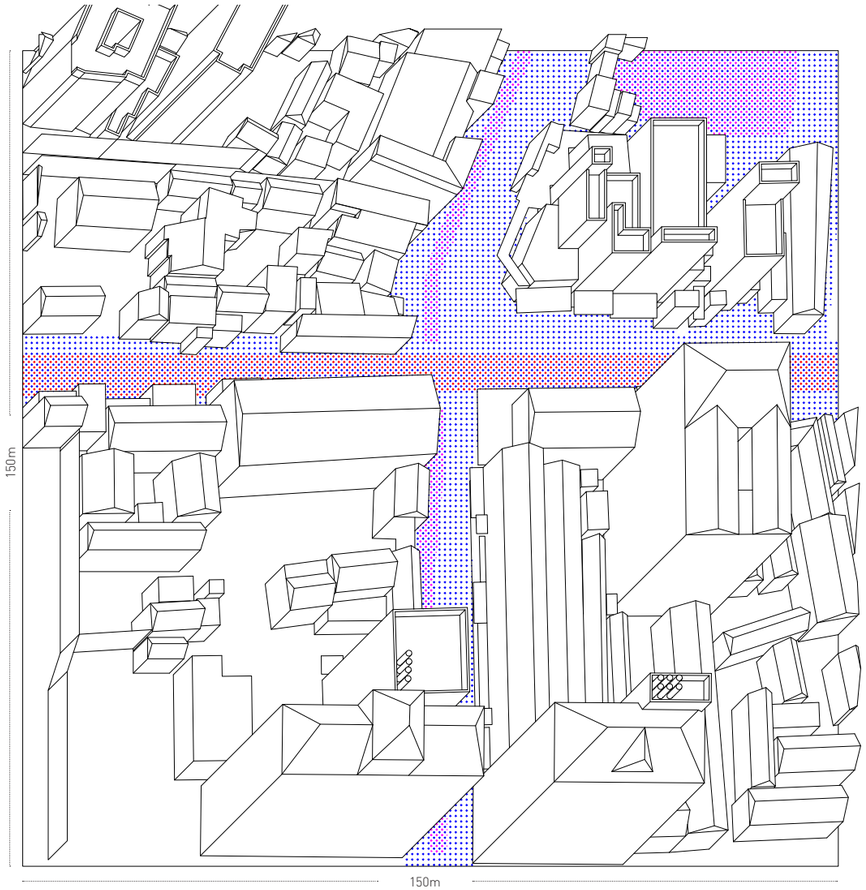


image base retrieved from Ramani Geosystems



pedestrian space
traffic space
appropriable space
green space



C | RACECOURSE



image retrieved from Google Earth

SITE C | RACECOURSE | OPEN AIR FACTORY

Furthest away from the city centre, Racecourse is perhaps the most peculiar of the three sites. Here, Ngong Road is bordered by Ngong Forest, a large patch of public, yet barely used forest and the city's colonial horse race grounds to the south and perpendicular former shanty towns to the north. The combination of a relatively poor community and Ngong Road, leading to the city's most affluent suburbs has led to intense artisanal activity along the road. Wood and metal workshops, signage painters, makeshift garages and stone masons occupy every open centimetre producing anything from wooden toilet seats to larger-than-life ornamental giraffes made from scrap metal.

By consequence, the neighbourhoods to the back of this linear open-air workshop are increasingly occupied by low density residential developments in neighbouring Riruta. However, there is still widely open land less than one kilometre from Ngong Road, currently only used as a connection to adjacent Kawangware.



Racecourse | a carpentry workshop occupying public space adjacent to the street



Racecourse | under-used road leading into Ngong Forest


500m
750m

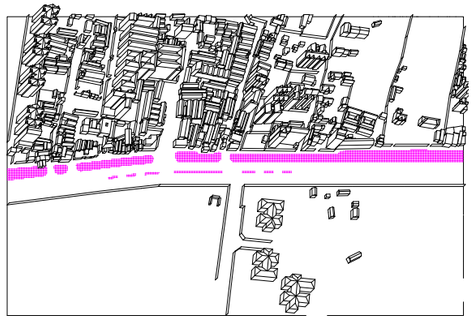

500m
750m



dynamic zoning I pedestrian space



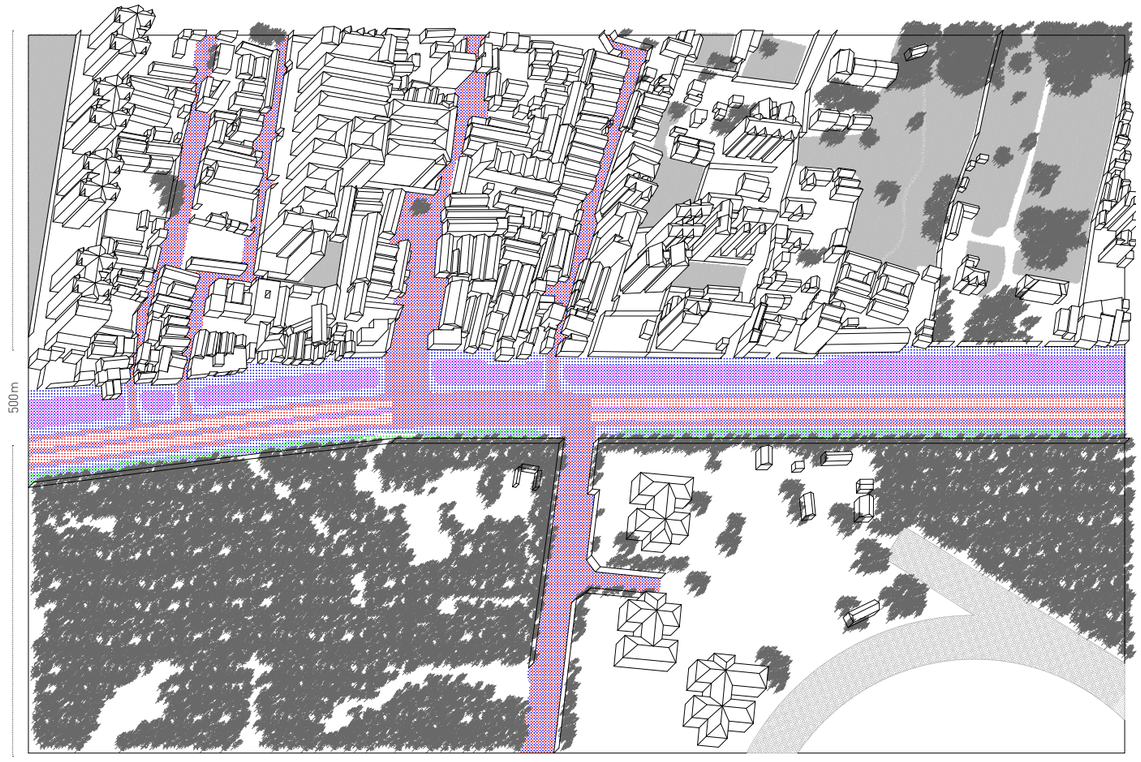
dynamic zoning I traffic space



dynamic zoning I appropriable space



dynamic zoning I green space



C$_1$ I RACECOURSE I MASTER PLAN





hard traffic space
based on local indicators

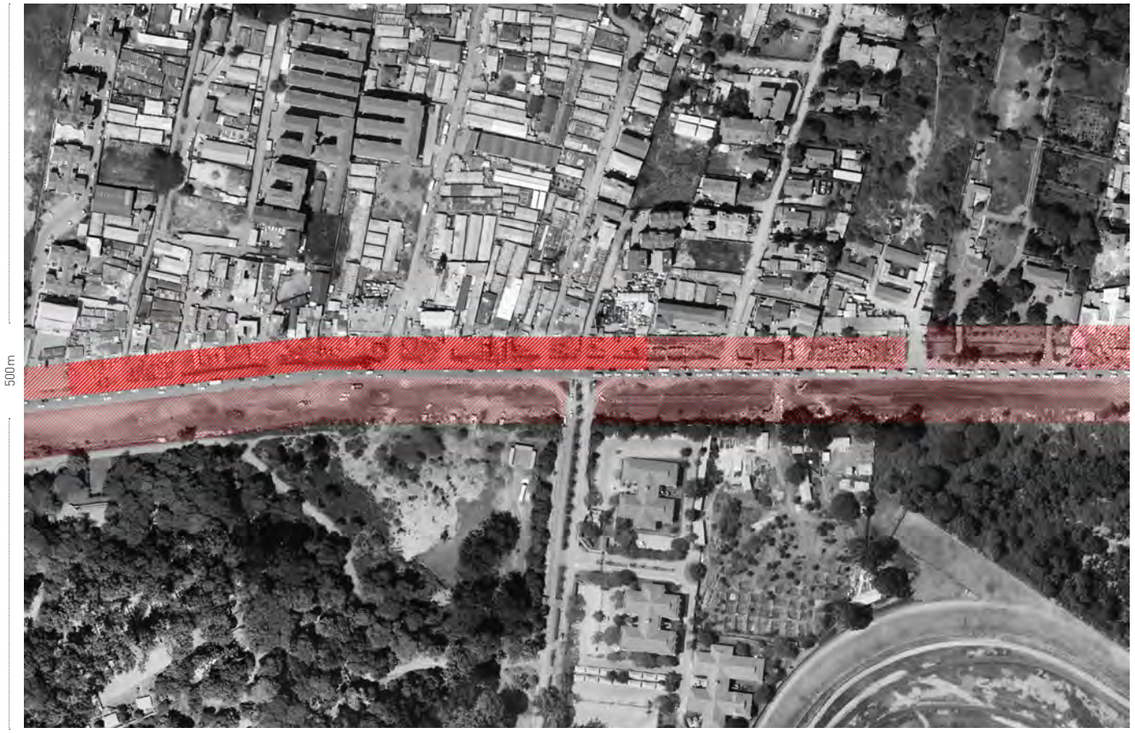
medium traffic space
based on local indicators

soft traffic space
based on local indicators

image retrieved from Ramani Geosystems

C$_1$ I RACECOURSE I TRAFFIC SPACE





hard buffer space
based on local indicators

medium buffer space
based on local indicators

soft buffer space
based on local indicators

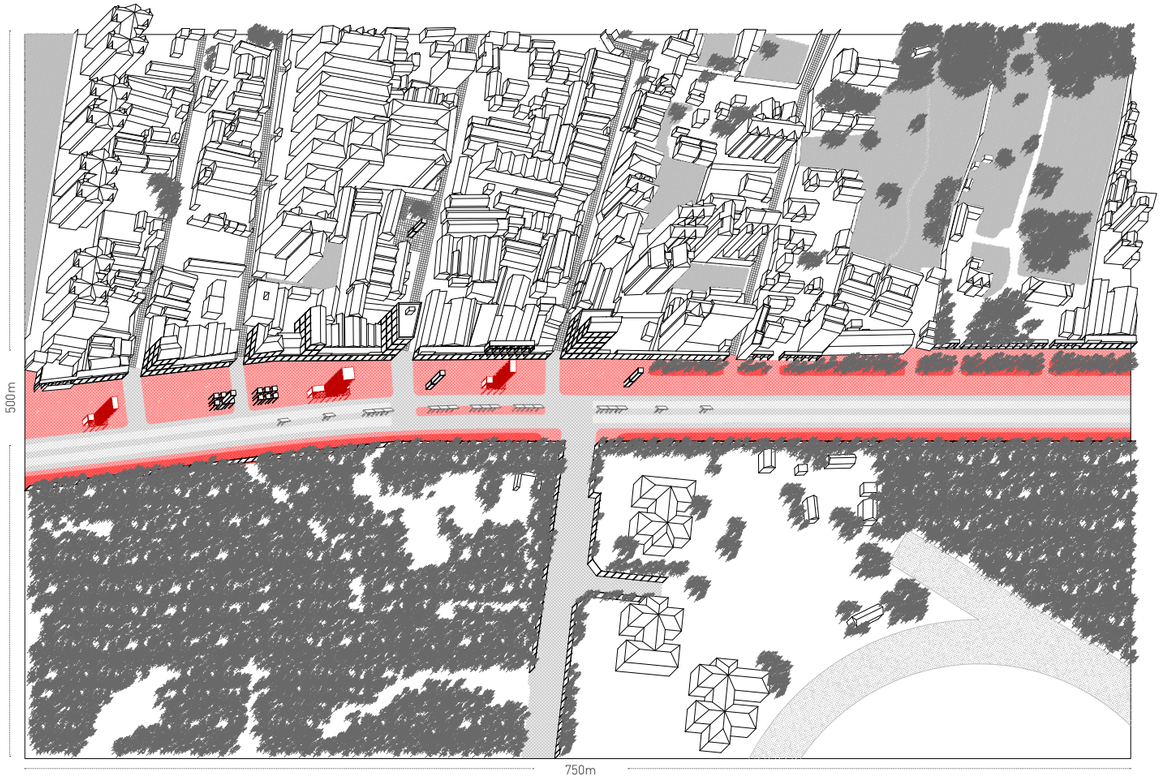
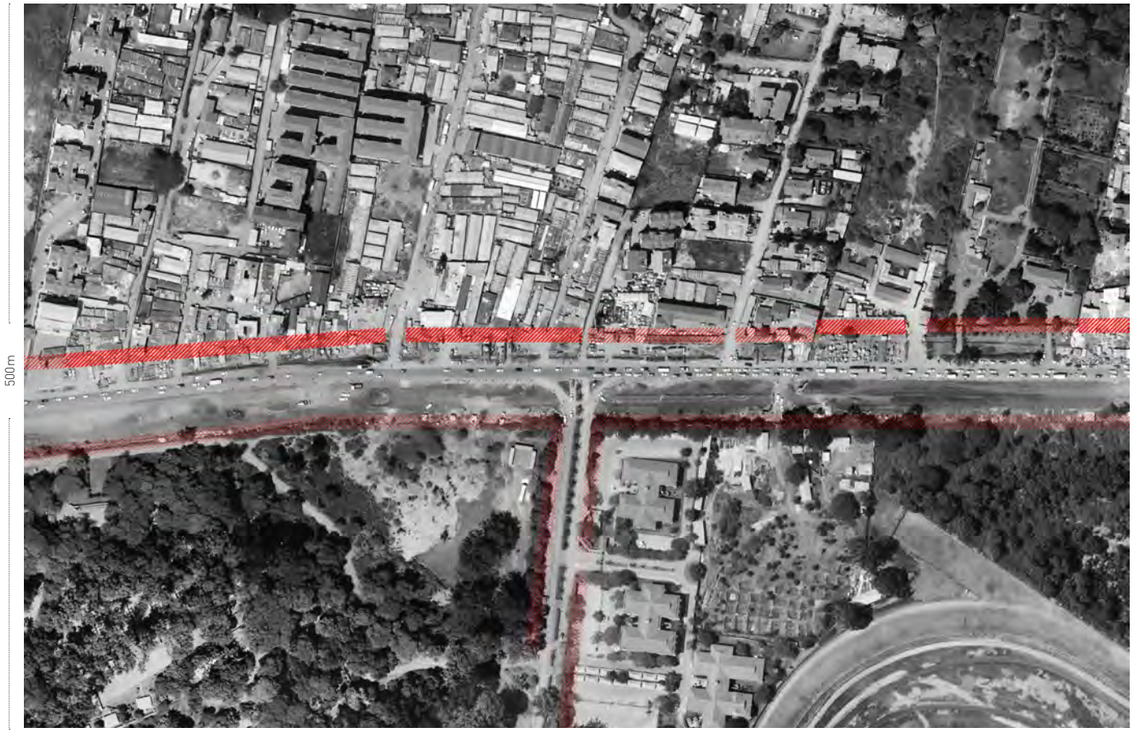


image retrieved from Ramani Geosystems

C_1 I RACECOURSE I BUFFER SPACE



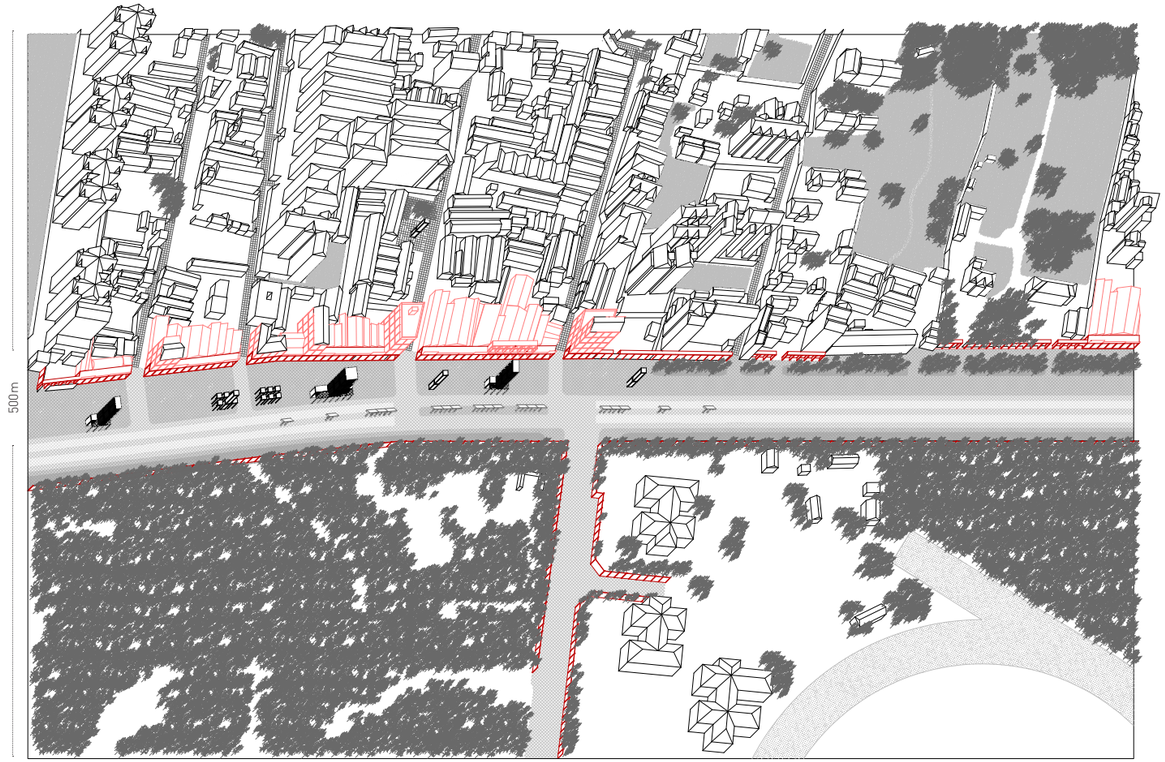
hard threshold space
based on local indicators

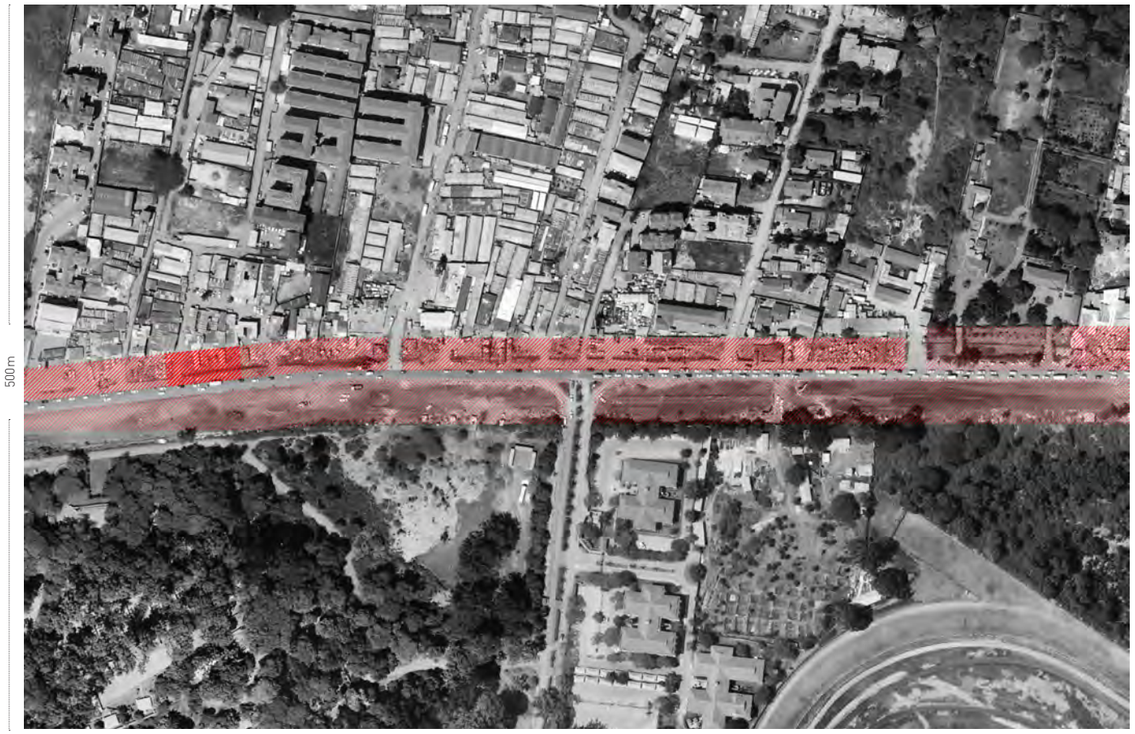
medium threshold space
based on local indicators

soft threshold space
based on local indicators

image retrieved from Ramani Geosystems

C$_1$ I RACECOURSE I THRESHOLD SPACE





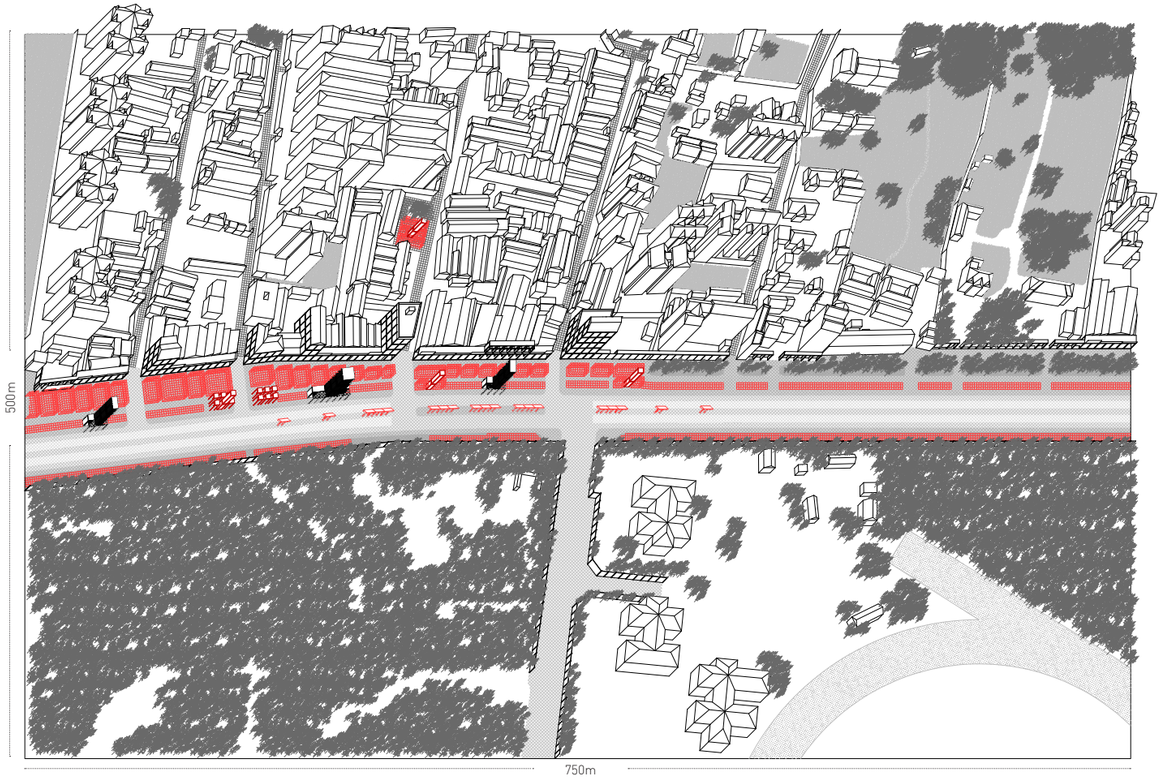
hard market space
based on local indicators

medium market space
based on local indicators

soft market space
based on local indicators

image retrieved from Ramani Geosystems

C$_1$ I RACECOURSE I MARKET SPACE



C$_1$ I RACECOURSE I ALTERNATIVE DESIGN DETAIL NODE





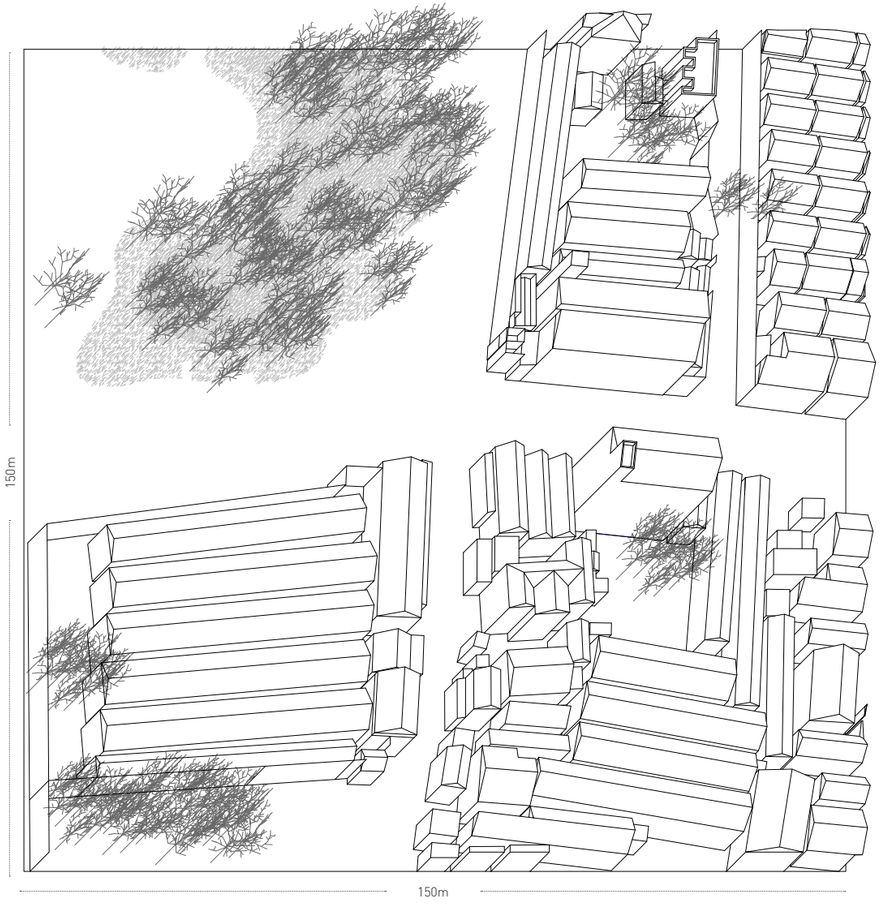
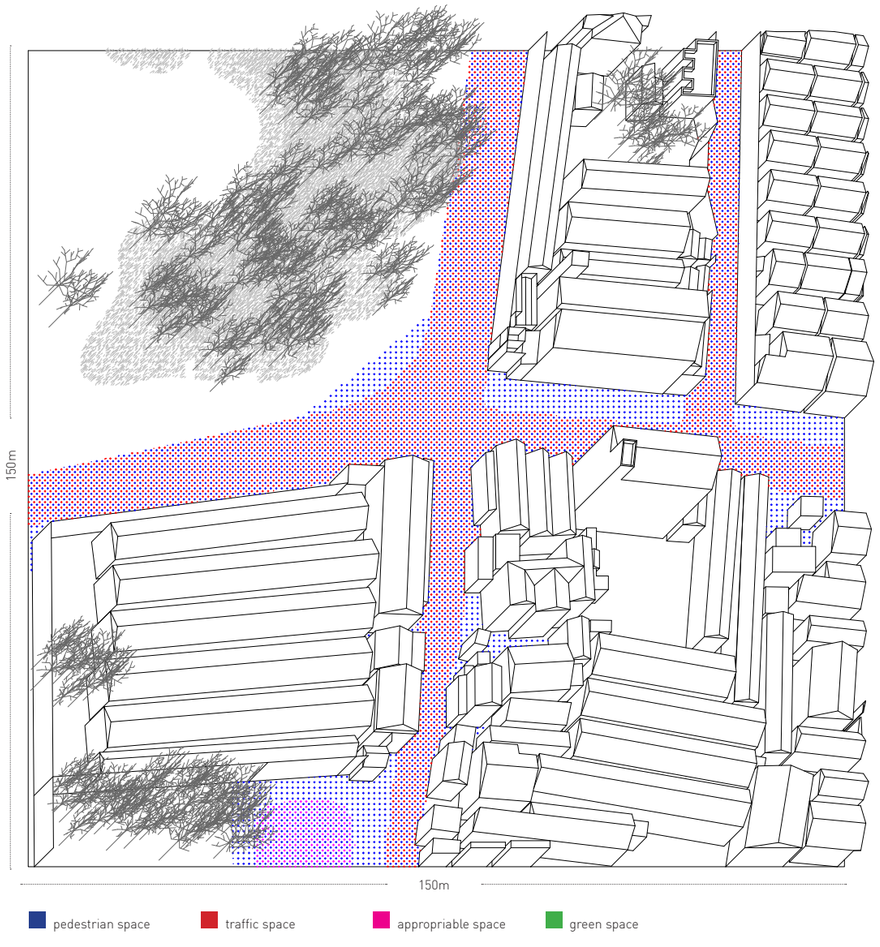
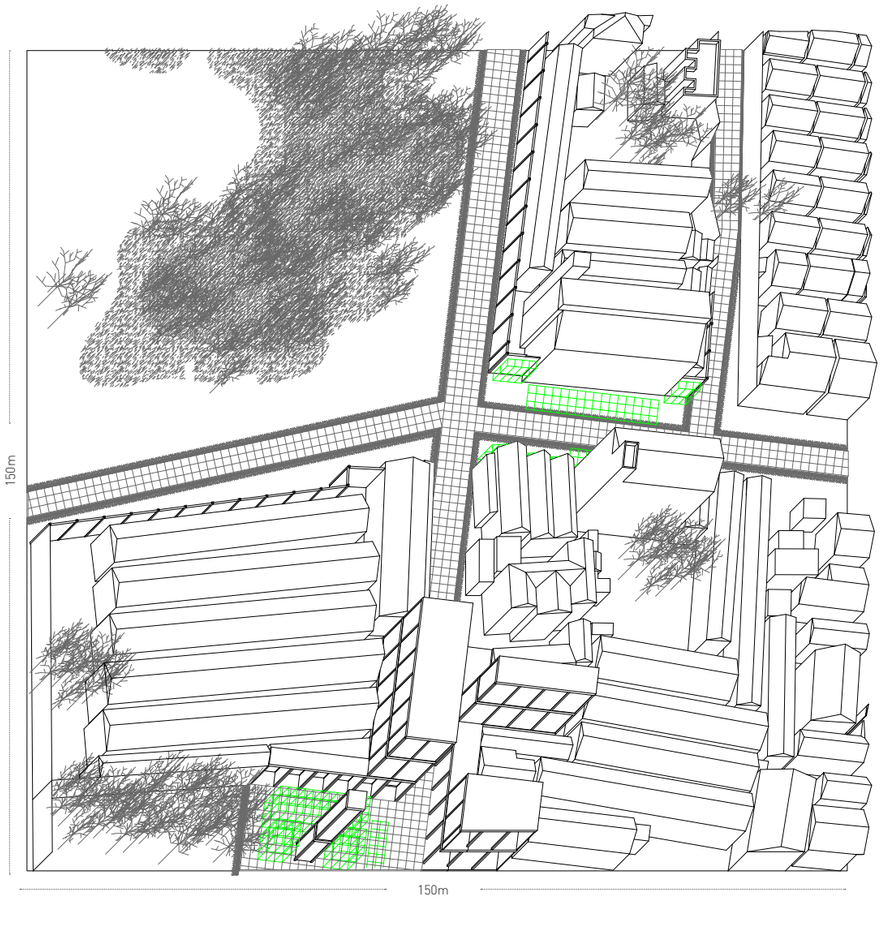


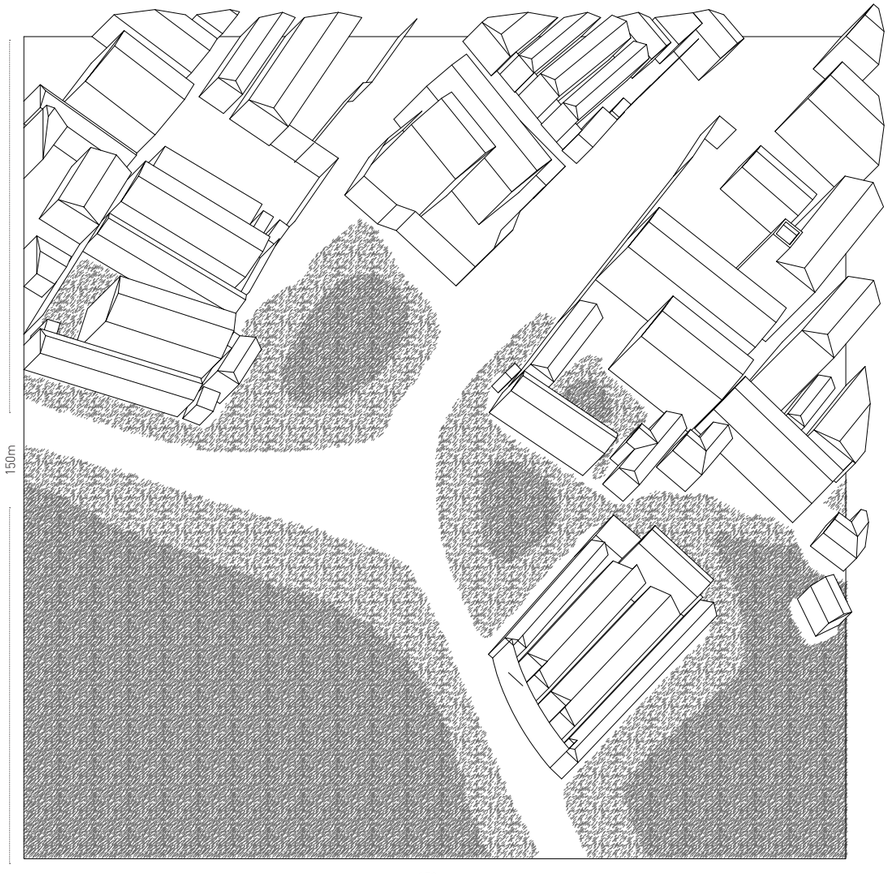
image retrieved from Ramani Geosystems

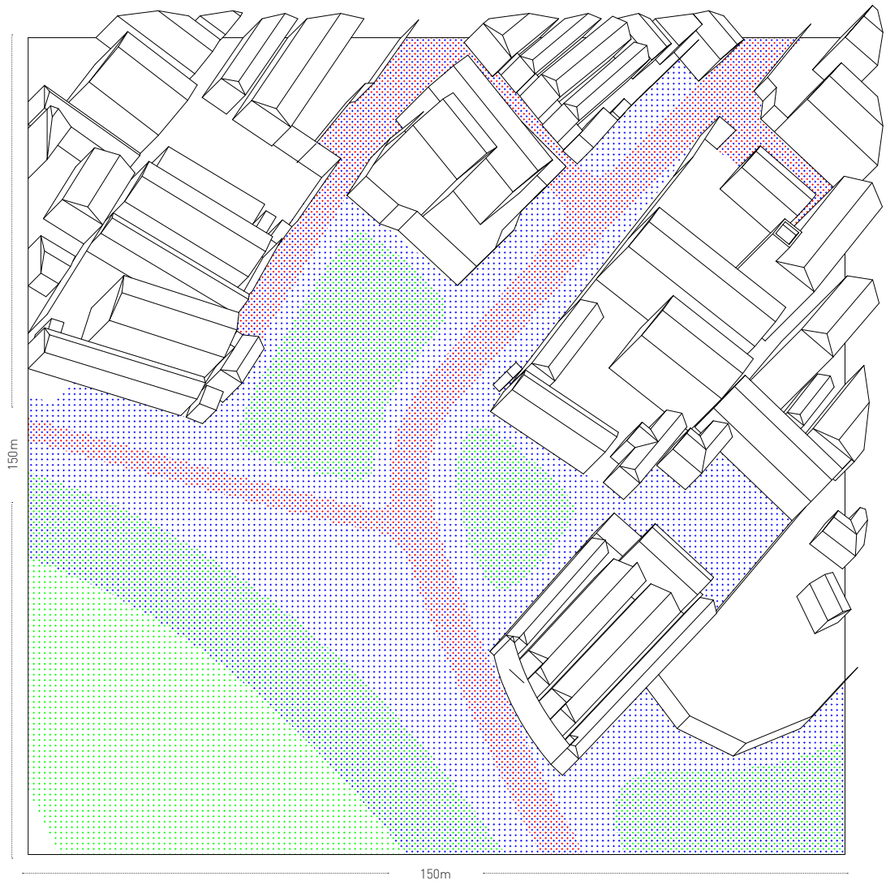

150m
150m
pedestrian space
traffic space
appropriable space
green space


150m
150m

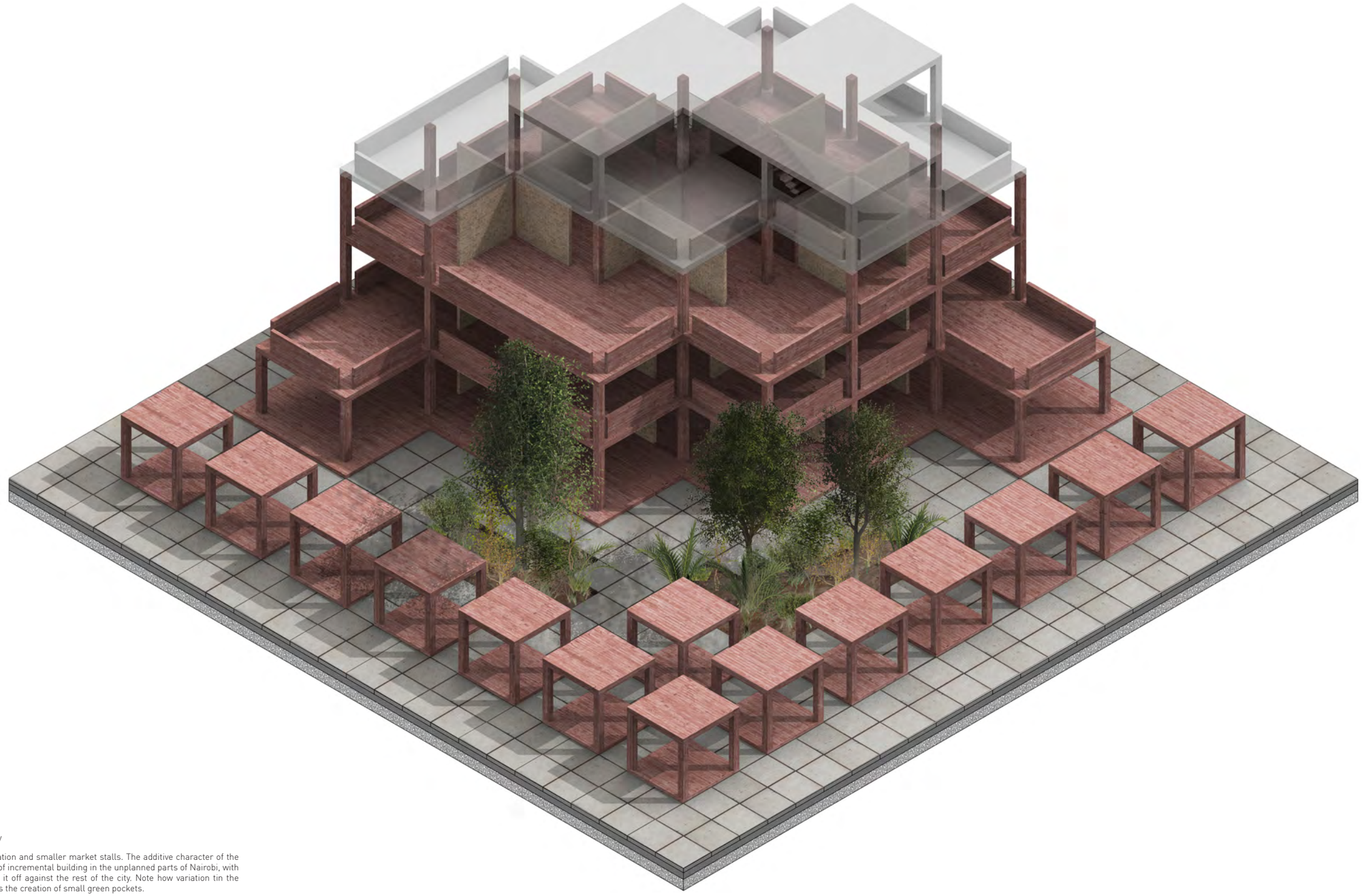
C_3 I NGOTHO ROAD I STATUS QUO






150m
150m
pedestrian space
traffic space
appropriable space
green space


150m
150m



node and market space | materiality

Detail of larger nodes for appropriation and smaller market stalls. The additive character of the nodal building evokes the tradition of incremental building in the unplanned parts of Nairobi, with the use of red concrete clearly set it off against the rest of the city. Note how variation tin the placement of STELCON slabs allows the creation of small green pockets.

GROUNDING THE DESIGN | MATERIALITY

The research section of this report elaborated on the lack of precedents in specifically Kenyan or even African urban design. It thus does not come as a surprise that the materiality and atmosphere of Nairobi's streetscape, similar to other African metropolises currently experiencing vast dimensions of infrastructural expansion, is shaped by an engineer's approach to urban design. Focused on the mere functionality of space, the use of conventional, Neufert-inspired street sections is fittingly accompanied by the dull material and elements used for infrastructural projects globally.

The lack of inventiveness and originality on the part of the executing designers and engineers is however not only an issue of atmosphere and aesthetics, it also creates functional conflict in everyday use, implementation and maintenance. To illustrate, I will elaborate on the most problematic elements of design detailing encountered in Nairobi and along Ngong Road.

THE CURB

Intended as both an element of storm drainage and a barrier between the space used by motorists and that used by pedestrians, the humble curb has been an essential element of street design since Roman times. In Nairobi, where road demarcation remains a subtle suggestion to hordes of irreverent matatu drivers, the curb fails to serve one of its core functionalities. More than that, the engineers' determination in its necessity creates safety hazards for both vehicles and pedestrians due to their irregularity and somewhat counter-intuitive placement. On Ngong Road this is driven to absurd dimensions, where a dashed curb separates the main road from a narrow bike path right next to an open storm drain, rendering the track unusable for bikes and scooters alike.

THE STORM DRAIN

While Nairobi is not located anywhere near Kenya's moist and lush tropical landscapes, the city is still haunted by the biannual rainy season, transforming wide parts of the streetscape into muddy madness. It thus seems only consequential that new roads should be fitted with appropriate storm drainage. In the light of the tremendous cost, both in terms of construction and maintenance, of proper, underground sewer pipes, the designers have opted for a simple, in a best-case-scenario inadequately covered concrete ditch. This is problematic for multiple reasons. Firstly, in a city where proper cleaning regiments are virtually inexistent, open drainage ditches accumulate massive amounts of waste and dirt within just weeks of completion. Secondly, and perhaps more significantly, they are a magnet for accidents for both slow and motorized traffic, a trend that is confirmed by the scores of Nairobians with friends or relatives who broke an arm or leg jumping across a ditch to catch a matatu.



Ngong Road | flawed detailing in a new infrastructural development

THE SIDEWALK

Often the by-product of a new road, the issue with sidewalks in Nairobi is not it design per se, but rather the process it requires. As a side note to the actual road, they are designed with the same precision and complexity, making them one of the first components to fall victim to corruption, lack of funding or greediness of the contractor. By consequence, the majority of even new roads in Nairobi lack adequate facilities for pedestrians, who still make up a large proportion of the users of the streetscape.

A MATERIAL LANGUAGE FOR NAIROBI

The design proposed tries to address the discrepancy between the current paradigm of designing public space in Nairobi, while simultaneously aiming at establishing a distinct aesthetic and atmospheric identity for Kenya's capital.

Sheer pragmatic criteria played an additional role in the choice and development of this aesthetic language. Due to its intensity of use and dynamic nature, delicate and fragile elements and materials, such as the use of wood or steel frame structures, were excluded in favour of rigid, durable structural components. By the same token, cost-efficiency narrowed down options further, as the importance of public private partnerships and bottom-up initiatives drastically reduces the chances of non-essential components to be implemented.

With all these considerations in mind, four distinct material components make up the core of the new aesthetic identity of public space in Nairobi.

RED IN-SITU CONCRETE

Concrete already plays an essential role in the construction boom in Nairobi, whether as a space frame for a new high rise, as pavement or in canalisation. Due to the reddish hue of the soils in the area, concrete already tends to have a slight colouring, giving exposed concrete a slightly dirty expression. The ubiquitous dust only adds to this appearance as the structure ages. Adding red colorant to in-situ concrete thus serves two purposes. Firstly, it will age better than conventional concrete, improving the general aesthetic quality of concrete in public space. Secondly, the continuous use of a prominent colour will strengthen Nairobi's visual identity, based on the very local properties of the landscape surrounding the city.

OPEN PAVERS

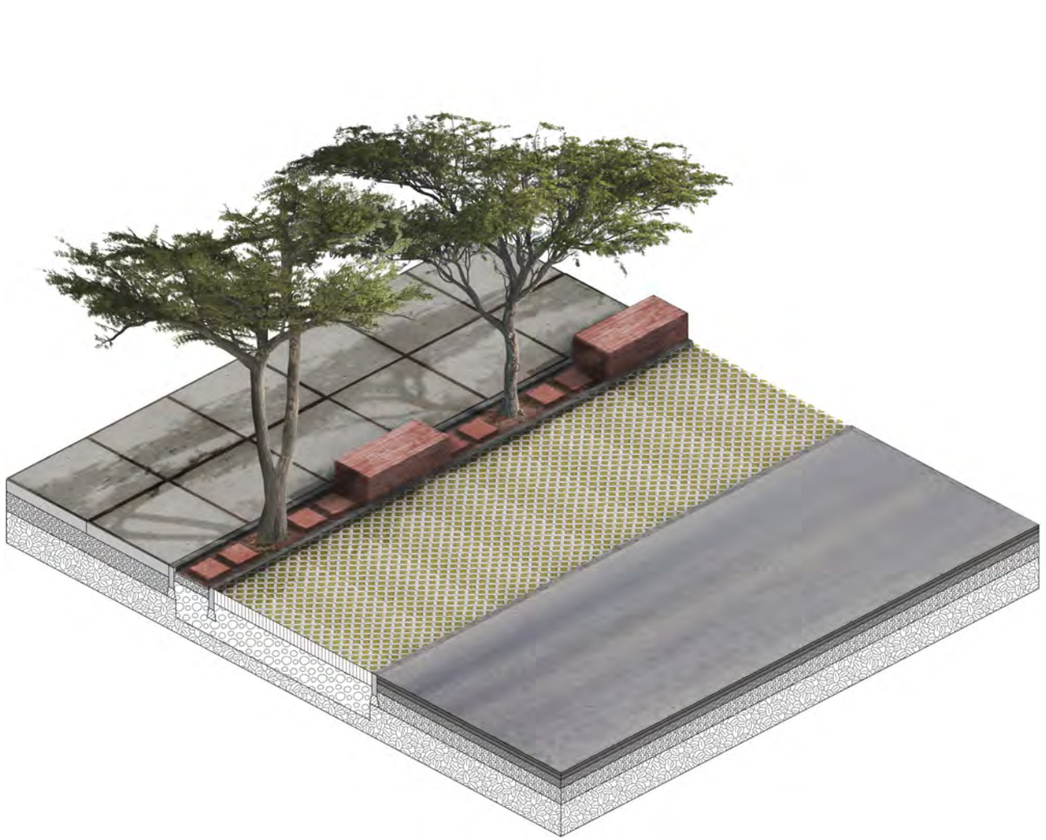
An essential component of the spatial concept described earlier is the creation of smooth transitions between competing uses of public space in the city. By consequence, this space has to be able to accommodate pedestrians as well as motorised traffic on the same level, ruling out tarmac, cobblestones or other conventional surface materials. Open, rough-structure grass pavers on the other hand, provide a common ground for all uses. Vehicles, while able to drive over them, have to drastically reduce their speed driving over them while pedestrians will usually prefer the adjacent sidewalk, thus creating a secure dynamic buffer between two contesting uses of public space. Additionally, open pavers eliminate the need for an open storm drainage, as they can absorb the excess water during even heavier rain as recent studies have shown (Dreelin et al., 2006; Fassman et al. 2010).

STELCON SLABS

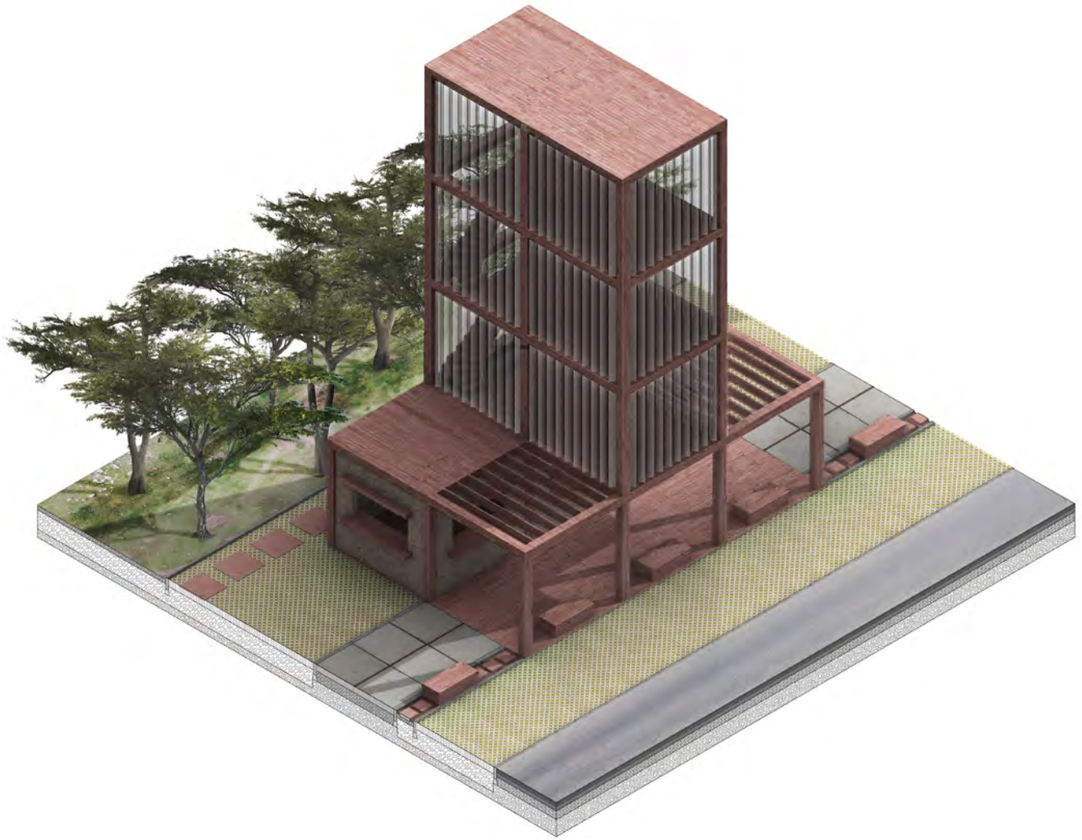
In Nairobi, residents often have to wait for years or even decades until the city manages to construct an adequate road to their homes. At the same time, the sheer amount of skill and machinery required to build anything like a road makes it impossible for locals to take matters into their own hands. STELCON slabs, developed in Germany as temporary pavement for industrial estates, allows an almost instant creation of a paved surface, requiring virtually no ground work or machinery. This makes it the ideal material for the construction of sidewalks and side streets in Nairobi, as it enables locals or small entrepreneurs to take matters into their own hands. In addition, the slabs are in itself flexible and can be removed or rearranged easily, adding to the dynamics of space in the city.

LIGHT CONCRETE BLOCKS

As in many emerging cities, the light concrete block has become the architectural symbol of the growing lower middle class. In search of affordable, permanent housing, the combination of an unadorned concrete frame filled with concrete blocks, tainted by the colours of the local soil has become the answer to the housing crisis, whether in Delhi, Addis Ababa or Nairobi. The use of this material in public space is thus not only affordable, but also a symbol of the becoming of Kenyan society at large.



Detail of a sample section of road clearly showing the use of open pavers as a buffer between road and pedestrian space. Red Concrete blocks form a physical barrier to vehicles and can be used both as benches and vending pedestal. The wide crown of the umbrella acacia provides shade and protection against sun and rain. STELCON slabs form the sidewalk and can be individually placed by either municipality or private investors.



Detail of a buffer kiosk adjacent to the road. Its exposition makes it an attractive pickup point for matatus and taxis. Its vertical facades are intended to be covered by billboards, enhancing the commercial value of the structure, while the inside space can be used as office or gastronomical space. Pavers away from the street allow temporary appropriation and form a transition to the adjacent green space.

MATERIALITY | THRESHOLD SPACE



Details of various degrees of threshold space. Red in-situ concrete for structural elements and concrete blocks for the infill define the visual identity of the transition between public and private space.



the New Ngong Road **I** ideal perspective of physical space towards Adams with appropriation ghosted

IMPLEMETATION

Talking to a variety of actors involved in the development of the city of Nairobi, the uniting comment I received was that the greatest challenge while designing in Nairobi is not the of design in itself but the process of implementing it.
The following section will thus highlight some of the key stakeholders involved in the development of public space in the city of Nairobi and puts forth a set of tools, all aiming at the involvement of private investors of different size and power at multiple scales. While the diagram on the following spread explains the interrelation of actors and tools, the next section will elaborate on the peculiarities and competencies of the individual stakeholders.

GOVERNMENTAL I NATIONAL GOVERNMENT

As the capital, large infrastructural investments in Nairobi are primarily directed and financed by the national government. At the same time, the metropolitan development strategy for the urban region of Nairobi, containing multiple counties and authorities, is administered by the national government.

GOVERNMENTAL I KENYA URBAN ROADS AUTHORITY

The Kenya Urban Roads Authority is an agency of the national government specifically tasked with the planning, development and upgrading of urban trunk roads throughout Kenya. In this capacity, the agency is responsible for the tendering of major roadworks in Nairobi, such as the ongoing expansion of Ngong Road, and the supervision of the tenders.

GOVERNMENTAL I NAIROBI CITY COUNTY

Nairobi's municipal government, established in its current form as a response to the push for decentralisation established in Kenya's new, 2010 constitution is responsible for the development and implementation of the Nairobi Integrated Urban Development Master Plan. In this capacity, it is the main authority in the development of the city, particularly concerning issues of public space, public transport and small-scale infrastructure.

PRIVATE I KENYAN CORPORATIONS

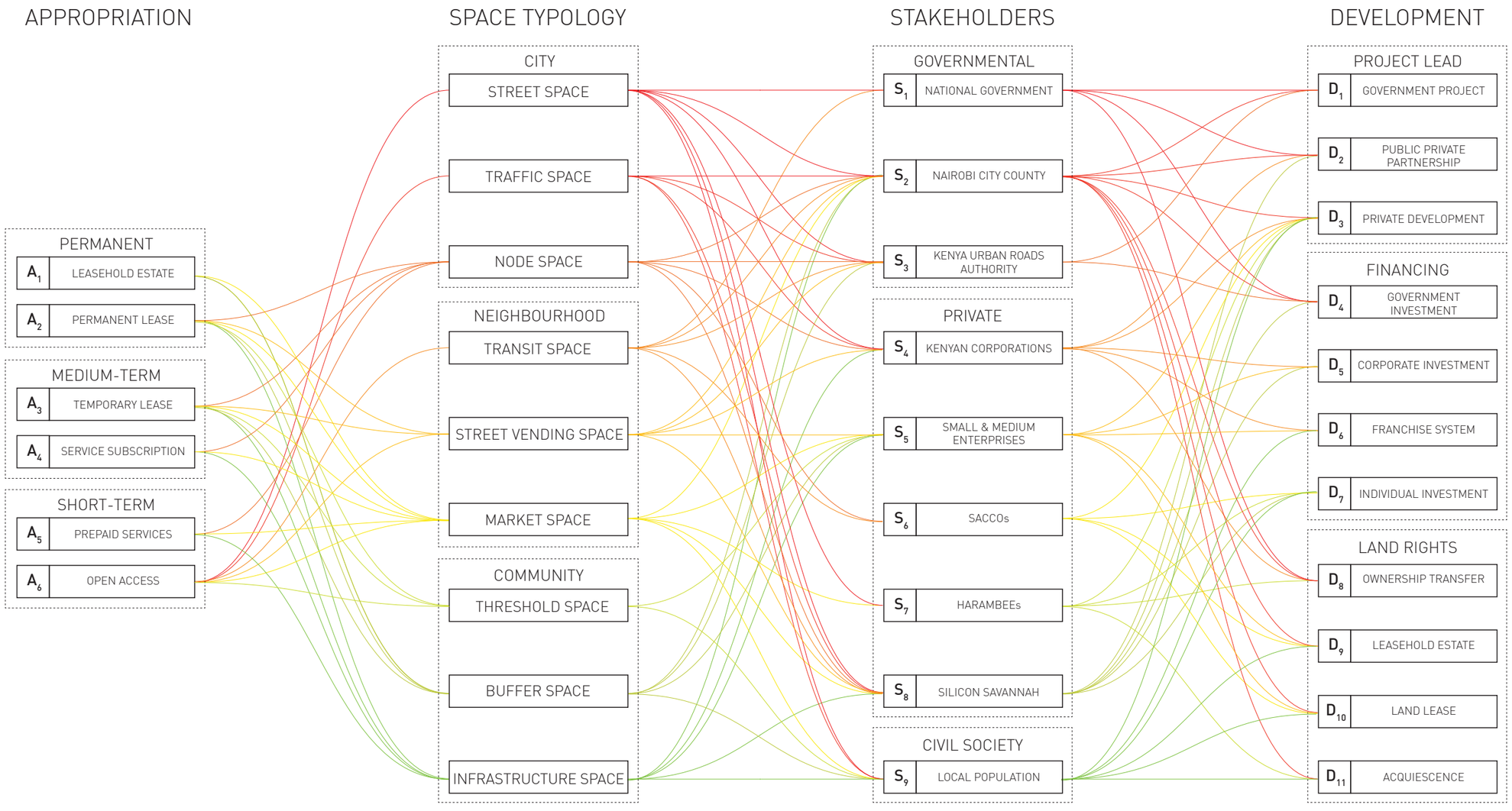
As former government enterprises, companies such as Safaricom continue to have a strong impact on public space in the city. This interest manifests itself through the sheer amount of advertising and sponsoring these companies use in public space, but perhaps more importantly through their franchise partners, be it Coca-Cola kiosks or M-Pesa agents. With the growth of the digital economy corporations and their data will be of key interest in further shaping Nairobi's public space.

PRIVATE I SACCOs

Savings and Credit Cooperative Organisations, in short SACCOs, play an important role in Nairobi's urban life since most independently owned Matatus are organised in SACCOS for operational reasons. As the main providers of transit, they have considerable interest in the development of the city's road infrastructure.

PRIVATE I HARAMBEEs

Intended as self-help groups for local communities right after Kenyan independence, Harambees form an essential part of modern social culture in Kenya. Originating in a costomary alternative to formal insurances, they are a key tool in driving local development, led by the community. They are hence a key driver in the development of public space on a neighbourhood scale.


APPROPRIATION
PERMANENT
A1 LEASEHOLD ESTATE
A2 PERMANENT LEASE
MEDIUM-TERM
A3 TEMPORARY LEASE
A4 SERVICE SUBSCRIPTION
SHORT-TERM
A5 PREPAID SERVICES
A6 OPEN ACCESS
SPACE TYPOLOGY
CITY
STREET SPACE
TRAFFIC SPACE
NODE SPACE
NEIGHBOURHOOD
TRANSIT SPACE
STREET VENDING SPACE
MARKET SPACE
COMMUNITY
THRESHOLD SPACE
BUFFER SPACE
INFRASTRUCTURE SPACE
STAKEHOLDERS
GOVERNMENTAL
S1 NATIONAL GOVERNMENT
S2 NAIROBI CITY COUNTY
S3 KENYA URBAN ROADS AUTHORITY
PRIVATE
S4 KENYAN CORPORATIONS
S5 SMALL & MEDIUM ENTERPRISES
S6 SACCOs
S7 HARAMBEEs
S8 SILICON SAVANNAH
CIVIL SOCIETY
S9 LOCAL POPULATION
DEVELOPMENT
PROJECT LEAD
D1 GOVERNMENT PROJECT
D2 PUBLIC PRIVATE PARTNERSHIP
D3 PRIVATE DEVELOPMENT
FINANCING
D4 GOVERNMENT INVESTMENT
D5 CORPORATE INVESTMENT
D6 FRANCHISE SYSTEM
D7 INDIVIDUAL INVESTMENT
LAND RIGHTS
D8 OWNERSHIP TRANSFER
D9 LEASEHOLD ESTATE
D10 LAND LEASE
D11 ACQUIESCENCE



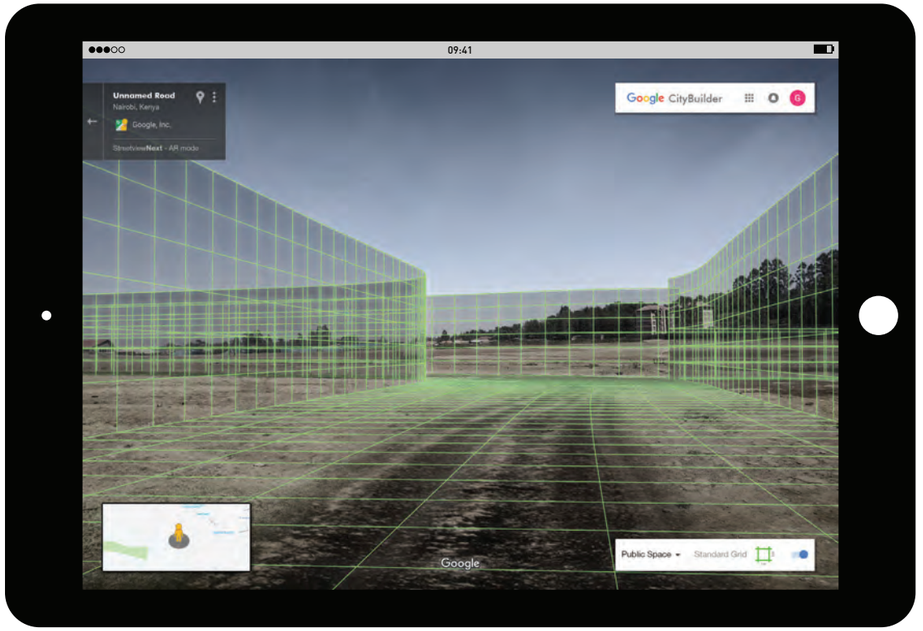
the New Ngong Road **I** realistic perspective of physical space towards Adams preconcieving failure during implementation

DIGITAL SPACE

The previous section hinted at the difficulties of the implementation process while working in Nairobi. While the elaborations on the stakeholders can certainly only scratch the surface of the complexities and inside relationships of municipal policy in the city, one can be certain that every design that is not at the absolute centre of national or metropolitan prestige, regardless of its quality, public backing or meticulously planned implementation strategy is bound to be built incorrectly, incompletely or worse, not at all. By consequence, every design of public space in Nairobi has to incorporate the possibility of failure.

Of course, the notion of a smooth transition between hard and soft spaces, developed earlier already implies a transition between planned and unplanned space. More than just a differentiation between dynamic and static space, it suggests that by combining physical intervention and digital space, i.e. augmented space, the issue of failure in the development of public space can be relativized.

However, the failure of public planning can only be compensated by augmented space if this virtual rendition of the public realm offers more than a mere digital representation of unbuilt space. By consequence, the digital space for Nairobi is further augmented through the use of dynamic user data, public information and forecasting. The following examples highlight potential features for the realm of traffic and trade.



augmented urban pathway **I** early draft

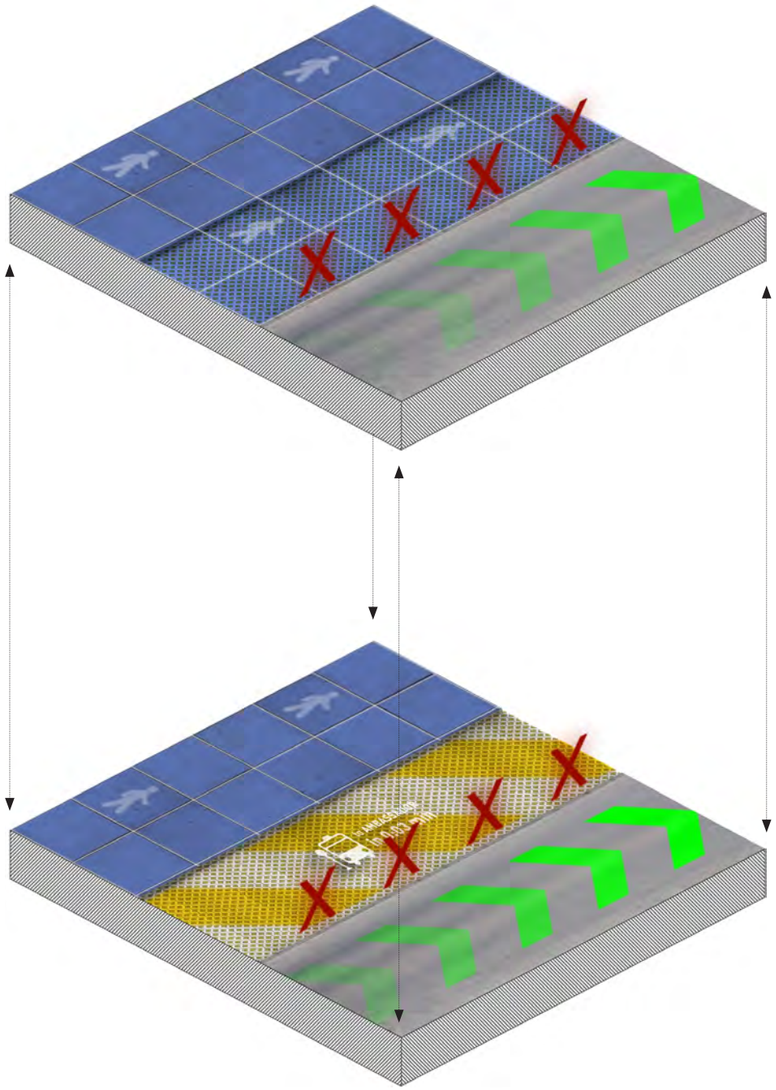
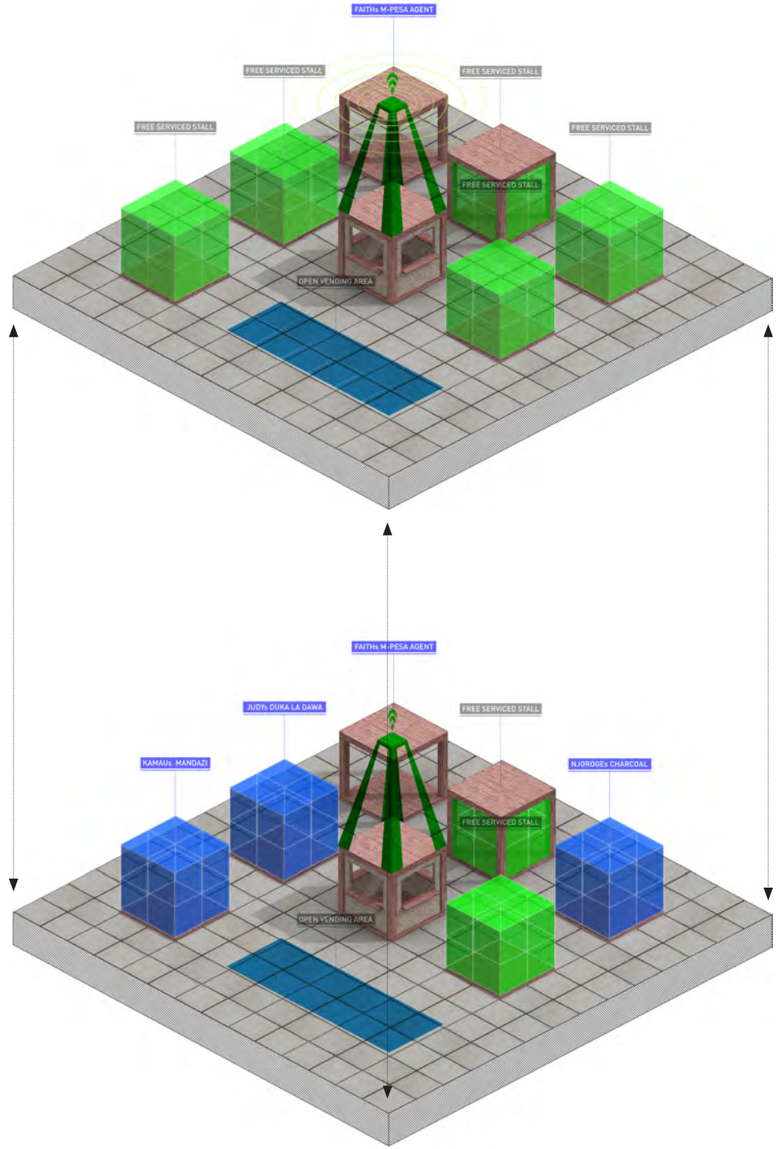
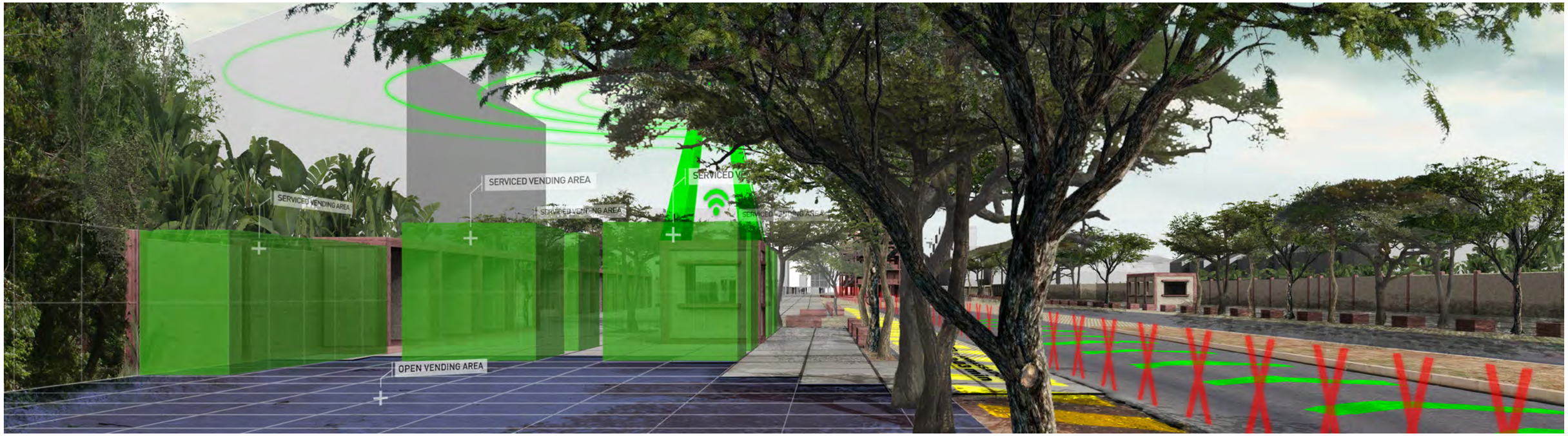


Diagram indicating the visualisation of traffic in augmented reality. The buffer zone (pavers) switches between use by motorised traffic, notably public transport (bottom) and pedestrians (top).



The drawing visualises appropriable and appropriated space in augmented reality. Areas are highlighted, while areas and stalls providing services such as Wi-Fi, electricity or water are shown as occupied (blue) or available (green).



the New Ngong Road **I** using augmented reality as a prosthesis to the exiting design


iDUKA
45m
where is my spot?
Safaricom

COMING TO A NEW NAIROBI

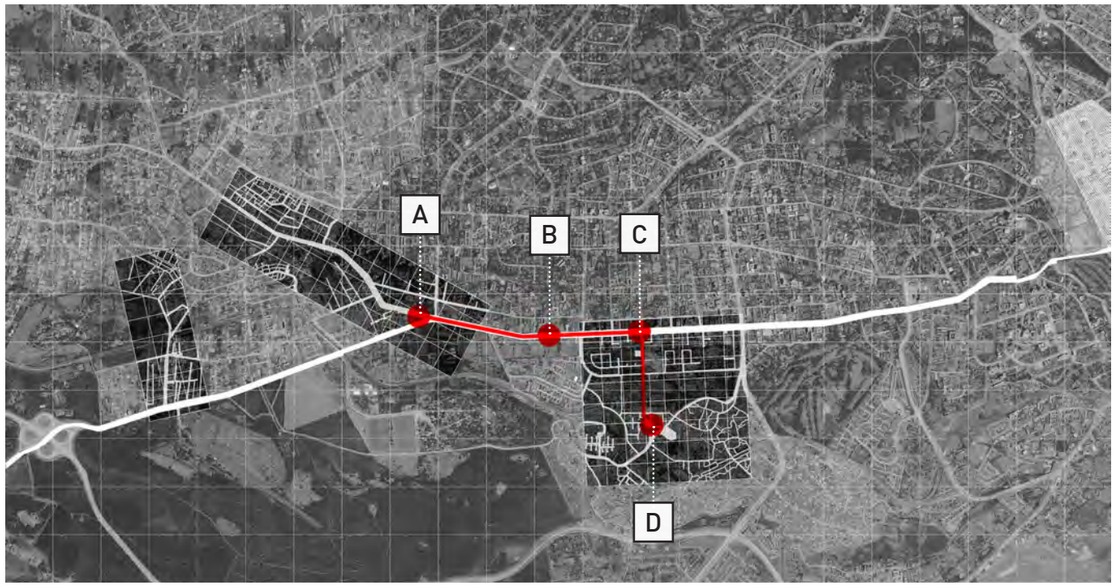
The The last chapters elaborated on the possibilities of introducing a new language of public space into the city of Nairobi. What remains to be discussed now is whether the interventions proposed in this project actually contribute to improving the legibility of space in the city.

I started my explorations into public space in Nairobi by looking at the various kinds of migrants arriving to Kenya's capital every day. Through its brief urban history, the city is still strongly dominated by dynamics of comings and goings, with large parts of the population being second or third generation immigrants at best.

I will consequently use the process of arriving to Nairobi for the first time to simulate a novice's interaction with the dynamic, now legible environment they encounter on their way through the city. More precisely, four situations essential to the understanding of the city's system of public space will illustrate an improved readability of Nairobi to its users and citizens.

A. The Bus Terminal
B. in the Matatu
C. Along the Street
D. On the Market

Everyone of these situations is fundamental to how public space works in Nairobi. Navigating the chaos of a bus terminal, using the city's matatu network, shopping along the streets and finally appropriating space for your own commercial use are activities that are part of every Nairobian's daily routine. With the interventions proposed in this project these actions will no longer be subject to subjective, tacit knowledge but embedded in the city's commons, whether physically or digitally.



Coming to a New Nairobi **I** an arrivals first stations in the city



The Bus Terminal | Physical Space



The Bus Terminal | Augmented Space



The Bus Terminal | Impression



In the Matatu I Physical Space



In the Matatu I Augmented Space



In the Matatu I Impression



Along the Street I Physical Space



Along the Street I Augmented Space



Along the Street I Impression



At the Market I Physical Space



At the Market I Augmented Space



At the Market I Impression

CHAPTER V:

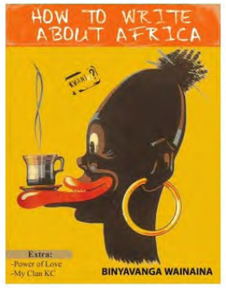
APPENDIX

or

everything that didn't fit with the rest

REFLECTION

THE ~~WHITE MAN'S~~ URBANIST'S ~~BURDEN~~ ANXIETY



'Establish early on that your liberalism is impeccable, and mention near the beginning how much you love Africa, how you fell in love with the place and can't live without her. Africa is to be pitied, worshipped or dominated. Whichever angle you take, be sure to leave the strong impression that without your intervention Africa is doomed.'

Binyavanga Wainaina in *How to write about Africa*

In times in which political discourse around the world is increasingly oscillating between profuse political correctness on one hand and non-factual populism on the other, attempting a graduation project in a third world context in general and an African city in particular, can result in considerable moral and ethical pressure on the project to perform. Coming from a European background, working on my graduation project in Nairobi, the capital of Kenya, questioning my stance towards the city and its society but also towards western liberal thinking has been a defining part of my work over the past nine months, starting with the broad considerations on research methodology and going all the way to the meticulous, detail-oriented designing of street sections.

By consequence, in this reflection I will try to elaborate how my particular disposition as a western-educated urban designer has influenced my process. Most evidently of course this means discussing some of the ethical dilemmas I have encountered and reflecting on the societal relevance of developing my project. At the same time, my distinct position has directly influenced the project at large: Be it the connection between research and design in the project, my relationship with the Design as Politics graduation studio or its scientific relevance, working in an African context has left me questioning a wide range of assumptions that I held up to now.

ON ETHICS

A pressing issue in the context of my work on Nairobi is of course my role as a non-African, non-Kenyan urbanist working on the city. Because of colonial history and what some writers would call the perpetuation of colonial thinking one has to be aware of the sensitivities one will inevitably touch. The risk of being perceived as naive (if you do slum upgrading), neo-colonialist (if you support Chinese infrastructure spending) or romanticising (if you accept the informality of housing and the economy) is omnipresent when working in an African context. It is, in fact, so strong that Rem Koolhaas and his team at Harvard, after years of research on the city of Lagos, decided not to publish a vast amount of work they had produced in fear of local but mostly academic backlash (Koolhaas and Adeyemi 2016).

There is of course a danger of a similar reaction to this research. Through establishing a model of the city of Nairobi that, for the sake of analysis, ignores the social conditions on the ground, I have inevitably thrown the doors wide open for accusations of romanticising the precarious situation of the urban poor.

In this context, my positivist stance on the appropriation and occupation of public space in Nairobi by its Jua Kali[1] workforce is at particular risk of being discussed controversially. Recently, the transformation of a gallery pavilion into a primary school in Kibera by Spanish architecture firm SelgasCano sparked controversy, particularly because of Iwan Baan's documentation of the project, perceived by many as romanticising the blight of life in one of Africa's largest informal communities and by some as a reinforcement of colonial thinking[2]. While the criticism in this discussion was mostly directed at the implantation of a design conceived for a European context in Nairobi as a means of improving the conditions in Kibera, there is a risk of this project being discussed along the same line: While my interventions are certainly not reproducing specifically European designs, they will most certainly be influenced by my European education and professional experience, begging the question whether it is advisable or even possible for me to attempt designing public space that is specifically 'Nairobian'.

To me, the most suitable approach to counter this risk was a constant questioning of my interventions in the design process. However, a discussion of the results with local stakeholders and residents will ultimately be the only means of validating the design in terms of its ethical implications.

A second issue that needs to be discussed in the context of ethics and the romanticisation of urban precariousness in Nairobi is my positivist stance on the importance of the mobile economy. In the project I highlight the potential of digitalisation and specifically the platform economy to adequately codify and stabilise the structural informal labour force in Nairobi. Similarly, the sharing economy has been widely discussed as a disruptive success by academics around the world. However, scholars have increasingly highlighted the precariousness of the emerging workforce making a living through platforms such as Uber, TaskRabbit or Etsy. Unbound from or simply in disobedience of local labour regulation, the workers of the digital economy tend to carry much of the entrepreneurial risk while platform providers such as Uber can maximise their profits, leading to what David Murillo and others have referred to as neoliberalism on steroids (2017).

One would thus have to further assess the potential of the mobile economy not only as a contributor to economic growth in Kenya, but also as a creator of socio-economic stability to get a better grasp of its ethical implications.

ON RELEVANCE

In the light of an increasing interest in the whole continent of Africa, fuelled by both enduring economic growth and rapid population growth, it doesn't surprise that African cities are of increasing interest to urban planners, designers and scholars. In fact, just this year our very faculty has made Africa a focus of research and knowledge exchange through the 'A is for Africa' programme initiated by former dean Peter Russel.

At the same time however, knowledge on urbanism on the continent is still scarce, not only at our faculty but in urban design and planning in general. In fact, the amount of institutions globally committed to comprehensive research on African cities is minuscule with Edgar Pieterse's African Centre for Cities playing a leading role in the development of knowledge.

At the same time, there is a grave danger of falling back into old habits and paradigms of research precisely because of the little amount of knowledge and experience on African urbanism in general. In the lack of a comprehensive theoretical backdrop, research has recently focussed on what is perceived by many as the most essential problems on the continent. By consequence, over the past decade there has been a disproportionally strong focus of research on informal settlements in African cities. In the case of Nairobi this focus has led to the bizarre situation of private individuals and NGOs profiting from the dire situation of slum residents as I found out in conversations with professionals during my field work in Nairobi. Kibera, the city's oldest and by far largest informal settlement has become a marketing brand in anything from research proposals[3] and NGO projects[4] to tourism[5]. By contrast, African success stories such as Kenya's bustling tech scene, epitomised in the wildly successful Kenyan-made money transfer system M-Pesa, have so far been widely ignored as topics of urban research. By consequence, a project seriously addressing an African city can not only contribute to a relevant body of knowledge but should in any case also be the starting point for original research on cities that are still utterly underrepresented in academic discourse.

ON REEARCH & DESIGN

As I elaborated in the previous section, there is a fundamental lack of comprehensive research on African cities, creating a strong sense of urgency to address the issue. It shouldn't come as a surprise then, that there is an equal lack of design precedents on cities like Nairobi, particular on an urban scale. With the exception of some plans developed by post-war modernists in the wake of African independence and the recent expansions of Chinese investment in wide parts of the continent there is little reference to draw back on when designing public space in Nairobi. For me personally this proposed a particular challenge since my conservative architectural training has – up to now – forced me to put the analysis of references at the beginning of every design project. In addition, the issue of romanticisation described earlier made it quite impossible for me to start designing from a spell of pure intuition. By consequence, connecting research and design was quite essential to my project both as a means of informing and inspiring the design and as a tool to evaluate and justify it. This is perhaps most clearly visible in the vision for the future influence of the mobile phone that I use as a means of legitimising and codifying the existing socio-economic structures within the city. Each one of the typologies developed is the direct result of socio-economic research combined with precedents already existing in throughout the continent. While not spatial or even architectural, they thus directly make use of my research to inform a design. In a more conventional sense, there is an essential link between research and design in the spatial distribution of the hard and soft typologies at the core of my design proposal. Intended as a spatial representation of the socio-economic structures at play in Nairobi's public realm, the layout and design of public space on my sites by definition has to be closely linked to my research these same structures. By consequence, my statistical research, represented in several maps analysing Nairobi in terms of morphology, accessibility and activity has directly shaped my final design proposal.

[1] Jua Kali is the Kiswahili term used to describe the sum of all informal labour taking place in Kenya
[2] Specifically referring to the notion of placing a western-specific design in a marginalized context to improve the situation in the area.

[3] According to one of my professional contacts in Nairobi, residents of Kibera are being paid in excess of 1'000 KSh to fill out research questionnaires on a regular basis, meaning an additional income drastically above the average income in the area. ua Kali is the Kiswahili term used to describe the sum of all informal labour taking place in Kenya
[4] In OpenStreetMaps, Kibera remains the only part of the city fully mapped as the result of an NGO working on said site.
[5] On the appartment-sharing platform Airbnb a 'movie making class in Kibera with a local film maker' is available to tourists at the price of 60$ per person. It is among the most highly recommended activities on the platform.

ON METHODOLOGY

One of my main motivations to choose the Design as Politics graduation studio was undoubtedly the methodological freedom the research group grants its students in developing their projects. This was of particular relevance to me since my site and topic required me to take an explorative approach in terms of research.

As previously mentioned, the lack of comprehensive knowledge on African urbanism is one of the main motivators for this project. At the same time, this very lack of knowledge was one of the main challenges throughout the project.

This is perhaps most clearly visible in the availability of reliable data for a city like Nairobi. More precisely, the problem is not that data in general is not available. The graver issue is that – unlike in a western context – the data available is either inaccurate or because of the may it has been processed, unusable. The Kenyan census is an interesting case on how availability of data and reliability of data can be two different issues indeed. While data is available going back to 1975, administrative reforms, different questionnaires and formatting render the data practically unreadable for the purposes of a graduation in urbanism. More crucially however, publicly collected data like the census, due to its formal nature, largely ignores the informal parts of society, strongly distorting the image of a city like Nairobi.

In the wake of Nairobi's rapid digitalisation, crowdsourced data from sources such as the Goole Places API, OpenStreetMaps or Twitter turned out to be a helpful supplement in understanding the structure of the city. For example, a comparison of government data and a dataset retrieved from Google Maps revealed that the amount of primary schools in Nairobi was actually ten times higher than government data, used in the development of the city's current masterplan, suggested.

There is however, clear limitations to the use of big data in a city like Nairobi. A strong case for the bias of crowdsourced data is the Twitter dataset produced for this graduation. While giving an interesting insight in the social media activity of an African city one easily oversees that most Twitter-users in Nairobi are males between 18 and 29, making the data unreliable as a driver for urban planning and design.

For me, this insight is emblematic of the explorative approach I took towards methodology in the course of my graduation. While the project certainly profited from me applying a wide variety of methods such as data scraping, video analysis, space syntax evaluations and extensive literature analysis, the lack of a strict methodological framework for addressing the design of public space in a city like Nairobi meant that the process of the development of this project was extremely inefficient and at times frustrating: I spent considerably more time than required getting acquainted with new methods and software and as the case of the Twitter data shows, not all of the results were as helpful in developing my project as I expected.

At the same time, I do feel that through this explorative process I have been able to critically reflect on the challenges of developing a project on urban Africa. However, seeing my process in the wider context of the faculty's ambition to strengthen research and knowledge on the continent, I believe that future graduation projects addressing African urbanism and other under-researched topics alike, should receive more methodological support from the faculty.

ON DESIGN AS POLITICS

For this years' studio the team of the Design as Politics chair have chosen the topic 'A City of Comings and Goings' in response to the increasingly negative sentiment towards migration, particularly in Europe. Highlighting the diversity of different types of migration happening around the globe the studio, in conjunction with a research project initiated by Crimson Architectural Historians, tries to advocate for migration as a constant in the structure and dynamics of cities and aims to develop research and design in support of dynamic cities with a high absorption capacity for migrants of any kind.

During my research over the past months I have increasingly been able to establish that Nairobi basically is already a 'City of Comings and Goings' in the sense of the studio. Because of its particular history of colonialism, Kenyan independence and leapfrog urbanisation Nairobi has been a city shaped by strong dynamics of migration ever since its foundation just over 100 years ago. Because the native population was practically excluded from life in the city during colonial times, Nairobi remained a city that Kenyans would temporarily migrate to in order to make money, ultimately returning to their original homestead in the countryside. While this paradigm has established an urban system that is utterly dynamic and - in its own way – capable of absorbing migrants, it lacks codification, making it challenging to understand for arrivals to the city and inhibiting the permanent identification of residents with the city. In this sense, the aim of my project is, rather than promoting the dynamic absorption capacity, mediating the adverse effects of the dynamics that currently allow this absorption.

In more general terms this of course ties in with the overall aims of the urbanism track at TU Delft which has a strong emphasis on the promotion of resilient and sustainable urban development. In addition, the project is very much in line with the faculty's recent effort to increase knowledge and research on African cities. However, as most efforts in the urbanism department to address African cities are based in UN Habitat's New Urban Agenda and the Sustainable Development Goals rather than research into African urbanism itself I hope that this project can provide an alternate perspective on how to address a city like Nairobi in this day and age.

In Search of the African City

Exploring Theory on African Urbanism towards a Framework for Urban Practice

Gereon Rolvering | Stud.-No. 4598237 | AR3U022 Theory of Urbanism Delft University of Technology | December 2017

Abstract

Over the past decade the narrative on the development of African societies in general, and African cities in particular, has grown increasingly dichotomous, if not even schizophrenic. On one hand observers praise the continent's capacity for innovation in technology and urban development, on the other hand they evoke the impending doom of cities in the face of growing informality and failure to keep up with the standards of the western world. For anyone dealing with the development of African cities this reveals the lack of a widely accepted theoretical backdrop for metropolises developing south of the Sahara. This paper will therefore discuss and test whether the various positions advocating the establishment of an African urban theory can be used as a means for practitioners to read African metropolises without automatically falling back on western preconceptions of the city. Inspired by Venturi's non-judgemental, positivist *Learning from Las Vegas*, I will look at two different iterations of a similar approach in the African context. Firtsly, I will revisit the practice-driven analysis of Lagos developed by Rem Koolhaas, coming to the conclusion that while painting a ground-breaking and in many ways accurate picture, the work fails in providing a framework for a practice-oriented, theoretical discussion of African urbanity. In a second step, I will therefore discuss the more recent, 'experimental'[1] work of AbdouMaliq Simone, who looks at the genesis of the African city through the lens of social relationships, identifying a difference in use and appropriation of the city at the core of the differences between the 'western urban' and the 'African urban'. In search of confirmation of these two different approaches I will analyse the genesis of the city of Nairobi to conclude that, within limits, the notion of an 'African City' is a valid point of departure for urban analysis on the continent.

Keywords

African Urbanism, African Exeptionalism, Post-Colonialism, Nairobi, Kenya, Colonial Legacy

Introduction | Learning from [the African City]

The publication of Denise Scott-Brown and Robert Venturi's magnum opus, *Learning from Las Vegas* in 1972 fundamentally altered the paradigm of urban research on the American city. By means of a non-prepossessed, one might even say naïve analysis of Las Vegas and its commanding strip, they established a model of a city that, in contrast to the established conviction of the time, saw symbolism and representation in form of the city's ubiquitous commercialism as a veritable element of the cityscape. Demonstratively distancing themselves from the academic pretence and elitism of their colleagues, *Learning from Las* Vegas established a means of reading the city on an eye-to-eye level with all the forces shaping it.

The 'African City' has yet to experience this kind of paradigm shift. This is perhaps most obviously visible in the moralist discussions that almost inevitably erupt when western planners, Chinese government institutions and well-meaning NGOs intervene in urban processes on the continent. For lack of an established, theoretical framework, interventions will almost inevitably be discussed as either neo-colonialist, romanticizing or simply naïve. In this realm of inopportune political correctness, the recipes developed by organisations such as UN Habitat seem like the only universally accepted framework of discussion. This notion is probably most clearly epitomised in UN Habitat's New Urban Agenda, clearly aimed at dealing with the challenges faced by cities in the so-called 'Global South'. A resolution adopted by the General Assembly of the United Nation in late 2016, it commits its members to a development

[1] In a lecture at the London School of Economics on 26 January 2011 Pieterse explicitly describes his and Simone's work as highly experimental due to the limited amount of academic precedents in the field of specifically African urban theory (Pieterse 2011)

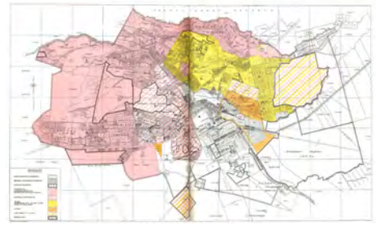


Figure 1: Map for the racial segregation of Nairobi in the master-plan of 1948

of cities that are 'just, safe, healthy, accessible, affordable, resilient and sustainable' (UN Habitat 2016). It is hardly surprising, that practitioners, politicians and scholars have incorporated these fundamental and apparently universal principles into their *modus operandi*.

However, scholars are increasingly questioning this universality of urban policy because of its Eurocentric[2] tendencies. As Edgar Pieterse notes, 'policy approaches with the aim of ameliorating poverty etc. come with built-in assumptions about the nature of the city, its people, culture and possible futures' (p. 13) and might therefore miss their aim in practice (Pieterse and Simone 2013). The city of Nairobi, where due to lack of political will a colonial masterplan suggesting racial segregation (White, Silberman et al. 1948) is *de jure* still in place[3], is a tragic example of the failure of designers to address planning in African cities adequately up to the present day.

At the same time, research conducted by practicing architects, scholarly urbanists and even management consultancies suggests that the application western planning and development principles might be of little relevance or even contradictory to cities in Africa. These investigations hint at urban societies that operate by their own sets of rules, independent from western precedents and shaped by the continents' distinct history and culture. But how can these theories support an alternative basis for the analysis of an African metropolis such as Nairobi?

In Search of the 'African City'

Coming back to Venturi's approach, Rem Koolhaas' analysis of Lagos, at first glance an African iteration of *Learning from Las Vegas*, will be the starting point for my explorations in search of the African city. Taking a distanced approach, he, much like Venturi, establishes an observative model of Lagos as it is. However, as I will point out, his distance from the culture and every-day-lives of Lagosians, is not only a major difference to the position of Venturi in the context of *Learning from Las Vegas*. It also means that his position will not help in addressing the challenges of the 'African City' because he doesn't position himself on the matter. By contrast, the work of AbdouMaliq Simone, one of the earliest African proponents of African Urbanism, is driven by an almost ideologic sense of urgency. Focussing on the particularities of the social structures in African Cities his starting point is not observational but based in his own cultural, spatial and academic experience in these systems.
Looking at both Koolhaas and Simone as - in a way – pioneers of African urbanism approaching the issue from different motivations and backgrounds might thus lead to a balanced understanding of what defines the 'African City'.

Rem Koolhaas

Having analysed both the Pearl River Delta and the city of Lagos with a team of researchers and students from Harvard GSD, Rem Koolhaas suggests that in these regions 'the notion of the city has mutated into something that is no longer western' (Koolhaas 2002). Even more radically so, he suggests that not only a notion of the 'African City' has developed over the past decades, but that this very idea of the city foreshadows the future of the global metropolis at large (Koolhaas, Lavalou et al. 2000).
Fuelled by the lack of research on a city considered a no-go-zone of violence and chaos by most western governments and the knowledge that Lagos will develop into the third largest city in the world by 2050, the focus of research was on establishing an understanding of the city that would resist the use of vocabulary common to a Eurocentric analysis of the metropolis. The resulting study describes Lagos as a city in which the distinction between the formal and the informal has become redundant, revealing a dynamic, adaptive urban system working outside of western conventions (Koolhaas, Lavalou et al. 2000).
At the core of this Lagosian model of urbanism is the unplanned leapfrogging of the Nigerian society

[2] In In this paper I will use the term 'Eurocentrism' not in the anti-capitalist sense coined by Samir Amin but rather in the way defined by John Brohman, who sees Eurocentrism as a perpetuation of 'intellectual dependence on a restricted group of prestigious Western academic institutions that determine the subject matter and methods of research.' (p. 121, Brohman, 1995)
[3] For lack of political will, amendments to the city's masterplan in the seventies have never been written into law (Syagga 2005).
A new masterplan presented by the Japanese Development Agency in 2014 remains under consultation up to this day (Nairobi City Council 2017).



Figure 2: Typologies of congestion and their potential in the city of Lagos according to Rem Koolhaas

from rural to urban. In the face of hyperspeed urbanisation, the traditional Yoruba compound in which individuals delimit their space on communal ground with the community's approval, remains the main typology of urban development. In this process, fencing one's property in defence of other individuals, is a defining moment, separating urban space into the radically private and the ultimately public. Instead of being planned, public space is the result of the individual occupation of plots, reducing it to the bare minimum needed.
By consequence, public space is both notoriously congested and actively (as well as productively) used. The result is a city that is, in Koolhaas' view, extremely resilient because the city itself is constantly renegotiated and reconfigured (Koolhaas, R. and K. Adeyemi 2016).

This hypothesis is of course not uncontroversial. While his research did receive support, praising it as a means to depart from the negative reading of African cities towards a more positive, empowered bottom-up model (De Boeck and Jacquemin 2006, Haynes 2007), a number of scholars, such as Matthew Gandy accuse Rem Koolhaas of romanticizing the precarious situation of Lagosians and exploiting the city for the benefit of academic discourse[4].
Others believe that he overestimates the flexible capacity of Lagos' infrastructure (Thrift 2005) or simply criticise his almost complete ignorance for the suffering of the poor (Packer 2006). At the same time, as much of the research is unpublished (Koolhaas and Adeyemi 2016), wide parts of his hypotheses lack substantial backing in the form of historical, empirical and even mapped evidence.

The radical dialectic in the analysis of Koolhaas' work thus clearly indicates the necessity of a widely accepted theoretical backdrop in reading the African city.
By the same token it demonstrates that in the sensitive domain of African urbanism, the purely observational analysis of an architect-turned-scholar is not convincing enough to establish a model of a city.

AbdouMaliq Simone

The aforementioned notion of a lack of theory is increasingly reflected in research on African urbanism, particularly by authors from the continent who share Koolhaas' belief that well-established, Eurocentric theory fails to do justice to the complexity, challenges and qualities of African cities.

One of the most cited authors in this context is Sudanese-born AbdouMaliq Simone. In this context, particularly his research on the social composition and structure of African cities could be seen as a starting point from which to reshape practice through theory. A sociologist by training, he looks at urban processes through the lens of social linkages and their expression in space. Looking at both the colonial and post-colonial development of African cities he argues that the very dialectics of African societies, oscillating between formal and informal, urban and rural, customary and civil, private and public, have led to a volatile relationship of Africans with urban space (Simone 2004).
The consequence of this dynamics is a city in which the people's sense of belonging is undermined, whether through a constant struggle over access to and ownership of land or through the uncertainty over the rule of law. At the same time however, Simone sees this ambiguity as one of these societies largest strengths, because it increases their flexibility and capacity for innovation. In this sense the mediation of societal volatility is the core function the city has to fulfil (2004).
Considering that weak government institutions largely fail to provide this mediation, self-organisation of citizens takes the place of established institutions.
The social network of the individual replaces the government-provided social security. In that sense, the social connections become part of a city's infrastructure (Simone 2004).
In times in which political, economic and social developments increasingly undermine these infrastructures[5], Simone sees the strengthening of such support systems as key in establishing a sense of belonging among citizens (Simone 2004).

While the principles described by Simone certainly provide a new perspective on the African city, some of its core principles are not entirely new. In a philosophical context, his hypothesis evokes Hannah Arendt's conception of the public and the private. Rather than the static result of planning, the public realm she describes is the result of 'action', or in other words active use, and therefore defined by the social structures that appropriate it (Arendt 1958).
By the same token, one might consider Simones ideas as a specifically African iteration of Lefebvre's work on the construction of social space. In the same way that Simone sees the social structure as its backbone, Lefebvre highlights the importance of (social) space as a means of production as well as a means of control and power in the city (Lefebvre 1968, Lefebvre 1974). At the same time, Simone's reference to Lefebvre might be the basis for an alternative, Africa-specific interpretation of international resolutions such as the New Urban Agenda, that incorporate his concept of 'the right to the city'.

However, one cannot ignore the fact that Simone's work gives little evidence of the spatial implications of his hypothesis. A combination of both Simone's and Koolhaas' approach could thus be seen as a basis for the notion of the 'African City'. While observing African metropolises from two divergent vantage points, both approaches share their analysis on the dynamic of the use of public space, its constant re-use, re-configuration and re-appropriation[6].
However, while Simone uses this observation as a starting point for the analysis of the city's social structure, for Koolhaas it is a notion in support of his non-western spatial configuration of Lagos. Together, it seems, these two approaches could form a pragmatic framework for practitioners to read cities in the sub-Saharan context.

By consequence, the main question remaining here is how this new theoretical framework on the African city can be applied by practitioners such as myself. Having lived and worked in East Africa for a little over 18 months, it seemed opportune to analyse Nairobi, its historical and morphological development and compare whether my findings would somewhat reflect the conclusions drawn by both Rem Koolhaas and AbdouMaliq Simone.

Revisiting Nairobi

Nairobi, the capital of Kenya, the economic hub of East Africa and home to the largest office of the United Nations in the developing world, bustling with the life of its more than four million inhabitants, is an ideal showcase of the current situation of many sub-Saharan cities. Caught between economic growth and informal sprawl, technological revolution and democratic unrest, rural history and urban future, the city reflects the key dialectics prevalent on the continent.

In getting an understanding of this state of ambiguity, the key is to understand the physical and social structure of Nairobi through the history of Kenya as a whole, and more particularly in the disruption of its development in the context of colonisation.
While modern Nairobi is the economic and political hub for the whole region, bustling with the life of its more than four million inhabitants, Kenya as whole lacks what one might call a veritable urban history. In fact, prior to its colonisation, the land that makes up modern Kenya was quintessentially

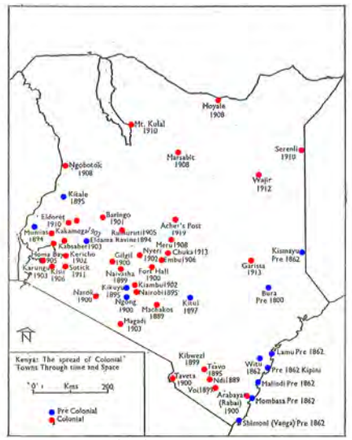


Figure 3: Pre-colonial (blue) and colonial settlements in Kenya and their foundation year

[4] Being a geographer, Gandy's criticism is mostly based in Koolhaas' polemic, unscholarly approach, particular in terms of Nigeria's postcolonial history and the tendency of the research to focus on the extremes of Lagosian urbanism (Gandy 2005).

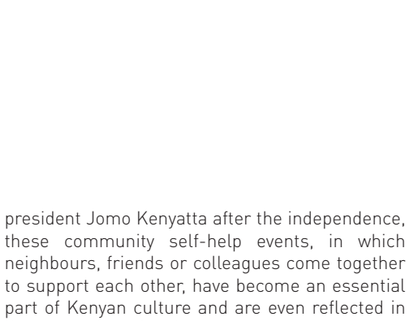
[5] Simone refers to increasing urban growth and continuing liberalisation as a driver of an increasing, destructive competiton among dwellers in African cities (2004).

[6] Koolhaas writes 'In Lagos public space is continuously being occupied in new ways. Pavements have become crowded with [...] all kinds of entrepreneurs [...] jostle anarchically for turf while 'life' seems to thrive in the congestion of streets.' (Koolhaas et al. 2005) Similarly, Simone describes public space as 'an incessant throbbing produced by the intense proximity of hundreds of activities' to

rural. With the exception of Muslim towns along the coast such as Mombasa or Lamu, the country was basically devoid of settlements considered 'urban' by western standards (Obudho 1979). The few settlements that did exist were marketplaces and had little relevance as a places of residence as people would return to their homesteads after having traded their produce (1979). These homesteads, small collections of huts built on communal land in a framework of customary law, would be inhabited by the individual, extended families of a tribal clan.
The forceful occupation of East Africa by the British at the turn of the 20th century radically disrupted this traditional form of live. The large-scale appropriation and conversion of ground into 'Crown Land' as well as the spatial segregation of the native population in reserves eradicated most of the traditional forms of live and made way for the foundation of new settlements. Hence, most of the towns that have developed in Kenya over the past 100-odd years are colonial foundations. Established as trade posts, military camps or rail depots, these new settlements were exclusive to new white settlers and Indian administration workforce (Charton-Bigot and Rodriguez-Torres 2006, Syagga 2006).
By consequence, the only access to the city for the black population was as domestic or menial labour (Syagga 2006), meaning that large parts of the Kenyan population felt disenfranchised even after Kenya's independence in 1963.
By the same token, particularly in the first decades after the independence, people would move to Nairobi for a fixed period, but would eventually return to their homelands (Charton-Bigot and Rodriguez-Torres 2006).

The disconnect of the urban population with their city has in many ways continued into the 21st century. As a reflection of their strong connection with their rural roots most Nairobeans will insist on being buried in their ancestral land hundreds of kilometres away from the city (Dohrenbusch 2008). This paradigm clearly mirrors the issue of belonging, described as one of the essential characters of the African city by AbdouMaliq Simone. The disruption of tradition and segregation of space introduced by the British has, on one hand, generated a population that, in large parts, does not identify with the city and as a consequence, fails to take responsibility for it. On the other hand, forms of self-organisation through cooperatives or more prominently the tradition of *Harambee*[7] have emerged in post-colonial Kenya as a means of strengthening Kenyans' sense of belonging. Introduced by first president Jomo Kenyatta after the independence, these community self-help events, in which neighbours, friends or colleagues come together to support each other, have become an essential part of Kenyan culture and are even reflected in the country's national motto.

But what are the spatial consequences of this disconnect with the city? The segregationist policies of the colonial administration meant that there was no land legally available for the development by the Kenyans themselves. By consequence, the settlements that did start to sprawl eventually, reflected not the notions of European town planning but replicated the patterns of settlements known to Kenyans for centuries. The homestead and its principles were applied in the city and gradually adapted to fit the new urban condition after Kenya's independence. The homestead itself was replaced by an (il) legally occupied plot, its thorn tree protection transformed into brick walls with iron gates and mud huts evolved into humble sheds of corrugated iron or lavish villas of brick and Chinese marble.



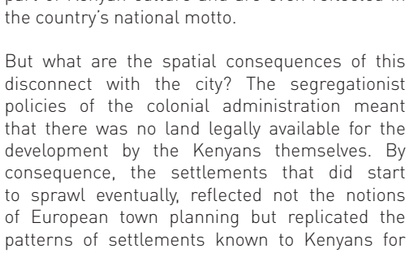


Figure 4: A Kikuyu homestead in the Nairobi metropolitan area; picture ca. 1946
Figure 5: Governmental housing project in Mathare, Nairobi; picture ca. 2016

At the same time the streets, forming the only part of the urban structure not affected by segregation during the colonial period, developed into Nairobi's only true public realm.

[7] Lit. Kiswahili for ‚all pull together'





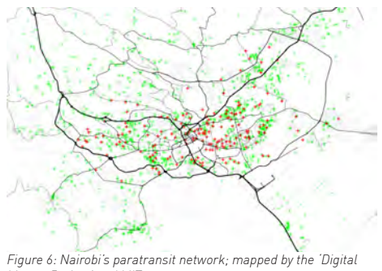


Figure 6: Nairobi's paratransit network; mapped by the 'Digital Matatu Project' and MIT
Figure 7: Analysis of Twitter-Activity in Nairobi over the period of one month; Data scraped by Mark Graham (2012)
Figure 8: Primary schools mapped by the government (red) vs. listings in Google Maps (green); Data scraped by the author (2017)

In lack of space to express themselves, trade, meet or protest, Nairobeans have appropriated the streetscape and created the public inverse of the isolated, private, urban homestead.
The development of the city as a direct translation of the rural to the urban, the stark contrast between what is considered public and private and the strong importance of the street are characteristics equally reflected in Rem Koolhaas' reflections on Lagos. It seems that although the history of both city and country are fundamentally different, they share certain structural patterns.
It thus seems that there is some validity in the argument for the notion of the 'African City'.

The model of the city of Nairobi described here is not without consequence for its analysis in practice. This is first and foremost visible in the inadequacy of conventional statistical data as a mapping tool. For example, the national census still largely fails to take into account the residents of the informal parts of the city[8].
One promising addition to using centrally generated statistics seems to be the use of data crowdsourced on various online platforms and by community mapping projects (Graham 2013, Panek and Sobotova 2015, Williams, White et al. 2015), covering the entire scope of the city, not discriminating between formal and informal.
At the same time, means of documenting the dynamic, precarious relationship between private and public space in African cities have to be established. While little research has been conducted on this topic to date, the phenomenological approach used in projects such as Learning from Las Vegas and referenced by Koolhaas in his work on Lagos might be a first step in understanding the spatial structures of this system.

The image of Nairobi in such an analysis is thus different from what is normally associated with Kenya's capital. Rather than focussing on the conflict between the formal and the informal, the legal and the illegal, the public and the private, it highlights the challenges and potentials of a city in which the definitions of these same dialectics are continuously changing.
This however does not mean a romanticizing of the obvious precariousness of the urban poor; moreover, it challenges planners and designers to deal with the city outside of the Eurocentric conventions of formality, publicness or policy.

[8] For example, the census lists the area containing Kibera, one of Africa's largest informal settlements, as one of the least densely populated within the city of Nairobi (Kenya National Bureau of Statistics 2009).

Conclusion I The Notion of the African City as a Tool for Designers

> Robert Venturi:
> *'For people of culture and taste, Los Angeles didn't exist before Reyner Banham.'*
>
> Audience Comment:
> *'We didn't need you or Reyner Banham to bring us into existence.'*
>
> Robert Venturi:
> *'In fact ... you did.'*
>
> (p.4, Day 2009)

Sharp and in many ways patronising at the same time, Robert Venturi's remarks at a conference in Los Angeles epitomise the clash of academic urban theory and local urban identity. Celebrated by architects and planners, particularly from abroad, publications like 'Learning from Las Vegas' and Banhams' 'Architecture of Four Ecologies' were often met with fury on the part of the actual residents of Las Vegas and Los Angeles, respectively (Day 2009).

In a way, there's a 'lesson learned' here for the treatment of African cities in the context of the positivistic literature described in this paper. For within an attempt of describing a city that is considered failed, as both working and a positive example of an urban model, there is a danger of side-lining the local population and their legitimate push towards a 'formalisation' of their livelihood.

This being said, I believe there is a legitimate reason and an actual need for the establishment of theory describing the African city.
Rather than evoking the image of a utopian/ dystopian model of the city in the way Koolhaas does in the case of Lagos, one should understand positivist, exceptionalist descriptions of African urban structures as a means of reading the city.
By doing this designers and planners can attempt to solve the issues inherent to these systems, such as marginalization, accessibility and equal opportunities, by capitalising on the city's intrinsic strengths.

Bibliography

ARENDT, H. (1958). *The Human Condition*. Chicago, University of Chicago Press.

BROHMAN, J. (1995). *Universalism, Eurocentrism, and ideological bias in development studies: from modernisation to neoliberalism*. Third World Quarterly 16: 121-121.

CHARTON-BIGOT, H. AND D. RODRIGUEZ-TORRES (2006). *Nairobi contemporain. Les paradoxes d'une ville fragmentée*, Karthala Editions.

DAY, J. (2009). *After Ecologies*. Foreword to Los Angeles: The Architecture of Four Ecologies'.

DE BOECK, F. AND J.-P. JACQUEMIN (2006). L*a ville de Kinshasa, une architecture du verbe*. Esprit(12): 79-105.

DOHRENBUSCH, W. (2008). *Reportage Kenia - Einmal Nairobi und Retour*. Vienna, Picus Verlag.

GANDY, M. (2005). *Learning from Lagos*. New Left Review 33: 37.

GRAHAM, M. (2013). *Where do tweets in Nairobi come from?*. Retrieved 10.12.2017, from http://www.markgraham.space/blog/where-do-tweets-in-nairobi-come-from?rq=nairobi.

HAYNES, J. (2007). *Nollywood in Lagos, Lagos in Nollywood Films*. Africa Today 54(2): 131-150.

KENYA NATIONAL BUREAU OF STATISTICS (2009). *Kenya Population and Housing Census 2009*. Nairobi.

KOOLHAAS, R. (2002). *Fragments of a lecture on Lagos*. Documenta 11_Platform 4: 173-184.

KOOLHAAS, R. AND K. ADEYEMI (2016). *Lagos shows how a city can recover from a deep, deep pit: Rem Koolhaas talks to Kunlé Adeyemi*. Guardian Cities. C. Michael. London, Guardian News and Media Ltd.

KOOLHAAS, R., ET AL. (2000). *Mutations*. Barcelona, Bordeaux : arc en rêve centre dárchitecture.

LEFEBVRE, H. (1968). *Le droit à la ville*. Paris, Anthropos.

LEFEBVRE, H. (1974). L*a production de l'espace, Paris*. Anthropos 420.

NAIROBI CITY COUNCIL (2017). *Integrated Urban Development Masterplan for the City of Nairopi (NIUPLAN)*. retrieved from http://citymasterplan.nairobi.go.ke/.

OBUDHO, R. (1979). *Urbanization and development planning in Kenya*. Praeger Special Studies: 242-257.

PACKER, G. (2006). T*he megacity: decoding the legacy of Lagos*. The New Yorker.

PANEK, J. AND L. SOBOTOVA (2015). *Community mapping in urban informal settlements: examples from Nairobi, Kenya*. The electronic journal of information systems in developing countries 68.

PIETERSE, E. (2011). *African Urbanism*. Lecture at LSE Cities. London. retrieved from https://www.youtube.com/watch?v=KUBTGzx9yOk.

PIETERSE, E. AND A. SIMONE (2013). *Introducing rogue urbanism*. Pieterse and AbdouMaliq: 12-15.

SIMONE, A. (2004). *For the city yet to come: Changing African life in four cities*, Duke University Press.

SIMONE, A. (2004). *People as infrastructure: intersecting fragments in Johannesburg*. Public culture 16(3): 407-429.

SYAGGA, P. M. (2006). *Land ownership and use in Kenya: policy prescriptions from an inequality perspective*. Readings on Inequality in Kenya. Sectoral Dynamics and Perspectives, Nairobi: 289-344.

THRIFT, N. (2005). *But malice aforethought: cities and the natural history of hatred*. Transactions of the institute of British Geographers 30(2): 133-150.

UN HABITAT (2016). *New Urban Agenda*. New York, United Nations.

VENTURI, R., ET AL. (1977). *Learning from Las Vegas: the forgotten symbolism of architectural form*, MIT press.

WHITE, L. W. T., ET AL. (1948). *Nairobi, Master Plan for a Colonial Capital: A Report Prepared for the Municipal Council of Nairobi*, HM Stationery Office.

WILLIAMS, S., ET AL. (2015). *The digital matatu project: Using cell phones to create an open source data for Nairobi's semi-formal bus system*. Journal of Transport Geography 49: 39-51.

Table of Figures

Figure 1: WHITE, L. W. T., ET AL. (1948). *Nairobi, Master Plan for a Colonial Capital: A Report Prepared for the Municipal Council of Nairobi*, HM Stationery

Figure 2: KOOLHAAS, R., ET AL. (2000). *Mutations*. Barcelona, Bordeaux : arc en rêve centre dárchitecture.

Figure 3: OBUDHO, R. (1979). *Urbanization and development planning in Kenya*. Praeger Special Studies: 242-257.

Figure 4: WHITE, L. W. T., ET AL. (1948). *Nairobi, Master Plan for a Colonial Capital: A Report Prepared for the Municipal Council of Nairobi*, HM Stationery

Figure 5: retrieved from: http://citiscope.org/sites/default/files/styles/story_large/public/dsc07644.jpg

Figure 6: retrieved from: http://news.mit.edu/sites/mit.edu.newsoffice/files/styles/news_article_image_top_slideshow/public/images/2015/pocketmap-matatus-1024x663_0.jpeg

Figure 7: retrieved from: http://www.markgraham.space/blog/where-do-tweets-in-nairobi-come-from?rq=nairobi

Figure 8: Drawing by Author based on data retrieved from Open Street Maps, the Google Places API and the Nairobi Board of Education

REFERENCES

BOOKS

Appleyard, D., et al. (1966). The view from the road. Cambridge. MIT Press.

Arendt, H. (1958). The Human Condition. Chicago, University of Chicago Press.

Banham, R. (1986). Los Angeles : the architecture of four ecologies. Harmondsworth, Penguin.

Barber, B. R. (2013). If mayors ruled the world: Dysfunctional nations, rising cities. New Haven, Yale University Press.

Bonn, G. and N. Ysenburg (2010). 24Nairobi. Nairobi, Kwani Trust.

Charton-Bigot, H. and D. Rodriguez-Torres (2006). Nairobi contemporain. Les paradoxes d'une ville fragmentée. Paris, KARTHALA Editions.

De Soto, H. (2000). The mystery of capital: Why capitalism triumphs in the West and fails everywhere else. New York, Basic Civitas Books.

Dohrenbusch, W. (2008). Reportage Kenia - Einmal Nairobi und Retour. Vienna, Picus Verlag.

Easterling, K. (2014). Extrastatecraft: the power of infrastructure space. New York, Verso Books.

Enwezor, O. (2002). Under Siege, Four African Cities, Freetown, Johannesburg, Kinshasa, Lagos: Documenta 11, Platform 4. Berlin, Hatje Cantz.

Falola, T. and A. A. Usman (2009). Movements, borders, and identities in Africa. Rochester, University Rochester Press.

Glaeser, E. (2011). Triumph of the city: How our greatest invention makes us richer, smarter, greener, healthier, and happier. London, Penguin.

Koolhaas, R., et al. (2000). Mutations. Barcelona, Bordeaux : ACTAR arc en rêve centre dárchitecture.

Lefebvre, H. (1968). Le droit à la ville. Paris, Anthropos.

Lefebvre, H. (1974). "La production de l'espace", Paris. Anthropos.

Mboya, J. and J. Ogana (2008). Kenya Burning. Nairobi, Kwani Trust.

Obudho, R. (1979). Urbanization and development planning in Kenya. Nairobi.

Pieterse, E. A. and A. M. Simone (2013). Rogue urbanism: emergent African cities. Cape town, Jacana Media

Sassen, S. (2001). The Global City: New York, London, Tokyo. Princeton, Princeton University Press.

Simone, A. (2004). For the city yet to come: Changing African life in four cities. Durham, Duke University Press.

Simone, A. M. and A. Abouhani (2005). Urban Africa: changing contours of survival in the city,.London, Zed Books.

Venturi, R., et al. (1977). Learning from Las Vegas: the forgotten symbolism of architectural form. Cmbridge, MIT press.

White, L. W. T., et al. (1948). Nairobi, Master Plan for a Colonial Capital: A Report Prepared Fr the Municipal Council of Nairobi. London, HM Stationery Office.

Yakubu, M. G. (1985). Land Law in Nigeria. Basingstoke, MacMillan Publishers, Limited.

PAPERS

Abuya, E. O. and C. Ikobe (2010). "Wasted Lives: Internally Displaced Persons Living in Camps in Kenya." Journal of International Humanitarian Legal Studies 1(2): 233-274.

Cleeve, E. and Z. Yiheyis (2014). "Mobile Telephony and Economic Growth in Africa." Thunderbird International Business Review 56(6): 1.

Brohman, J. (1995). "Universalism, Eurocentrism, and ideological bias in development studies: from modernisation to neoliberalism." Third World Quarterly 16: 121-121.

Browder, J. O. and B. J. Godfrey (1997). Rainforest cities: Urbanization, development, and globalization of the Brazilian Amazon, Columbia University Press.

De Boeck, F. and J.-P. Jacquemin (2006). "La ville de Kinshasa, une architecture du verbe." Esprit(12): 79-105.

Friedmann, J. (1986). "The world city hypothesis." Development and change 17(1): 69-83.

Gandy, M. (2005). "Learning from Lagos." New Left Review 33: 37.

Githira, D. N. (2016). "Growth and eviction of Informal Settlements in Nairobi." University of Twente Faculty of Geo-Information and Earth Observation (ITC): Enschede.

Haynes, J. (2007). "Nollywood in Lagos, Lagos in Nollywood Films." Africa Today 54(2): 131-150.

Koolhaas, R. (2002). "Fragments of a lecture on Lagos." Documenta 11_Platform 4: 173-184.

LeBas, A. (2013). "Violence and urban order in Nairobi, Kenya and Lagos, Nigeria." Studies in Comparative International Development 48(3): 240-262.

Makworo, M. and C. Mireri (2011). "Public open spaces in Nairobi City, Kenya, under threat." Journal of environmental planning and management 54(8): 1107-1123.

Mbiti, I. and D. N. Weil (2011). Mobile banking: The impact of M-Pesa in Kenya, National Bureau of Economic Research.

Obala, L. M. and M. Mattingly (2014). "Ethnicity, corruption and violence in urban land conflict in Kenya." Urban Studies 51(13): 2735-2751.

Provoost, M. and W. Vanstiphout (2016). "A City of Comings and Goings." Landscape Architecture And Urban Design In The Netherlands Yearbook 2015: 123-128.

Ratti, C., et al. (2006). "Mobile landscapes: using location data from cell phones for urban analysis." Environment and Planning B: Planning and Design 33(5): 727-748.

Sassen, S. (2005). "When national territory is home to the global: Old borders to novel borderings." New Political Economy 10(4): 523-541.

Simone, A. (2004). "People as infrastructure: intersecting fragments in Johannesburg." Public culture 16(3): 407-429.

Syagga, P. M. (2006). "Land ownership and use in Kenya: policy prescriptions from an inequality perspective." Readings on Inequality in Kenya. Sectoral Dynamics and Perspectives, Nairobi: 289-344.

Thrift, N. (2005). "But malice aforethought: cities and the natural history of hatred." Transactions of the institute of British Geographers 30(2): 133-150.

Williams, S., et al. (2015). "The digital matatu project: Using cell phones to create an open source data for Nairobi's semi-formal bus system." Journal of Transport Geography 49: 39-51.

STUDIES, REPORTS & ARTICLES

August, O. (2013). "Africa rising: A hopeful continent." The Economist 2.

Clos, J. (2013). "Streets as public spaces and drivers of urban prosperity." Nairobi: UN Habitat.

Graham, M. (2013). "Where do tweets in Nairobi come from?". Retrieved 10.12.2017, from http://www.markgraham.space/blog/where-do-tweets-in-nairobi-come-from?rq=nairobi.

GSM Association (2016). The Mobile Economy - Africa 2016. London, GSM Association.

Hales, M. and A. M. Pena (2012). 2012 Global Cities Index and Emerging Cities Outlook. Chicago.

Kamungi, P. (2013). Municipalities and IDPs Outside of Camps: The Case of Kenya's' integrated'Displaced Persons, Brookings Institution-London School for Economics Project on Internal Displacement.

Koolhaas, R. and K. Adeyemi (2016). 'Lagos shows how a city can recover from a deep, deep pit': Rem Koolhaas talks to Kunlé Adeyemi. Guardian Cities. C. Michael. London, Guardian News and Media Ltd.

McKinsey Golbal Institute (2016). Lions on the Move II: Realizing the Potential of Africa's Economies. Chicago.

Metcalfe, V., et al. (2011). Sanctuary in the City?: Urban Displacement and Vulnerability in Nairobi, Humanitarian Policy Group (HPG), Overseas Development Institute (ODI).

Nairobi City Council (2017). "Integrated Urban Development Masterplan for the City of Nairobi (NIUPLAN)." from http://citymasterplan.nairobi.go.ke/.

Packer, G. (2006). "The megacity: decoding the legacy of Lagos." The New Yorker.

Perry, A. (2012). "Africa rising." Time Magazine 3.

Pieterse, E. A. (2014). How can we transcend slum urbanism in Africa? UN Habitat Urban Lecture Series. UN Habitat.

Safaricom (2017). Safaricom Annual Report and Financial Statements 2017. Nairobi, Safaricom.

UN Habitat (2016). New Urban Agenda. U. HABITAT. New York, United Nations.

Veras, O. (2017). Smart cities in Africa: Nairobi and Cape Town, How We Made it in Africa.

DATASETS AND CODE USED FOR WEB SCRAPING

European Commission, Joint Research Centre (JRC) Columbia University, Center for International Earth Science Information Network - CIESIN (2015). GHS population grid, derived from GPW4, multitemporal (1975, 1990, 2000, 2015). Documentation available at http://ghsl.jrc.ec.europa.eu/

Google LLC (2017). Google Places API. Documentation available at https://developers.google.com/places/web-service/search?hl=en

Kenya National Bureau of Statistics (2009). Kenya Population and Housing Census 2009. Nairobi.

OpenStreetMap Foundation (2017). Overpass API. Documentation available at https://wiki.openstreetmap.org/wiki/Overpass_API

Pesaresi, M., et al. (2015). GHS built-up grid, derived from Landsat, multitemporal (1975, 1990, 2000, 2014). J. R. C. J. European Commission. European Commission.

Ramani Geosystems (2018). Ramani Online. retrieved from http://www.maps.co.ke/

Roesslein, J. (2017). Tweepy. Documentation available at http://www.tweepy.org/

Twitter Inc. (2017). Twitter Search API. Documentation available at https://developer.twitter.com/en.html

United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision. United Nations.
Documentation available at http://ghsl.jrc.ec.europa.eu/

BECOMING NAIROBI

CODIFYING PUBLIC SPACE FOR AN ARRIVALS' CITY

MASTER THESIS **I** P5 REPORT

Department of Urbanism
Faculty of Architecture and the Built Environment
TU Delft

RESEARCH GROUP	**DESIGN AS POLITICS**
STUDENT	**GEREON ROLVERING**
STUDENT NO.	**4598237**
1ST MENTOR	**WOUTER VANSTIPHOUT**
2ND MENTOR	**LEO VAN DEN BURG**

