

# BORDER CONDITIONS ALONG THE NEW SILK ROAD GRADUATION STUDIO



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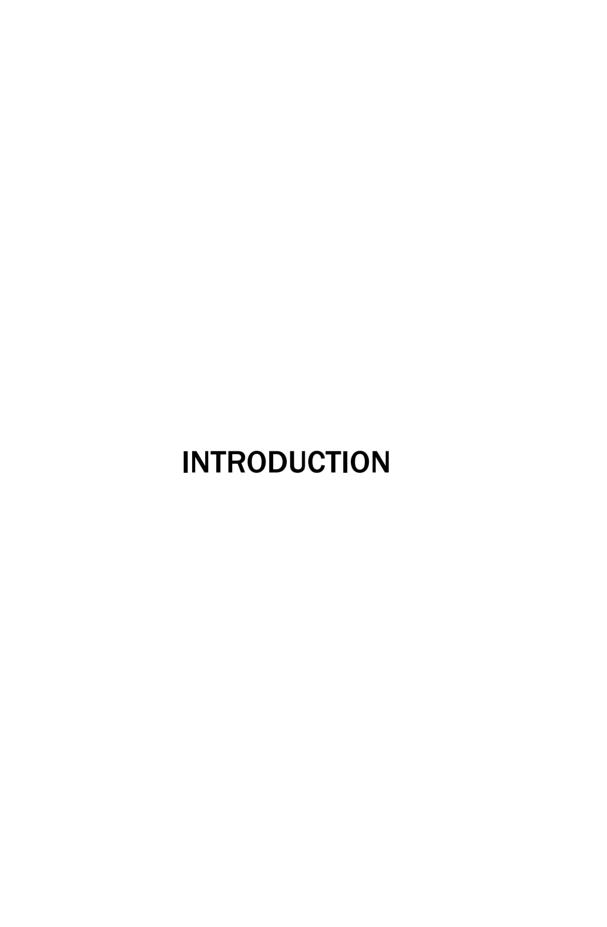
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# **INDEX**

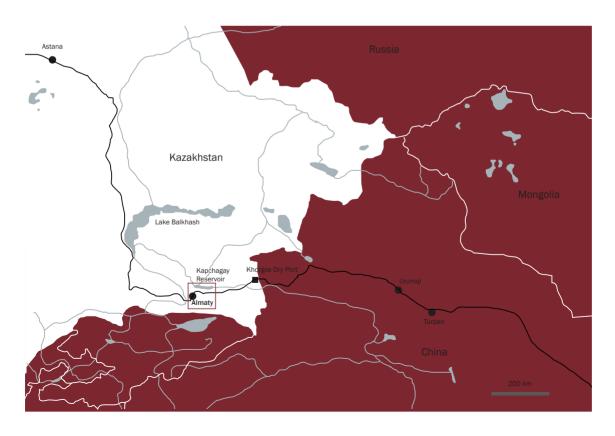
01	INTRODUCTION
02	GENERAL STUDIO INTRODUCTION
03	THE CITY OF ALMATY
04	COLLECTIVE RESEARCH
05	TERRITORY MAP
13	BORDERS MAP
23	INDIVIDUAL WORKS
24	SENSING AT EARTH MAGNITUDE
50	NOMADIC ROUTE
	THE CUL-DE-SAC AS AN EVENT
	A RADICAL RETHINKING OF THE INDUSTRIAL LANDSCAPE: THE CASE OF ALMATY
162	NEGOTIATING ENTITIES: BAZAAR IN MODERNIZATION



# GENERAL STUDIO INTRODUCTION

The BORDERS&TERRITORIES graduation studio 'Emergent Border Conditions in Eurasia' focuses on experimental architecture in socio-political contexts. The studio engages in architectural acts of experimentation while simultaneously emphasizing the importance of the contextual aspects of architecture, which range from the theoretical field(s) of the discipline to the multiplicity of 'contexts' offered by the urban and territorial environments. The studio will cultivate projects that investigate the contemporary spatial conditions located around borders and territories via acts of mapping in the attempt to relate theoretical reflection to spatial analysis and architectural design. Through the act of developing a project, architecture introduces the political as well as the social and the cultural

into everyday life of the city, through its projected spatial implications, through its physical manifestation and through its meditated reflection on the spatial (whether this is theoretical, historical or critical). The interest of the studio is therefore focusing on how architecture operates within a spatial field of power structures; how social relations have their physical effect in and on space; and how implemented policies have resulted in specific spatial conditions. The program positions architecture as an in-between condition, namely operating in-between design and theory, in-between art and science, in-between the rational and irrational, in-between logic and intuition. This space of the in-between is where the border transforms from a spatial element that implements segregation and division into a space of encounter within a spatial setting. This space of encounter is not necessarily a social space, yet it does contain a specific



understanding of the 'other'. Furthermore, within the contemporary built environment, the architectural object does not stand in isolation nor has it emerged out of architectural considerations solely. Fundamentally, architecture operates in an in-between field that is unstable, complex, fragmented and non-hierarchical.

Abstract from program for Emerging Border Conditions in Eurasia Studio September 2020

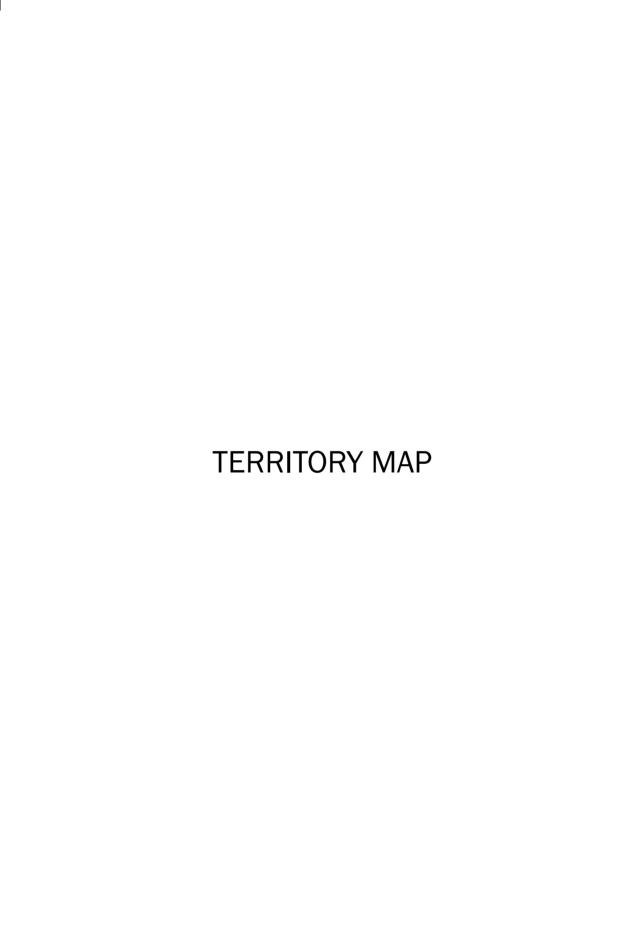
# THE CITY OF ALMATY

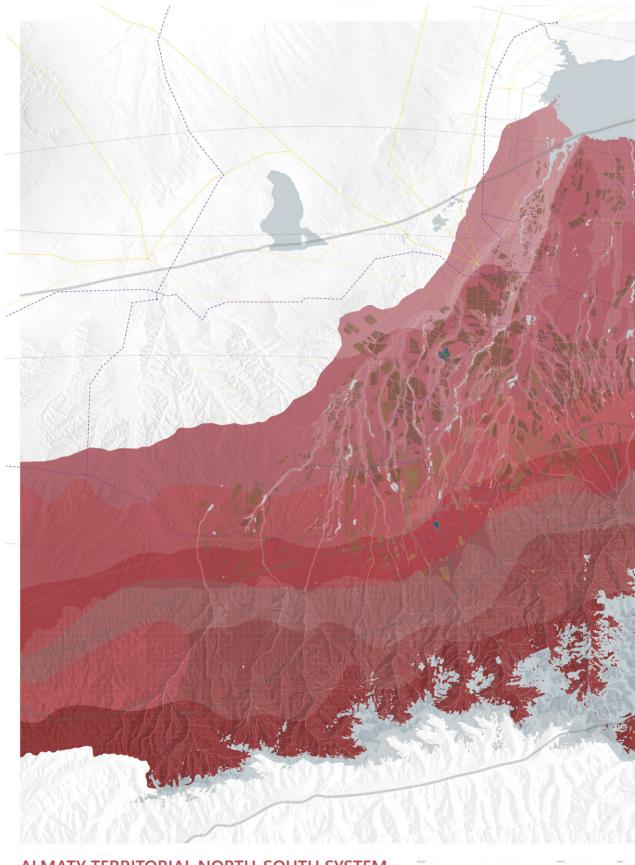
Almaty, the former capital of Kazakhstan and its most populous city, is distinguished for its complex political and demographic history. The position on the northern foothill of the Tien Shan Mountain range, provides a favorable setting both in terms of security, and climate. The height of the mountain range have led to the creation of a prolific bio-system, establishing the region as a scarcity in a country composed predominantly of desert landscapes. As a result, the area is known to have attracted inhabitation since the ancient times, both as a temporary and permanent settlement. Until the 19th century, the Almaty region has predominantly been a dwelling for Nomadic tribes, as a stopping point on the Kazakh Steppe, as an ideal region for nomadic pastoralism, and at other times, for more permanent horticultural settlements. This led to the establishment of small towns for trading produce, making the Almaty region one of the trade and agricultural centers of the Silk Road between the 10th and 14th century. The beginning of a more permanent settlement

dates back to the Russian military fortification. known as Fort Verniy, established in 1854 under the Russian Empire. However, permanence cannot be taken for granted in the case of Almaty. Even after the 19th century, both the material and social structure of the city has been reconfigured a multitude of times, both due to natural conditions, such as seismic activities and mudflows, and social ones, due to changing and contradicting political systems. The imprints of the empire were stamped on by a long and transformative Soviet rule, lasting from 1918 to 1991, while the period after the Soviet Union, baring all the previous traces, is marked predominantly by an attempt to reestablish the identity of the country as a whole. In Almaty, this can be noticed both in an architectural and social aspect. Economically, the city is developing towards a trading center restoring its relevance as an important point in the trading routes between China and Europe, through China's current Belt and Road Initiative.

Our analysis focuses on the spatial manifestation of the political and economical changes through which Almaty has and continues to be subject to, by mainly analyzing the current state of the spatial conditions, in different scales. As an investigation tool, we engaged in the mapping of both the territory and borders of Almaty. The urban analysis resulted in two mega maps in a 6 by 6 feet format. The first one aimed at recognizing the scope of the territory which affects most prominently the operations of the city that extend beyond its municipal borders. These operations include energy networks that relate to Almaty's role in the new Silk Road. The borders map, on the other hand, uses a bottom-up perspective of the streetscapes of the city to analyze its spatial conditions, as a method of understanding the city's urban development, that seems to have formed during an everlasting transitional period.



















# ALMATY TERRITORIAL NORTH-SOUTH SYSTEM

Original map size: 1830 x 1830mm

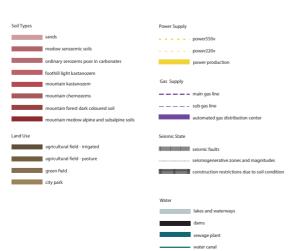
This map depicts the Almaty territory as a north-south system of material conditions. During the collective research, a certain north-south expansion of the city became apparent which formed the departure point of our understanding of the territory. Consequently, the city fabric has been removed from the map in order to understand the territory as a autonomous system without any prejudices from the urban fabric. Instead, the map portrays the material conditions that shape the territory as a north-south system such as water infrastructure, soil conditions and territory hardware.

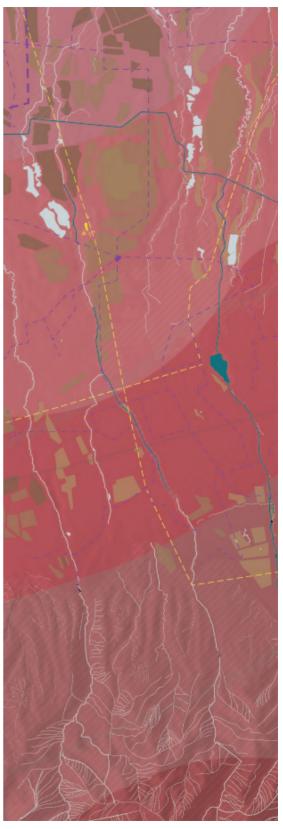
The water conditions form the basis of this territorial north-south system and influences the other conditions running along it. The glacial lakes on top of the mountains south of the city slowly melt throughout the year. The melted water is led downwards through branches of rivers which extend through the plateau and discharge into the Kapchagay reservoir on the North. This reservoir is a large man-made structure which was built in the 70's to regulate the river flow and produces electricity through hydroelectric stations. The introduction of this large artificial body of water led to a greater evaporation of water which precipitates in a larger intensity and volume on op of the mountains on the south. Due to the melting of the glacial lakes and increased heavy rainfall a high risk of mudflows arises along the northsouth water system. Next to the risk of mudflows, there is also a high risk of earthquakes and seismic disaster on the territory. Almaty is positioned on an active seismic fault which is likely to rupture one day and runs perpendicular to the north-south system. -



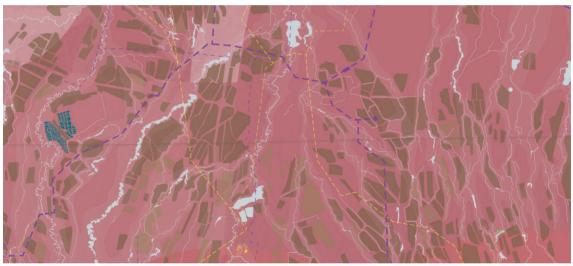
Additionally, due to the increased water volume, there is a larger moisture content in the soil which makes the ground rather unstable. These conditions together form territorial risk zones which follow the rivers. However, the water and soil conditions allow for a great number of irrigated agricultural fields. This high density of agricultural fields are unique for the rather dry Kazakhstan and are important for the city's economy and livestock.

Human interventions in the form of canalization, dams, and mud stoppers have been made in water system to avoid mud-related disaster and water and sewage treatment plants service the city's infrastructure. Along this system, electricity is produced to supply the city, however, despite the hydroelectric stations along the rivers and in the Kapchagay reservoir the production is not sufficient. To fulfill these needs electricity and gas is further imported in the city through territorial hardware. The composition of the territorial hardware creates a canyon like shape leaving voids on the east and west of the territory while further strengthening the north-south system. Finally, the extend of the map is cut to our understanding of the territory of Almaty as a north-south system of material conditions.

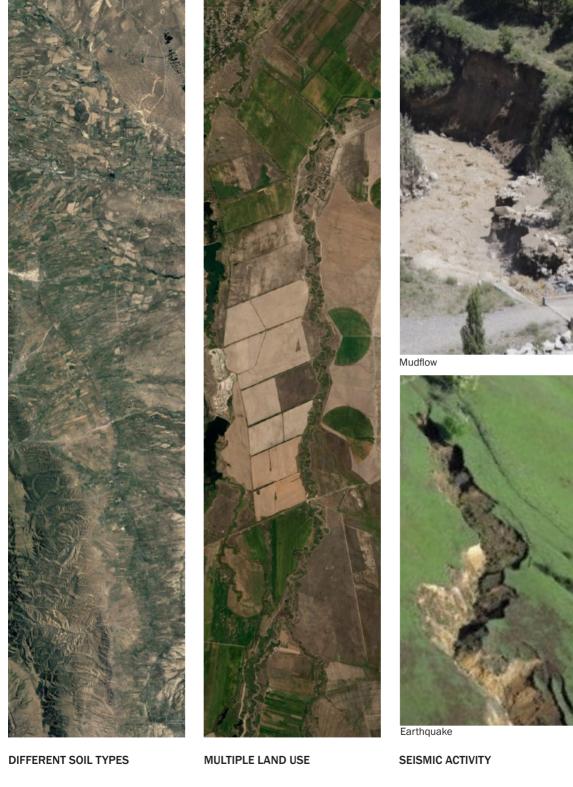












**AERIAL PHOTOGRAPHS MATCHING TERRITORIAL THEMES** 







Reservoir





Dam



Solar Power Station

1.



Canal



Coal Power Station Gas Station **POWER SUPPLY GAS SUPPLY** 

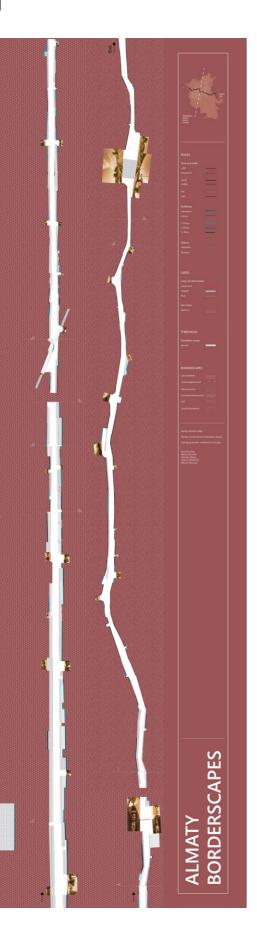


Sewage Plant

WATER SUPPLY







# **Almaty Borders Map**

Original map size: 1830 x 1830 mm

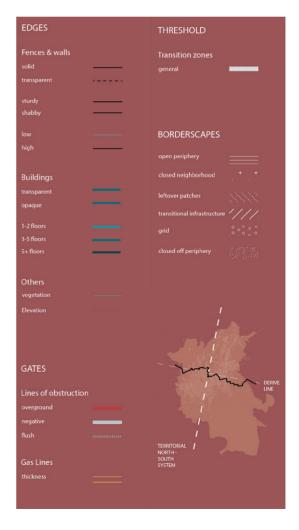
The borders map follows an opposite approach from the territory map. Instead of taking a topdown approach, the map expresses a bottom-up approach. This is because there are no conspicuous borders in Almaty that can be distinguished when analyzing the city as a whole so the map explores the city from within. A perpendicular line to the distinguished north-south system of the territory defines the digital derive route we traced. This leaves open the opportunity of overlapping the analysis of the two maps and takes the existing municipal boundaries of the city as a reference for where to begin and end. The choice of the streets was based on the amount of online information that was provided by Yandex. The map investigates the existing borders within the city and zones of transition, that characterize different borderscapes perceived throughout the digital walk.

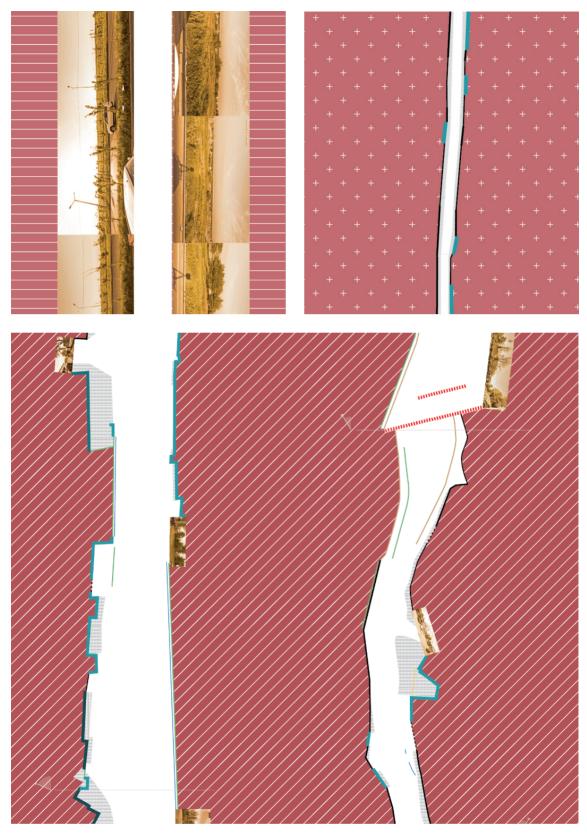
The map shows four elements that constitute the borderscapes: edges, thresholds, gates and vistas. Edges are vertical elements of obstruction such as building walls in blue, fences in black and vegetation in green. Thresholds are the horizontal zones that work with edges to define or emphasize borderscapes. Gates are openings through the edges, perpendicular to the line of movement, through which one can cross an edge. They are distinguished in flat (pedestrian crossings through large roads or highways), negative (rivers and canals) and positive (such as gas pipes rising above the streets). Finally, where there is no edge then the vista appears. The density of vistas emphasized in the map says something about the confinement of the borderscapes.

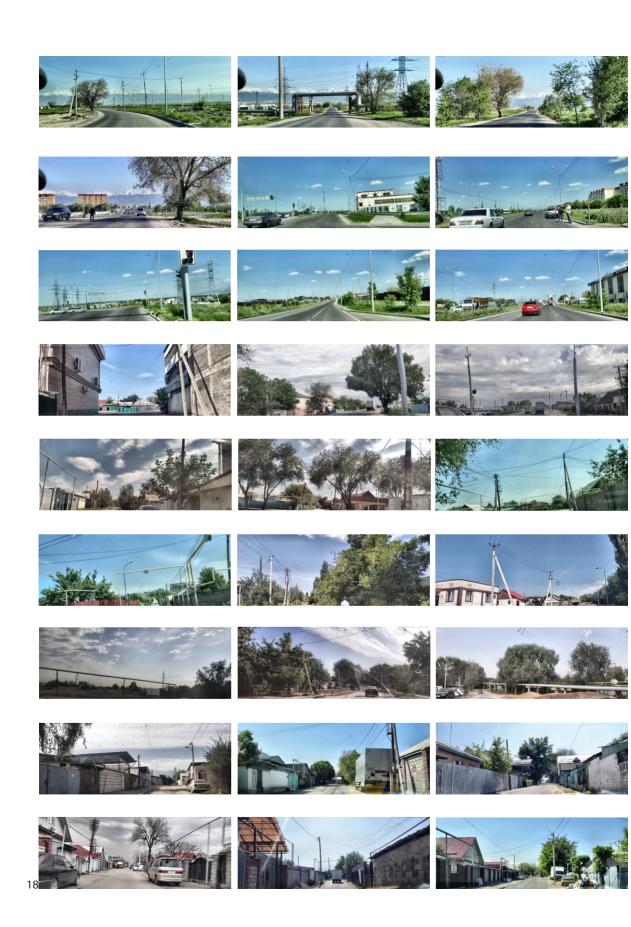
By reading the borderscapes, six different types of them are identified within the city. They are categorized through the shape and width of the streets, the types of edges and the density of vistas. Each of them is distinguished with a different hatch. The open periphery, at the edge of the city, is characterized by wider roads and lack of visual borders so the vistas become dense along the roads. The closed off neighbourhood is characterized by the very narrow streets, narrow thresholds, a continuity of edges created by mostly by the dwellings' walls or fences and consequently few and small vistas. The left-over patches, non-urbanized areas with open vistas, odd shaped street and large and varying thresholds are located in-between the urban fabric of the city. The transitional infrastructure borderscape is characterized by wide streets and infrastructural gates. There are more vistas than closed-off zones and a variety of edges such as walls, dense vegetation and hardware. The grid city is defined by wider streets, wider thresholds and a well defined rhythm of edges and vistas. In addition, the edges are highly characterized by the building blocks' walls and vegetation. Finally, the closed off periphery is similar to the closed off neighborhood but it is on the periphery of the urban fabric, going up the mountain and conferring a specific form to the street that follows the rise of the terrain.

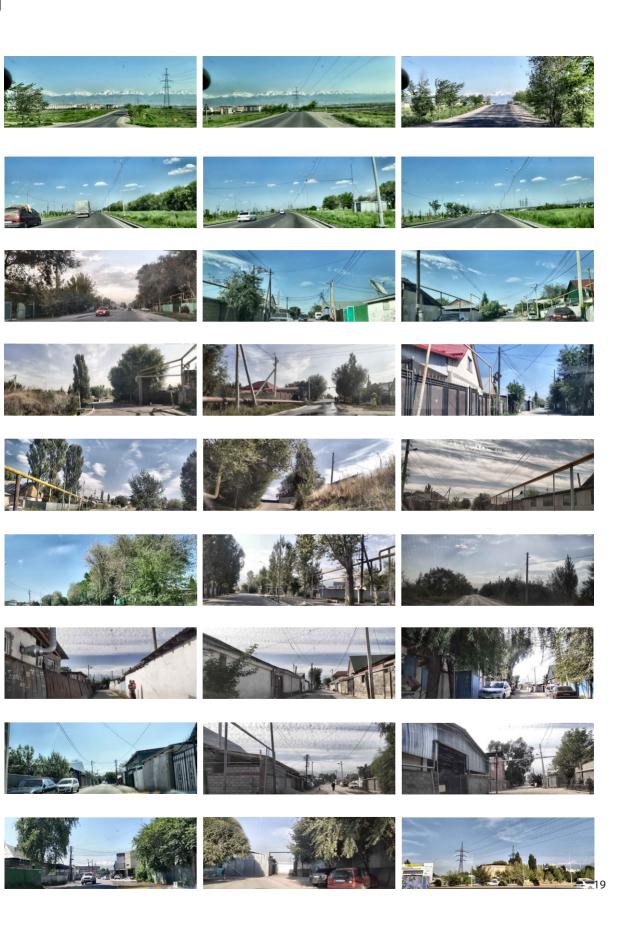
By relating the findings from the territory map to the established zones, we found a correlation to the soil types. The city was first established on highly fertile soil which is called kernozen. The first development is the highly organized grid system which reflects, to this day, on its rhythmic borderscape of building blocks, vegetation and vistas. What can also be seen is that the process of expansion of the city throughout time did not happen in that same organized manner but rather as an informal slow development

responding to emerging needs. This reflects on the borderscapes as the further you move from the grid, the less regular the shape of the streets becomes. The edges and vistas are also becoming less rhythmical. The need for one to two story housing against earthquakes results to dwellings that spread horizontally along the territory creating long streets of walled edges and no vistas. Transitional infrastructure zones of wide streets connect the city, creating some residual zones like the left-over patches or open peripheries. This series of expansion and amendments to connect the urban fabric resulted in internal borders between these areas of different borderscape characteristics.

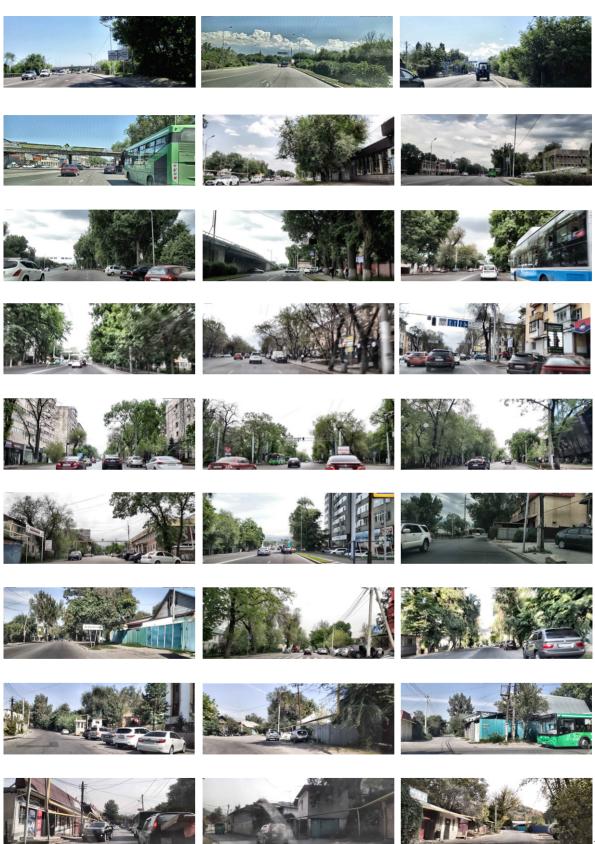


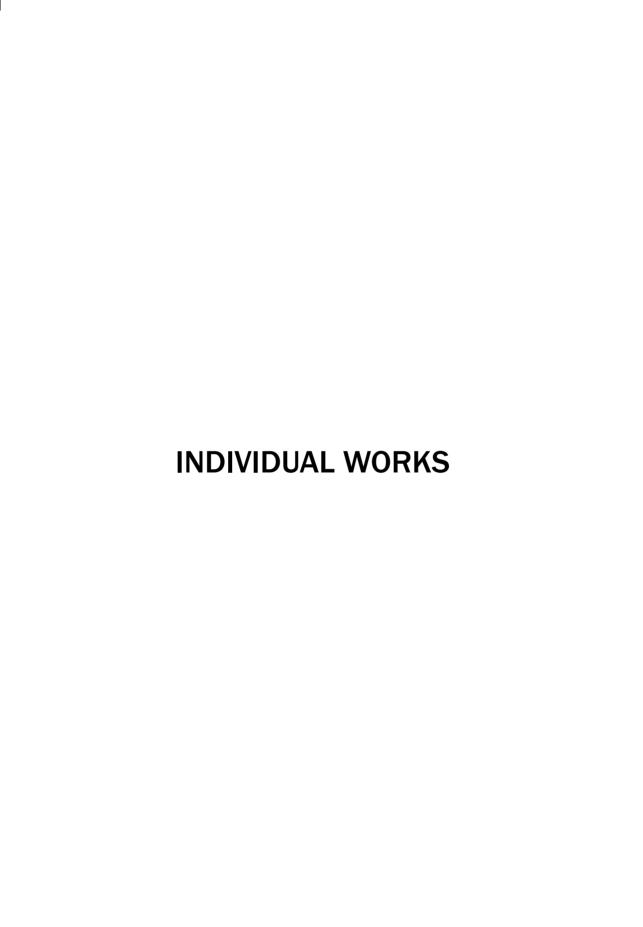


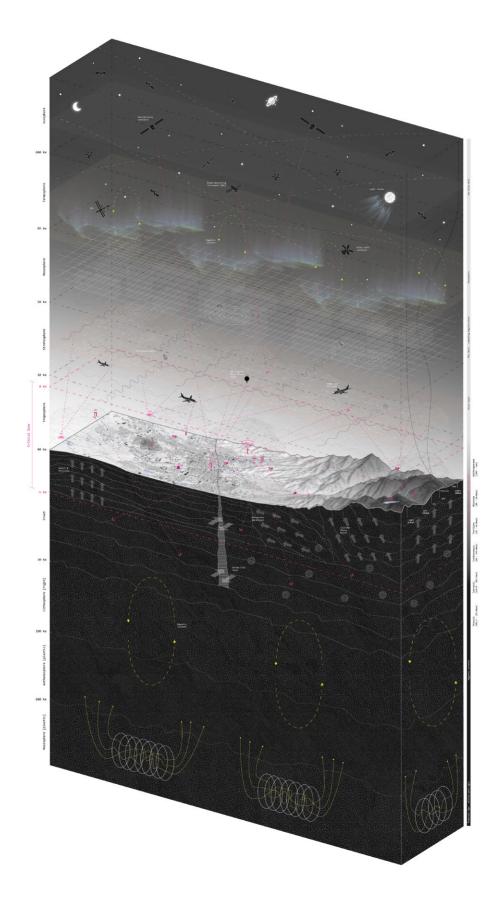












# **SENSING AT EARTH MAGNITUDE:**

HYPEROBJECTS & SENSORS

Menno Brouwer

# INTRODUCTION

Our contemporary world is filled with sensors, from weather stations to satellites, infrasound stations and seismic monitoring stations. These sensors form a very specific spatial part of our environment; they generate a specific architectural infrastructure, have a precise relation to their territory and operate on scales beyond our human perception. However, the sensor is often overlooked in architectural discourse and production.

'Sensing at Earth Magnitude' investigates the notion of the sensor, Earth Magnitude and Hyperobjects for the development of an architectural project. The developed theoretical framework is used as a point of departure for the graduation project and informs several mapping and experimental modeling excercises.









# THEORETICAL FRAMEWORK

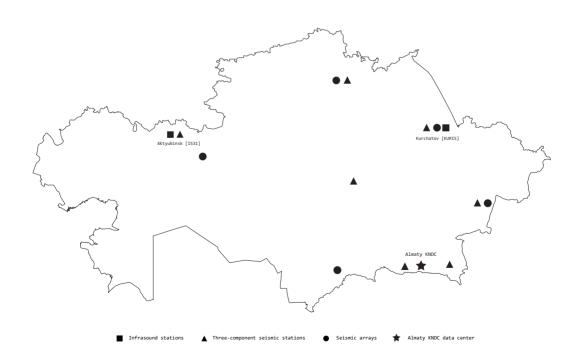
"Suppose we were equipped with the right senses and sensors, and looked at Earth from outer space. What we would see would resemble a giant Christmas tree, a planet that is brightly 'lit-up', not only with enormous amounts of visible light, but also with electromagnetic radiation, radio waves, infrasound and wireless telecom frequencies." 1

For us humans, it is difficult to perceive these phenomena since we are equipped with a limited set of senses and our human perception is limited to vision, sound, touch, tase, smell and our immediate surroundings. In order to reveal such phenomena to the human, there needs to be a transformation from one state of energy to another state that is perceivable by the human. This transformation is done through the notion of the sensor. A sensor is a device that detects changes in its physical environment and translates it into data that can be perceived by the human. The sensor allows us to perceive energies and entities which were previously invisible to us and which we are generally not aware of. Our contemporary world is filled with sensors, from weather stations to satellites, infrasound stations and seismic monitoring stations. These sensors form a very specific spatial part of our environment; they generate a specific architectural infrastructure. have a precise relation to their territory and operate on scales beyond our human perception. However, the sensor is often overlooked in architectural discourse and production.

This paper investigates the notion of the sensor for the development of an architectural project. It addresses Earth Magnitude as a hyperobject filled with energy and activity made perceivable through the sensor. Moreover, it encourages us to think at Earth Magnitude; at the true extend of earth's range, from its core to outer space, and beyond the human perspective. The argument is developed through examination of the Kazakhstan international monitoring system; how they reveal Earth Magnitude, what it means to think at Earth Magnitude and how the sensors constitute a specific spatial reality in the critical zone. Finally this paper discusses the potential of thinking at Earth Magnitude in architectural production and how the notion of the sensor can inform an architectural project in the Borders & Territories MSc 3/4 studio.

# INTERNATIONAL MONITORING SYSTEM

In order to gain an insight in the sensors on the territory of Kazakhstan, we will first look at the sensors of the International Monitoring System (IMS). The IMS is a worldwide network of monitoring stations that detect events that might indicate violations of the 1996 Comprehensive Nuclear-Test-Ban Treaty (CTBT). The CTBT is a multilateral treaty, that bans all nuclear tests, for both civilian and military purposes, in all environments. The International Monitoring System includes seismic, infrasound, radionuclide and hydro-acoustic stations located on the territory of 90 countries around the world, including Kazakhstan. The Kazakhstan monitoring stations network consists of seismic and infrasound stations (figure 1). The data from these stations are acquired and processed at the Kazakhstan National Data Center (KNDC) in Almaty. These stations, on the one hand, participate in the International Monitoring System, and on the other hand, monitor the seismic and infra-acoustic activities on the territory of Kazakhstan.



#### SEISMIC OBSERVATION

The Kazakh monitoring stations of the IMS record a variety of human, natural, and geological activities through infrasound recording and seismic observation. The seismic stations in Kazakhstan measure seismic activity 24 hours a day through seismometers. These seismometers are installed hundreds of meters deep in the earth's skin through boreholes and are connected to solid rock. Seismometers reveal seismic activity through the monitoring of seismic waves, which can have several sources such as earthquakes, explosions, drilling and tectonic movement. In his 1991 project 'The Skin of the Earth', architect Raoul Bunschoten elaborates on this seismic activity by writing: "Slow time. The time of geological movement. Movement of the crust that we call ground. Ground that reaches into the depths of our imagination, deceives us into trusting it as solid, heavy, static - ground to build upon, ground to deposit objects on." 2. This suggests the earth as a dynamic and moving entity, slowly changing over millions of years.

The earth is structured by several layers; a solid thin crust, a liquid asthenosphere, a solid mantle and a liquid core which generates earth's magnetic fields. Earth's crust accounts for less than 1% of earth's volume and ranges from 5-70km in depth. The composition of the crust is built up out of several layers such as igneous rocks like basalt and silicate rocks like granite. These different layers of the composition correspond to different geological times such as the Tertiary (10 - 66 mya) and Cretaceous (66 - 145 mya) periods <sup>3</sup>. According to Bunschoten, we scratch, incise and articulate earth's crust in order to place and orient ourselves. We build cities that hug the crust, drawn to, but also alienated from it, as a second skin which mimics

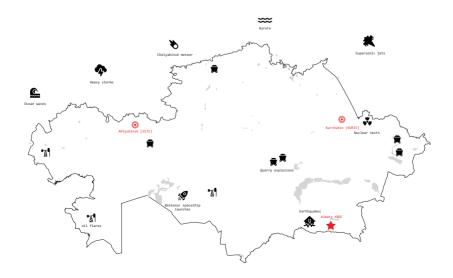
the first one with its slowly shifting features and sudden ruptures <sup>2</sup>.

The crust the city of Almaty is built upon contains a huge active seismic fault which. according to Geologist Christoph Grützner is likely to rupture one day. In its young history, Almaty has been hit by multiple devastating earthquakes in 1887 and 1911 4. All along the fault, Holocene fault scarps have been found which offset the terrain with heights between 5 and 50m. Some of these fault scarps stem from single large earthquakes while others are so big that they must have been formed by repeated earthquakes millions of years ago. Moreover, relatively young uplift and deformation has been found in the forelands of Almaty, indicating that several seismic sources may be active at the same time 5. These findings reveal the earth as a dynamic and moving entity filled with seismic activity of both today and millions of years ago. made perceivable through the seismic sensors.

#### **INFRASOUND**

Next to seismic observation stations, the IMS network in Kazakhstan contains infrasound observation stations. Infrasound, often referred to as low-frequency sound, describes sound waves with a frequency below the lower limit of audibility (generally 20 Hz), Infrasound was first discovered after the eruption of the Krakatoa volcano in 1883. Barographs around the world measured small air pressure fluctuations that corresponded to the event. Due to the low frequency of the soundwaves. they hardly experience any attenuation which makes them travel the world multiple times at atmospheric altitudes of over 100km 6. Due to the low frequency but high sound pressure characteristics of infrasound, the vibrations can be felt in the body and the sound gets a physical dimension. Due to this physical dimension, the soundwaves territorialize an area and they creates acoustic territories 7.

Infrasound waves are being caused by a wide variety of sources. Natural sources of infrasound include earthquakes, avalanches, solar storms and meteors. Human sources of infrasound include quarry explosions, oil flares, rocket launches and nuclear tests (figure 2), Sonologist Raviv Ganchrow terms this 'the bandwith of the Anthropocene' 7. The Anthropocene is a proposed epoch of geological time in which human activity started to have a large scale impact on earth's geology and ecosystems. The start date of the Anthropocene is often discussed. A growing group of scientists argue that the Anthropocene should follow up the Holocene (11,700 years ago - present) and start in the year 1945 with the detonation of the first atomic bomb and its peak in radionuclide fallout 8. Due to infrasound waves traveling the earth multiple times, they can be monitored thousands of kilometers away from their original sources. Ultimately, infrasound reveals human activity as a geological force capable of interacting with the scale of topography and even the eart 7.



#### EARTH MAGNITUDE & THE HYPEROBJECT

The sensors of the IMS reveal human and seismic activity as geological forces operating at the scale of the earth; at the scale of Earth Magnitude, However, what is Earth Magnitude? And what does it mean to think at Earth Magnitude? Earth Magnitude is first introduced by academic Douglas Kahn in his book 'Earth Sound Earth Signal: Energies and Earth Magnitude in the Arts' (2013). In this book, Kahn uses the term Earth Magnitude to relate energies to the scales of the earth — from sound at local and long distances, to the effects of electrical atmospheres, to electromagnetic activities occurring at the speed of light at Earth Magnitude 9. Kahn investigates several energy related artistic and scientific projects, such as the natural radio of Alvin Lucier, Gordon Mumma's seismic music and the whistler phenomenon. A whistler is a low frequency wave generated by bursts of lightning. Although they are electromagnetic waves, they occur at audio frequencies, and can be converted to audio using a suitable receiver 10. Whistlers bounce back and forth between the earth and the ionosphere. At a height of 600km, they arch over the equator and form globetrotting signals; Earth Magnitude signals in their truest sense 9.

Whistler science evolved out of the military communications of World War I and, along with geophysical sciences generated new scientific means of sensing physical phenomena and energetic states of the earth at a geophysical scale 9. In a late nineteenth-century contest to sense the scale of the earth, the main contenders were of acoustical nature: the eruption of the Krakatoa was heard thousands of kilometers away from its source and seismic signals from an earthquake in Japan hit seismographs in Germany. Both were -

means to sense the 'whole earth' long before technological surveillance aircraft and 'blue marble' photographs from space took over 9. Through the investigation of energy-related artistic and scientific projects, Kahn reveals Earth Magnitude as a large scale, dense entity filled with electromagnetic currents, weather systems, terrestrial activity and radio waves, made visible through years of artistic expression.

Philosopher Timothy Morton elaborates further on Earth Magnitude by stating that thinking at Earth Magnitude is thinking at a scale sufficient to open the concept of earth to the true extend of its range <sup>11</sup>. Global climate does this, as terrestrial weather events are caused by a massive entity that exists at Earth Magnitude. Solar storms do this as they interact with earth's magnetic shields and produce aurora's. Human thought at Earth Magnitude is human thinking that is as 'large' as the aurora. It is a thought that can think the aurora in such a way that its vastness is witnessed and opened in us <sup>11</sup>.

According to Morton, at Earth Magnitude, anthropocentric distinctions don't matter anymore. These distinctions include binaries such as here vs there, person vs thing, individual vs group and life vs non-life. Thinking at Earth Magnitude allows us to see human species and activity not as a thing we can ontically point to. but as something like the aurora, a mysterious yet distinct entity. Morton proposes to see human activity, with all its dense energies as an hyperobject that is real, yet inaccessible 11. Morton uses the term 'hyperobjects' to describe vast entities that are massively distributed in time and space and transcend spatiotemporal specificity; such as global warming and the atmosphere 12. -

It is the notion of the hyperobject that provides a way to think entities at Earth Magnitude, hyperobjects are real entities that cannot be seen, touched or grasped. They are beyond the human, but they are not infinite or abstract, they are just very, very big <sup>11</sup>.

Ultimately, the notion of the Hyperobject reveals Earth Magnitude as a massive entity that is filled with energy and activity and is massively distributed in time and space. The sensors of the IMS expose earth's atmosphere as filled with anthropogenic human activity and the earth itself as filled with geological-time seismic activity. Moreover, Earth Magnitude allows us to think at the true extend of earth's range, from its core to outer space, and beyond the human perspective.



Figure 3



Figure 4

#### THE SENSOR IN THE CRITICAL ZONE

Now that we have defined Earth Magnitude as a hyperobject filled with anthropogenic human activity in its atmosphere and geologicaltime seismic activity within the earth, made perceivable through the sensor, we can look at where these two intersect: the Critical Zone. As theorized by Bruno Latour, the critical zone is a thin layer of several kilometers thick above and below the surface of our planet in which human activity has a significant impact on earth's geology and ecosystems 13. Lying at the interface of geological time and the Anthropocene, at the intersection of earth and atmosphere, the critical zone is a complex entity where multiple scientific disciplines such as geology, hydrology, climatology and ecology come together 13. According to Latour, if we were to look at earth magnitude purely through the notion of the globe, it obliges you to squeeze the atmosphere, the earth and it's critical zone into nothing. The notion of the critical zone encourages us to see the earth from within, free our imagination from the blue marble as shot from outer space and break down the cartographical view of our planet 13. It is through the notion of the sensor that allows us to see things from within and generate an insight in the entities at earth magnitude.

It is in the critical zone that these sensors constitute a specific spatial reality. Even though the sensor reveals immaterial conditions to the human, the sensor in itself is a very physical object, with sophisticated forms and precise territorialization. In order for a sensor to operate properly, it requires a specific environment, an infrastructure, electrical power, a data transmitter and perhaps protection from the weather.

All of these technical conditions generate a very specific architectural manifestation. In order to gain an understanding of these architectural manifestations, we will examine two sensors of the Kazakh IMS; the seismometer and the infrasound monitoring station.

As previously discussed, a seismometer (figure 3) is a sensor that is connected to solid rock and is installed hundreds of meters deep in the earth's skin through a borehole. However, the data from the seismometer needs to be brought up to a computer processor. This equipment is very sensible so it has to be protected from the weather and the public. This protection is offered by an archetypical equipment vault, an architectural manifestation defined by technical requirements and framed by fences in a desolate territory. From here, the data is transmitted to a recording facility by an antenna. The infrasound station (figure 4) contains multiple micro-barometers which are connected to a spider-like steel pipe structure that reduces surrounding noise and amplifies the sound signal. This structure is elevated from the terrain to reduce the interference of surrounding vibrations. The spatial composition of the array allows for accurate source location. Next to this specific spatial structure, an archetypical equipment vault protects the data transmitter.

#### THE STACK

Finally, another entity that exists at earth magnitude has been theorized by philosopher Benjamin Bratton as 'The Stack'. The Stack is a political design theory of planetary scale computation that forms an accidental megastructure. Within this megastructure. Bratton proposes various information orders stacked on top of each other, operating as a whole and forming both a computational apparatus and a new governing architecture. The stack consists out of the layers earth, cloud, city. address, interface and user. Planetary scale computation distorts and deforms traditional logics of nation states and its political geography and produces new territories in its own 14. However, the stack should not be understood only through its virtuality but also through its physicality. The stack is an energy intensive megastructure with physical manifestations of the virtual in the form datacenters, oil refineries, powerplants and sensing devices. Moreover, the stack is based on rare earth minerals, pulled from mountain streams in central Africa that go into all of the electronics that we use. "The stack terraforms its host planet by drinking its elemental juices." 14. In the atmosphere, the stack forms a vast and specific infrastructure of cloud computing, data, addresses and interfaces existing all over the earth. The stack creates a new subdivision of territories by stacking vertical layers on top of the existing horizontal territory, generating the corresponding jurisdictional complexity 14. Ultimately, the stack forms a vast and specific megastructure that is part of Earth Magnitude and is manifested by physical infrastructure in the critical zone.

## **DISCUSSION / POSITIONING**

In this paper, Earth Magnitude is defined as a hyperobject filled with energy and activity, and that is massively distributed in time and space. The sensors of the IMS expose earth's atmosphere as filled with anthropogenic human activity and the earth itself as filled with geological-time seismic activity. Moreover, Earth Magnitude encourages us to think at the true extend of earth's range, from its core to outer space, and beyond the human perspective. It is the notion of the sensor that allows us to perceive the dense energies and activities at Earth Magnitude. These sensors constitute a specific spatial and architectural reality in the critical zone and introduce the idea of the territory as a sensing device.

Thinking at Earth Magnitude in architectural production allows us to create an architectural project that is not limited by traditional human perspective. It opens up our thought to the true extend of earth's range and encourages us to position an architectural project in a dense hyperobject that is beyond the human. Thinking at Earth Magnitude allows us to connect an architectural project to entities and energies we are generally not aware of and provide a new scale for thinking about architecture. Moreover, thinking at Earth Magnitude is related to relatively new philosophical thinking where the human perspective is no longer privileged and human activity is seen as a geological force of the Anthropocene. This places the project in a contemporary philosophical debate about our relationship to the planet.

Our contemporary world is filled with sensors, from weather stations to satellites and the seismic and infrasound monitoring stations. The sensor forms a very spatial part of our environment, however, they are often overlooked in architectural discourse and production. The sensor generates new types of spatial components and architectural manifestations as a result of our contemporary reality. By taking the sensor and their spatial components highly serious, a new kind of departure point for an architectural project in the Borders & Territories MSc 3/4 project can be laid out. In our ever growing world of sensors and data, such a project would deal with contemporary and further emerging conditions, contribute to a field of experimental architectural production and makes us aware of the impact and scale of sensing at Earth Magnitude. By mapping out the sensors in the critical zone, the spatialization of the sensor and the territory as a sensing device can be revealed.

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#### **FIGURES**

#### 1.

Kazakhstan IMS Stations -Menno Brouwer

## 2.

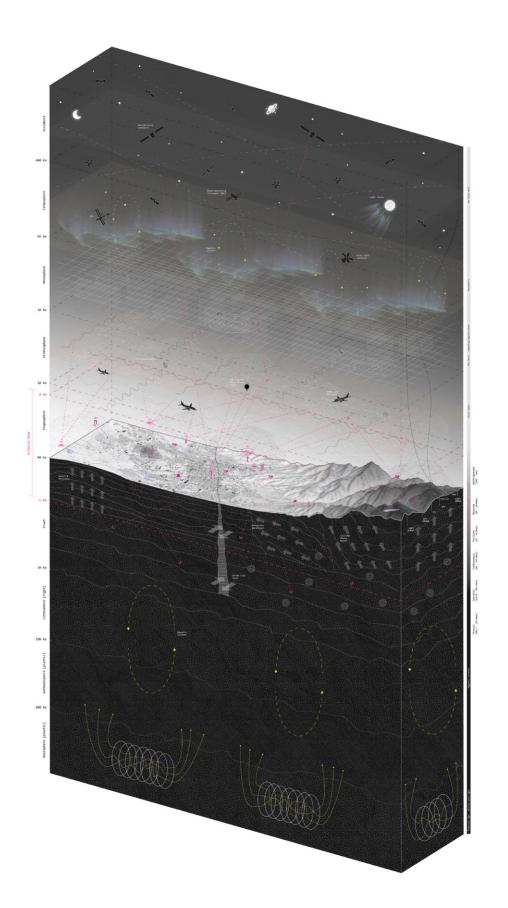
Kazakhstan infrasound sources - Menno Brouwer

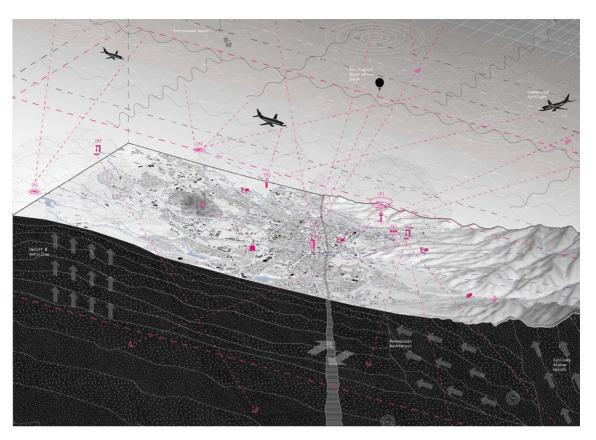
## 3.

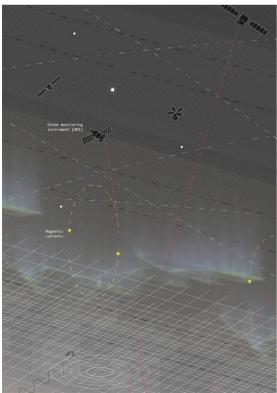
Seismometer station http://publications.isc.ac.uk/ index.php/summary/article/ view/28/29

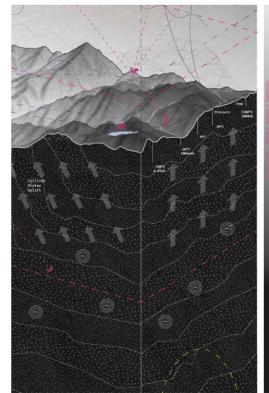
#### 4.

Infrasound station https://en.wikipedia.org/ wiki/Infrasound#/media/ File:Infrasound\_Arrays.jpg







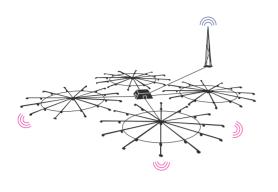


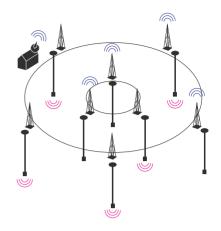
Anthropocene [1945 - now] Accompanying drawing shows a mapping of Earth Magnitude and it's sensors based on the developed theoretical framework. The mapping reveals Earth Magnitude as a Hyperobject with dense energies and activites from the core of the Earth till outer space which are made perceivable through the sensors. These sensors measure phenomena such as infrasound. electromagnetic waves, weather events, atmospheric conditions, seismic activity and airflight. These sensors constitute a specific spatial reality in the critical zone and introduce the idea of the territory itself as a sensing device. The timeline shows the critical zone as an interface between earth and atmosphere: between geological time and the Anthropocene.

> Earth Magnitude is a largescale Hyperobject filled with energy and activity that is massively distributed in time and space made perceivable through the sensor.

Thinking at Earth Magnitude encourages us to think at the true extend of earth's range; from its core to outer space, and beyond the human perspective.

The sensors constitute a specific spatial and architectural reality in the critical zone and introduce the idea of the territory as a sensing device.





## [A] Infrasound Stations

[Device] Microbarometer MB-3 Infrasound [Senses] [Phenomena]

Soundwaves

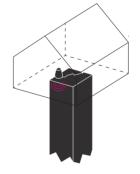
Electromagnetic waves

## [B] Seismic Array's

[Device] Seismometer GS21 Seismic activity [Senses] [Phenomena] Seismic waves

Electromagnetic waves





## [D] Kazhydromet Weather stations

[Device] Weather instruments [Senses] Weather conditions [Phenomena] Atmospheric conditions

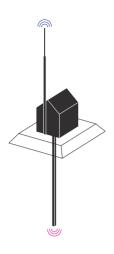
## [E] 3-Component Seismic Station

[Device] Seismometer ST2 [Senses] Seismic activity [Phenomena] Seismic waves



Sensing // Sending

The resemblence between the sensors is that they all interact with waveform phenomena.

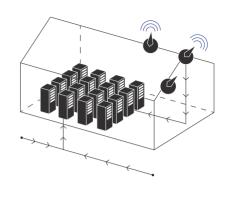


## [B] Seismic Array's

[Device] Seismometer GS21 [Senses] [Phenomena]

Seismic activity Seismic waves

Electromagnetic waves



## [C] Almaty KNDC Data Center

[Device] [Senses] [Phenomena] Servers & Sattelite Data processing Electromagnetic waves



## [F] Ozone Monitoring Instrument [OMI]

[Device] Remote sensing, LIDAR [Senses] Atmospheric conditions Electromagnetic waves [Phenomena]

The inventory of sensors defines the Hyperobject as filled with electromagnetic waves and radiation.



## [G] Almaty TV Tower

[Device] TV-signal transmitter [Senses] TV signals

[Phenomena] Electromagnetic waves



## **MODI OPERANDI 01 - GROUNDING**



The first 2.5D Modi Operandi workshop uses the conceptualization of the Seismometer as a grounding excercise. Through the model, sensing and sending is understood as an inverse of eachother. The seismometer senses seismic activity in the ground and cuts through the earth in the front plane. The architectural manifestation forms an interface on the datum. From here, the sensed data is sent into the atmosphere through an antenna which cuts back through the baseplate.

Earth and atmosphere are modelled as a continious layered surface of activity with the datum in the middle to show their equality.



# **MODI OPERANDI 02 - ASEMBLAGE**



Is there a material that can be shaped by magnetic forces? - By the Hyperobject





The second Modi Operandi workshop started with the question if there's a material that can be shaped by magnetic forces - by the Hyperobject. This resulted in experiments with Iron fibers and magnets. The magnets generate a magnetic field where the iron fibers are arranged according to natural forces. The result forms an asemblage between the material and the magnetic field, and within the iron fibers themselves. This results in a distinct magnetic morphology and production technique. In order to solidify the material and freeze the forces several tests have been made with clay, gypsum and fiber mixtures.



# **MODI OPERANDI 03 - ATMOSPHERE**

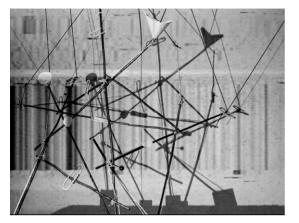


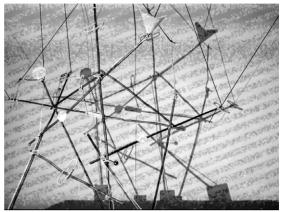


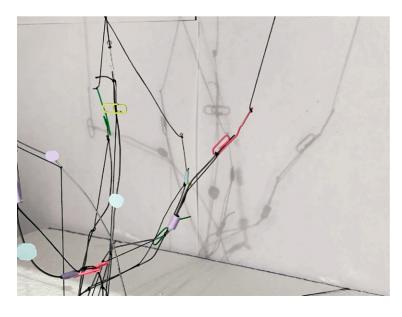


Model for an idiosyncratic sensing & sending device



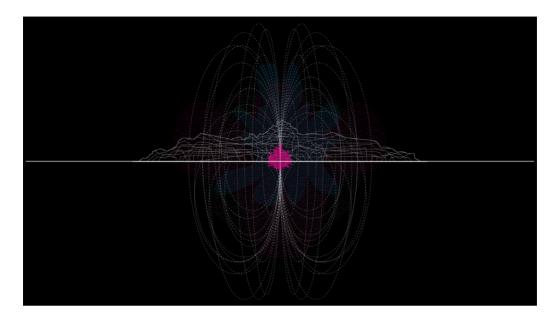




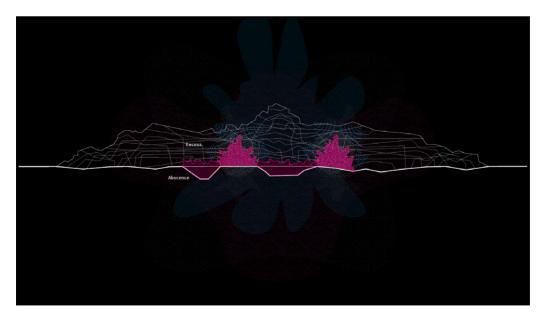


The final Modi Operandi workshop starts with the idea of sensing and sending as being very closely related to each other. This idea has been pushed to the max in the form of an ideosyncratic sensing & sending device. Here, the architecture serves as an infrastructure for the suspension of the technical devices and wires. The projected shadow generates the resemblance of an insect with it's sensors and antennas. Finally, an atmospheric montage has been made of what it could be like to be within the device. Here, buzzing and humming sounds come together with distortion and amplification effects which generate the idea of a signal jammer.

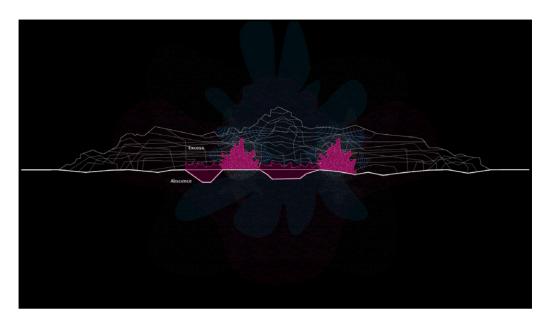
## PRELIMINARY STATEMENT OF INTENT



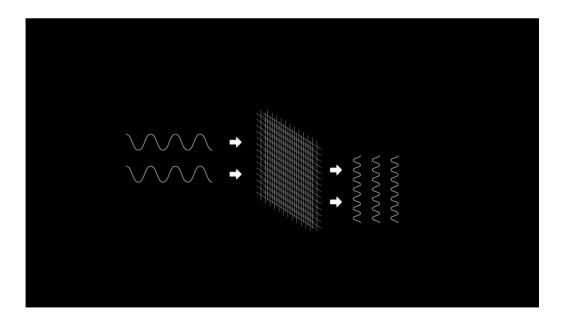
1. The project aims to be shaped by the electromagnetic Hyperobject. The project solidifies the non-tangible Hyperobject and forms a local manifestation of the non-local.



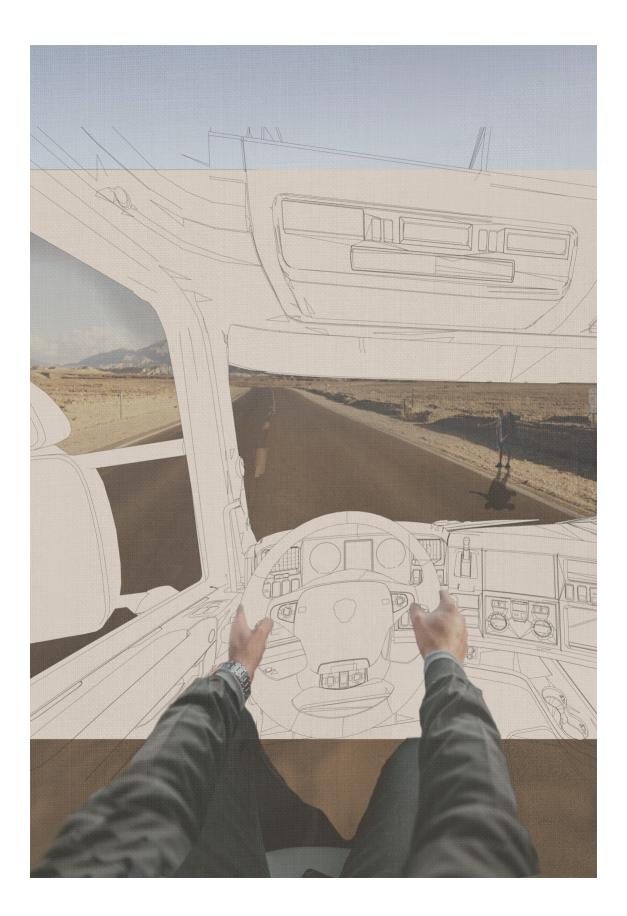
2. Through the sensor the project interacts with the Hyperobject of electromagnetic radiation. It amplifies and distorts the Hyperobject and generates an experience of being in the Hyperobject.



3. Usage of the mountainous topography to interact with the Hyperobject. Being above and below ground generetes Excess and Abscence of the Hyperobject.



4. Usage of metamaterials to interact with the Hyperobject. Metamaterials change the state of waveforms and allow us to amplify, distort, block or bend electromagnetic waves.



# NOMADIC ROUTE THE PLACE OF THE ROAD

Marina Brücker

## Introduction

I decided to approach my research through the characteristic cultural heritage of the Kazakh people: the nomads. The decision was made partly due to personal curiosity about mobility and its relationship to the built environment and partly to understand the context of the place I am working with, Almaty.

I have stated by looking at the nomadic groups of the Kazakh territory and their relationship to their landscape, specially in their moments of mobility, as a way to get acquainted with the territory independent of its current situation and conflicts. This research then led me to the "discovery" of the current nomads in the country's territory and a further research on their mobilities, which all together created the bagagge to give rise to a design project circling around all these themes.

## **Almaty**

Almaty is the largest city of Kazakhstan, with over 2 million inhabitants and located at the foot of the Trans-Ili Alatau moutantains - part of the Tian Shan mountain range - on the Southern part of the country, bordering Kyrgyzstan.

Before being absorbed by the Russian Empire in the 1850's and later becoming the capital of the Kazakh Soviet Socialist Republic - under the Soviet Union -, Almaty, as well as all of the Kazakh territory was home to nomadic groups who practiced seasonal transhumance\* throughout the Steppe desert (horizontal transhumance) or up and down the Alatau mountains (vertical transhumance).

\*Transhumance is a type of nomadic mobility characterized by the movement of livestock between fixed season pastures.



Almaty and the Alatau mountains on the background



The Kazakh Steppe - home to the nomads

#### **Ili-Balkhash Nomads**

The focus here is on the pastoralist nomads of the Ili-Balkhash region in between lake Balkhash and the Trans-Ili Alatau mountains, where Almaty is located.

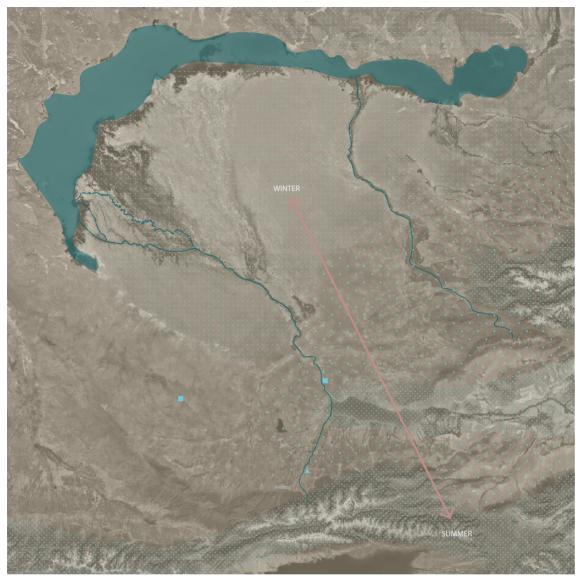
In order to supply their herds with pasture, water and protection, this area's mobile groups practiced seasonal vertical transhumance between the plateau-pastures in the winter and the alpine meadows in the

summer, with some cases of spring and autumn pastures as well.

Whereas in the bronze age nomads' the location of these nomads' occupations were defined by the presence of resource materials such as water and pasture, in the Iron Age, nomads develop new technologies, such as water transport infrastructure and wheeled chariots that allowed

certain independence from raw materials, leading to farther occupations.

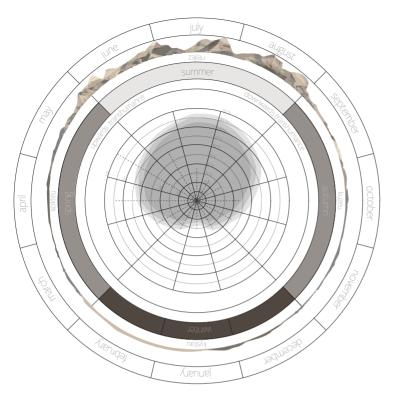
During the middle ages, with the development of trade and expansion of agricultural and later economical societies, the location of occupation of nomads also begin to change: from being dependant on the natural resources to being dependant on the exchange market around the medieval



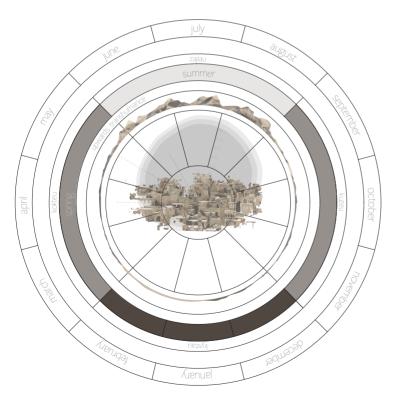
Vertical Transhumance - Ili-Balkhash Region

# cities or villages.

So they start locating their settlements in places of strategic economic opportunity: longitudinally along transport ways, such as the Silk Roads, as seen on the map of page 22.

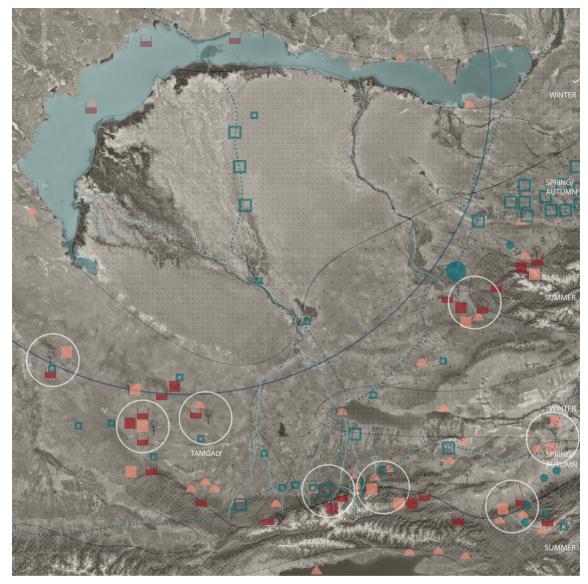


before - seasonal conditions

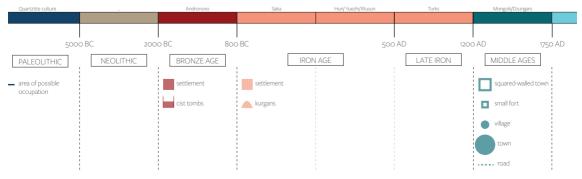


later - proximity to settlements

**Throughout** the centuries. the location of occupation of pastoralist nomads in this area have changed, but always in function of their herds or agriculture: from finding resources to raise them to finding the market to exchange them. The nomad would move to raise the cattle grow the plants and later move to market their produce.



Land Occupation - Ili-Balkhash Region



## **Rock Art**

Taking a nomad example: Despite the mobile life, nomads still found some attachment to the landscape.

Tamgaly, for example could be considered an example of place-making. It's one of the instances, where along their routes, nomads would interfere with the natural landscape with a different intent than survival.

These intentional landscape marks "witness the visual perception and conceptualization, by part of the ancient inhabitants, of the intermingling of natural and behavioral landscapes: in that way they







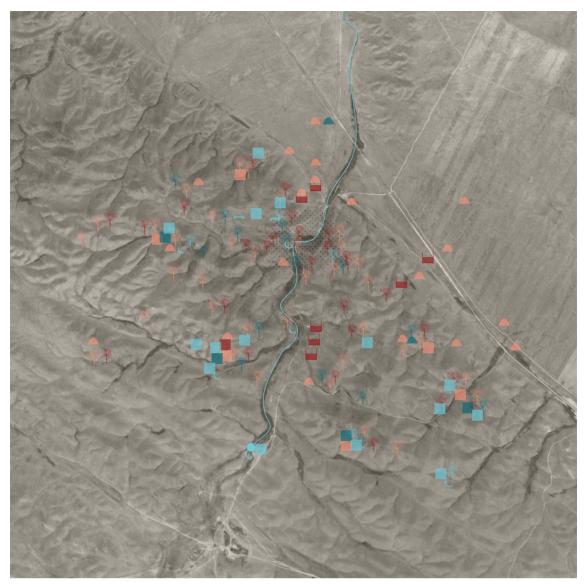




Rock Art in Tamgaly (Ili-Balkhash region)



Buddhist Petroglyph in Tamgaly-Tas (Ili-Balkhash region)

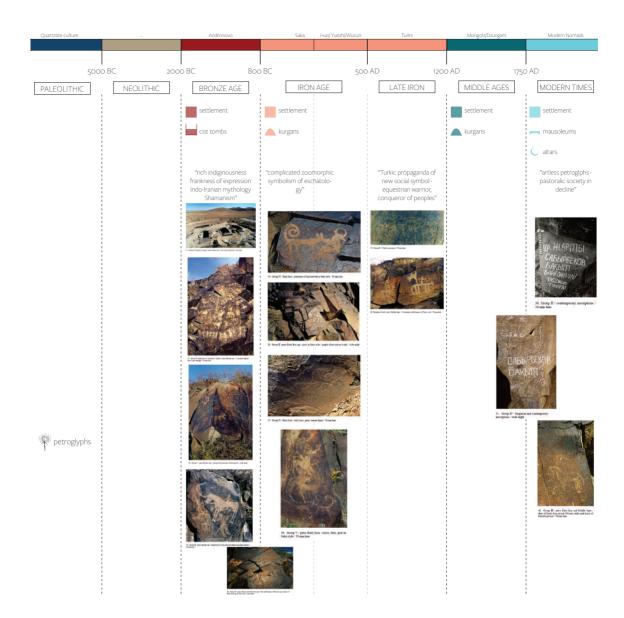


Cultural Landscape of Tamgaly - Intentional Marks

represent semiological markers of the theatrical structuring and use of the space by conscious actors and spectators."

Within this cultural landscape, other natural elements such as mountain peaks, lakes, rivers or canyons, also take great importance as forms of significant associative elements.

It is believed that ancient nomad groups deliberately chose the stepped rock terraces of shiny surface overlooking the canyon - a place of spotlight to draw their petroglyphs. The making of pertroglyphs and burial mounds makes this place of transience, one of meaning, history and memory which concentrated influences of different groups that passed through here throughout different epochs and from different cultures.



## **Nomadic Theory**

Parallel to this research on Kazakh nomads, I've started investigating nomadic metaphysics within the context of our sedentarist cities. And I concluded that the production of cities and its citizens has been based on an ideology that treats nomadic aspects of life such as migration, occupation, ephemeraility and informality as intrinsically pathological.

My argumentation, on the other hand, insists that these are exactly the characteristics

missing in our cities, which are required for the creation of environments that are better accepting of "otherness", that are well resilient to rapid changes of the contemporary world and are welcoming to mobilities.

And in fact, the sedentarist mindset treats mobility as a problem to be solved in service of connection between places, but if we look at the city primarily through its mobilities then these "non-places" would be conceived through meaning

and become as significant and relational as what sedentarists like to call "place".

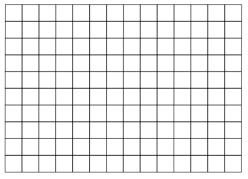
(The full text about this nomadic theory can be found by the end of this report.)



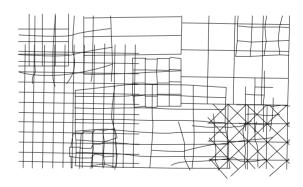
Modi Operandi Workshop model #2 - "Challenging the Grid"

When the grid is challenged, different forms of categorization and production of space surface:
 by using the same principle of the grid but incorporating different methodologies in its making and combining the differently produced structures. In essence the grid can also be seen as infinitely expansible and infinitely divisible, allowing in differences.





grid system



combination of different systems



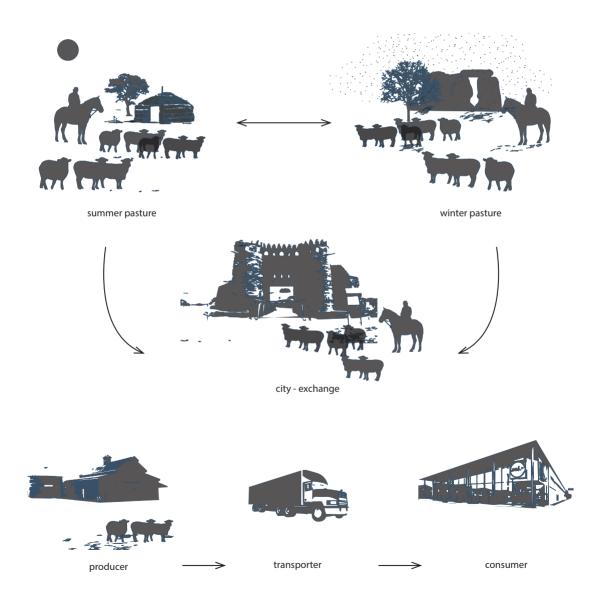
defies and welcomes differences

## **The Contemporary Nomad**

With these in mind, it was now important to find the relationship of ancient mobile practices of nomadism to the current culture in the same territory that the Kazakhs once inhabited. The country of Kazakhstan, after decades of Russian Empire and Soviet occupation, gained a complex and lasting history of culture and identity given the various ethnicities that were led to inhabit this land along with nomadic groups who were

forced to sedentarize. However, there is one aspect of the mobile life that persists today independent of culture.

The mobility of the Kazakh pastoralists has always been defined by their important relationship with their herds and produce: their movement would happen in function of better environments for raising and exchanging them..



Nowadays, the character who was once the producer, transporter as well as exchanger of goods is not the standard anymore. The process which revolved around a single family or group has been broken down and new categorical figures now take on each of those roles independently. One of these figures, however, remains defined by a nomadic character: the truck driver who transports goods from producer to consumer.



























A-2 Highway in Almaty



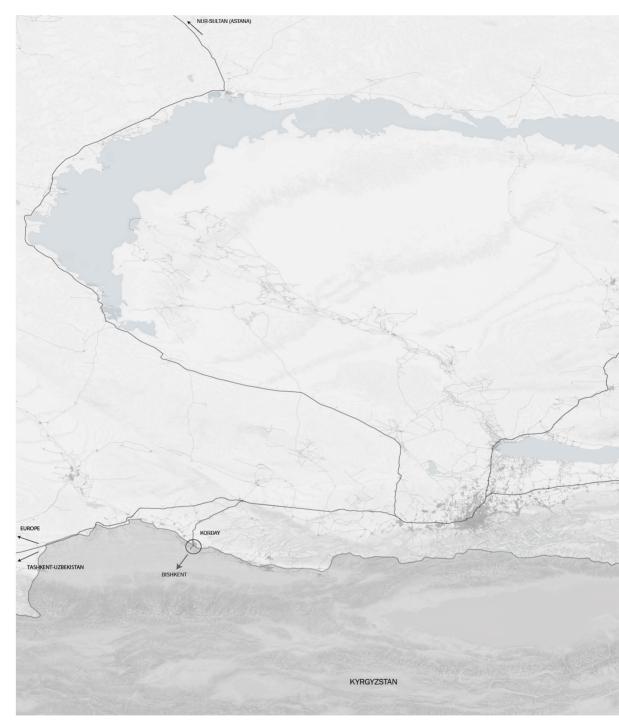








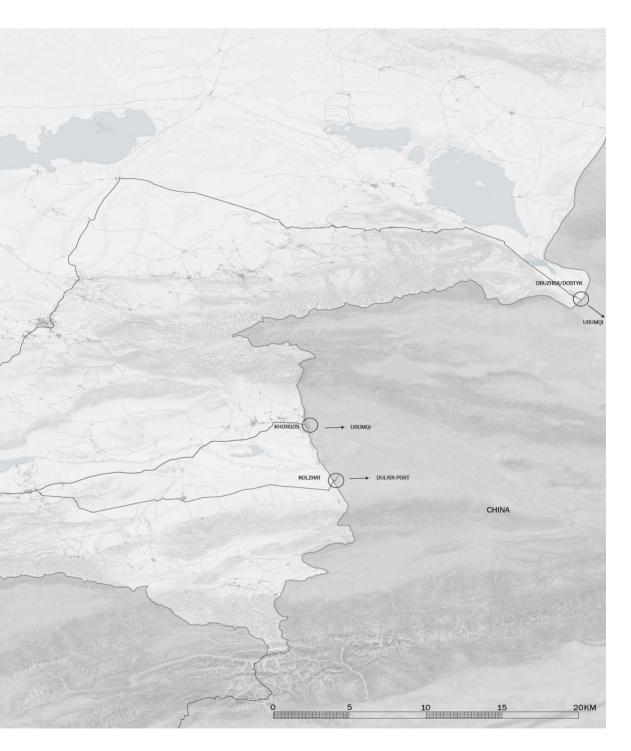




# **Transportation Corridors**

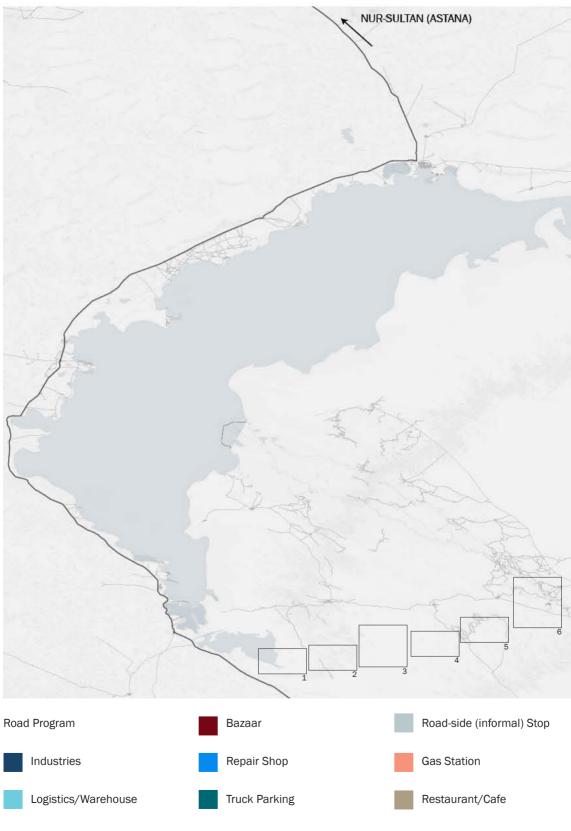
Naturally, the next step of the research concerned with an exploration and analysis of the mobility of these contemporary nomads, starting from their routes through the country, many times reaching from or leading abroad.

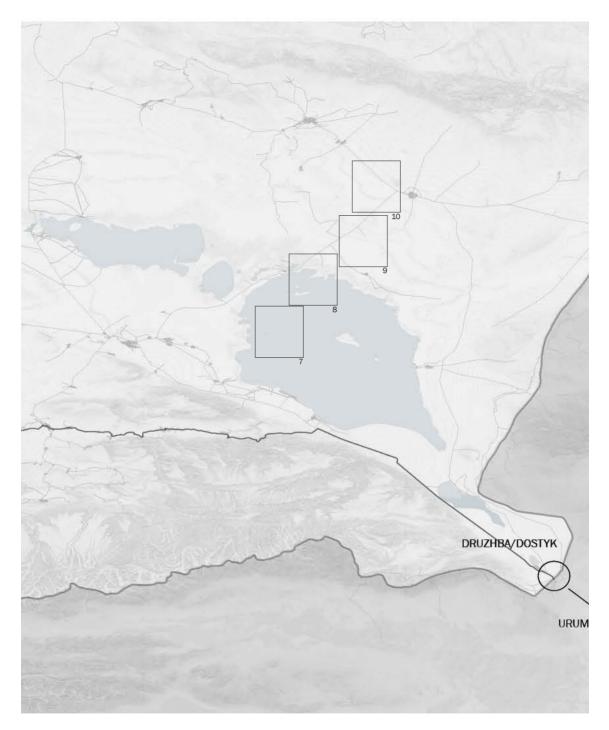
The current key driver to Kazakhstan's economy lies in its strategic location between Europe and China, making it one of the most important transportation corridor – the New Silk Road. The transportation sector alone corresponds to



about 10% of the country's GDP and employment rate likewise. Its landlocked situation entails the movement of goods either through land or air, hence why road transport corresponds to 85% of the country's transported freight.

One of the most important corridors is the A-2 highway leading from Khorgos to Tashkent (after bifurcating into the E-38 which leads to Russia then Europe).





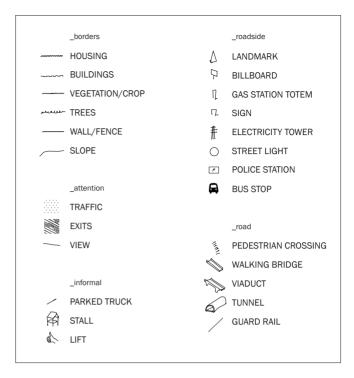
# The A-2 highway - Almaty

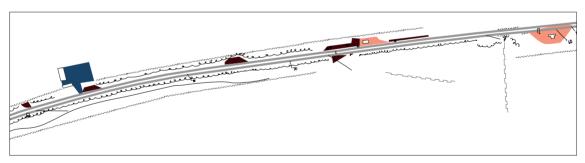
The road that leads from Tashkent to Almaty is of unquestionable beauty afforded by its natural landscape of the Steppe plains and the Tian Shan mountain range. However, as it approaches the city of Almaty, it becomes

the single instance where the highway crosses through the the urban fabric of a city.

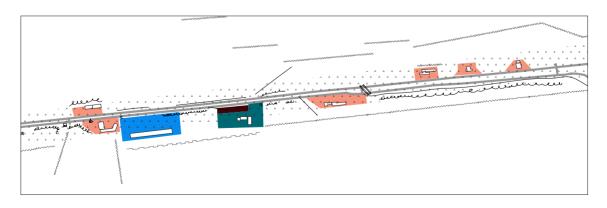
The highway was originally built in what used to be the outskirsts of Almaty, however, due to

the rapid growth of the largest city in Kazakhstan, its urban expansion developed towards these outskirts engulfing the road into its urban fabric. And correspondingly, a specific program began to flourish along the highway within Almaty: structures directed to serving the mobilities of this road. Repair shops, gas stations, convenience stores, supermarkets, diners, TIR parking as well as informal roadside stops and markets.

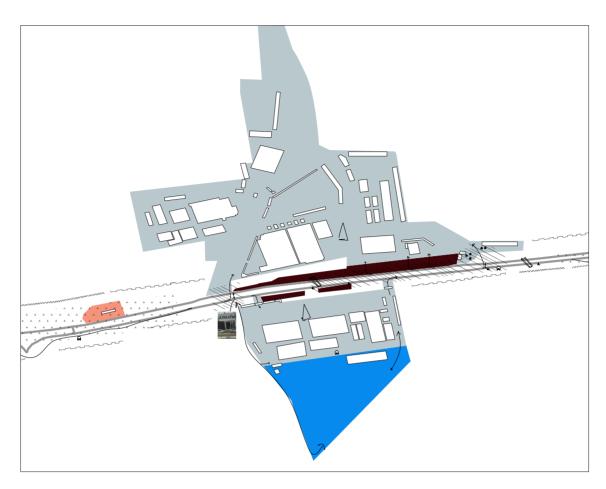




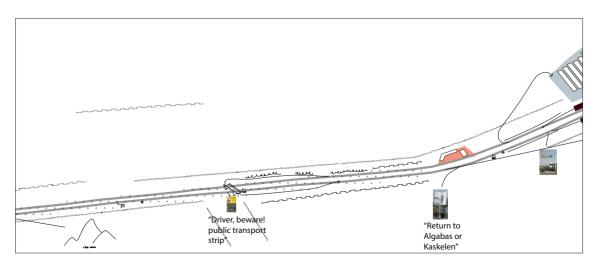
Fragment 1



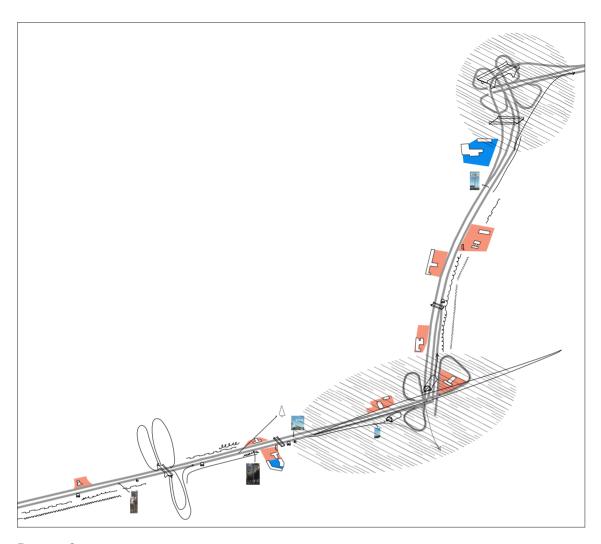
Fragment 2



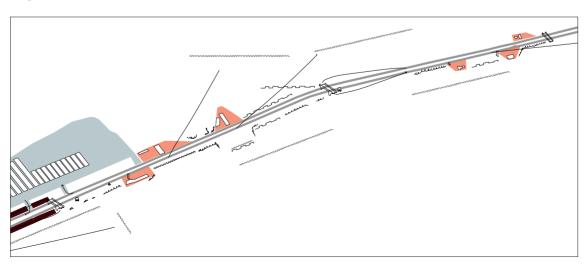
Fragment 3



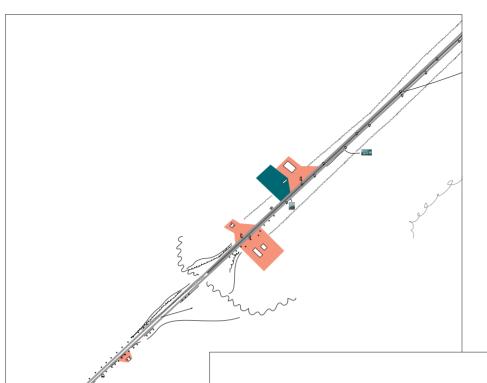
Fragment 4



Fragment 6



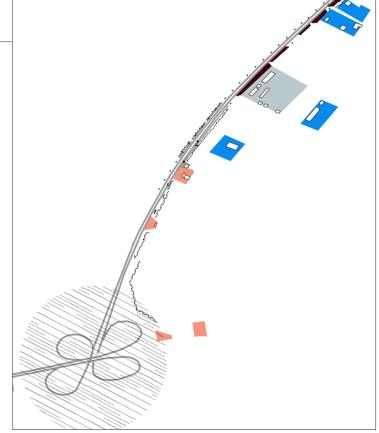
Fragment 5



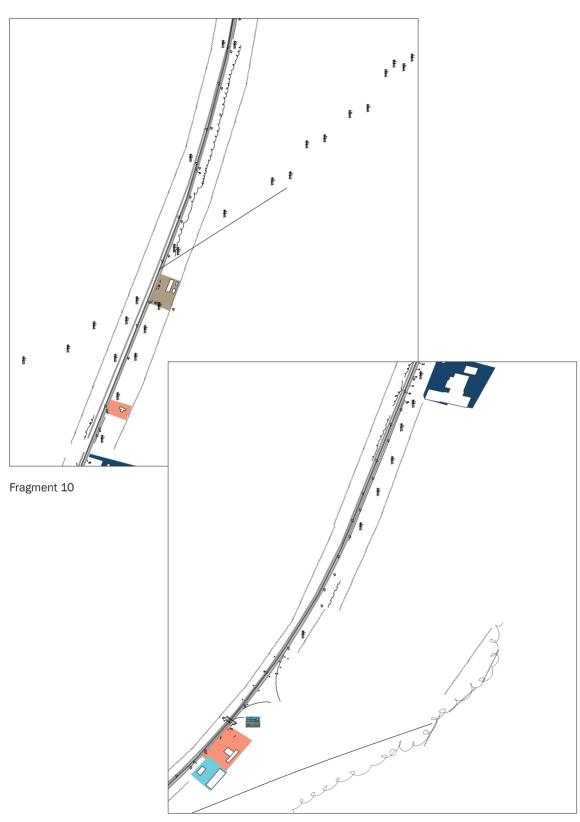
Fragment 8

Besides these, in recent years other functions have developed in Almaty in response to the government's Nurly Zhol programme to transform the country in a key logistics and transportation hub. These are mainly logistic centres and industrial parks, including SEZs. This re-esestablishes Almaty as a hotspot for truckers and drivers, not only because of its full programatic supply of infrastructure towards these mobilities, but also because of its attractive job market in transportation and logistics.

Despite the provision of a convenient program, the A-2



Fragment 7



Fragment 9



Modi Operandi Workshop model #1 - Occupation

loses its highway character in Almaty: through an analysis based on Kevin Lynch's "The View from The Road", I could start pointing out some of the factors that contributed to that loss of character.

From the city's outskirts towards its centre, the road starts changing and signaling an urban centre by displaying continuous street lights, billboards and electricity lines crossing the road.

The absorption of the road into the urban fabric is a condition promptly felt: within the city, the sense of location is lost due to the cramping of buildings along the road hindering the view to the landscape which was once present all along the road. Throughout the city, a bunch of information is presented at once to the driver in a confined space. Claustrophobia.

The driver is also confronted with a repetition of mundane buildings: the same gas station typology, same warehouse-like markets and bazaars, apartment blocks.

The driver's attention suddenly has to be magnified to choose the right exits in order to maintain himself within the highway and avoid getting lost in the city's neighbourhoods.

By crossing the city, the highway becomes entangled with the local mobilities that happen in a much slower pace: the pedestrians, the public transportation, bus stops, coaches, city traffic.

Great part of this commotion is due to the informal occupations along the road: not only eventual street stalls, hitchhiker spots and roadside parking, but also the bazaars that first sprawled years ago in what once was the margin of the city. A process which was essentially nomadic: transgressing spaces for occupation within the careful regulated grid of the city (model #1).

# The freedom of movement. Different kinds of social relations. Intended alienation.

#### On the Road

Being on the road, for some, has a certain quality, a certain advantage, a specifc experience that is sought for and only found there. A lifestyle. It is defined by its mobility and often contested by the norms of a sedentarist society.

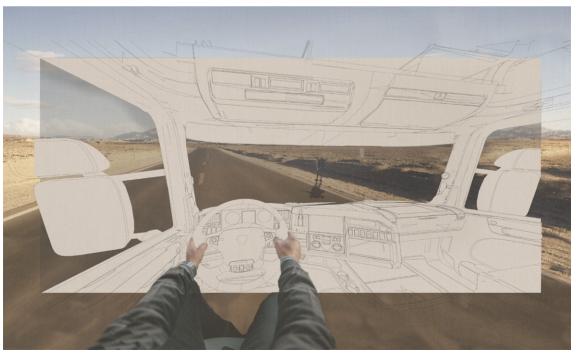
It encompasses a sense of freedom. Freedom of movement. Freedom of choice. Freedom of decision. The driver can decide his schedule while on the road. He can choose which way to go, where to stop. He can determine who can join if he wishes one to join.

Being on the road also determines different types of relationships. Temporary, sporadic, sudden, singular. Comradeship prevails. Between fellow colleagues, between other ambulants, between strangers.

But the road also affords the option of being alone. Isolation, alienation, indifference when one feels like being by himself with their throughts.

It allows the traveller to inhabit different places, different territories and find belonging in each of them by temporarily inhabiting a corner of a diner, a stall in the bathroom, a roadside edge, a place underneath everyone's moon.

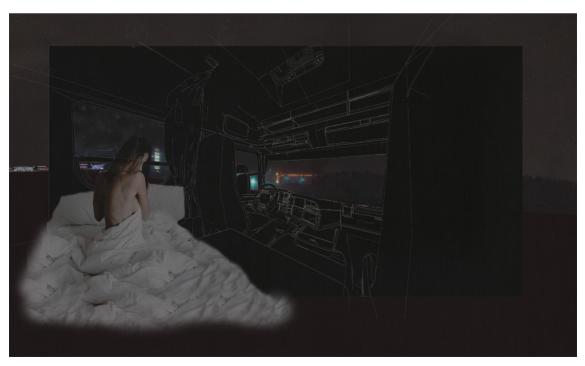
The choice of living this life is by many elected for such possibilities. That is why the road experience becomes as important as the provision of infrastructure for these mobilities.



Freedom



Alienation



Relationships

## **Metaphysical Territories**

Generally speaking, the road experience is about the inhabitation of different territories physically and metaphysically. The road becomes a moment of introspection like the labyrinth.

Throughout the movement, the conscious switches from the physical road to the metaphysical mind. Like in this model, the moments that the loops extend 3-dimensionally they occupy a different territory than the base, and when a loop meets the base, it becomes self-aware of its territory again.

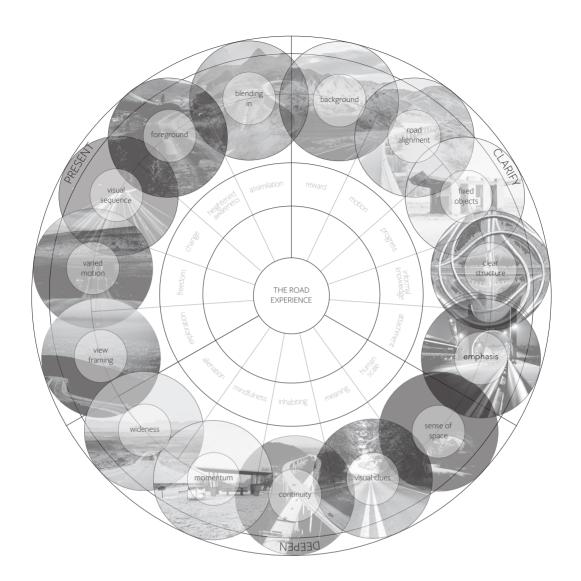
The same happens to the driver when inhabiting the physical territory of the road while simultaneously wandering different territories with his/her mind in a sort of trance.



Modi Operandi Workshop model #3 (in process) - Metaphysical Territories



Modi Operandi Workshop model #3 - Metaphysical Territories



## The Road Experience

Aiming to understand in more detail how these experiences develop, I created a framework to look back to this road and judge it based on a theoretically positive road experience.

The road experience is based on the first hand experience of physical objects and visual images along the road that help establishing a metaphysical experience. These physical aspects serve in 3 different ways: to present the road, to clarify its meaning and then to deepen it.

For example, the design of the road furniture, or,

the foreground, such as guardrails, signage, retaining walls, the pavement, help on a sense of heightened, yet drowsy awareness. The mystical feeling one has while driving while occupying the mind in other places at the same time.

Or the provision of points for momentum. Like rest stops with a certain quality of view, of use, of atmosphere that attracts the driver to cease the moment and enjoy it to gain momentum to continue on the road.

Or the presence of fixed objects at sight and

emphasis which allows one to find some point of attachment, but also serves as a way to calculate the movement by seeing objects in a distance progressively becoming more detailed as they are approached. A sense of reaching goals, which makes the drive less dull.

The presence of visual clues which allows the driver to grasp the meaning of the environment - a certain event, a particular typology.

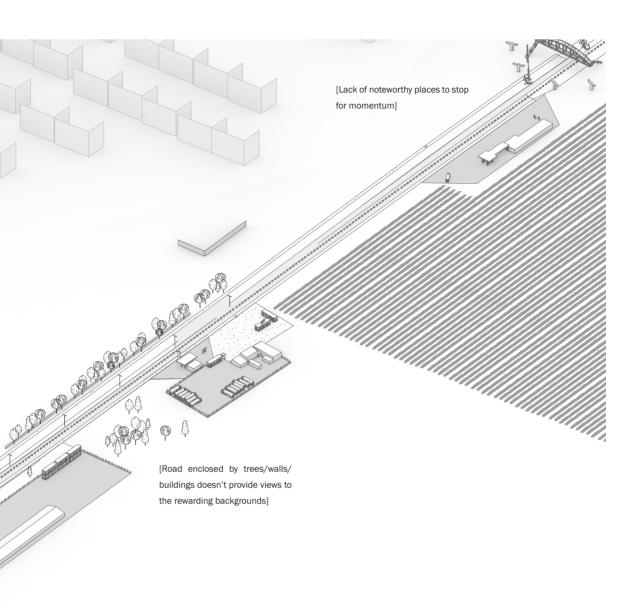
A framed view, a certain perspective towards an object of emphasis, a background or even the city affording the driver with a moment of individual exploration, of self-discovery.

[Unintentional view-framing of random buildings such as apartment blocks]

[Foreground: repetition of street lights, billboards and guardrails. Lack of fixed objects, no sense of progress]

> [Motion interruption by bus stops/ pedestrian crossings]

[Mostly unintentional emphasis to mundane building structures]



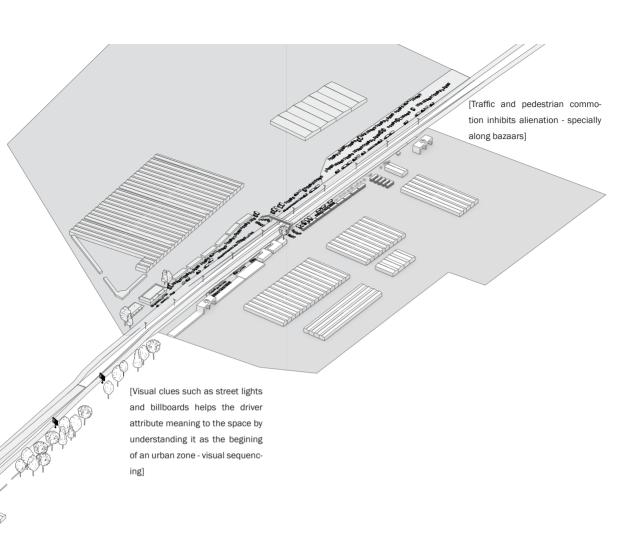
A given visual sequence that renders a slow but continual change of the environment, of which the driver can realize the covered distance but not notice the exact moments of change.

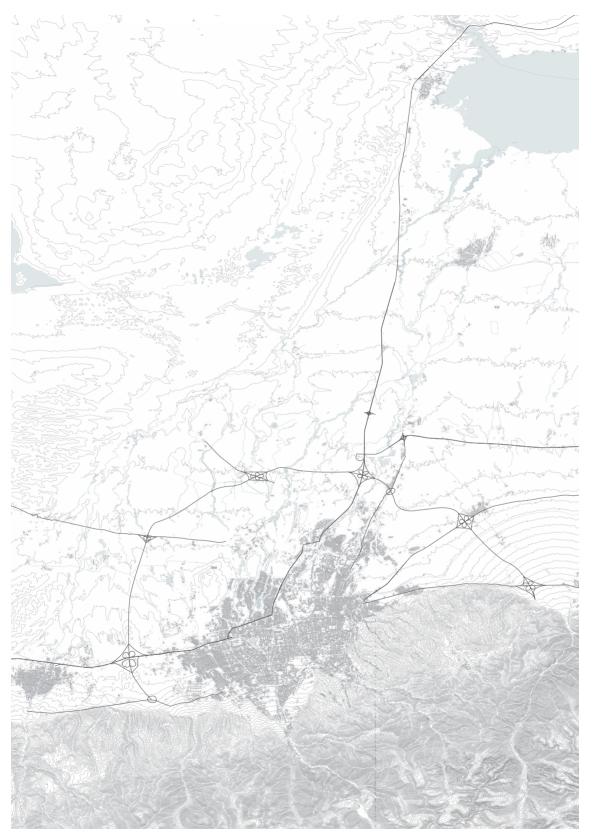
The contrast between exposure and disclosure that not only relieves monotony but also indicates a sense of space through a human scale comparison, feeling enclosed by woodlands or exposed in the bare desert. But also to the human scale and sense of space pertains the feeling of feeling small in a vast world but potent by covering large distances within it.

[Repetition of the same typology - specially the gas station. No specific or intentional emphasis -

detachment]

[Limited movement - mostly straight, flat road - restraint] [Changing road allignment - construction works demand brisk attention and response by driver]





The BAKAD project from the government of Kazakhstan aims to solve traffic problems in the city of Almaty by introducing a ring road around it its urban centre.

### Almaty Ring Road

Non-coincidentally, as a response to the increased traffic and chaos of having one of the most important national highways crossing the biggest city of Kazakhstan, the Kazakh government plans to build a ring road around Almaty to replace the highway that crosses through the city.

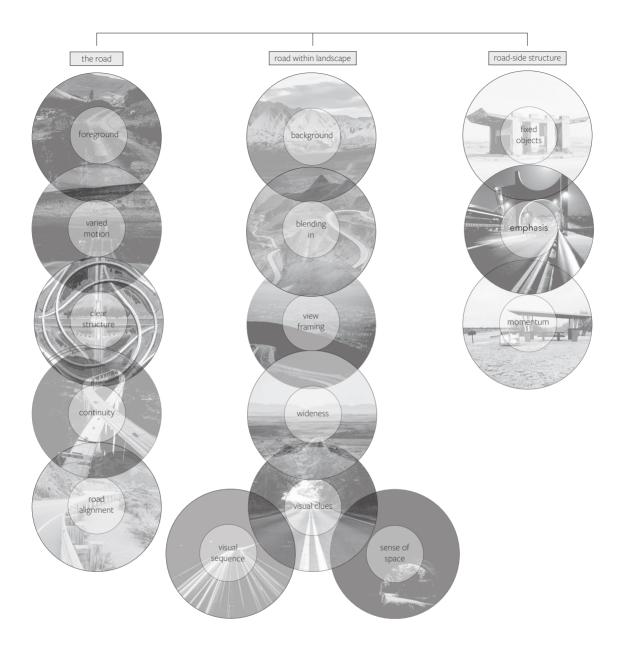
This location becomes my point of interest for the development of the next steps of the design project. It connects to the previously stated conclusions of looking at cities primarily through its moments of mobility. It also has the potential to explore further the road experience, but it also poses the challenge in finding amendments with what is the main quality of the road when crossing the city of Almaty: that it is a hotspot for all of a driver's needs.

Indeed the road in almaty is full of amenities but as much as it serves the basic program it lacks the road experience. In fact, most of the A-2 highway experience is afforded by its beautiful landscape alone. There is a general lack of infrastructure along the road (outside Almaty) and an even greater lack of attention to the road

experience throughout its entire length.

The ringroad provides the opportunity to re-think road architecture beyond its functional purpose. It allows to ponder on the future developments of the city towards this new road, the installation of new mobility program, the consideration on the future of the ones left behind, and last but not least, the enhancement of a road experience.

The design challenge consists of placing "mundane" road programes to serve these mobilities while also providing for the road experience. A challenge which might gain additional insight by revisiting the investigations and applying aspects of the ancient nomads' rock art - intentional marks on the natural landscape of mobility that held an intentionality beyond basic needs.

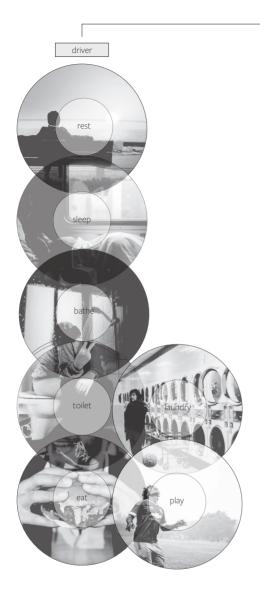


# **The Road Program**

In order to begin, I've arranged a schematic program divided in two parts.

The first is related to the uses and characteristics of the road and its environment. All the aspects mentioned previously - related to a theoretically

positive road experience - must be addressed in the constitution of the highway itself and its road furniture, in the landscape directly related to the road and finally the road-side structures that will not only serve the road experience but also the users' needs.





# The User Program

And thus the road program must primarily serve the users' basic needs, and these serve two different categories: the driver and his automobile.

The driver, and it must be said here, not necessarily the truck driver but anyone on the road, must be offered spaces for

their basic needs - besides a road to drive, a place to rest, sleep, use the shower or the toilet, eat, play or do the laundry.

And the driver's car must be supported with a repair shop, a gas station, parking spots, a carwash, an auto-products shop

And so I would follow with the design of these transient spaces by combining a basic road program and enhancing it with the elements that define a good road experience.

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Adopting nomadic thought to address contemporary cities

Nomadic aspects of society sprawl every now and then within our sedentary cities. One might have noticed the street markets, festivals, urban performances, pilgrimage and celebration structures, protest and occupation fields, living camps, etc. All these have an ephemeral and informal character to their structure and becoming. All emerge through the highly organized urban fabrics of the city at required moments, following needs and adapting to context. As if it were human nature proclaiming its instincts for survival. These spaces can be understood as an emanation of nomadic culture that has for long been attempted to be dissolved through its elimination or formalization by a sedentary ideology. The same ideology that condemns human mobility deeming them as pathological forces (given its origins in nomadic cultures) to be controlled and minimized - a task which is ironically proving to be increasingly harder as cities grow larger, technologies smarter and transportation reaching further distances. Nowadays, facilitating mobility is a necessary struggle faced by every city because the ability to move is desperately required by most of the contemporary population. Yet, this ability is largely obstructed by the production and organization of space into things like cities, states or countries.

This sedentarist ideology is represented by Deleuze and Guattari's A Thousand Plateaus book in the State. The State's biggest enemy is the nomad (also war machine) – the only figure external to the State, which is impossible to be fully institutionalize and therefore a threat to the stability of the State's power¹. In an attempt to control its citizens and distinguish the insubordinates, the State produces striated space: it organizes its land-scape in dimensions, defining limits and borders, assigning uses, delineating movement between one point an another, establishing who can enter. Whatever and whoever is outside, in the smooth space, runs organically, informally, spontaneously, freely, representing a threat to the order. A threat to the established power. The nomad.

The problem is that in the desperate need to divide space into bounded territorial units, deeply rooted conceptions of social identity are created. And such conception "actively territorializes our identities, whether cultural or national. [...] it also directly enables a vision of territorial displacement as pathological." And it treats the "other", original to another place, as an imminent threat. However, this mechanism has made itself so intrinsic to the sedentary society, that it is by now imperceptible, and like anything else, deeply rooted into the physical space of the city and the metaphysical spaces of society.

But once aware, one can easily notice such mechanisms. Take Kazakhstan, for example. Prior to the Soviet rule the smooth space of the Kazakh Steppe was inhabited by nomadic peoples, whose movement was only <sup>1</sup>Deleuze and Guattari, A THOU-SAND PLATEAUS Capitalism and Schizophrenia, 360.

<sup>2</sup> Malkki, "National Geographic: The Rooting of Peoples and the Territorialization of National Identity Among Scholars and Refugees", 31. influenced by natural phenomena and the relationship to the territory was one of temporary occupations instead of definite settlement. Kazakhstan under Soviet rule was then re-organized as part of a nation by an overruling power producing a striated space of representative structures, delimited territory (the private houses, the public streets, the collective farms, workers' factories) and actively territorialisation of the Kazakh identity into its sedentary space. Kazakhs' mobility wasn't suppressed only in the physical space, but also in the metaphysical through the imposition of a Russian nationality with its full set of "rights" and obligations towards the State.

The issue with our sedentary culture is not sedentarism itself (the organization of groups, the building of permanent cities, or the will to be fixed in one place) but rather the ideology behind the State's attempts to maintain society always and entirely sedentary. An ideology that presented negative portrayals of nomadic cultures, which was in fact evil and dangerous but only, as we can now understand, towards the stable power of the State. It is for that reason that we must now adopt nomadic thoughts and practices to allow cities and societies to be understood and evolved beyond the enclosed and exclusive space of a sedentarist metaphysics. I do not mean to fully condemn a sedentary culture, on the contrary, I think it may also be part of our being. What I mean to do is condemn the ideology behind sedentarist culture that undermines nomadic culture, and to encourage the incorporation of a nomadic metaphysics in the discourses relayed to our cities and their societies. Then we can counter problems that have been produced by and are beyond the control of a sedentarist metaphysics.

For that reason, this paper will follow through 3 principal and interconnected domains of our contemporary society which I believe can benefit from a nomadic metaphysics: the citizen, the city and their mobility. Mobility is as important, but for now will remain in the background of the discussions of the first two due to constraints that limit the expansion of this paper. In as much as the text tries to clarify a structure to describe them in order, their existences are interdependent and convergent thus to fully understand the argumentation for each of them, all parts must be read as part of a whole.

#### The Citizen

It is hard to conceive of the city without the citizen and vice versa. Even though the constitution of the citizen comes before the construction of the city, it is as if the condition of citizen is only formalized after the city, when all its symbolical architecture is fixed into real physical space. A sedentary condition by nature.

According to Engin Isin, the production of such space (the city) is tied to the formation of citizenship – "constituting oneself as an agent to govern and be governed, deliberate with others and enjoin determining the fate of polity"<sup>3</sup>. Citizenship is in its essence the formation of a group and as Isin arguments, groups cannot realize themselves in space without building in it physical and symbolical representations of their bond – their citizenship<sup>4</sup>. Cities and their permanent monumental urban artifacts are thus built to perpetuate the identity and permanence of such groups:

"[...] "history" so embodied in the fabric of the city represented an ordering structure enabling each spectator to understand its heroic and virtuous lessons and the progress and stewardship its shaping revealed. Not only was the city with its collection of monuments expected to be a source of inspiration, but monumental buildings were as well theatrical backdrops for dramatic representation and enduring civic display"<sup>5</sup>

According to Aldo Rossi, the city itself is the locus of collective memory. In the same way that individual memory associates with an object or a place, the collective memory finds associative elements in the urban artifacts of the city<sup>6</sup>. Thus when the State makes the concept of citizenship visual, it institutes in its people a sense of belonging heightened by the natural generation of collective memory attached to the these artifacts. But in doing so, the State also purposefully excludes the outsiders by presenting them with the group's virtues and deeds as unattainable ideals to them <sup>7</sup>.

It then becomes clear that the idea of citizen, has been conceived at the expense of another categorical figure, the non-citizen. In grouping themselves into citizens of a certain place and exercising similar and reciprocal civil acts, sociological boundaries have been created distinguishing them from the non-citizens of that place<sup>8</sup>. And much like the rest of the civic city, these boundaries are spatialized through the constitution of borders and territories which serve to formalize the segregation between those who belong and those who don't:

"As groups realize themselves in space, they engage in strategies by inventing various technologies that alter configurations and properties of space so as to fragment, weaken, destabilize, constrain, immobilize, segregate, incarcerate, or disperse other groups as much as possible while increasing their own solidarities" 9

The city and its restrictive definitions are social constructions of space based on a sedentary culture that judges movement and outsiders. Changing our vision on the production of this space towards a nomadic perspective could help establishing less exclusive definitions of citizenship that

- <sup>3</sup> Isin, Being Political Genealogies of Citizenship, 1.
- 4 Isin, 42.
- <sup>5</sup> Boyer, The City of Collective Memory Its Historical Imagery and Architectural Entertainments. 14.
- <sup>6</sup> Rossi, The Architecture of the City. 130.
- 7 Isin. 176.
- <sup>8</sup> Isin, 45.
- <sup>9</sup> Isin, 49.

would allow sentiments of belonging and building of collective memory to those that are original to other places. Cresswell convincingly argues that in the contemporary world it is inconceivable to think of culture as pertaining to a single location<sup>10</sup>, that people can't be labelled by a place of origin, but rather by a complex collection of traces left by their mobility through multiple territories. And therefore, social and cultural understandings are but a continuous trace left behind by those who draw the limits to their own mobility amidst endless possibilities in this world.

Marx already said that humans are social beings and being social is the ability to be several things, such as being part of several groups at once<sup>11</sup>. It is in fact this ability of being more than one thing at a time that makes a group member essentially an individual. In other words, one can say that through the possibility of belonging to many places, one also finds herself as an unique human being among all the "others". And therefore the classification of that individual based on its birth location becomes abstract and incomplete:

"Yet just as human beings make their own history, they also make their cultures and ethnic identities. No one can deny the persisting continuities of long traditions, sustained habitations, national languages, and cultural geographies, but there seems no reason except fear and prejudice to keep insisting on their separation and distinctiveness" 12

According to Tim Cresswell, humanists, who in his view fail to study societies when treating mobility as dysfunctional, argue that rootedness or "having and knowing your place" is central to what being a human is<sup>13</sup>. This seized place would provide security, a sense of location in the world and psychological attachment. Where I believe this argument fails is in being unable to recognize the multiplicity of such place. I argue that to be human is to be able to find your places and inhabit them. To be human is to build your social identity by finding places to belong to – be part of several groups.

"Go first to your old plant and watch carefully the watercourse made by the rain. By now the rain must have carried the seeds far away. Watch the crevices made by the runoff, and from them determine the direction of the flow. Then find the plant that is growing at the farthest point from your plant. All the devil's weed plants that are growing in between are yours. Later. . . you can extend the size of your territory." 14

Like the Deleuze and Guattari's weed growing in the garden, the territory of one's identity is not just where one was born, but it's constituted out of all the places one has occupied and belonged to.

MOBILITY IN THE MODERN
WESTERN WORLD, 45.

11 Isin, Being Political Genealogies of Citizenship, 24.

10 Cresswell, ON THE MOVE

<sup>12</sup> Said, Culture and Imperialism, 336.

13 Cresswell, 31.

<sup>14</sup> Deleuze and Guattari, A THOUSAND PLATEAUS Capitalism and Schizophrenia, 372. In fact, living a nomadic life presupposes reliant relationships between parties of different groups and a concealment of their differences. For a life on the move is never certain and therefore nomads must depend on one another to make it through. They learn how to deal and overcome their differences and join forces when it's necessary. It is rather a way of finding that safe place that humanists defend:

"The members of a wandering society are especially dependent upon one another. Their common interests have a more momentary form by comparison to those of sedentary groups, and for that reason they conceal individual differences with the specific energy of the momentary, which so often triumphs over that which is objectively more essential." And "Precisely because wandering individualizes and isolates in its own right, because it makes people rely on themselves, it drives them towards a tight cohesion, over and above otherwise existing differences." 15

- <sup>15</sup> Featherstone, Frisby, and Simmel, Simmel On Culture : Selected Writings Theory, Culture & Society, 162.
- <sup>16</sup> Deleuze and Guattari, A THOUSAND PLATEAUS Capitalism and Schizophrenia, 474.
- <sup>17</sup> Cresswell, ON THE MOVE MOBILITY IN THE MODERN WESTERN WORLD, 47.
- 18 Cresswell, 47.
- <sup>19</sup> "Sustainability: Definition of Sustainability by Oxford Dictionary on Lexico.com Also Meaning of Sustainability." Lexico Dictionaries. Accessed January 06, 2021. https://www.lexico.com/ definition/sustainability.

## The City

A specific character of nomadic life since ancient times was the manipulation of space given by nature, negotiating with it ways to survive within. In the contemporary world, this mechanism must happen in the city instead, and its emanations can be found in the sprawls of emerging temporary structures as first mentioned in the beginning of this text.

Nomadic thought criticizes the space of the city for its dominating character: the striation of space, as discussed by Deleuze and Guattari<sup>16</sup>, imposes upon each individual a certain manner in which to move or stay. The nomad, on the other hand, makes use of tactics to be in space. Tim Cresswell defines them as daily protests, or heroic acts towards the city<sup>17</sup>. It is a form of sustainably consuming the territory by overlooking striated space and finding emerging possibilities against its formality. Thus nomadic tactics never produce proper places, but always manipulates spaces produced by others<sup>18</sup>.

Sustainability is probably the most used and misused word of the 21st century. Before being coupled with the "global" to conceptualize human and nature co-existence – aka. environmental sustainability- the word "sustainability" means "The ability to be maintained at a certain rate or level" 19. It is derived from the Latin sustinere, or (ability to) sustain – to "maintain", "support", "uphold" or "endure". Time and movement both pertain in the meaning of these words: a continuous action to be performed through a span of time in order to keep something at a certain level. Attention,

"at a certain level" and not necessarily "as it is". It is no non-sense that in environmental discourse the idea of balance is central - an equation of ins and outs where the only constant is the adjustment of the variables to maintain a state of affairs.

The point to be made is that sustainability – as an environmental necessity – demands maintenance of our living environments by means of adjusting the variables. Cities today are, more than ever, marked by gigantic flows of peoples, economics, information, technology, natural disasters: in one day people from all over the world are going back and forth around the planet contributing to massive global economies and the next, a world-wide virus pandemic locks everyone at home, slams shut factories and businesses, affecting the great majority of the world population not only physically, but also economically<sup>20</sup> and socially<sup>21</sup>.

Significant changes to the balances of the world happen ever-so-fast and the need for adaptability requires a certain speed of reaction. This raises two concerns: the rhythm within which the urban fabric of the city has to maintain as a response to society's contextual changes and the ingenuity with which its people must adapt in order to find quick but promising solutions. Therefore here, again, I would like to argue in favour of nomadic thought, and the art of tactics (or nomad science).

The tendency of a sedentarist society is to remain. According to Deleuze and Guattari, remain evolving in compliance with the rules established by the State and its science of reproduction. Always looking for the patterns, always in search of the constants to explain life phenomena, to improve ways of living through science and technology. Despite all attempts, the occupation territory of this State science remains the same if a science of following (nomad science) is not attempted: thoughts and understandings will remain revolving around a same point of view without ever breaking apart to allow them to expand to greater territories<sup>22</sup>. The science of following, by looking at variables, by looking at the different, the exceptions, the minorities by not only accepting these within their boundaries, but also giving them as much importance, allows the territory to expand way beyond that which was first established by the State and its reproducers.

In catastrophic moments such as these, creativity and ingenuity of nomad science prevail. The ability of resilience becomes the most-sought for evolutionary trait. Characteristics which are found in the "nomad science", that which does not reproduce, but rather thinks outside of the constraints imposed by the State. During the 2020 Coronavirus pandemic such examples are vast. The online platform, Creative Review, for example, dedicates an entire section to "creative industries" responses towards COVID-19<sup>23</sup>.

Daniele Palumbo & David
 Brown Lora Jones, "Coronavirus:
 A Visual Guide to the Economic
 Impact," BBC News
 "Everyone Included: Social
 Impact of COVID-19 | DISD,"
 United Nations
 Deleuze and Guattari, A

THOUSAND PLATEAUS Capital-

ism and Schizophrenia, 372.

By now, it should be safe to say that "cities must resemple and facilitate active fluxes in motion instead of being limited by static, material configurations"<sup>24</sup>. Cities should support other forms of being that are more tactical. Informal ephemeral systems of urbanism could respond better to situations that, as explained before, demand high, fast and ingenious adaptability. By having greater flexibility to adaptations, more responsive reactions and greater investment opportunity due to lower investment capital and risk<sup>25</sup>.

It's important to emphasize here that I am not suggesting a completely kinetic city of constant change in its structure, but merely that a city should support instances of ephemerality that can easily adapt to the fast-paced characteristic of our contemporary society in order to maintain the balances of our environment's equations in order to sustain life in the city. And doing so demands the provision of infrastructural spaces that can readily accommodate informal structures without sedentary prejudice.

The problem with this kind of smooth production of space within the city is that it is seen with prejudice by those who believe in the attachment of collective memory to be solely in the monumental city. Rossi states that memory is the consciousness of the city, that it represents in space truths that have already been established<sup>26</sup>. But even Rossi recognizes the mechanisms of memory to be mobile "[...] great ideas flow through the history of the city and give shape to it" <sup>27</sup>. And in being a flow, it is free to find different places to attach to, because in essence, truths are also always changing and a city may also represent processes in their ephemeralities. Truth isn't defined by time, but rather by acceptance of whoever believes in it. In that way, the city may become representative of mobilities and accepting of the otherness.

Additionally, I use Rahul Mehrotra's arguments which state that the prioritization of permanent structures is ignorant to alternative manners to carry collective memory. Not only collective memory can find locus in folklorism, arts and crafts, music, but "temporal celebratory landscapes are also ways to provide space and place to the conservation of social traditions enhancing the values of cohesion and allowing for interactions in the form of cathartic gatherings."<sup>28</sup>

"Once upon a time, before these older neighborhoods had been colonized by new property interests, they had been provincial enclaves, entity points for new arrivals to the cities and breeding spots for colorful folklore, music, poetry, and art-essential ingredients to any urban cultural heritage." <sup>29</sup>

- <sup>23</sup> "Creativity in the Age of Coronavirus," Creative Review, <sup>24</sup> Mehrotra, Vera, and Mayoral, EPHEMERAL URBANISM Does Permanence Matter?, 13. <sup>25</sup> Mehrotra, Vera, and Mayoral, 31.
- <sup>26</sup> Rossi, The Architecture of the City, 131.
- <sup>27</sup> Rossi, 130.
- <sup>28</sup> Mehrotra, Vera, and Mayoral, EPHEMERAL URBANISM Does Permanence Matter?, 23.
- <sup>29</sup> Boyer, The City of Collective Memory Its Historical Imagery and Architectural Entertainments. 401.

#### The Conclusion

The intent of this paper is not to condemn cities or sedentary lifestyles. Throughout the paper I've tried to show that the problem of cities, their citizens and mobilities lies in the ideology used to produce them in the first place. This ideology treats nomadic aspects of life, such as migration, ephemeraility and informality as intrinsically pathological. And my argumentation insists that these are exactly the characteristics missing in our cities, which are required for the creation of environments that are better accepting of "otherness", that are well resilient to rapid changes of the contemporary world and are welcoming to mobilities. Due to constraints of time and space I couldn't elaborate nomadic concepts more profoundly within the domain of mobility which should therefore be done in a future opportunity for completion of the argumentation.

For now it maybe suffices to say that based on nomadic thoughts, allowing oneself to look at the city primarily through its mobilities - without the misjudgements that shaped sedentary societies - would also influence the conception of spaces of movement as more than a service space of connection between place-points in the city, an undesirable yet uncontainable output. Instead, these "non-places" would be conceived through meaning and become as significant and relational as what sedentarists like to call "place".

<sup>&</sup>lt;sup>30</sup>Non-places – term coined by Marc Auge to define places of large transience that do not hold any significance and conceal individuals' identities.

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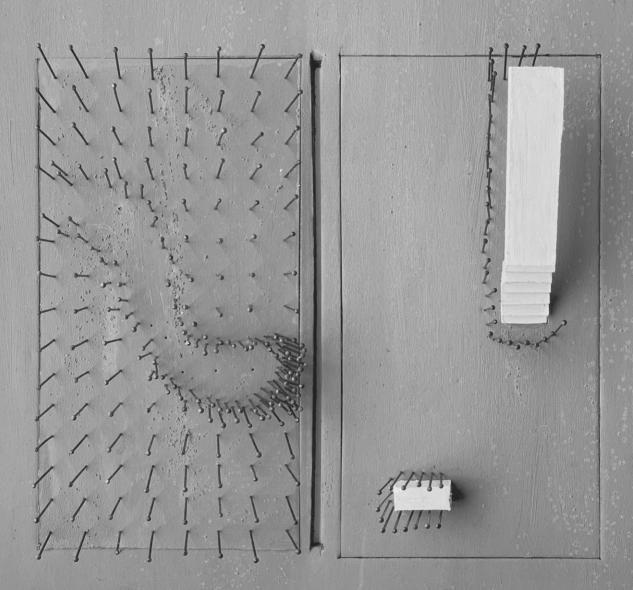
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page 64



# THE CUL-DE-SAC AS AN EVENT THE MANIFESTATION OF AN INTERRUPTION

Rina Gorchaj

- 1 a. Downtown Broklyn New York
  - b. Baidibek Bi Street Almaty
  - c. Callejón Naranjos Toledo
  - d. Hornchurch Road Lordshill
  - e. M. Mezdurecka Street Skopje



#### INTRODUCTION

The cul-de-sac is an omnipresent urban morphology encompassing an array of very different situations, whose specificity however is overshadowed by its functional definition. The research confronts the functional conception and challenges its appropriateness. Furthermore, when addressing the concept, there is a tendency to focus only on one configuration, as if it is the one culde-sac, when actually they all are. The question for me was how to understand these spaces under a definition, which tells little to nothing about the space, how to understand the forgotten back alley (figure 1.a) in the same logic as the cul-de-sac where I grew up, which carries pleasant memories from my childhood (figure 1.e)?

The analysis attempts to provide an alternative understanding of the cul-de-sacs, by approaching them as a change in event. Changing the focus of observation has the potential to highlight relations and elements which otherwise remain invisible. This methodology is used both in the paper, which tackles a number of both general and specific cases, and in the research on the city of Almaty.

In relation to the studio topic of borders and territories, the project deals with a morphology caused by an interruption, a border between two conditions. The way it approaches the phenomenon is by defining the interruption not as a linear confinement, but as a threshold that is manifested through different relations and spatial configurations.

In the case of Almaty, the topic of internal urban borders is a redundant phenomenon creating unprecedented interruptions, which affect the way in which the city operates and define the urban atmosphere. During the collective research, in attempts to identify the most prominent borders that define the city of Almaty, we were unable to do so by viewing the city as a whole. It was only after analyzing the city from within, by taking virtual walks, that we distinguished the fragmentation of the city, both on the level of the street, and that of the urban fabric. Cul-de-sacs are one manifestation of the city's fragmentation.

#### THE CUL-DE-SAC AS AN EVENT

### Redefining a Functional Term

There is no one definition of the cul-de-sac.

As an urban morphology, it does refer to an interrupted street, where the only way out, is the way back. This definition though lies in its functional aspect, considering it solely as a string of the urban network, which marks the point where the connecting function ends. In those terms follows the terminative tone attached to it and associations with life instances of predicament and adversity. However, when one starts thinking of the cul-de-sac as a spatial occurrence, which in different circumstances is manifested in the most diverse ways, that is when the aforementioned definition of the term, becomes scarce.

The functional definition of the cul-de-sac refers to a static condition, and by that, overlooks the movement through the street in accordance to which the perception of the space can change. It is precisely the possibility of change in the perception, whether it occurs at all, or it states static, and to what degree a transformation happens, that defines a cul-de-sac more profoundly than its role in the urban network of the streets. This functional account, which is taken for granted, and almost never questioned, encompasses an array of very different spatial occurrences and shadows their more meaningful qualities.

There is a tendency to address the cul-de-sac specifically for one of its configurations, and acknowledge it as the only type there is. This mostly happens in literature on residential neighborhoods which either address the cul-de-sac in a positive tone, highlighting the lack of traffic and the security for children that it brings, or in books about new urbanism which condemn its lack of connectivity placing it in the lowest rank of the "street hierarchy", as a condition which would ruin the connectivity of a fluid vibrant neighborhood.¹ On other occasions, the cul-de-sacs are often labeled as the filthy spots of the urban fabric, when referring to the back alleys of big cities. In each case however, the condition of an interruption is seen in a closed context, detached from other realities of cul-de-sacs, and more often highlighting the most obvious parameters. This essay looks at the notion of the cul-de-sac as one that covers a wide spectrum of occurrences, by dismissing

A cave as a naturally enclosed habitat the functional state of the street in relation to the rest of the city as its defining characteristic, and instead, analyzing the street itself through an empirical approach. Perceiving how the nature of the interruption affects the experience of the street from the moment one notices it, and proceeding to how the impression changes once one engages with the space. The analysis will reveal the parameters which shape this event, and thus give the cul-de-sac its character. Additionally, by analyzing the different manifestations of a cul-de-sac in the same paper, the possibility arises to highlight the recurring parameters and their transformation through the cases.

Acknowledging the closure which the cul-de-sac creates, as an inevitable consequence of an interruption, the first chapter addresses this characteristic as a state that humans are predisposed to look for in their environment. Ergo, it analyzes the cave, which as one of the earliest natural inhabitations of humans, is an indicator of humans' genetical inclination to feel at ease in enclosed spaces. Tackling the notion of security, this chapter looks into the types of cul-de-sacs which were designed because of its inherent protective shape. The closure as a key parameter of the cul-de-sac, is analyzed in all the subsequent types, how it appears and in which forms it occurs, but also moments when it disappears, and what that implies for the character of the space.

#### The Cave

The cave, as a naturally occurring enclosure, is known to be one of the main human dwellings of the prehistoric times, and still continues to serve that purpose in different places around the world. The simple reason why these natural spaces were ideal for inhabitation lies in their protective character. The enclosure from all sides offered security as there is only one way in and out, making it possible to have control over the surrounding, and reduce the possibility of unforeseen danger. Nevertheless, what made these enclosures favorable was also heavily dependent on the unique configuration of caves, which adds to the feeling of protection and ease. Such are the undulating surfaces of the walls, the roof and even the floor, creating smaller niches which are discovered through movement. A possible debris of rocks or random vegetation, would also close off the open access of the front. The unique manifestation of each of these parameters, made caves ideal spaces for appropriation.



Throughout history, humans have strived in creating closures, not only for personal dwellings, but also in public contexts. even when the chance of actual danger was close to null. This tendency can be seen as an inherent disposition, dating from the prehistoric times. In the urban level, a common manifestation of a closure is the cul-de-sac, which has been present as an urban morphology at least from the time of Ancient Egypt. Alberti makes note in Ten Books on Architecture, of the existence of cul-de-sacs. from the ancient times, as streets where the enemy would be trapped.<sup>2</sup> Additionally, from the 20th century on, in some European countries they started becoming an answer for suburban neighborhoods as an artificial tool that guaranteed security. It was considered a model where the interruption of a street would decrease the traffic substantially, avoiding random drive-throughs completely, and thus providing a safe space for kids to play.3 In the book Ladders. Albert Pope identifies the developments in the 20th century, which include the urban planning of suburban cul-de-sacs, as attempts to truncate the universal spatial field established by the 19th century industrial grid city. He addresses it as "the phobia of space inherent in these reforms that laid the groundwork for the modern "implosion" of urban form in the 20th century and the postwar emergence of closed urban development "4

#### The Closed Tunnel

A recurring configuration of the suburban cul-de-sacs in the European and American context, is that of very structured design. The housing units have repetitive parameters, creating continuous and monotonous edges, with usually a significant distance from the actual street, reducing (or making impossible) a chance for interaction with a passerby. The streets have functional dimensions with a 2-lane width for cars including pavements on the side. So far it resembles a typical modern suburban street, with a very functional setting. The ending itself is boringly the continuation of the same design. The only change that occurs is the broadening of the street working as a roundabout. The strict delineation is often emphasized by a green patch in the middle, defining further the order of events and the movement of the actors involved. Due to the functional character, the street is wide enough to exclude the feeling of a bodily closure, and thus the widening of the ending only furthers the lack of closure. These parameters create a

along the way, except perhaps that of disappointment when reaching the end, as the interruption is not acknowledged in any way. It seems that the stoppage is "resolved" through a thoroughly functional design, but when seen as an experience, one almost feels as if the interruption, this inherent change in state, isn't done just. When thinking about this perhaps subjective feeling, the question arises, as to whether an interruption should be solved at all? Or instead, there should be some apparent manifestation of it that embodies this change?

The super-designed suburban cul-de-sac as an evolved model of the secure habitat has the character of a purely functional closure, devoid of any other qualities.

#### The Back Alley

The almost opposite case of a cul-de-sac are the back alleys of urban blocks, as the most saturated version of a dead-end. Unlike the super-designed streets, they are the places where the tension of an interruption is manifested in an array of elements and potential events. In urban blocks of western cities, the streets unto which the back of the buildings face, are a common contingency. They bare the necessities of buildings which no-one wants to see, such as garbage containers, supply vans, fire exits and huge ventilation outlets.

A contradicting event of these spaces is that their residual character, and lack of maintenance, makes them available for appropriation by social groups who don't find security anywhere else. By becoming a shelter for the homeless, the enclosure returns to some extent its original protective function. The summation of these elements and events makes interrupted back alleys seem as the accumulation of the chaos, that otherwise cannot be surmounted by the city. It's the unwanted consequence of urban design, the counterpart of precision and planning. Elizabeth Grosz explains how human inhabitations are frames, cut out of the chaotic nature, "the laying down of a grid or order that entraps chaotic shards, chaotic states to arrest or slow them into a space and a time". In that logic, perhaps these cul-de-sacs can be seen as the outlet of the entrapped chaos, that humans try to keep under control.

This chaotic character is also spatially recognizable, accounting for a very intense experience. The layered state is noticeable without even entering the street.

When being inside however, the bodily containment is intensified due to the dense closure in width. The height of the buildings is another important parameter that can accordingly magnify the experience of the closure even further.

2. excerpts from the movie *Dead*End by William Wyler - 1937

#### The Verge

Rivers and mountains draw borders for human inhabitations as they present an anomaly of the agreeable flat terrain which is comfortable for inhabitation. The urban fabric needs to consequently adapt to this anomaly, and a common answer when meeting such a border, is the sudden interruption of the streets, leading to a sequence of cul-de-sacs. These borders create a striking contrast especially to the urban grid, being a very ordered and repetitive system. The river as a boundary bares an intrinsic contradiction, since it physically confines but at the same time provides a vast openness, which is the opposite of what grid cities offer. Except for this phenomenon, the configuration of these dead-ends is further determined by their context.

To be more accurate in the analysis, the case of river culde-sacs in Manhattan, as one of the most prominent urban grids, will be addressed. More precisely, on its east side streets around Sutton Place, there is an array of cul-de-sacs facing the river, aligned with upper scale apartment buildings. The streets lay 10 meters higher than the shore of the river and are divided with it by a highway on the level of the shore, which remains invisible while walking through the street. When reaching the ending, there is a definitive interruption of movement, highlighted by the detachment in elevation. Nonetheless, the termination dissolves through the wide and deep openness, with views reaching the shore on the other side of the river.

It is crucial to acknowledge the importance of the social aspect in defining the character of a space. The concerning culde-sacs are currently residential areas of rich New Yorkers, and this fact has shaped many of the spatial characteristics which make them very different from other dead-ends of the city. It is interesting to know that these actual streets had also a completely different character in the 1900s, before the rich had started yearning for a residence by the picturesque shoreline. Its reconfiguration over the years is solidified in the movie Dead End by William Wyler, filmed on East 53rd Street, which shows a period before, or at the genesis of the area's gentrification. In the movie,









the character of the cul-de-sac and its relationship with the river are depicted quite vividly. The openness of the river was contrasted more intensely by the chaos of the street at that time, full of small local shops, lack of cleanliness, hybrid buildings, with fire escapes layering the facades and hanged laundry creating a net over the street. Furthermore, a crucial effect on the nature of the closure had the immediate closeness to the shore, as the dividing highway wasn't built at the time. The river itself provides an additional form of transcendence made apparent by the kids of the neighborhood who occasionally jump for a swim. As the movie depicts the dead-end street as a space of decadence, which all the residents try to escape in one way or another, the kids as the immature residents, challenge the confinements of the street through play.

The current and historical state of the riverside Manhattan cul-de-sacs, makes apparent a certain fluidity in the closure, and not only in the unmistakable material aspect, but conceptual as well. When looking out at the view, the closure disappears completely; when wanting to escape the space, vthe river turns into a very strong confinement, while the intermediary option emerges when one challenges the boundary by moving in it.

#### The Maze

The movie presents insights into a space which can be discovered only through a longer observation of the residents' behaviour. This points at the social layers of spaces that enrichen its character, nonetheless remain unknown when analyzing the space through a passerby's perspective. In order to bring forward an analysis of a space, not limited to the eyes of a passerby, I will now address a personal case. For analyzing the deeper implications of the social aspect, I chose to analyze the cul-de-sac of my childhood, as an example for which I have first-handed knowledge of its social dynamics, and their consequential spatial manifestations.

Mara Mezhdurecka, can be categorized as a typical heterogenous suburban street of Skopje. An atypical trait, which adds to the visual closure, as it becomes apparent a few steps past the start of the street, is the hill behind the cul-de-sac, whose verticality is emphasized further by a residential tower on it. Once you start walking through the street, an array of traits, quite opposing the characteristics of the "closed tunnel" discussed above, reveal themselves. The width of the street is only wide enough to barely

allow opposite cars to pass through, which creates a contrast with the widened area of the street ending. The sudden disappearance of the pavements (contrasting to the "closed tunnel"), is another way in which the interruptions is manifested. The extended space in the end refuses the defined division of functions, allowing for unplanned events to happen on the street area, which in that configuration works both as a street and a pavement. This led to us, the kids of the street, to use the space as a common playground. It consequently thinned the borders between our gardens and the street zone, as at moments both of these areas served the same function, and worked as a continuous space to play. In that sense, the cul-de-sac achieves a unity, having a stronger character as a space which works together with its edges.

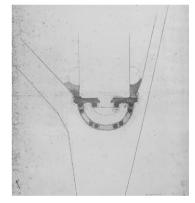
An interesting parameter which isn't inscribed on the space, but was crucial to my perception of it, were the routes breaking through the cul-de-sac, to come to the hill behind the ending, or the open field behind the western row of houses. These routes took place through the gardens of the kids who had the most favorable access to the back spaces. In our experience of the space, they represented moments of transgression, events that happened from time to time outside our personal playground, and away from the possible surveillance of our parents.

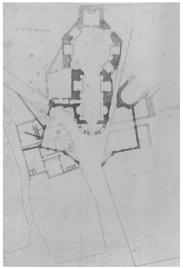
#### The Urban Room

The escape routes of the previous example present a case of breaching the enclosure of the cul-de-sac in a suburban setting, which isn't achieved through an actual spatial intervention, but rather through the internal affairs of the residents. Nonetheless, it portrays the unavoidable necessity of people to at least have the option to move through a closure, and their tendency to create the way to do so, when possible. The internal affairs solution wouldn't work in an urban setting as it would involve most probably a much higher number of passersby, exceeding that of the actual residents. Therefore, the urban parallel would have to contain actual spatial passages breaking the enclosed cul-de-sac. This configuration would combine the closure that is inherent to the dead-end, with a passage which presents no obstacle for moving through, a passage that solidifies the transgression of the limit in a culde-sac. Such a setting can be paralleled to the idea of an urban room, for which Camillo Sitte advocates strongly in his book, Der Städtebau nach seinen künstlerischen Grundsätzen.7 A city

- 4. Mara Mezdurecka Street Skopje
- 5. design for the porch of S.Maria della Pace, Rome, 1656
- 6. design for Piazza S.Maria della Pace, Rome, 1656







7. Justus van Effencomplex Rotterdam

famous for an urban fabric with recurrent urban rooms is Rome that, as Norberg-Schulz puts it, is made out of spaces that "have an 'interiority' which give us a strong sense of protection and belonging".8 An important parameter in the creation of these urban closures in Rome, are the baroque facades (play between concave and convex) whose shapes delineate unconventional perimeters, while their complexities, intensify and give the sense of interior space. An example of an urban room, which bares the impression of a cul-de-sac, is the square in front of Santa Maria della Pace. where the impression of an enclosed plaza is given through the unified scheme of the adjacent facades looking as a continuation of the church facade.9 This unification of the architectural wall of the piazza achieves to conceal the passages on both sides of the church, by making them appear as openings of the facade. The ambiguity of the facade both creates and releases a tension. by firstly creating an illusion of an interrupted space, and then revealing the possibility to break through the facade, to transgress the border of the space.

Another case of an urban room with obscure passages, this time of a residential block, in a completely different setting however, is to be found in the Justus van Effencomplex in Rotterdam, designed by Michiel Brinkman. The courtyards within the block invoke the feeling of an enclosed and secure space being walled on three sides, but at the same time have the elevated streets in the first-floor piercing through the front wall. Through this configuration in a residential setting, the architect plays with the limits between the public and private sphere. A passerby can enjoy the closure of the courtyard, and at the same time be intrigued by the elevated passages to which he has no access to. While a resident, gains a level of privacy and security in a quite open public space.



#### Conclusion

This paper attempts to bring forward an analysis beyond the limitations posed by the functional conception of a cul-de-sac. More precisely, through a selection of very different cases of cul-de-sacs, the research makes apparent how detrimental the role of their functional aspect is in defining the configuration and character of their space. That instead, it is by thinking of a change of event, and not a change in function that one can more accurately comprehend the nature of a dead-end.

The last chapter presents cases which are not per se cul-de-sacs, since they don't represent an interrupted street, but rather the impression of one. Nonetheless, when perceiving the cul-de-sac as an event, the moments of passing beyond the enclosed space, of transgressing, become just a part in the sequence of events, which is preceded by a strong impression of a closure. This interpretation portrays transgression as a requisite of a limit, being always present even if in a very idle form. Revisiting the previously analyzed cases, it becomes clear that in most of them the idea of transgression is present, the least as a desire.

Even though at a first impression, the notion of transgression, of passing through a limit, goes against the essence of a limitation, in actuality, the existence of the two is mutually dependent. Foucault expresses in his essay A Preface to Transgression how the coexistence of a limit and a transgression, intensifies their presence and strength:

But can the limit have a life of its own out-side of the act that gloriously passes through it and negates it? What becomes of it after this act and what might it have been before? For its part, does transgression not exhaust its nature when it crosses the limit, knowing no other life beyond this point in time? And this point, this curious intersection of beings that have no other life beyond this moment where they totally exchange their beings, is it not also everything which overflows from it on all sides? It serves as a glorification of the nature it excludes: the limit opens violently onto the limitless, finds itself suddenly carried away by the content it had rejected and fulfilled by this alien plenitude which invades it to the core of its being. <sup>11</sup>

In terms of a cul-de-sac, the closure produced as a contingency of the interruption, is what creates a tension, intensifies the experience, and naturally brings forth the question of surmounting the interruption. It is this play with the possibilities of events which has the potential to give the space a complexity and character, and is consequently determined by the configuration of the edges of the cul-de-sac, as made apparent through the analyzed types. The only addressed example where the transgression is not in question is that of the western suburban streets, which I associate with a closed tunnel. In these functionally designed streets, the interruption is handled by negating it, as its design resembles very closely that of a continuous street, allowing it to work within

any spontaneous events. All the following cases however, deal with the idea of a transgression, the idea of moving beyond the limit of the interruption. And if there is no chance of passing through, then the interruption is manifested in the street itself, like it is the case in the back alley, where the inability to transgress backlashes through a potpourri of elements creating a chaotic and intense space.

The case of the cul-de-sacs by the river, analyzed through the movie by Wyler, depicts a play with the border, tackling the possibility of transgressing it, through the grown-up characters who want to escape from the confines of the dead-end, and the children who swim in the waters of the river, questioning the rigidity of the interruption. Moreover, the cul-de-sac of my childhood presents a step further into the transgression of the interruption, as its limits are actually surpassed, in a quest for playgrounds that lie beyond the edges of the street end. Lastly, the case of the urban rooms brings forth the highest step of surmounting the interruption, by actually formalizing the transgression in permanent passages. This enrooting of the breach perhaps decreases the intensity of the interruption quite rapidly, nonetheless, doesn't erase the inherent dynamic of the relationship between a limit and a transgression.

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In A Preface to Transgression M.Foucault explains the interdependence of a limit and a transgression, by pointing out that "a limit could not exist if it were absolutely uncrossable and, reciprocally, transgression would be pointless if it merely crossed a limit composed of illusions and shadows."

#### 11.

Michel Foucault and Donald F. Bouchard, "A Preface to Transgression," in Language, Counter-Memory, Practice Selected Essays and Interviews (Ithaca, NY: Cornell Univ. Pr., 1977), 34.

#### **Figures**

#### 1.

a. https://placesjournal.org/ article/the-end-of-brooklyn/?cn-reloaded=1

- b.https://yandex.com/maps
- c.https://www.google.com/ maps
- d.lbid
- e.lbid

#### 2.

https://www.saobserver. net/community/history-mystery-mammoth-sized-cavediscovered-at-shuswap-lake/

#### 3

Dead End, directed by William Wyler (United Artists Corp., 1937). https://www.youtube.com/ watch?v=jEOdGsL5PyE

#### 4.

https://www.google.com/ maps

#### 5.

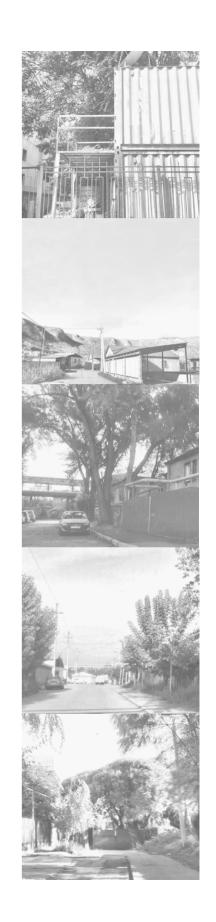
Pietro di Cortona, design for the porch of S.Maria della Pace, 1656, Rome, Biblioteca Apostolica Vaticana in Jörg Martin. Merz and Pietro, Pietro Da Cortona and Roman Baroque Architecture (New Haven Conn.: Yale University Press, 2008), 166.

#### 6.

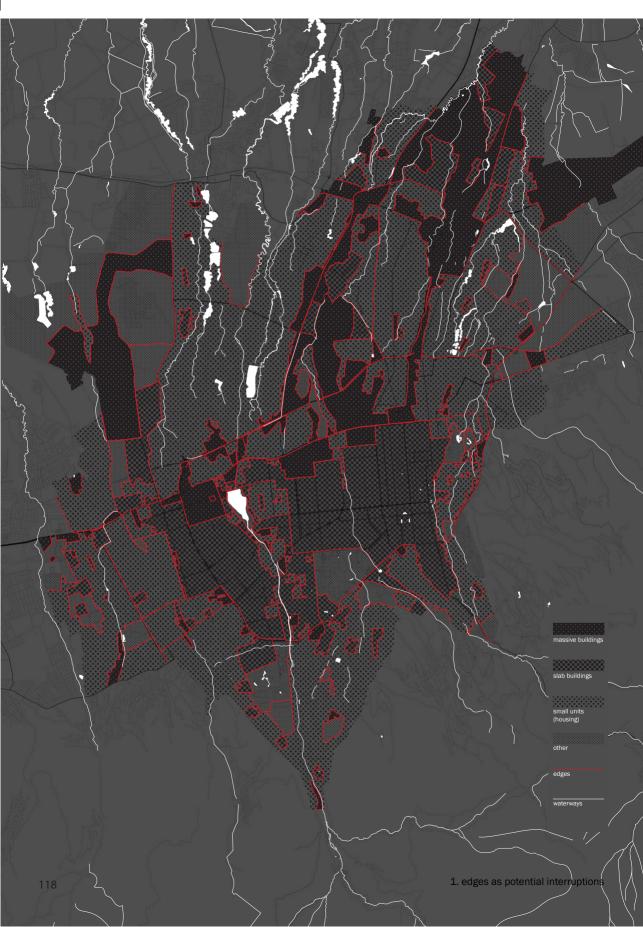
Studio of Pietro di Cortona, design for Piazza S.Maria della Pace, 1656, Rome, Biblioteca Apostolica Vaticana in Jörg Martin. Merz and Pietro, Pietro Da Cortona and Roman Baroque Architecture, 169.

#### 7.

https://www.dearchitect.nl/architectuur/ nieuws/2012/09/renovatie-justus-van-effencomplex-afgerond-101138751?



THE CUL-DE-SAC AS AN EVENT IN ALMATY



#### FRAGMENTED CITY

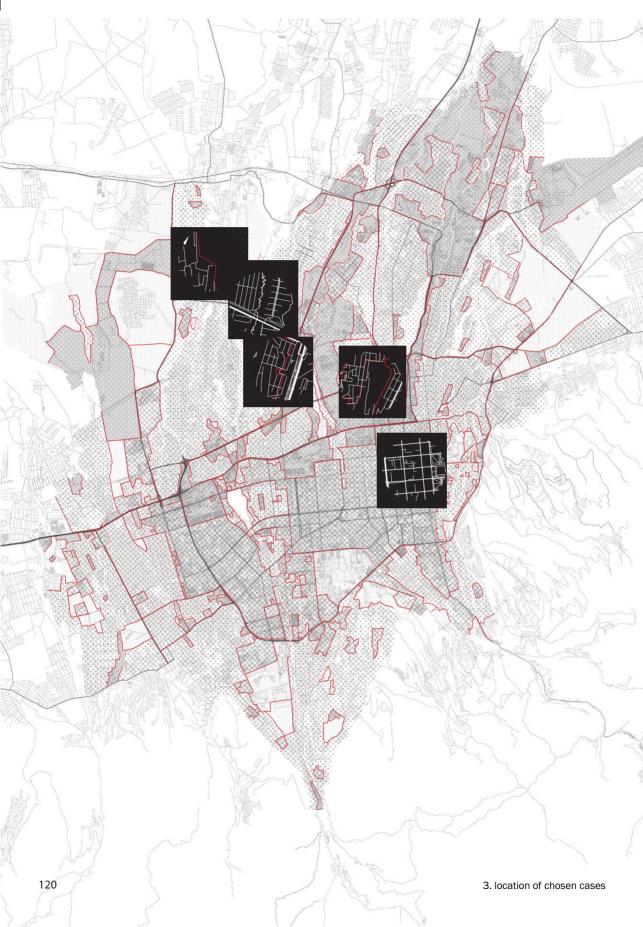
Almaty, as the former capital of Kazakhstan, except for the change in its position as the center of the country, has undergone an array of perpetual changes over its history, with almost each one, fluctuating the intensity and direction of its development, which can be vividly read in its urban fabric (figure 1). After the laying of the grid system by the Russians, during the first half of the 20th century, that mainly consists of slab buildings, taking a central position in the city, the later developments, that predominantly spread on the northern flat side, show a clear inconsistency resulting in a patchwork. The post-grid area, doesn't have a discernible unifying logic. It consists of developments of industrial zones along highways, a few separate industries stemming from the soviet 'kombinati" (the conglomerates) and a few microdisctrics of residential buildings, a few of which were built during Almaty's biggest urban sprawl of the Soviet period, known as the Kunaev Boom (1964-1986). 1 The remaining fabric is a sea of housing, filling every gap between the other tissues and leading to a high number of emerging edges fragmentation in the city occurs due to its position on the foothill of a high mountain range, resulting in an array of rivers and creeks running through the territory. Putting together these edges portrays the potential for the emergence of interruptions, and consequently the emergence of cul-de-sacs as well.

The last contributor to the fragmented nature of the city, as an aftermath of the Soviet Union, are the omnipresent high fences. The deprivation of private ownership during the Soviet times, is still being manifested as an excessive need to mark one's territory, creating an excessive amount of interruptions within the tissues as well. According to journalist Maxim Trudolyubov, the fences remain monuments to the incompletely fulfilled dream of privacy"<sup>2</sup>.

#### **APPROACH**

For a closer analysis, I have chosen several cases of cul-de-sacs, resulting from different edge conditions in the city. For each one, the most prominent friction between the conditions is chosen as a focus for the manifestation of the interruption (figure 4).





#### 1. BACK SIDE

> conditions ::

gov.b: public b.: residential b

> frictions:

accessibility, exlusiveness, use

accessibility

#### 2. VERGE

> conditions ::

river valley: housing

elevation, sturdiness, urbanization

> focus::

sturdiness

### 3. CANYON

plateau: housing

elevation, closure, materiality

closure

#### 4. BACKSTAGE

heating plant : city grid

scale, use

use

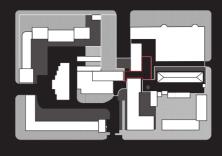
#### 5. GRID

market: housing

scale, use

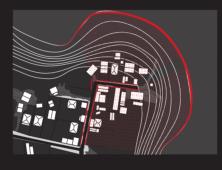
> focus::

scale

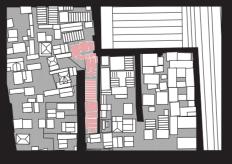


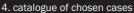














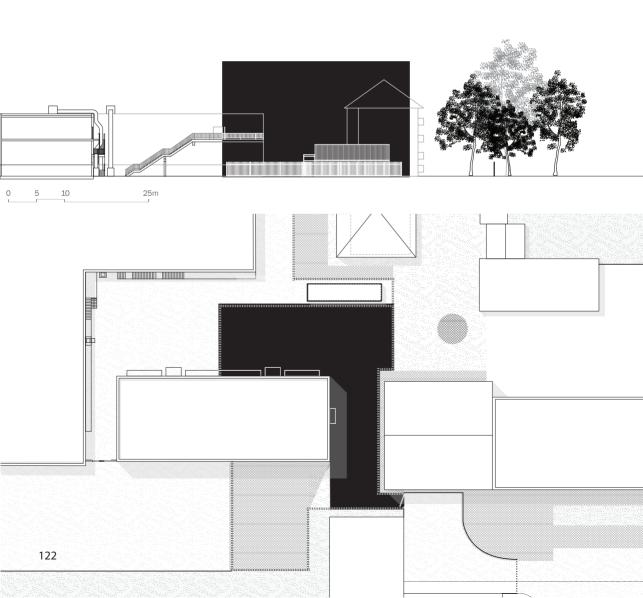




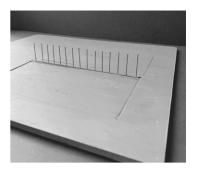


The backside arises due to the close proximity of buildings with differing accessibility levels, and results in a space loosely hanging on to a public street, surrounded by privatized zones, and their imposed fences. Thus, the manifestation of this interruption lies on the effect of the fences on this sur-

rounded zone, almost annexed from the public realm. The mapping of the interruption references one of the exercises from the Modus Operandi Workshop, that takes the fence as an element of inquiry (figure 6). Through the making of a three dimensional model, I analyzed the agency the



fence has on the area around it, and how the strength of its obstruction changes according to one's position in the field. The more one approaches the fences, the higher the feeling of obstruction, and the unattainability of the elements on the other side, visible through the pickets.

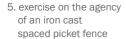




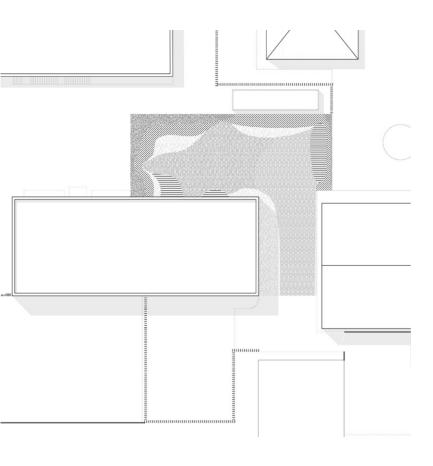








6. the field of agency created by the fences



lingering

movement

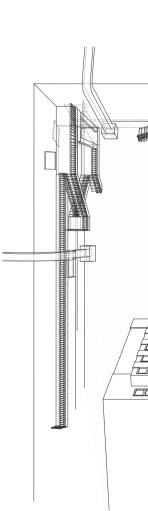
interruption - light

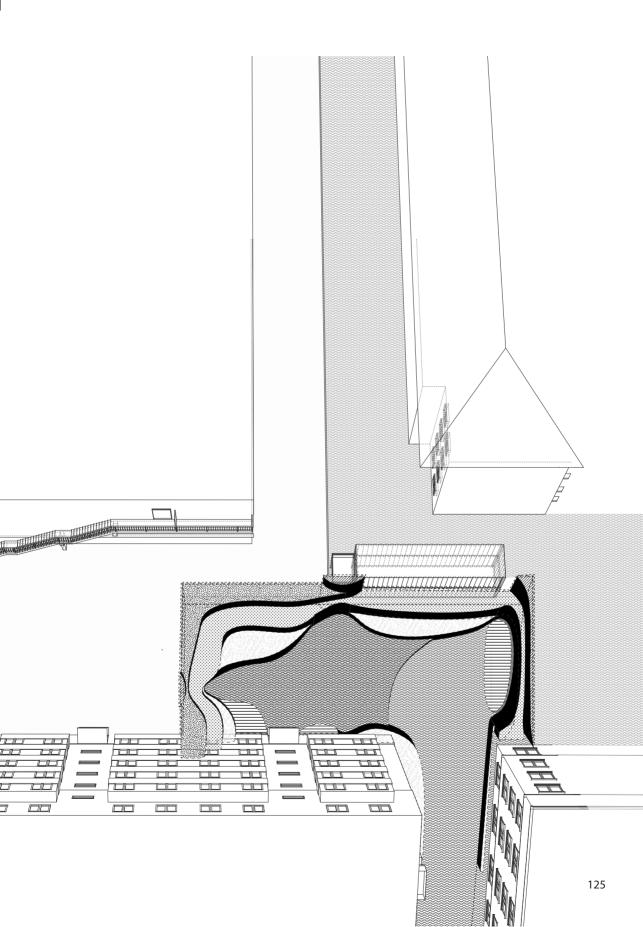
interruption - severe

interruption - strong

interruption - medium

In line with the observations from the exercise, the agency that the fences have on the surrounded backside are mapped as a dynamic field of tension. The field is shaped in accordance with one's proximity to the fence, and changed depending on the elements behind it. I lastly visualize the field three dimensionally, elevating the area, the higher the obstruction becomes, and descending it in areas that invite one to linger.

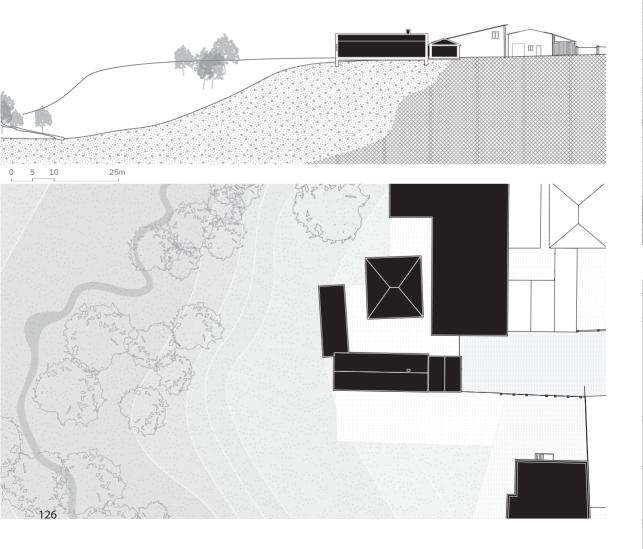


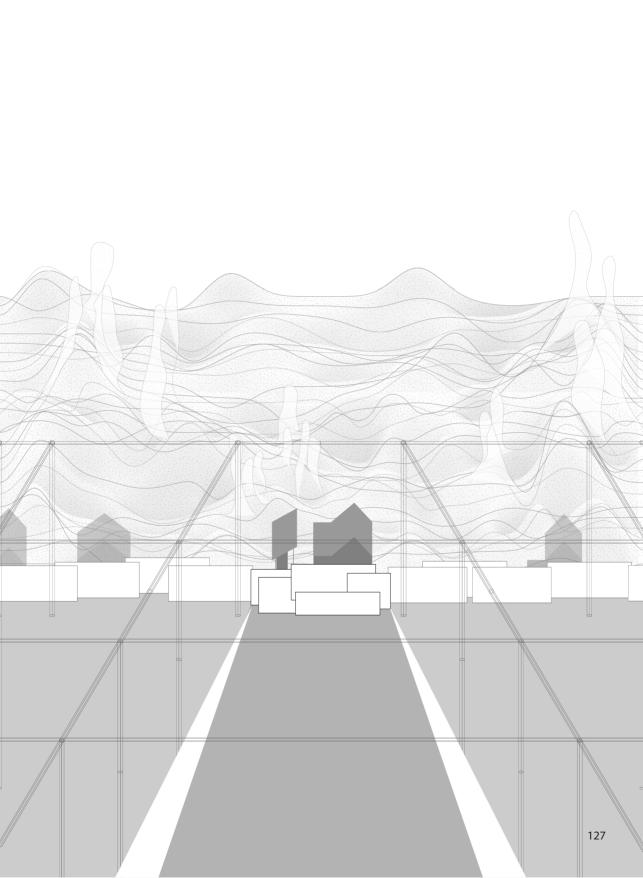


#### THE VERGE



In the case of the verge, the friction that I concentrate on is the change in the sturdiness of materiality, from the street to the river valley. The houses are the elements that manifest this difference through their relation to both spaces. On the side of the inhabited ground, a recurring theme are the solid metal fences that force a very linear movement, but at the same time, very quickly lose their rigidity as they become part of the background of the perceived space. On the other hand, in the valley, the earth is constantly changing and unstable, as represented through the undulating ground as shown in the drawing to the right. One has to carve one's way through it, and in that sense, always be aware of the ground. The house manifests the relation between the two conditions as with the street it has a very strict separation, while towards the field there are no fences, but an open, undefined

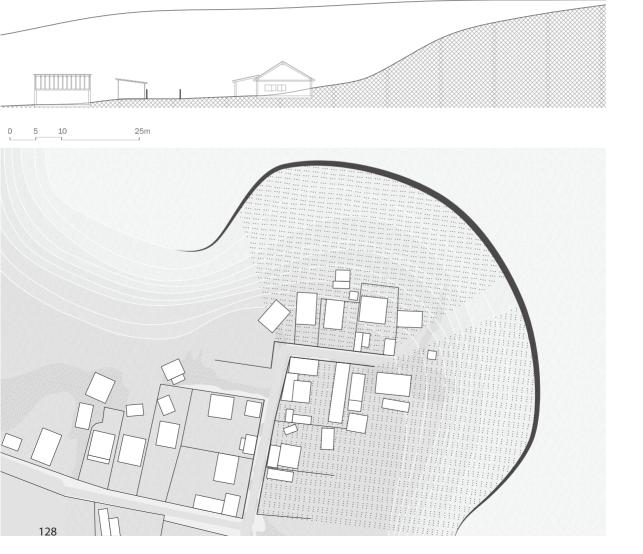


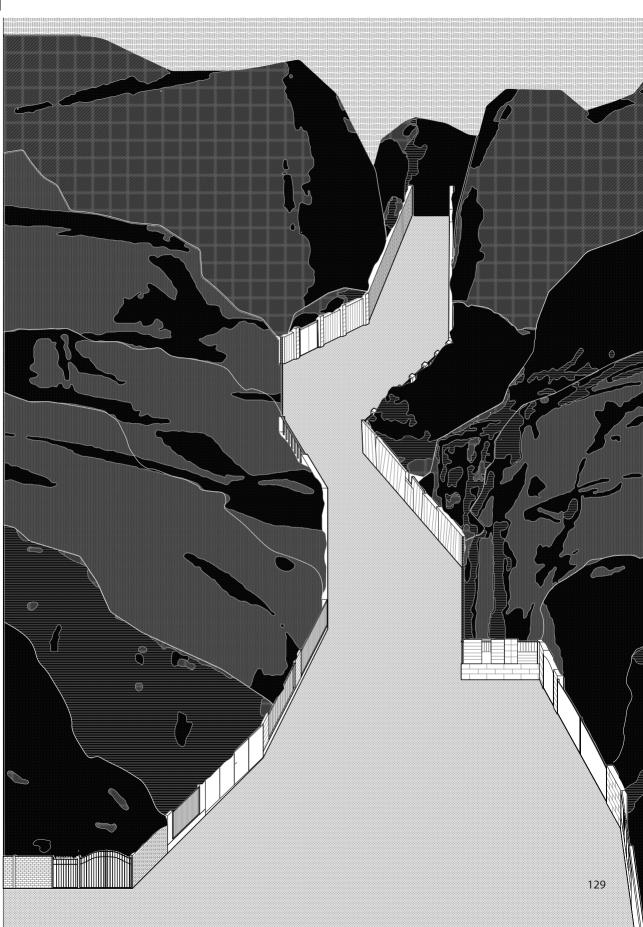


#### THE CANYON



The last case, between the plateau and the lower housing street, the most striking manifestation of the interruption was discerned in the closure created through the presence of both the fences and the surrounding hill. While the mountains create a sense of closure, the fences define the direction of movement, hence together acting as a canyon. This wouldn't be the case if they were acting on their own, as demonstrated in the previous case. The closure is created not between the fence and the route, but between the fence and the mountain. Here, the houses are the ephemeral parts, as they don't play a role in the perception of the space, and are therefore left out of the drawing.







## A RADICAL RETHINKING OF THE INDUSTRIAL LANDSCAPE THROUGH NEW MATERIALISM

THE CASE OF ALMATY
Giannis Nikiforou

#### INTRODUCTION

New Materialism is a cultural theory that emerged at the end of the 20th century, after postmodernism, and has been adopted in the 21st century. It cuts across many disciplines and has already influenced contemporary artists, philosophers, cultural theorists, and scientists. The leading scholars who have written about this theoretical framework are Rosi Braidotti, Manuel DeLanda, Karen Barad, and Quentin Meillassoux. New Materialism moves away from the anthropocentric approach of Modernism and starts from the idea that human and nature are a single entity. Humans are seen as one of the many species that live on earth, therefore the focus of inquiry has shifted from humans to objects. Since nature is in man, what man creates can also be seen as nature or the natural evolution of our planet. The built environment can be described as mutations of nature. These mutations change the ecology and geography of a place and leave their mark on the landscape. In the case of Almaty, industry plays a major role in the country's economy. Many different factories have sprung up, producing a variety of products for the country itself and for export to Russia, China, and the rest of Asia and Europe. Almaty's strategic role within the

New Silk Road economic belt increases the importance of the city's industrial character and raises questions about the relationship between industrial production and ecological thinking. This thesis examines the mutations that have happened to the landscape. and thus the new conditions under which architecture must operate. The final chapter of the thesis considers the implications of these mutations for architecture and how architects should deal with these spatial conditions in light of theory.

## CHAPTER 1: NEW MATERIALISM

Global warming and climate change are two terms humans use to describe the effects of their actions on the earth. This change is something ongoing, something that accelerates and often surprises humanity, which seems helpless in the face of this phenomenon. This event makes us aware of how fragile the world we live in is and how non-human forces can take control and change our living environment. According to William E. Connolly, the cosmos is made up of multiple. interacting systems with varying degrees of self-organising capabilities. The intersection between these systems and capitalism has created the conditions for climate change, which creates feelings of

uncertainty and fragility. To understand how these self-organised systems function, it is crucial to shift our focus from anthropocentric theories to non-human theories such as New Materialism.

New Materialism arises from the idea of monism. Monism argues that there is no difference between mind and matter, meaning and matter, or culture and nature, and this theory can be applied in many different branches of thinking.2 In architectural thinking, it can be argued that the meaning of a building lies in its matter or materiality. Karen Barad defines matter as 'a dynamic expression or articulation of the world in its intra-active becoming' that feels, converses, suffers, desires, yearns, and remembers. She also states that matter are interactive entanglements with morphogenetic capacities.3 The term entanglement can be defined as the state of being twisted and infolded within a mass, therefore matter can be described as a mass that has multiple states within it. These states interact with each other and lead to the formation of organic forms. It is impossible for these states to escape from the mass. These states also have human characteristics such as memory, feelings, and desires.

Gilbert Simondon states that 'matter can take a form and in this form-matter relationship lies the ontogenesis'.4 The property of matter to take on a form seems crucial to its understanding. Matter comes into being after being given a particular form, and its development, its anatomy, and the way it behaves depends on the relationship between its form and the substance of which it is made. This understanding of matter leads to an appreciation of the objects that surround us and a definition of matter as a living organism.

What is also interesting about the New Materialist way of thinking is the way the theory defines objects and objective entities. Manuel DeLanda defines objective entities as 'products of a historical process, that is, their identity is synthesised or produced as part of cosmological, geological, biological, or social history'.5 This definition introduces the concept of temporality as a tool for understanding objects. The object becomes an overlay of different layers that all together create its identity. These external factors are strongly linked to the location of the object and the various events that have taken place at that location. These events are both human and non-human and their result has produced the

objective entity. The word entity highlights the unique character of the object and its ability to function or exist as something unique and independent. Another way to define the object is to think of it as a technical device. According to Karen Barad, the ontology of the object changes depending on how we measure it.6 Consequently, the nature of the object is defined by the apparatus we use to measure it. This means that an object does not have a singular nature, but several. Each nature is revealed by a specific technological device or machine. Technology seems to have the ability to determine the nature of the objects that surround us, and since the nature of an object and its meaning is something inseparable, according to New Materialism, this leads to the conclusion that meaning is given by technology. Without a technological device, an object would have no meaning. This also leads to the fact that without the measurements. the object would also have no meaning and no nature. Therefore, the object can be defined as a collection of numbers and letters arranged in a certain order.

# CHAPTER 2: LANDSCAPE MUTATIONS

Within a time frame of hundreds of years, the landscape

has mutated into various forms of landscapes that humans have not encountered before. Such landscapes are defined as urban, industrial, or toxic to many of the planet's living organisms and to the planet itself. Humans, along with all other species, not only should operate in such contexts, but also plan for the future development of certain landscapes. This chapter focuses on the industrial landscapes of Almaty and, more specifically, on five different understandings of such landscapes that arise from their spatial characteristics, conditions, and from New Materialism as a theoretical framework. These five understandings outline five landscape mutations and raise questions about the role of architecture and the ways in which it can intervene.

### LANDSCAPE AS A THREE-DIMENSIONAL TRAJECTORY

The first mutation of the landscape into a three-dimensional trajectory arises from considering the spatial properties of industrial landscapes and, more specifically, the infrastructure that enables certain operations. Such infrastructural elements usually take the form of pipes that follow different directions and connect several components. Within these pipes, various fluids, gases or

solids are transported and help the object to function. The trajectories that these pipes follow can be described as the arteries of the object, as their role is crucial to its overall function. This notion of the movement of various substances is not only what keeps the object alive, but also what defines it. Matter, whether in the form of a fluid, a gas or a solid, moves along a predefined path and under the action of a certain force. Furthermore, certain trajectories connect the underground with the surfaces above ground, blurring the boundaries between these two realities.

# LANDSCAPE AS AN ANTHROPO-FREE OBJECT

One of the most interesting mutations that has happened to the landscape is its transition to a landscape that lacks human existence. Industrial landscapes often consist of a series of self-sufficient machines that can function without the need for human interaction. Going back to the definition of the object as a set of measurements and assuming that these measurements can be made automatically by a technological apparatus, the Anthropos sometimes has zero input during this process. What defines the measurements. and thus the landscape that is the object of study, is automation and the machine's ability to record, process and produce data. Furthermore, certain spatial features of industrial landscapes reflect their Anthropo-free character. The dimensions or temperature of some spaces are two examples that often reflect the absence of humans within these buildings.

# LANDSCAPE AS TOXIC MOLECULAR NETWORKS

Another way to examine the nature of landscape mutations is to zoom in on the molecular scale of matter. In order for a landscape to transform into an industrial landscape, different types of building materials must come together to form structures that are made of matter. Matter is the end product of multiple chemical reactions, therefore matter or materiality is the physical manifestation of specific arrangements between molecules. The substances of matter in combination with external conditions often lead to new collisions between molecules and create new toxic substances. The change in location of certain substances and their transport into a specific landscape is what creates this toxic metamorphosis. The interaction between different substances under certain conditions creates new networks between molecules and thus

new chemical substances that change the appearance and nature of the landscape. Landscape as an Autogenetic Entity

Nature has the capacity to recover, reproduce, and form independent existences without the need of human intervention. Nature's mutation into industry seems to preserve these capacities and express them in the form of the built environment. Assuming that the purpose of industry is to produce matter in any form. and that industrial landscapes are themselves made of matter, it can be argued that these landscapes are self-generated. Various building materials, machines and apparatus are the result of an industrial process and are the essential components of an industrial landscape.

# LANDSCAPE AS AN AUTOGENETIC ENTITY

Nature has the capacity to recover, reproduce, and form independent existences without the need of human intervention. Nature's mutation into industry seems to preserve these capacities and express them in the form of the built environment. Assuming that the purpose of industry is to produce matter in any form, and that industrial landscapes are themselves made of matter, it can be argued that these

landscapes are self-generated. Various building materials, machines and apparatus are the result of an industrial process and are the essential components of an industrial landscape. These landscapes are capable of reproducing themselves, spreading across territories while changing their appearance through numerous shapes and forms. Autogenesis lies in the idea that matter creates matter and all mutations are the result of the same event. Moreover, this idea implies that a certain entity comes into being by itself. without the action of external forces, but by an event that happens from within.

# LANDSCAPE AS A TECHNO-ECOLOGICAL ENTITY

The relationship between industrial landscapes and ecology is something fundamental. As mentioned earlier, these industrial landscapes are made up of machines, so technology is the starting point for the existence of such landscapes. Technology is defined as the application of scientific knowledge to practical purposes and ecology as 'the branch of biology that deals with the relationships of organisms to each other and to their physical environment'. The metamorphosis of landscape into industry is an expression of the application

of scientific knowledge about the nature and capabilities of materials. These materials are part of the ecosystem, therefore technology also investigates ecological aspects. This last mutation introduces the industrial landscape as a hybrid between technology and ecology, or a mixture between the need for practical solutions and the existence of the physical environment.

### CHAPTER 3: IMPLICATIONS FOR ARCHITECTURE

Architecture is a profession that has been greatly affected by these mutations of the landscape. The conditions in which architecture has to operate are in constant flux and architects must be aware of these phenomena before they act. For this to happen, it is essential to radicalize the way we think and make architecture, based on the theory we are given. This final chapter presents the consequences of the mutated landscape in architecture, emphasizing a way of thinking that involves accepting these kinds of landscapes and speculating on their significance for future architectural scenarios.

Accepting the fact that the landscape has transformed into a three-dimensional trajectory will help us to move forward and discuss what the

possible consequences of this event in architecture are. The infrastructure, which can be considered as an architectural component, is capable of extending for several kilometres in any direction over a territory. The result of this phenomenon is the rapid movement between certain substances along the three axes. Movement and connectivity are two concepts that define certain types of landscapes, so we should not consider architecture as something static, but as something that is moving. . The components of a building should be designed along trajectories and change their position according to the needs of the site or the user. On a vertical axis, architecture should be able to respond to both above ground and below ground conditions, as a polluted surface triggers the search for new locations, which they can be below ground. The ambition is not only to create mobile spaces that can respond to any depth, but also to benefit from these site conditions through a specific choice of materials or form design.

The realisation that we design buildings that contain machines should lead us to question what the nature of a building's occupants may be. Humans, machines, animals, and other living organisms

should be considered as possible inhabitants of architecture. Artificial landscapes should be able to become a refuge for any kind of organism living in coexistence with humans. If we think on a larger scale. we need to start speculating about ideas for architecture inhabited by forests that are in danger, by polluted water, or by icebergs. Architecture should be able to protect these places in the same way it protects humans. Giga - structures that span over miles of territory and enclose large surfaces of land should provide the right living conditions to help landscapes survive and recover. Architectural thinking and making should not have the Anthropos at its centre, but focus on larger phenomena that they have an immediate effect on every living organism.

The transformation of the landscape into toxic molecular networks is caused by the interactions between certain substances or materials. Architecture is a driving force of these networks, as it promotes the transport and accumulation of various materials on the ground, altering the soil and water conditions of a site. Architects should acknowledge this occurrence and seek to minimise the interaction between architecture and soil. Zero contact with the ground

would result in structures that can float in the air. An interim solution may be new forms of urban landscapes that stand on piers and leave the ground surface untouched. Another way to deal with existing toxic conditions is to start building architecture out of the toxic waste that already lies on the ground. These structures should also be able to absorb their own waste and prevent it from spreading across the territory. With this way of thinking, we are not only expressing our understanding of the existence of toxic waste, but also trying to make it part of our living environment rather than ignoring it.

As noted in the previous chapter, the industrial landscape also has the capacity to reproduce itself and thus to spread. This autogenesis fundamentally affects architecture in the way it is made and thought. Buildings should be able to produce themselves not only on a theoretical level, but also on an actual level. Buildings that have the ability to grow and shrink according to the needs of their site can be an example of the design of an autogenetic architecture. In this sense, the role of the architect is challenged as the design is carried out by a machine that reads and processes data from a given site. The machine is able to construct and

deconstruct buildings that are no longer forced by humans onto a specific territory, and architecture becomes a highly engineered flexible object that is in constant transformation.

The final landscape condition in which architecture should operate is the transformation of the landscape into a techno-ecological entity. Technology is constantly creating new possibilities in the way we design and think about buildings. so these two concepts are inextricably linked. Architecture should express this hybrid of technology and ecology in order to continue to function. A fundamental element that should express this hybrid is the materials we use to make architecture. An example is the production of a building material that is capable of releasing oxygen into the atmosphere. The oxygen should be produced both mechanically and naturally using trees and vegetation. This mixture of machinery and vegetation should also have a positive effect on the fauna and flora of a place. The machinery of the building should provide conditions similar to what nature has to offer. The industrial landscape can be seen as a collection of buildings with a technological input and a positive ecological output.

## CONCLUSION

In order to move forward and deal with landscape changes. we as architects need to truly acknowledge the situation as it is now and stop avoiding it. We should see the way the landscape has changed as a natural evolution of the built environment, because only then we will be able to take action and create architecture out of darkness. The way to do this is to re-evaluate why, for whom and how we build and think about buildings. Architecture should not be limited to the surface of the ground, but should explore new places and new possibilities at different heights and depths. This level of experimentation should also be expressed in the way architecture is put together. We should stop thinking of buildings as something fixed, but experiment with movable and flexible structures that can adapt to different locations and weather conditions. In addition, we should continue to use technology, but not just for the benefit of people. We should take a broader mind-set about who can benefit from architecture and start designing for more living organisms to coexist with. The last point we need to consider is what materials we use to make architecture. As architects we need to find ways to use waste, toxic substances and vegetation

during the design phase and acknowledge these materials as part of what the earth has to offer. Only through acceptance, recognition and action we can move towards a more honest, durable and healthy architecture.

# **FOOTNOTES**

- 1.William E. Connolly, The 'New Materialism' and the Fragility of Things, Millennium: Journal of International Studies 41 (3), 2013, pp. 399-412.
- 2. Rick Dolphijn and Iris van der Tuin, New Materialism: Interviews and Cartographies (Open Humanity Press, 2012), pg. 93.
- 3. Karen Barad, Meeting Utrecht Halfway (7th European Feminist Research Conference, 2009).
- 4.Gilbert Simondon, The Position of the Problem of Ontogenesis (Perrhesia 7, 2009), pp. 4-16.
- 5. Manuel DeLanda in New Materialism: Interviews and Cartographies (Open Humanity Press, 2012), pg. 39.
  6. Karen Barad, Meeting Utrecht Halfway (7th European Feminist Research Conference, 2009).
- 7. Cambridge Dictionary, https://dictionary.cambridge.org/dictionary/english/ecology and https://dictionary.cambridge.org/dictionary/english/technology (accessed January 09, 2021).

# SITE INTRODUCTION: ALMATY'S STRATEGIC LOCATION ALONG THE NEW SILK ROAD ECONOMIC BELT.



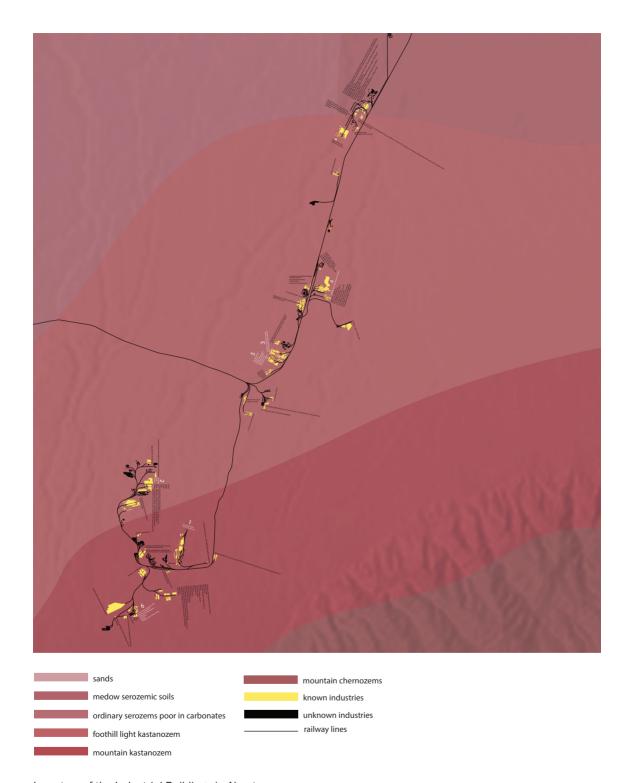
Global warming and climate change are two terms humans use to describe the effects of their actions on the earth. This change is something ongoing, something that accelerates and often surprises humanity, which seems helpless in the face of this phenomenon. This event makes us aware of how fragile the world we live in is and how non-human forces can take control and change our living environment.

# THEORETICAL FRAMEWORK

In order to understand how these non-human systems work, it is crucial to shift our focus from anthropocentric theories to non-human theories such as New Materialism. New Materialism is a cultural theory that emerged in the late 20th century, after postmodernism, and has become known during the 21st century. It cuts across many disciplines and has already influenced contemporary artists, philosophers, cultural theorists, and scientists. The leading scholars who have written about this theoretical framework are Rosi Braidotti, Manuel DeLanda, Karen Barad and Quentin Meillassoux. New Materialism arises from the idea of monism. Monism argues that there is no difference between mind and matter, meaning and matter, or culture and nature, and this theory can be applied in many different branches of thinking. Karen Barad defines matter as a set of interactive entanglements with a morphogenetic character and object as a technological apparatus or set of measurements. Manuel DeLanda defines object as a composition of historical, geological, social and biological events. Moreover, Gilbert Simondon argues that matter comes into existence after being given a particular form, and its evolution, anatomy, and the way it behaves depend on the relationship between its form and the substance of which it is made.

of the objects that surround us raise questions not only about the nature of the cities and landscapes in which we live, but also about the relationship between technology and ecology. Since nature is within humans, what humans create can also be seen as nature, or the natural evolution of our planet, and thus the built environment can be described as mutations of nature. These mutations change the ecology and geography of a place and leave their mark on the landscape. New Materialism gives new definitions to the object and matter and thus to the built environment. Industrial landscapes, which are part of the built environment and one of the main factors contributing to global warming, serve as tools to explore possible new relationships between a technological development and ecological thinking.

New Materialism and this specific understanding



Inventory of the Industrial Buildings in Almaty

## **TOPIC**

Looking at Industrial Buildings through the lens of New Materialism

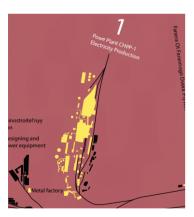
If according to New Materialism the shift is from the human to the object, in what ways can these industrial landscapes be described? How can we expand the understanding of the factories and what are the implications of these understandings in architecture?

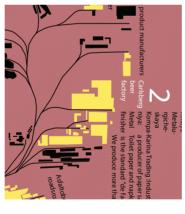
# METHOD DESCRIPTION

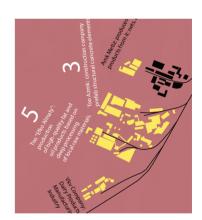
The theoretical framework of this research is inspired by the book New Materialism: Interview & Cartographies by Iris van der Tuin and Rick

Dolphijn. The research uses this book as a starting point and more specifically the definitions given to subject, object, matter and topology. By looking at the properties of matter, as defined by Karen Barad, the research focuses on its morphogenetic capacities and zooms into land-scapes where matter produce matter. Industrial landscapes is an example where this phenomenon occurs and hence becomes the object of research.

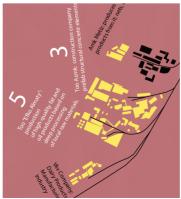
Six industrial landscapes are examined and mapped within the context of Almaty, Kazakhstan in order to reveal different relationships and characteristics. The six sites are shown below.

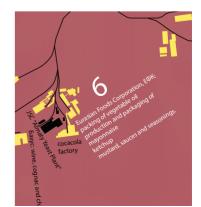


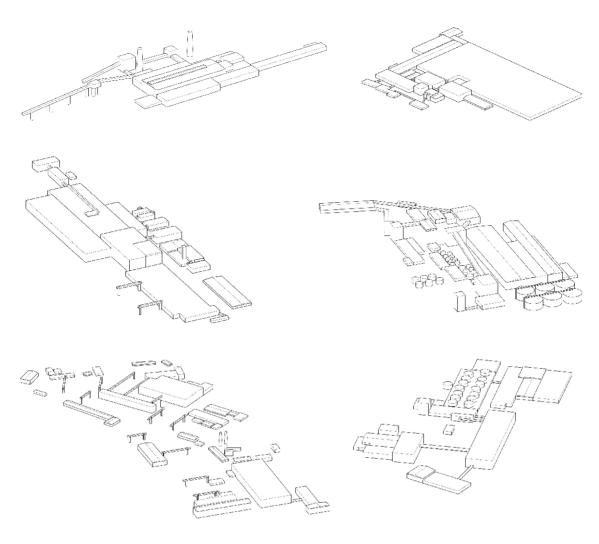












Inventory of the six industrial case studies

The choice of these six industries is defined by the remote character of the research and hence the amount of information that can be accessed online. The inventory becomes a catalogue of industrial objects that generates six different understandings. The following understandings will be presented:

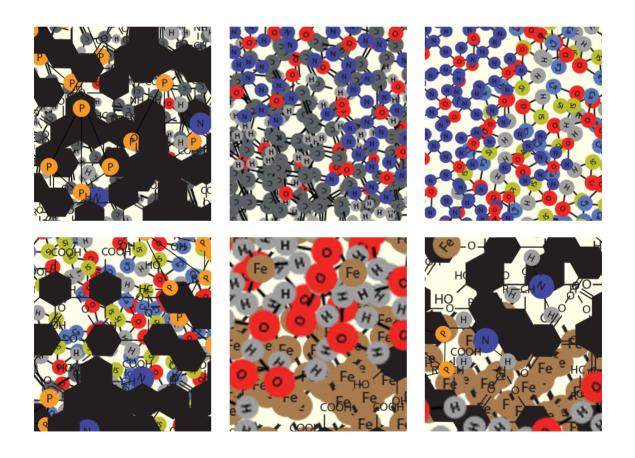
- 1. Chemical Understanding: Molecular exchange between physical objects
- 2. Material Transformation
- 3. Time Displacement understanding: Mapping different types of movement

- 4. Ecological Understanding: flora, fauna and industrial waste
- 5. Soil Conditions understanding
- 6. Understanding of the factory as an assemblage of materials



Site 1: Power Plant Station CHPP-1 Chemical Understanding, microscale

The first understanding focuses on the molecular exchange between physical substances. The power plant station in Almaty uses coal in order to generate electricity and this generates questions about the environmental impact of this building. The investigation zooms into a specific part of the building where different substances are in contact with the soil, the underground water and the air. The investigation aims to reveal conditions that cannot be observed by the human eye and propose a chemical understanding for this building.



Molecular exchange between physical objects.

Coal entering the soil and air, concrete entering the soil and air, pipe rust entering the soil and water.



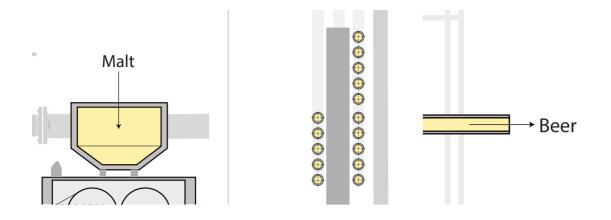


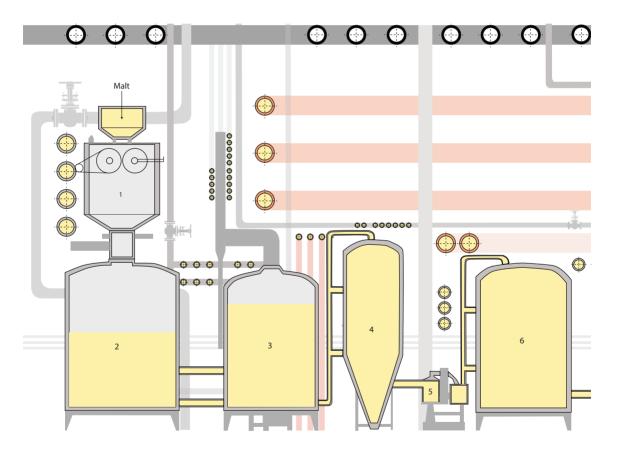
Site 2: Beer Factory

Material Transformation

The second understanding focuses on the second site which is the beer factory. This understanding is about the material transformations that happen within the factory and through the brewing equipment. The drawing shows a vertical cross section through this equipment and presents a series of machines that allow for this transformation to happen. Solid is tranforms to fluid. What is also visible on the above drawing are the different types of pipes and infrastructure of the factory that also contribute to the material transformation. The pipes have different colours, sizes and materials and run either

in parallel or perpendicular to the rest of the brewing equipment. A set of mechanical connections connect the pipes.











Galvanized pipes / zinc diametre: 25 - 254 mm



Mechanical connection

1. Mill

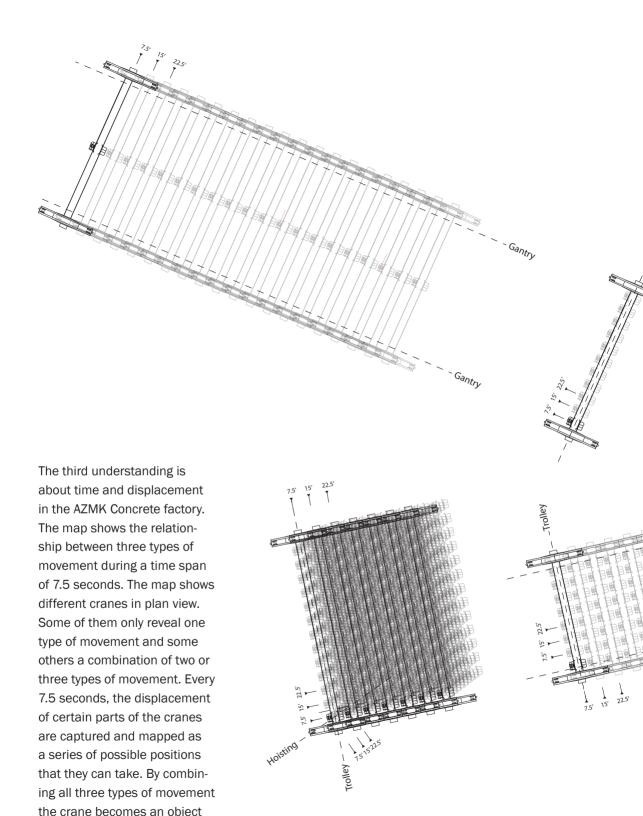
4. Fermenter

2. Mush Tun

5. Filter

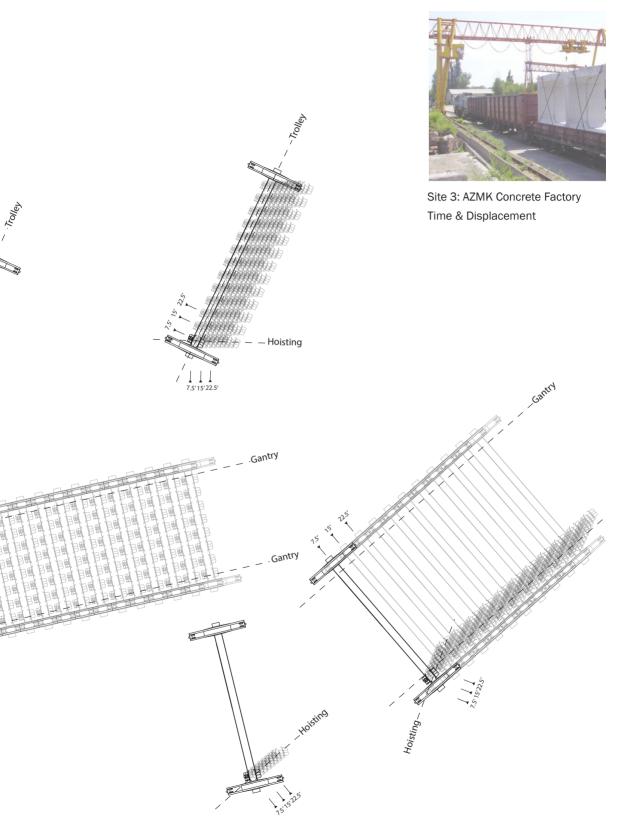
3. Kettle

6. Serving Tank



where time can be understood

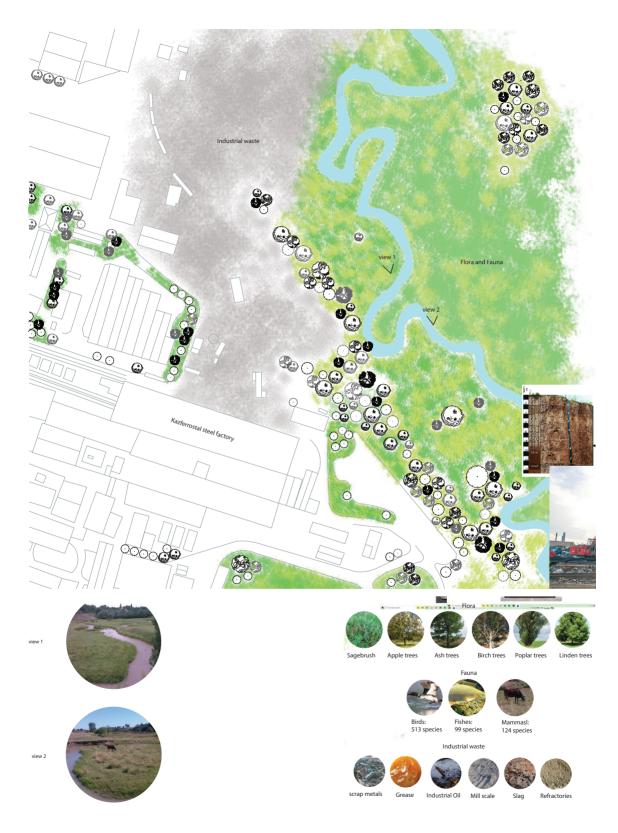
in three different ways.





Site 4: Kazferrostal Steel Factory Ecological Understanding

The fourth understanding focuses on the case study of Kazferrostal steel factory and investigates the existing ecological and landscape conditions. The map shows the different types of flora and fauna that exist next to the factory and the atmosphere around the river. These ecological aspects coexist with the industrial waste of the factory. The waste lies on the ground and merges with the vegetation of the site.



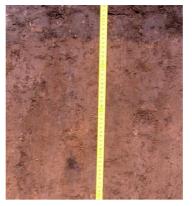
Existing ecological and landscape conditions of the site



Site 5: Efko Oil Products Factory Soil Conditions

This understanding investigates the soil conditions of the site where the efko oil products factory is. The name of the soil is Kastanozem and its characteristic is its porosity on the upper level which makes the soil moister. The porosity decreases on a higher depth and eventually reaches zero. The lowest part of kastanozem are more compact, dry and allow for zero water to penetrate. The two models on the right express these soil conditions and show the areas within the soil where contamination happens. The models are vertical cross sections through the soil in microscale.











Kastanozem 32x20 cm / Positive

Kastanozem 32x20 cm / Negative

Vertical cross section showing the characteristics of kastanozem in terms of porosity and soil contamination in microscale

Modi Operandi exercise 1: Site



Site 6: Eurasian Food Cooperations Material Assemblage

The sixth site is investigated according to its materiality. The process that lead to the model on the right consists of three steps. The first step is the collection of materials that can be found on an industrial site such as plastic, steel, rubber, brick and wood. The second step is to decontextualise these materials and the third step to assemble them in a form of a static sculpture using flexible joints. The six images on the top right part of the page show six possible deformations of the structure over time. The flexibility of the joints allow for these deformations.



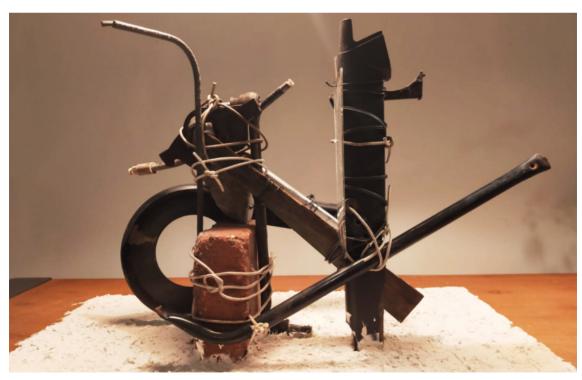












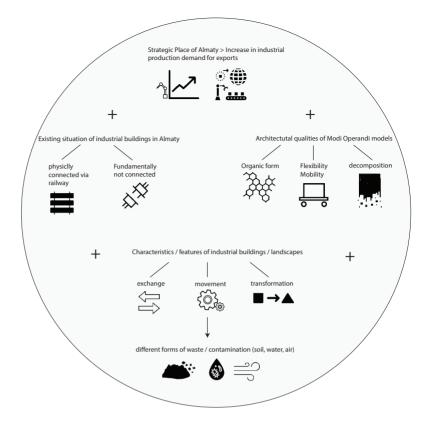
Understanding of the factory as an assemblage of different materials Modi Operandi exercise 2: Assemblage





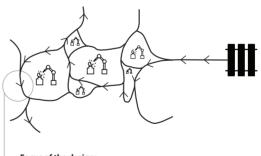


This model investigates the notions of movement and decay during the third exercise of the Modi Operandi workshop with title 'Tectonics and Atmosphere'. The model shows the ordering of different materials on a facade compositions. These materials are able to move and the friction between them cause a change in their appearance.



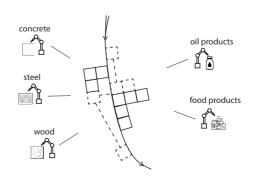
#### Intent for design phase

Design of a new production line that is connected to the existing railway infrastructure.



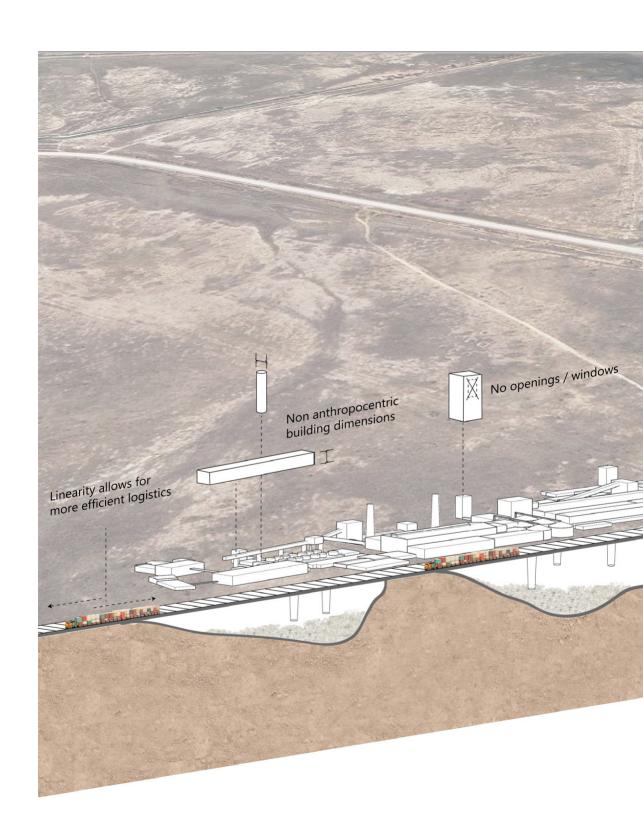
#### Focus of the design:

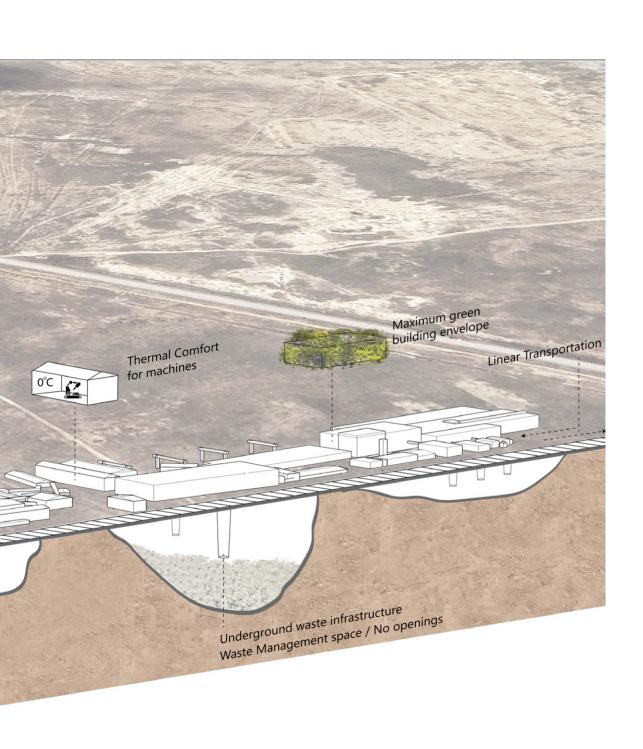
A new Industrial typology along the new production line that offers a flexible and collective manufacturing.

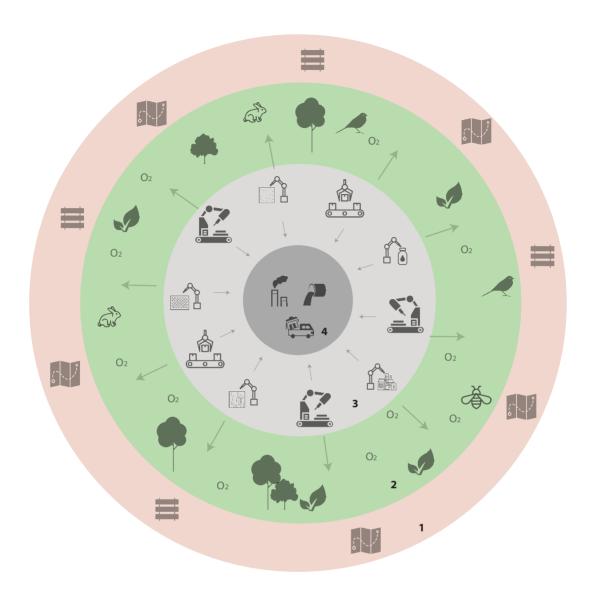


# **CONCLUSIONS**

The sum up of the conclusions from the six different investigations are shown in the diagram above. These aspects lead to the design intent which is the design of a new production line. The focus of the design is one part of this new network and more specifically the design of a new industrial typology along this piece of infrastructure.







The concept of the intention is the integration of four elements. Urban planning, ecological thinking, post-human architecture and waste management are the four elements that they will be further studied. The aim of this project is to create a new industrial typology that is not inhabited by humans but it is inhabited by machines. This new typology aims also to be constructed by machines resulting to a zero human interaction between architecture and human. The projects uses waste extraction as a starting point and investigates robotic building processes.

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# SITE IMAGES

Site 1. Google Earth Pro: Image by Dmitriy Tkachenko

Site 2. Google Earth Pro: Image by Виктор Мирошниченко

Site 3. file:///C:/Users/HP%20 User/Desktop/MSC3/Graduation%20Research/Locations/ AZMK/GALLERY.html [accessed 15 Nov 2020]

Site 4. file:///C:/Users/HP%20 User/Desktop/MSC3/Graduation%20Research/Locations/ kazferrostal/KazNRTU%20 teachers%20visited%20 the%20KazFerroStal%20 plant%20-%20Satbayev%20 University.html [accessed 15 Nov 2020]

Site 5. Google Earth Pro: Image by Сергей Тим

Site 6. Image taken from Yandex maps



# **NEGOTIATING ENTITIES:**

**BAZAAR IN MODERNIZATION** 

Yanchen Wang

# **NEGOTIATING ENTITIES**

An Understanding of Urban Space Based on Actor-Network Theory

#### Abstract:

In recent years, actor-network theory (ANT) has been increasingly applied to urban space study in response to the complexity and uncertainty of contemporary cities. The article explores the actor-network theory's potential to understand the multiplicity and stability of urban spaces, suggesting objects as mediators and territoriality as obligatory passage points contributing to the coexistence of different entities and activity networks.

## **Associations of Actors**

"The notion of network, in its barest topological outline, allows us already to reshuffle spatial metaphors that have rendered the study of society-nature so difficult: close and far, up and down, local and global, inside and outside. They are replaced by associations and connections "[1]

ANT Theorists consider connections and associations as methodological means, and all the existence is actively constructed by different actor-networks. Actors refer both to human beings and non-human objects such as concepts, organizations, ideas, technology, biology, etc. In the actor world, each actor is a node of the network and shares equal importance; the only difference in this decentralized network is the number and complexity of connections.

Space, as a construct about networks, is constituted by the association between humans and objects. According to Latour, the emergence of space is in the process of the network connecting different sites; sites are defined by the types and paths of actors' activities, independent of the boundaries or scale of the space. The con-

cept of network and actor extend the dimension of understanding the materiality and sociality of urban space. On the one hand it frees spatiality from the Euclidean geometry to a topological and socio-spatial relations; on the other hand, it affirms non-human entities' role in the construction of social relations.

Examples can be found in Latour and Emilie Herman's Paris: Invisible City [2]. Four actions: traversing, proportioning, distributing, and allowing, depict Paris as a dynamic network of actors' interactions, where the relationships between actors exist across time and places. In this network, a person's identity is defined by the people or objects they are associated with, such as an ID card, registration documents, or neighbors. Meanwhile, human interactions and behaviors are supported by objects (transportation infrastructures, small objects, technology, etc.), in turn, feed technological systems (monitoring systems, management systems, etc.). Connections exist among human and non-human actors that together build social networks and ascribe meaning to spaces.

## **Network: Negotiation and Coexistence**

Society is not in a pre-determined nor complete hierarchical order but rather competes for the right to speak to each other because all actors have their interests. ANT theorists introduce the notion of multiplicity concerns the coexistence of multiple realities and different orders. [3] Latour considers that the order never complete and the existence of power relations is not made of social ties but always spread in time and space which "has no inertia and is to be ceaselessly renegotiated" [4]. Through network construction, heterogeneous elements establish connections

and coexist with each other, and the coexistence begins in space more than in time.

The concept of translation is used to describe an essential process of network construction. Through translation, actors reinterpret others' ideas as their own and establish connections, setting orders among the chaos and differences. Translation is a process in which actors seek common ground while preserving differences. Michel Callon points out, despite the indelible differences and gaps between entities, they share a degree of underlying unity; and convergences and homologies are created in the process of translation to make a durable and resilient actor-network.[5]

Two terms further explain the construction of networks, explaining that translation is actually a process of discussion and negotiation among actors. The concept of mediator emphasizes the multiple roles of actors in translation and explains how diverse and dynamic networks are shaped. Mediators are actors that can "transform, translate, distort, and modify the meaning or the elements they are supposed to carry." [6] Obligatory passage points (OOP) are defined as "single locus that could shape and mobilize the local network";[7] OOP mediates interactions between actors and defines actions by setting up negotiation spaces to allow local networks/ actors to obtain a certain degree of autonomy from others.[8]

ANT theorists suggest a certain degree of spatial stability allows social relations to be transmitted smoothly, while the *fluidity of space*[9], however, allows relations to be more durable. Based on the discussion of actor-networks' fluidity and stability, Murdoch concludes two actions to address the dynamism of actor-network: 1.

The standardization and regulation of behaviors within a classified network. 2. Attempts to retain the negotiation power.[10] For a space that can accommodate diverse groups and activities, Murdoch categorizes it as a space of negotiation, where the translation process is non-unified and unclassified.

Because the interests of entities always differ, the connections between people and objects are ever-changing, and social networks have been translated in various ways. Therefore, from ANT's perspective, urban space is contingent, diverse, and heterogeneous, a relation complex that dominance and resistance are intertwined. Cities are not a given fact but rather shifting networks assembled [11] by heterogeneous entities in multiple forms.

Based on the above discussion, this article considers that today's urban space is a place of negotiation, which can formulate the multiplicity and stability of the actor-networks. The next sections elaborate on how objects and territoriality make the coexistence of different entities and activities possible.

## Objects as Mediators

"Materials solidify social relations and allow these relations to endure through space and time." [12].

Urban space is physically constituted by multiple artifacts, natural objects and associated by multiple users. Considering the material aspects of space have the potential to meet or bend the users' intent or adapt to improvised use, objects are of functional importance for the multiplicity of the activity networks. Objects transmit and carry envisaged activities. For artifacts, they are produced or constructed with conceptual functions, regardless of whether they successfully perform them. For natural objects, even though their existence does not require human agency, they can be and often are employed to serve human intentions.

One object can be translated to multiple activity networks; the occurrence of various translations of objects often depends on the relationship with other things. The same object in different spaces does not mean that they generate the same activity or form activity networks of equal complexity. For overlapping activity networks in the same space-time, objects can help set orders of activities. For example, we can glimpse a city's connectivity and the priorities of different areas in the relations of transport infrastructures. On the street, different pavement or the setting of boundaries often indicate the range of groups' movement (walkers, vehicles, or bicycles).

Objects establish and consolidate human connections, keeping the activity patterns stable and durable. In some informal cross-border trade activities, commodities act as crucial mediators in building a dialogue between formal regimes and informal practices. Shuttle traders offer commodities as gifts/bribes to border corps or relevant administrators in exchange for cross-border passage and the possibility of tax avoidance. Over time, this pattern has become an unwritten rule to keep informal trade activities on track.

The association between objects can affect the clarity and ambiguity of spatial functions, determining whether a place welcomes a wide range of uses. When the objects in space are made up of common or similar pre-determined goals or set to build conscious connections, space tends to have a dominant function and a stable network

of users and activities; for example, medical devices for hospitals and sorting machines for distribution centers

Things are defined regarding the network in which they are embedded and change as the network or other actors change. The adaptability of an object to the translational process can be interpreted by the term "affordance", which was first introduced by James Gibson. The affordance indicates action possibilities, encompassing planned uses, as well as potential uses. And environmental affordance is described as "what it offers people." [13]

The affordance of the built environment allows the urban space to be associated with tactical use, and appropriations which generate different types of activity networks, while also making it possible for different groups and related interactions to coexist in space and time. However, the overlap of different activity networks in space is often accompanied by agreements and disputes over the use of space, inevitably trigger territorial claims.

# Territoriality as OOP

"The access to space has to be subdivided (in time or space) to accommodate different uses and to make room for as many different categories of users as possible. A certain degree of territorial differentiation and superpositioning could very well bring about a much greater degree of accessibility "[14]

The concept of territoriality has been introduced to understand the relationship between human behaviors and physical spaces as well as spatially power control, mainly subdivided into two fields:human territoriality and politico-geographical territoriality. Human territoriality refers

to a set of actions and perceptions presented by a person or group based on the perceived possession of physical space.[15] In a politico-geographical view, territoriality is regarded as a strategy that uses bounded space to delimit and assert power and influence.[16] In this section, the above two definitions of territoriality are applied to urban space at a micro-scale.

Although most discussions of territoriality have focused on urban conflict and the privatization of space, territoriality has the potential to be used to study the coexistence of power relations from the perspective of actor-network theory. Kärrholm suggests that urban space can be seen as territorial complexities with multiple layers of territory present simultaneously; multilayered territorial production may involve the availability for various groups and activities.[17] Following this, this article considers the territoriality acts as OOP that holds the negotiations between entities.

Territoriality conducts human actors on how to decrease the degree of conflicts or avoid conflicts. Territoriality is a human intuition; territorial behavior is an invisible boundary system to mark a place, dividing self and others;[18]and territorial cognition is a sense of affiliation and dependency on a certain space. Through the perception of territoriality, we tend to be aware of a territory's properties, what to do and should not do, and how to behave appropriately in a certain place, avoid collisions as much as possible.

Territoriality engenders the translation of human actors' interests to different forms, thereby establishing or improving negotiation rules. Territorial strategies are often adopted to maintain and defend the territory, where artifacts, persons, laws are involved, and regulations and boundaries are produced to coordinate conflicting areas.

For example, green belts or fences are built to mitigate conflicts between vehicles and people. Territorial practices of power can be seen as an influence, making the network of activities stable and predictable.[19]

Territoriality has the generative capacity to create new connections among entities with differences or conflicts. When a territorial influence is strong enough, it tends to gather entities into a whole that severs a certain area. For example, in the residential area on the west side of the Barakholka, a bazaar of Almaty, the conflicts between local residents and immigrant traders are eased with the bazaar's developing logistical territory. Traders and residents began to establish cooperation for transportation and storage beyond the original commercial place.

Different types of territories coexist in urban space, overlap with each other, and often transform over time. Territorial networks regulate the actors' accessibility to space and mobility within it, and it needs to be produced continuously to maintain influence. Territoriality is neither isolated nor static but related to the interaction between the physical environment and people, changing as the activity network changes. According to Kärrholm, different types of networks could lead to two main forms of territorial production: the intended production and production through the use.[20]

Different forms of territorial generation, shaping different degrees and tendencies of territoriality, affect entities' willingness to participate in discussions and influence the outcome of negotiations; determines whether the relationship between different activity networks is competitive or cooperative.

Highly territorial actors are less approachable,

and their established activity networks are often rigid and resist change. They fight for the right to use the space by reinforcing the original territorial strategies or creating new rules. This process often leads to the privatization of urban space with the emergence of boundaries or the agreement to use the space at different times, where activities are usually divided up and exclusive to each other.

Slightly territorial entities usually do not see space as their own, but a place can be associated with it. They tend to be collaborative and accepting of adjustments and changes. This type of group often agrees to coexist by sharing space, accommodating each other. This process is often followed by blurring territorial boundaries, bringing about the publicness of spaces and highly connected territorial networks, which makes urban space inclusive to multiple activity networks.

Under the mobilization of territoriality, actors negotiate with each other and subsequently translate into or be translated from different networks of activities. Each translation leaves traces, these traces redefine the territoriality of a certain place, reproduce territories, reconstruct the relationship between human actors and objects and sites, and bring dynamic stability to urban space.

## Conclusion

"the city is made up of potential and actual entities/associations/ togetherness" [21]

The article offers a new understanding of the multiplicity of urban space by introducing the concepts of affordance and territoriality within the perspective of actor-network theory; Considering the fact that multiple entities and activity networks coexist in space through negotiating contingencies and conflict of everyday practices.

The article argues that objects and territoriality act as mediators and obligatory passage points, respectively, are essential for establishing negotiation and maintaining the multiplicity and stability of actor-networks.

Through the discussion of the article, there are some inspirations worth noting:

- 1. Conflicts can only be settled, not resolved. With the complexity of social relations, urban space has become a contested place. Facing urban conflict, instead of thinking about how to solve or eliminate them, we could consider how to accommodate them because discrepancies never disappear and power relations are always changing.
- 2. Objects matters. Latour argues that when non-humans are intertwined with the social fabric sufficiently, it will create opportunities for non-human actors to hold society together.[22] Today's actor-networks cannot be built without urban mobility and information circulation, which are increasingly supported by objects. It is time to appropriately shift our gaze from the human-centered aspect to the material aspects of the built environment, focus more on artifacts and technology and their impact on space production and human activities. Meanwhile, we should also be aware of the relationships among designers, users, and artifacts, avoiding the disconnection between the space's intended function and the real demand.
- 3. Boundaries matters. Our cities are overlapped by groups of different races, religions, and genders, each with different habits of spatial intervention. Different networks of activity are worthy of existence, but coexistence without rules is chaos. Boundaries (whether visible or invisible) are required to shape territoriality, and the latter will guide us to interact with other actors and coexist in a comfortable and orderly manner.

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- [4] Bruno Latour, Reassembling the Social: an Introduction to Actor-Network-Theory (Oxford: Oxford University Press, 2008),p 66.
- [5] Michel Callon, "Struggles and Negotiations to Define What Is Problematic and What Is Not," The Social Process of Scientific Investigation, 1980, pp. 197-219, https://doi.org/10.1007/978-94-009-9109-5\_8, 211.
- [6] See note 4, p 39.
- [7] Law and Michel Callon (1994). "The life and death of an aircraft: A network analysis of technical change".33
- [8] Ibid.
- [9] John Law, "Objects and Spaces," Theory, Culture & Spaces," Theory, Culture & Spaces," Theory, Culture & Spaces, Theory, 10] Jonathan Murdoch, "The Spaces of Actor-Network Theory," Geoforum 29, no. 4 (1998): pp. 357-374, https://doi.org/10.1016/s0016-7185(98)00011-366
- https://doi.org/10.1016/s0016-7185(98)00011-366
- [11] Latour uses the word "assembling" to indicate how humans and no-human hold society.
- [12] See note 10.
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- [14] Mattias Kärrholm, "The Materiality of Territori-

- al Production," Space and Culture 10, no. 4 (2007): pp. 437-453,
- https://doi.org/10.1177/1206331207304356, 447. [15] Paul A. Bell, Environmental Psychology (New York: Psychology Press, 2011), 304.
- [16] Sack, Robert David. Essay. In Human Territoriality Its Theory and History, 15–19. Cambridge: Cambridge University Press, 2009.
- [17] See note 14 above
- [18] Altman and Chemers, "Culture and Environment," in Culture and Environment (Cambridge: Cambridge university press, 1984).
- [19] Kärrholm, Mattias. (2005). Territorial Complexity in Public Places A Study of Three Squares in Lund. Nordic Journal of Architectural Research. 18. 99-114
- [20] See note 10, 362.
- [21] Ash Amin and Nigel Thrift, "Cities and Ethnicities," Ethnicities 2, no. 3 (2002): pp. 291-300, https://doi.org/10.1177/14687968020020030101, 27. Quoted in Thomas Bender and Ignacio Farias, in Urban Assemblages (Hoboken: Taylor and Francis, 2012), pp. 1-35, 14.
- [22] Bruno Latour, "Technology Is Society Made Durable," The Sociological Review 38, no. 1\_suppl (1990): pp. 103-131, https://doi.org/10.1111/j.1467-954x.1990.tb03350.x.

# BETWEEN TRADITION AND MODERNITY

The Dilemma Facing the Central Asian Bazaar

#### A FUTURE OF UNCERTAINTY

Bazaars have been considered an exchange point for commodities, nodes for interpersonal interactions, where social networks and everyday commercial practices are embedded. In Central Asia, the Soviet socialist economic system's collapse liberated a decentralized trading network and the pervasiveness of trade opportunities. (Fig. 1.)

In Kazakhstan, Bazaars was once the country's economy's lifeblood and developed on various scales. These informal economies drove local, regional, and cross-border trade(Fig. 3); meanwhile, it plays a significant role as an urban public space to accommodate the diversity of activities and entangled with urban development. In recent years, the formal economy has gradually overtaken the informal economy in Kazakhstan, and with the development of digital trade, the informal economy's status is being challenged(Fig. 2).

For Almaty, once the capital and now a vital corridor of the New Silk Road, the entire city faces a transformation. The modernization notion took over the urban landscape; Bazaars appeared outdated, remain marginal, and anachronistic to modernity, facing an uncertain future.



FIG.1 BAZAAR IN THE EARLY 1990S Image from @eurasianet.org

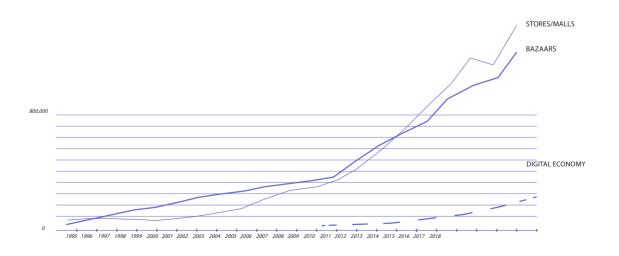


FIG.2 TRADE TURNOVER IN KAZAKHSTAN



REGINAL: Altyn Orda



LOCAL: Sary-Arkaa



INTERNATIONL: Barakholka



LOCATION

Bazaar Type	InternationaL	Regional	Local
Official bazaar fees (\$ million)	49.8	4.4	0.6
Informal bazaar fees (\$ million	141.4	0	0
Share of wholesale in total sales (%)	60	70	0
Share in local employment (%)	5.1	1.3	0.9

FIG.3 BAZAAR IN ALMATY







IMPULSE

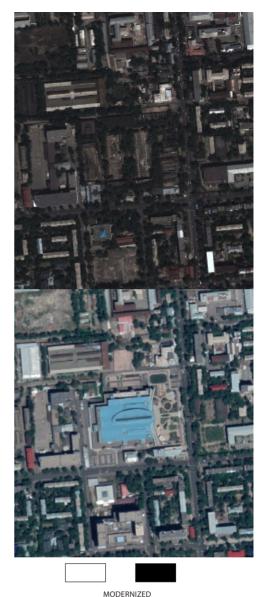
# **Transformation & Conflict**

Although bazaars still play an essential role today, especially in contributing to local employment and providing affordable goods to locals, Outdated facilities in bazaar have caused several problems: traffic congestion, environmental pollution, epidemics, etc. This has led the government to urge the bazaar to move to a civilized path since 2010. (Fig. 4)

In my preliminary background research, I found four trends in Almaty's bazaars in the last decade:1. The formalization of large bazaars.

2. The expansion of bazaars as an impulse in a formalized mode. 3. The consolidation or demobilization of small-scale bazaars formerly parasite formal spaces. 4. The replacement of bazaars by modern shopping malls as the main shopping venues. The first two patterns are mostly found





PARASITE MODERNIZED

FIG. 4 PATTERN OF TRANSITION 2011-2020 Image from GOOGLE EARTH

in bazaars in the peripheral areas of cities, while the last two are mostly found in the city center ring or the developing urban areas.

However, the transition has brought new problems. Some traders have lost their trading places and homes, trade networks established over the past decade are affected. A growing number of conflicts appeared between traders and administrations, landowners, and users, which mainly reflected in the territorial conflict between formal and informal trade.

Most shuttle traders refuse to change, but land reuse is imminent, which often results in the enforcement of land expropriation, such as the fire in Barakholka for unknown reasons but implied as a government measure. (Fig. 5)

"nobody was willing to move. Then, one day there was a fire here."



FIG. 5 BARAKHOLKA BAZAAR AFTER A FIRE. Image from@Almaz Kumenov

# BAZAAR AS A SPACE OF NEGOTIATION

A Study of Barakholka in Almaty

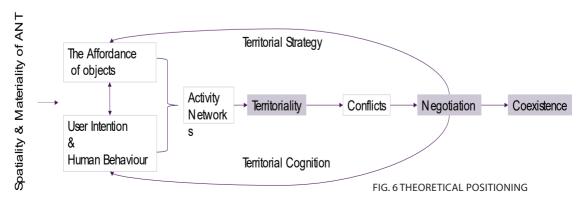
Like most Central Asian cities, beginning in the 1980s, Almaty experienced a bazaar broom. After twenty years' expansion, more than 70% of bazaar sites were situated in the northern periphery of Almaty by 2006, collectively called Barakholka. It covered both local/regional integration and cross-border cooperation and has become one of the largest bazaars in Central Asia today.

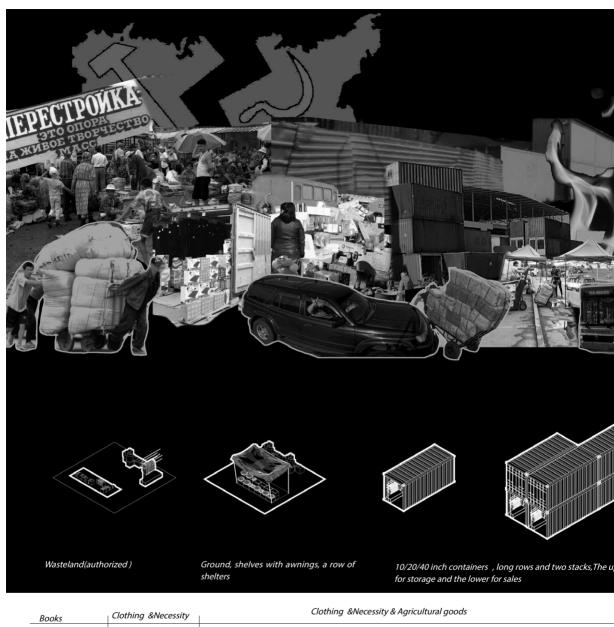
Since 2010, the strip has been demolished and transformed to achieve a "civilized path." The main official measures:

- The demolition of markets outside the Red Line to make way for transportation facilities and parking lots.
- The establishment of new shopping malls where traders continue to trade by renting space in the newly constructed malls on the original demolished sites;
- 3. The construction of fixed covered infrastructure on the existing containers and the collection of regular cleaning and management fees.

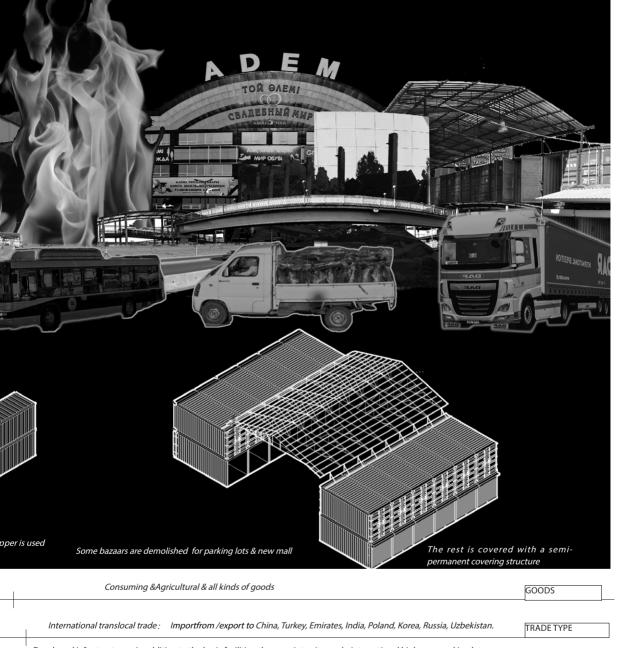
My research is based on actor-network theory. ANT and other social approaches' primary distinction is that ANT considers both human and non-human actors equally and advocates for a decentralized network. ANT believes existence is actively built through translation between actors and the heterogeneous networks they constitute. Understanding socio-material relations make ANT a unique tool to better think of heterogeneous urban spaces' complexities and well suited for studying environments in transition or facing dramatic changes. This is exactly the dilemma faced by Barakholka. Taking a developed position in my theory essay (Fig. 6), I see the bazaar as a negotiation place. My main research question is what kind of bazaar space can accommodate conflict and heterogeneous activities while maintaining dynamic stability.

Because it is impossible to physically visit the site this year, understanding the site's material condition and spatiality is through the mapping of the site plan and the street facade. The collection of information or data is mainly achieved by literature surveys, online interviews, online map websites (Yandex & Google), and GIS platforms. The research addresses the formation and transformation of marketplaces, the patterns of coexistence of the informal and formal economies, and how different entities contribute to activity networks' dynamics and stability.





Books	Clothing &Neces	ssity		Clothing &Necessity & Ag	Clothing &Necessity & Agricultural goods		
Local/Regional Trade		Cros.	rossboder Trade: Imported from China, Turkey, sold to Almaty/Russia, Tajikistan, and Uzbekistan.				
Ad hoc dumpsite			Basic shar	ed infrastructure (hygienic/electri	city/gas)		
Exchange point			Retail/Wholesale mainly			Wholesale Warehouse Leisure	
Shuttle traders personal ferry goods with bags seller Freight and transportation services/personal ferry,						ry,	
**************************************			.2000		······2006 ······		



Consuming & Agricultural & all kinds of goods					
International translocal trade: Importfrom /export to China, Turkey, Emirates, India, Poland, Korea, Russia, Uzbekistan.	TRADE TYPE				
Developed infrastructure, In addition to the basic facilities, there are intercity roads, international highways, parking lots, canals international gas pipelines, etc.	FICILITIES				
Wholesale -Retail - Warehouse -Terminals -Culture Leisure -Hotel	FUNCTION				
More than two hundred 40-seat motor coaches provide daily services for customers visiting	TRANSPORT				
ı					
 20112017					

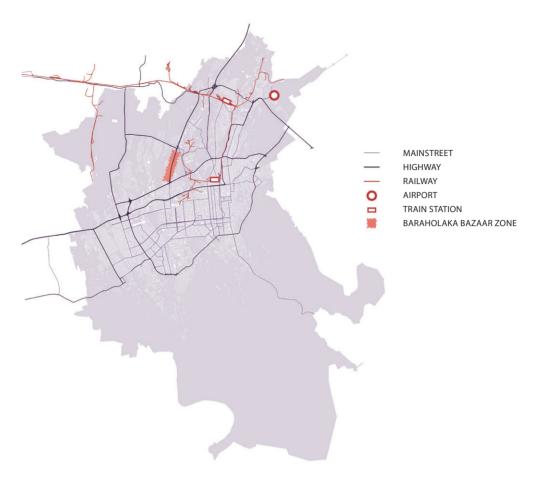


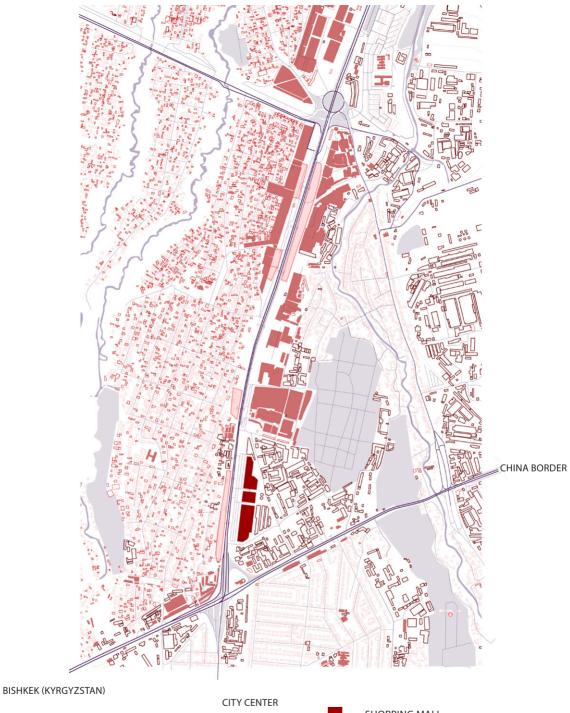
FIG. 8 BAZAAR ACCESSIBILITY

#### AGGLOMARATION & TRANSFORMATION OF BARAKHOLKA

Under the influence of Pereshaika, Barakholka first began to emerge in 1984 as an authorized book exchange, open only on weekends. Later, with the collapse of the Soviet Union, people who lost their jobs began to take to the streets as street traders, mainly from China and Turkey, and selling to several Central Asian countries. Gradually, Barakholka became a wholesale market where you could buy anything. The bazaar continued to develop today; it has become an international hub where covers trade, logistics, recreation, and other activities. (Fig.7) By studying the history of Barakholka, I found that the agglomeration of the bazaar is closely

linked to the development of facilities. Especially after the 20th century, a large part of Barakhol-ka's development was due to transport infrastructure construction.

In a geo-spatial phenomenon, the urban sprawl of Almaty has made the bazaars marginal both in a socio-spatial and temporal sense since it has been peripheralized and disconnected from the modernizing city center. However, from the perspective of the transportation network, Barakholka is a strong node and highly accessible. Its location on both sides of the highway to the city center is directly connected to the road to



CITY CENTER

SHOPPING MALL

VACATED BAZAAR(AROUND 2013)

VEGETATION

INDUSTRIAL

BAZAAR/MARKET

WACATED BAZAAR(AROUND 2013)

VEGETATION

HYDROGRAPHY

ROAD

FIG. 9 BARAKHOLKA AND SURROUNDINGS



FIG. 10.1BARAKHOLKA IN TRANSIITION

Kyrgyzstan and China's borders. (Fig.8)

The accessibility of the strip has led to a trade and logistics network, with hundreds of buses carrying local and foreign customers to the area every day and goods entering the bazaar through a large number of private transport or cargo services, which circulate directly to consumers or to local secondary bazaars or other large bazaars in Central Asia. A residential area called Zarya Vostoka on the west side of the Barakholka has become an important part of the logistics system. Most people who live there work for the Barakholka, and where there are residences, there are warehouses. (Fig.9)

With the bazaar development around 2010, the immense but poorly ordered logistics and trade network often caused traffic jams and a shortage of parking spaces. In the subsequent transformation, the main road was expanded from a two-lane highway to a six-lane highway, with parking lots about 45 meters wide at both ends of the road, at the expense of demolishing the bazaar(Fig.10.1). Compared to the radical transformation of the external environment in Barakholka, the bazaar itself has not changed much. Even in the newly built mall, the traditional bazaar atmosphere remains. (Fig.10.2)









FIG. 10.2BARAKHOLKA IN TRANSIITION Image from Yandex & @ADEM



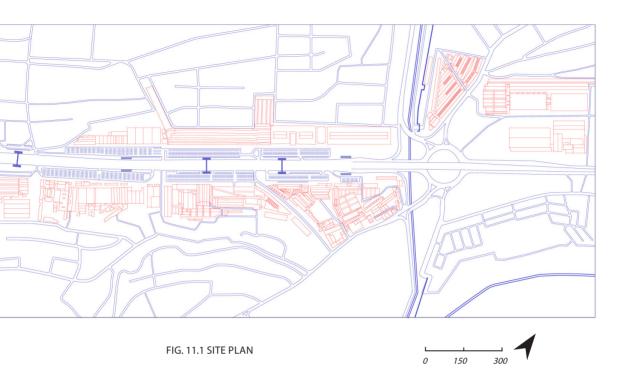
#### MAPPING OF SITE

My intervention in the site begins with the drawing of the site plan and facade. I try to understand the overall condition of the site, the internal flow of the space, and the relationship between the human-made objects. (Fig.11-13)

In a previous literature survey, there were 27 existing bazaars in Barakholka, but as I was mapping, I realized that the number of bazaars was challenging to distinguish, and it was difficult to differentiate between different bazaars, except for the new malls, most of the bazaaars are clusters of modular containers. However, it

is evident that the size and shape of the bazaar clusters in each site are related to the degree of connection and enclosure of the external roads.

The relationship between buildings and roads reflects the logistics network of the bazaar. The highway serves as a transportation route, a passenger route, and a clearly defined and functional infrastructure that separates people and vehicles through overpasses and underpasses, while the parking lot provides space for private cars and also serves as a buffer zone for loading and unloading.



The roads at the back of the market, however, are poorly maintained and do not have any flow divisions. Through a series of observations on the Yandex website, I found that logistics activities are more active at the back than at the front, becoming the main logistics flow in Barakholka. Especially for informal trade, after entering Barahoka through the ring road, traders go around to the back of the bazaar to enter Barakholka to ship and unload their goods.

There are two very different atmospheres on the two sides of the bazaar. The bazaar's front side fac-

es the well-maintained infrastructure, with a facade rich in form and color coating, numerous billboards, and decorative elements that make each bazaar look distinctive and individual. In contrast to the formal frontage, the back facade is relatively monotonous and highly enclosed, with layers of fencing and repeated use of aluminum panels, making the bazaar seem indistinguishable from each other and the mall, but rather a holistic area isolated from the outside world.



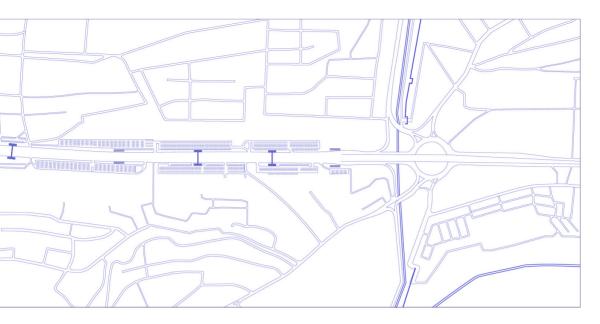
FIG. 11.2 INFRASTRUCTURE





BACKSIDE OF BARAKHOLKA

FIG.12 STREET ATMOSPHERE COMPARISON Image from Yandex

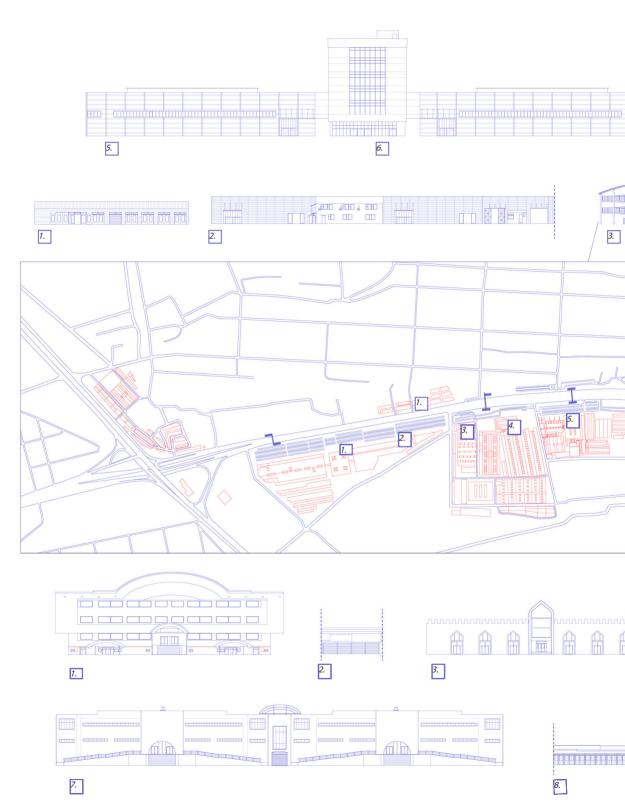


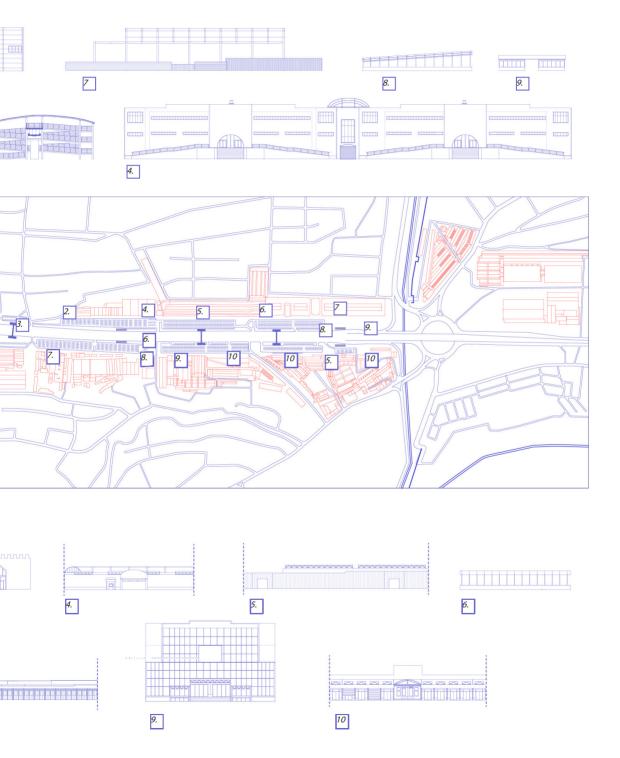


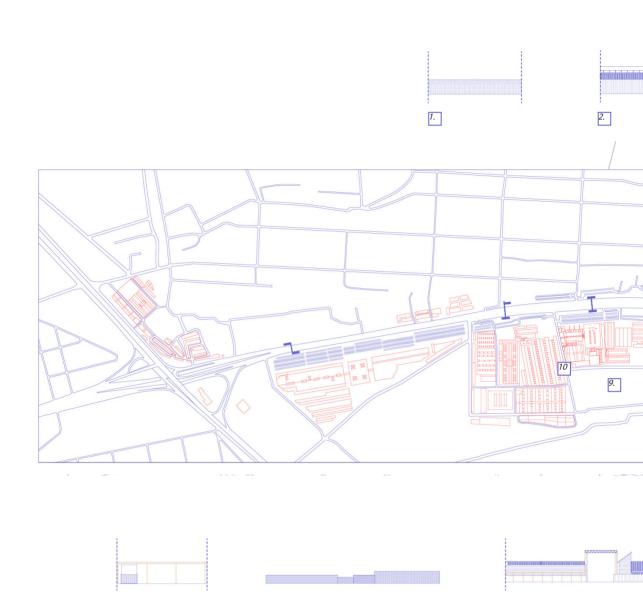


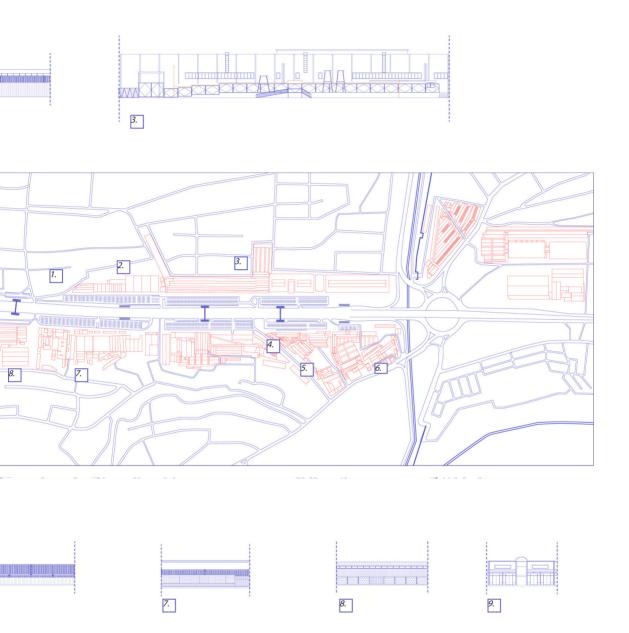


FRONTSIDE OF BARAKHOLKA









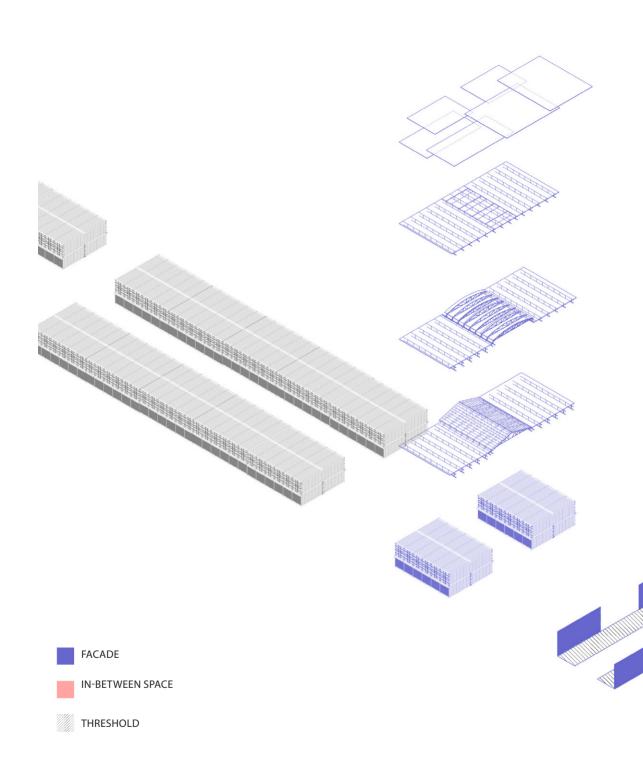


FIG.14 MEASURES FOR TRANSFORMATION

### "MODERNIZATION" OF BAZAAR SPACE

The mapping of the site is accompanied by the study of the transformation of the bazaar space. The modernization of the Barakholka is more about the renovation of the roof and façade of the bazaar than replacing the original container bazaar with a shopping mall.(Fig.14). The newly added fixed structures and light-transmitting roofs improved the original shopping environment. It also explained that it was difficult to distinguish the boundaries within the bazaar clusters in the plan because they all shared one or more roofs.

The transformation of the façade is more for the beautification of the street than for creating new market spaces(Fig.15). Most of the walls are detached from the market space. The façade is determined by the spatial relation between the containers and the hallway, making the façade of the front street is mostly symmetrical. Some of the walls have a multi-layered relationship with the market space, shaping new spaces and thresholds. Although not acting directly in the market space, these layers act as mediators and begin to accommodate service or entertainment activities or become fertile ground for new street trade. Besides, because the degree of renovation varies, it often leads to different internal connectivity (Fig.16).

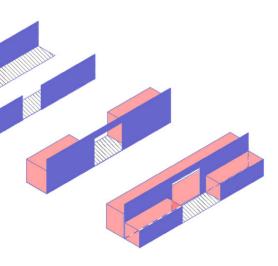


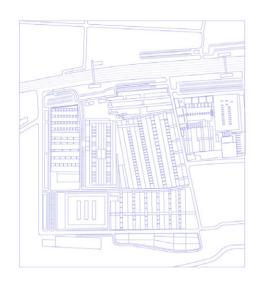








FIG.15 RENOVATED FACADE AND SPACE Image from Yandex





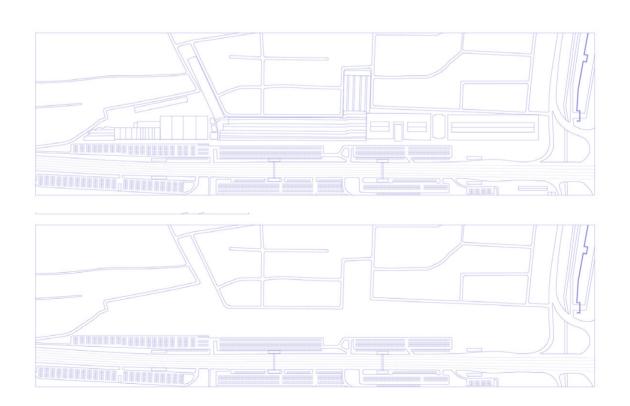


FIG.16 DIFFERENT INTERNAL CONNECTIVITY



FIG.17 PROGRAM

### **ACTOR AND ACTIVITY NETWORKS**

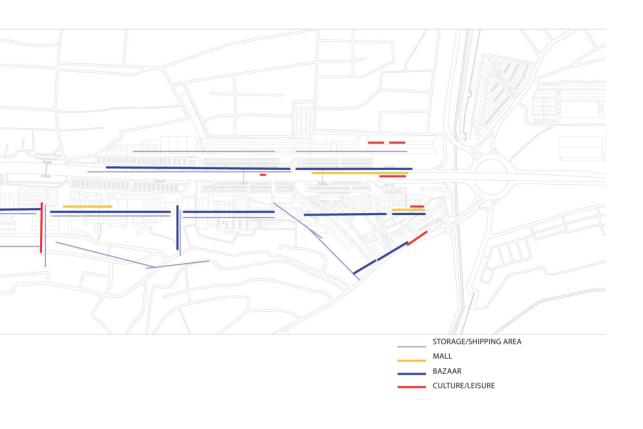
Through the previous research phases, I found that there are four main types of programs in Barakholka today:

- 1.Traditional bazaar spaces
- 2.Modern commercial spaces
- 3. Functional spaces for culture and leisure (restaurants, hotels, and offices, etc.)
- 4.Logistics spaces

By observing the Barakholka at different periods (through Yandex panoramas and photographs) and speculation based on the drawn planes, Figure 17 shows their distribution in the Barakholka space. Trade and logistics activities are often located at the bazaar's front and back or are intertwined. And where traditional bazaars

coexist with shopping malls and logistics sites, they are often associated with creating leisure and cultural activities. The latter also occurs in a fragmented form on the edge of Barakholka or between the roads perpendicular to the main arteries. In addition to the informal trade in the formalized bazaar, I also try to understand the patterns of space appropriation that exist in Barakholka (Fig. 18).

In this part of the study, I try to explore actors' contributions (human and non-human objects) in places to shaping activity networks and spatial characteristics(Fig. 19). The objective dynamism of human actors makes Barakholka's activity



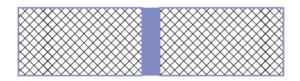
network diverse and complex. The affordances of objects and the subsequent interaction with people shape space's ability to accommodate these activities.

I categorized the actors into two groups: stable actors and dynamic actors. Stable actors contribute to constructing stable networks and shaping a high sense of territory. They tend to be part of the territorial strategy or tactics, such as fences, managers, containers. Stable actors are also entities that tend to be permanently present or active in the space or require the scale and form of the space, such as large freight cars. The presence of dynamic actors, accommo-

dating various behavioral activities in the marketplace, or being used in different usage scenarios, shapes or participates in spaces such as scaffolds, plazas, etc. These entities are considered to be associated rather than possessive and often satisfy temporary uses. There is also the possibility of interchange between actors in different contexts, such as the most common aluminum panels used to shape boundaries and displays of goods or temporary coverings. Dynamic and stable actors shape different spatial qualities, together forming multi-layered networks of activity and varying degrees of inclusivity or exclusivity in the present-day bazaar space(Fig. 20).















edge of public space











edge of vacant land

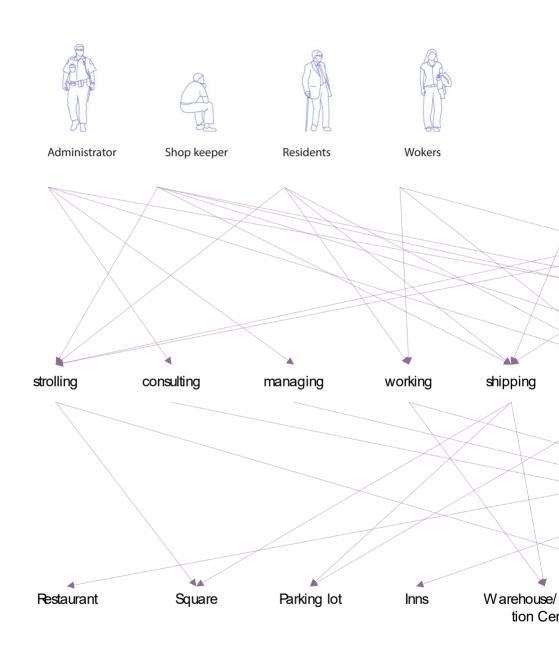
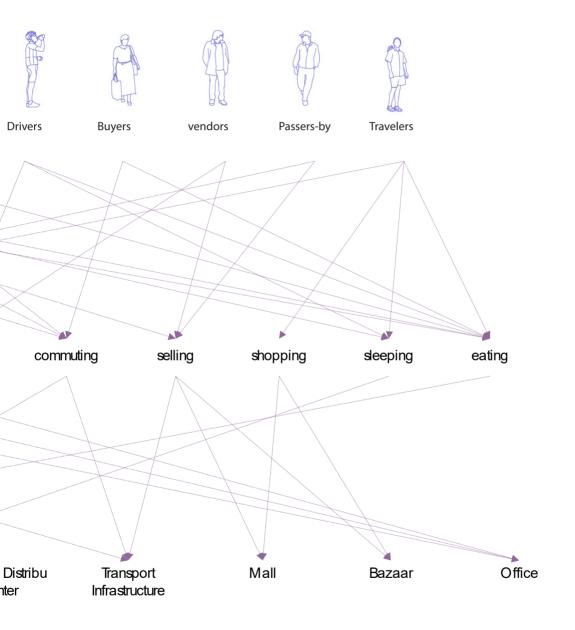
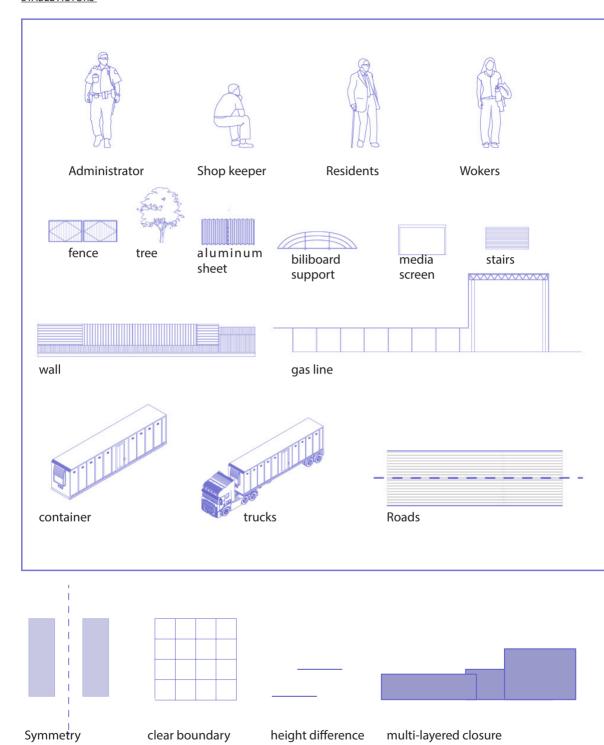
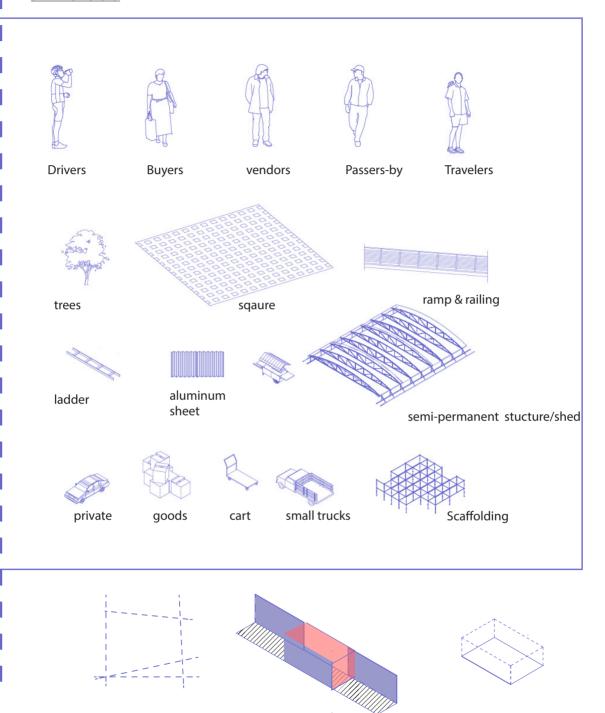


FIG.19 ACTIVITY NETWORKS





blurring borders



inbetween-space& threshold

open/semi-open space

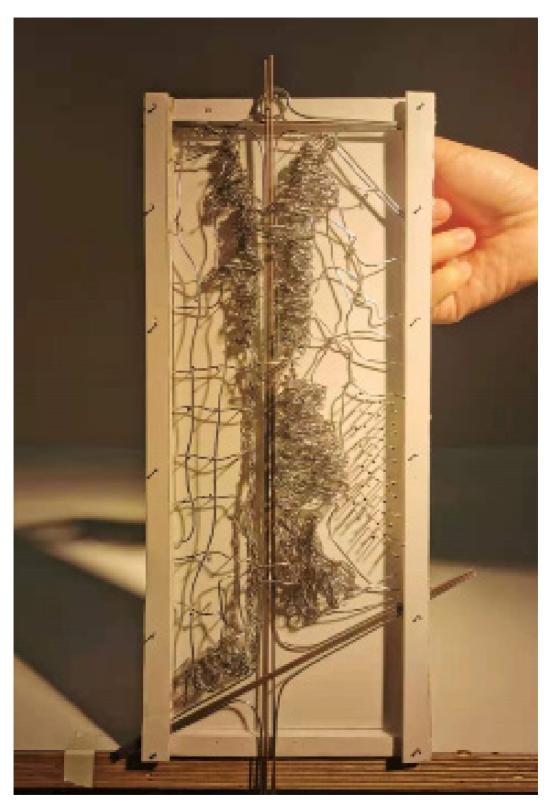


FIG.21 MO1: SITE



# MODI OPERANDI WORKSHOP

In the Modi Operandi workshop, I translated the preliminary research diagrams into 2.5d/3D models, a preliminary summary of the research part, and a reinterpretation of the drawings. The two weeks of model making were exploring spatial translations, giving me a deeper understanding of Barahoka and initial ideas about design.

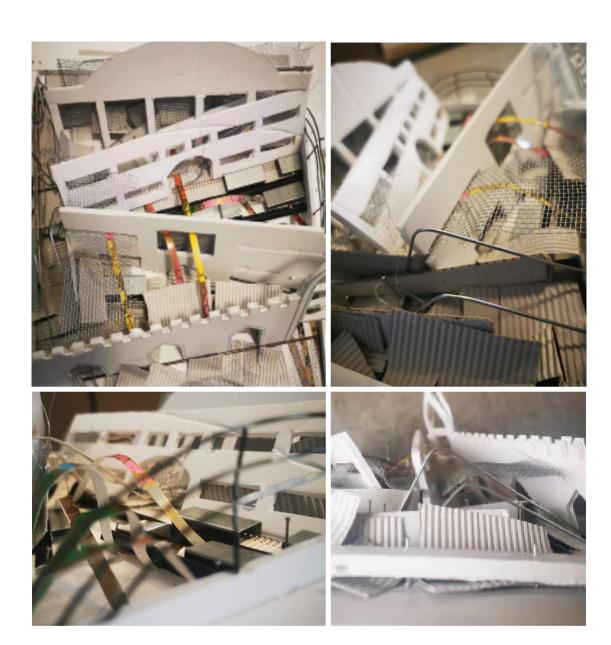


### MO1: SITE

The first model's theme is "site/ground," and my starting point is to see Barakholka as a whole object, an autonomous zone. The model wants to represent the relationship between the human-made objects on the site. In this model, the needles represent entities with controlling factors or prerequisites, such as existing grid, national boundaries, forests, etc. Different thicknesses of wires represent different infrastructures and bazaar space. The model reflects that the infrastructure shapes the morphology of Barakholka, while it in turn influences and changes the surrounding environment and flows.



FIG.22 MO2: ASSEMBLAGE



### MO2: ASSEMBLAGE

The first model's theme is "assemblage." Based on the understanding of the spatial characteristics shaped by the front and back streets of Barakholka, my approach is to take the shape of the facade and the facade components to fold the streets and create new spatial relationships and characteristics. Four main elements are involved

in this model: gas line, structure of billboards, faintly visible containers, materialized ribbon (symbolizing the color of the facade). This model is an architectural attempt to explore what kind of space has the potential to become a space of negotiation.



FIG.23 MO3: ATMOSPHERE









### MO3: ATMOSPHERE

The model is an exploration of the relationship between the four main program/activity networks in Barakholka. The four colored networks are connected to movable rods. The white woven nets refer to formal trade sales activities, while the black ones are informal business activities. The light yellow one refers to logistics activities, which spread throughout the installation, and the other networks are hooked to the logistics

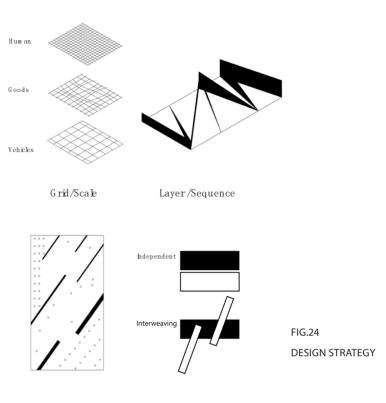
network and dependent on it. The orange network is the other commercial leisure activities derived from the other three and is anchored in the other weaving nets. The device itself is movable. With each change, the scale and size of the different networks change, each interdependent and cooperating, contribute to the bazaar system's fluid stability.

# CONCLUSION AND REFLECTION

Studying market spaces allows me to understand better the uncertainty and heterogeneity of everyday life and the importance of borders and territories in shaping urban environments and human activities. Meanwhile, the transformation of urban space is an everlasting and challenging issue. Instead of thinking about designing a modern space, we should think about what holds the area not obsolete and stable to be used. For example, in this project, the Logistics network and informal trade network are the backbones of this bazaar, and both of them rely on the circulation of goods and infrastructures. Hence, a transformation of commercial space only is not the way to improve the existing problems.

The power that influences the world today has become the relational effects of objects and their interaction with human beings. It shapes the city and engenders the space. It is time to appropriately shift our gaze from the human-centered aspect to the material aspects of the built environment, focus more on artifacts and technology and their impact on space production and human behaviors.

In my design, I believe that each existing practice and spatial field 208



Axis & ControlPoints/Flows

Volume/Formal& Informal

has its reasons for existence. Modern shopping malls bring a more comfortable experience, clean spaces, and more efficient logistics networks, while traditional bazaars are essential for local employment and cross-border trade contributions. Therefore, the transformation aims not to solve conflicts but to design a place of negotiation where heterogeneous entities and activity networks can coexist. The project should meet the following characteristics: inclusive, open, flexible, and resilient.

Besides, in this design, all

kinds of activities and practices often bring multiple flows that might affect the space's stability. Therefore, the project should consider the relationship between the different flows and the entities included as well as the combination of spaces of different scales to meet the usage of multiple groups(e.g.human, goods, vehicles, infrastructure). Figure 24 shows my initial design strategy.

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