

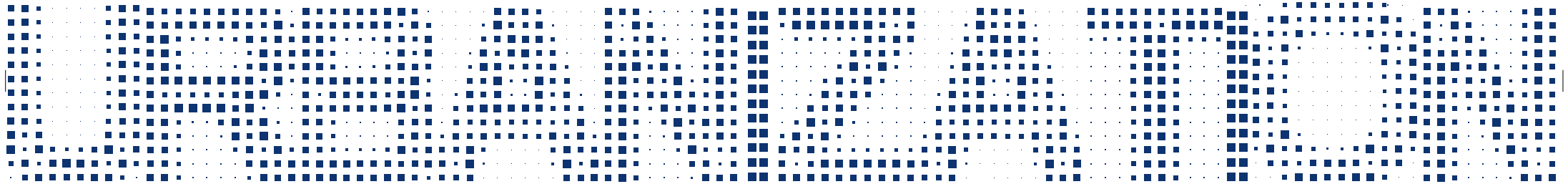
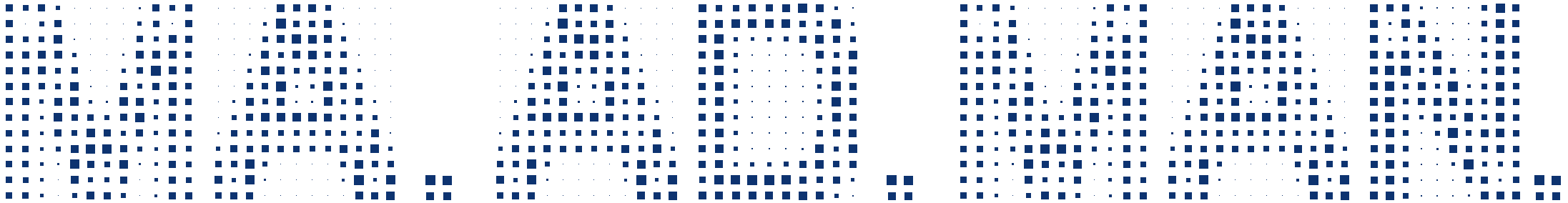
Die approbierte Originalversion dieser Diplom-/
Masterarbeit ist in der Hauptbibliothek der Tech-
nischen Universität Wien aufgestellt und zugänglich.

<http://www.ub.tuwien.ac.at>



The approved original version of this diploma or
master thesis is available at the main library of the
Vienna University of Technology.

<http://www.ub.tuwien.ac.at/eng>



Masters Thesis Diplomarbeit



TECHNISCHE
UNIVERSITÄT
WIEN

Ma.Ad.Man Urbanization

*Urbanisation and matters in urban planning:
investigating a tool for urban development the
invention of a utopia and the design of an urban toy.* *Thematiken der urbanen Planung und Entwicklung,
der Entwurf einer Utopie und das Design eines
urbanen Tools, ein Spielzeug.*

*Elaborated with the purpose to obtain the
academic degree of a Diplom-Ingenieur
under the supervising of:* *Ausgeführt zum Zwecke der Erlangung des
akademischen Grades eine Diplom-Ingenieurs
unter der Leitung von:*

Ass.Prof. Arch. Dipl.-Ing. Dr.techn. Markus Tomaselli

&

Arch. Dipl.-Ing. Michael Rieper

E260S

Department for spatial planning and urban development.

handed in at the Vienna University of Technology eingereicht an der Technischen Universität Wien

Department for Architecture and Spatial Planning Fakultät für Architektur und Raumplanung

Gregor Doblinger BSc.

0527307

Wien am, 30.10.2015

Abstract

English

The exciting matters in the context of globalization and urbanization, and the resulting influences on the lives of each of us, lead to a collection of experiences reflected in words and pictures. A discussion of the substantial qualities of urban space which makes a comparison of master planned structures and informally grown areas. Informal growth is a fact in many of the world's largest urbanities. A discourse in the middle of actual occurrences, historical and social facts influence the sustainability of Life in urban agglomerations.

This multitude of collected data and the observed social facets lead to the conceptual design of a Utopia: a Utopia that designates each user the same amount of space in an urban arrangement. Each resident of this Utopia can move and place its unit as it pleases, resulting in a "mobile - non static - urbanity". To observe the possibilities of this Utopia, I wrote a script in the field of algorithmic design, to be able to simulate and optimize random model versions of this urban utopian occurrence.

Freedom of scope for every Utopian is a further paradigm, visualized with the help of a further script, also written in the context of this thesis. This script generates from a plurality of options, unique and individual structures. And finally, these units can be reproduced by using rapid manufacturing techniques, this materialized output is a so called "urban tool" and has the quality of a "toy" for anyone, and can be used to mediate urban matters easily.

German/Deutsch

Die Inhalte rundum Globalisierung und Urbanisierung, und deren Einfluss auf das Leben von jeder Einzelnen und jedem Einzelnen, werden in Wort und Bild wiedergegeben.

Eine Erörterung von wesentlichen Eigenschaften urbaner Räume und eine Gegenüberstellung unterschiedlicher Strukturen, einem Masterplan zugrunde liegen andere die auf informellen Wachstum zurück zu führen sind. Informelles Wachstum das in vielen der größten Städte der Welt zum Alltag gehört.

Einen Diskurs zwischen aktuellen Geschehnissen, geschichtlichen und sozialen Fakten, welche das Leben in den erkundeten urbanen Agglomerationen nachhaltig beeinflussen.

Diese Vielzahl an Informationen und die erkannten sozialen Facetten führen zu einem Entwurf von Utopia, in welchem jedem Nutzer, jeder Nutzerin in einem urbanen Gefüge gleich viel Raum zusteht. Dieser Raum kann von jedem Bewohner bewegt und nach persönlichen Vorzügen positioniert werden. Es handelt sich um eine „mobile nicht statische Stadt.“

Dargestellt und entwickelt mit der Zuhilfenahme von algorithmischem Design und entsprechender Scripte, um dieses dynamische Modell von Utopia in Variationen simulieren und optimieren zu können.

Die Gestaltungsfreiheit jedes einzelnen Utopianers und jeder einzelnen Utopianerin ist ein weiteres Paradigma, und wird durch ein zweites Script visualisiert, das aus einer Vielzahl von Möglichkeiten für jede Einheit eine einzigartige Struktur generiert wird. Diese Strukturen können auf verschiedenen Wegen in Form von „Spielzeug“ ein „Urban Tool“, mittels Rapid Manufacturing 3D gedruckt und zum Bau eines ganz persönlichen Utopias verwendet werden und ermöglichen eine einfache Vermittlung der urbanen Thematik.

References

The methodology and process for this thesis is (claims) to make a span between scientific, artistic and personal ideas for future urban planning, analysing different situations in different places I have been to.

An intense communication with my supervisors for this thesis, Michael Rieper. Bringing order to my sometimes confused ideas and approaches

(Individual and personal interpretation of urban life for a better understanding of the needs urban planning should fulfil.)

The content of this thesis is widely based on personal experiences, with the addition of generally accessible data about the selected cities, and context-related literature, to meet scientific standards.

Methods:

A quantitative analysis of 14 different cities.

General theory about urban planning with a personal insight

A theoretical discussion of urban planning parameters.

Design and visualisation based on my architectural education and personal experiences in art and handicrafts.

Preface

It was not always my interest to deal with urban planning, but after some years of studying architecture I became totally fascinated by it. Even more, I was caught by the fact that urban life asks for a constant change in cities to keep them liveable for their inhabitants, as I would consider myself as one of many. My personal motivation to understand how urban life, planning and the building of urbanity work together. My teachers at the university and professionals in the fields of urban planning taught me to see the many different elements and needs that urban planners are tied to. But I learned as well to question existing strategies and theories for urban planning.

It is sometimes that we are caught between ideals and pure facts, but knowing that life is not always a task that is to be described by sciences. This is where we can be happy if art and creativity are acting as transformers of problems into understandable causes. This made this thesis in many ways a very personal collection of facts and ideas. A way through a lot of different emotions and difficulties. Difficulties a single person can hardly deal with.

I wish to thank parents Christine and Alois, who supported me throughout my studies and this thesis with all their possibilities. My brother Tobias who helped me to realize all the 3d printing for this thesis. My sisters Flora and Teresa and my family for their mental support. Mark Paul Hedley for his extraordinary effort in proofreading and Mrs. Adrea Mach for her spontaneous assistance in this regard too. My colleagues and friends from university, especially Eveline, Madlyn Christoph and Thomas. My tutors Markus and Michael. All my friends and flatmates, especially Johanna, Lukas, Henriette, Alma, Christian, Magdalena, Karina, Toni, Thomas for being there, understanding and helping. All the people I met on my travels from whom I learned so much for this thesis. Especially Edgar, Sheila, Vivian and Andrea who also offered their understanding, help and allowing me stay up on top of the mess we sometimes find in our cities and the dramatic situations many face.

Introduction

How can a city or urbanity be characterised?

There are many points of view regarding the perception of urbanity (a city), this variety of views has as many angles as people live and participate in an agglomeration. Some focused views are very technical and point to functionality, other insights tend to be philosophical and are based on humanities like sociology or anthropology. But the notions of many perspectives are just about dealing with the viewer's life and how to live it optimally and often how to survive.

The sciences have come up with a huge variety of criteria to define the various aspects of urban life. Simply, we classify urbanity in many different ways. If we find suitable embedded technological systems that define our cities then it is also likely that we use these systems to rate them. A city, for example, can be rated in terms of money, to see whether a city is financially liquid or not. This aspect is most likely to be used to rate a city if it is a good place for business, and finally tells us if there are good job opportunities. Cities also could be rated on whether they offer qualities that may result in a more "exiting life" as elsewhere, as for some of us it is only important that the city is an interesting and stimulating place. And there is, maybe, the most important criterion: "how liveable is a city?" Often however, this is not amongst the primary considerations of where to go. Sometimes people do not even think about their human nature and needs and others do not even have the chance to consider such criteria. Despite the multitude of facts and figures available, we gather our most intense impressions of cities with our senses and this is a point where pure science reaches its limits and a quantitative description of a city is not sufficient.

Almost half of the world's population lives in huge urban areas. Each city dweller has his own images, understanding and ideas of the area they live in. Some do not have a positive image because of shortages they may face; others chose a city they imagined to be their favoured place to live and have since found themselves with unmet expectations. Not uncommonly are the inhabitants' impressions formed based only on the perception from a local area that people would call their neighbourhood. These locally formed impressions may decide if an urban resident has a positive or negative image of the whole city, their home. To get a better understanding of the factors around urban life, this thesis starts by examining fourteen different cities rich and poor on four continents in a narrative way.

The impact of influences

The field of informal urban growth is of great importance in understanding what influences a city's identity. Places where the count of persons per km² reach a densities of 700.000 (p/km²), are as high as nowhere else, such densities are most probably found outside of formally planned urban neighbourhoods. These are the areas that express pure life in the undirected decisions of thousands of residents. On these streets you can read the histories of buildings, and with the story of a building, the story of its residents. Despite this gathering of multiple sometimes conflicting identities, every city shows a tendency towards a bigger identity. At its best, this comprises of things that everyone can use to like themselves to

where they live. In the case of an informally built neighbourhood these overlaid built-up structures of identification are not usually created on purpose, but this does not mean that the higher-level identification does not occur

With this in mind, a next step is to the search for more precise explanations, combined with the quest of comparable elements between informally grown and formally planned and built areas. If one compares some of the surfaces of these two entirely different poles, one does not find many overlapping characteristics, at first. But, if we compare currently growing and informal neighbourhoods to existing cities (developed over hundreds of years) one can see all kinds of layers and attributes that overlap or show similarities. Historic urban structures tell stories, each building within an area tells its own story, stories of failing and stories of succeeding, generating values for identification. And so it is with informally built houses, they all tell a story. All these different surfaces, influence our perception of urban space and make one decide if one feels well and human in an environment or not.

It could be that occasional failure is in fact a necessary part of the development of urbanity, trial and error helps the city to finally match the needs of its residents. A constant cycle of adaption to the current needs, often just for moments, is clear in informally built areas. The mostly simple constructions in informal areas also allow a much quicker response to changing needs. Conversely, structures of formally built areas are strong, very static and do not allow quick responses to the changing needs of their users but



when well-functioning not so many changes are required. A city is nothing static at all though and whatever we make in a city could be changed soon. As long as we have these opportunities to change where we live cities will adapt to their residents, otherwise we will become stuck with urban elements that become a pain by losing their functionality.

This leads to the question “is it possible that the two entirely different practises, formal and informal development, learn from each other so that we eventually have a mixture of the two?” There are areas where this is just happening, without anyone having planned it. It would be extremely challenging to attempt to willingly define a process that enables concurrent development of clearly informal and explicitly planned formal structures. To finally identify a method of achieving this mixture poses difficulties but overcoming these hurdles could be seen as a clear advance in urban development.

Finally, the way things are developed is directly related to the quality of the built structures, like sustainability or friendly appearance. The quality of built up urban areas is most commonly judged by their longevity, aesthetic appeal, internal function and community life. This includes life outside one’s home.

It is not easy to prioritise between different levels of quality formal and informal structures have to offer. Different city dwellers will interact with different aspects of the building depending if they are neighbours, owners or tenants. It is however hard to involve people, whose lives will never include the use of a skyscraper due to economic circumstances. It is therefore difficult for them

see any sense in relating to such structures: In this case the relationship between a poor person and a skyscraper does not exist per se.

To simplify this, formal and informal are simply seen as two different kinds of surfaces with different appearances. This is coherent with what we see if we walk through an urban neighbourhood. The main differences are in the size of the surfaces, informality appears with much smaller fragmentation of the surfaces than formally built structures. Further differences are to be seen in the regularity of urban fragments, fragments of the informal appear to be randomly scattered and formally planned fragments stand for a clear order. Translating this into a planning or development strategy would mean splitting the surfaces into a multitude of fragments, and allowing individual adoption of these surface fragments, it would also mean reducing the influence of the planners and architects on the resulting overall design. This would generate a much more vivid manifestation of urbanity, and in terms of storytelling each of these fragments would develop its own living history. The urban surface would be much more detailed and colourful, than rigidly planned and designed structures ever could be. If this were to be finally transformed onto the entire manifestation of built-up structures across a larger urban space, it would allow a much quicker response to required changes, because the individually shaped parts could be changed at a very small scale, and the changes needed could go head in many small steps without interrupting other related urban elements.

For a better understanding of this theory, a look into the processes of informal development is necessary. Informal development clearly has nothing in common with a long term plan. Squatters with little personal wealth and people who finance their lives on a day to day basis, will improve their home once they have some extra cash. They are only able to invest sporadically to improve their home, rather than make planned improvements or complete regular maintenance. The one day this could mean the buying of some sheet metal to improve the roof, and when the family has the money – bricks to replace wooden walls. This is clearly not the right situation for a long term centralised plan, the only working mechanism might be proper education about possible complications. An entire plan for a building would not help, as there is the clear missing of financial capital to implement such a process. But, as there is no plan involved the architecture resulting from this step by step evolution can be seen as a record of the people’s lives, and makes the stories behind this accretion visible.

To impose informality on a planning process is not a new idea, as there already exist some objects that show at least on the surface a structure that should imitate an informal process, but it never looks the same as buildings that carry the story of individuals on their surface. To imitate this with theoretical invented processes could never be as complex as the actual accretion of improvements and new features. If these qualities can be achieved, this is only possible by the direct inclusion of informalities and irregularities as an element of urban design and development.

The next step in scale is the general urban space, urban space is clearly not only about all the singularly built units but these units are still the elements of the general arrangement of urban space. These single units create uncountable possibilities of how to array, build, perceive and use the built-up space around us. The possibilities available to us are controlled by what we perceive, and these perceptions are responsible for the relations we might have to a certain space. A perception can be influenced by subtle details, imparted by the planned and unplanned structures around us. Urban surfaces and spaces are also not just the buildings and the space between them, they are much more. There are as many different ways to describe space as there are people who use it. The general theories reach out into different fields of study, for example sociology has its very own description for space. Space can also be described as a mind model.

Finally it is about the life of single inhabitants, urban life seen as the life of a single person. Each person has their own feelings and needs, skills and knowledge. And the question arises, if it is possible to incorporate in the life of a single person into the pluralities urbanity consists of? The other way around, urbanity is the addition of all the single urban residents, so it is obviously necessary to find a way to share the overlapping needs of all the unique participants, and the need to create awareness between all single humans. The conclusion is to share knowledge and skills by incorporation of all the future residents. To accomplish this we require a pool of know-how which includes the designing, the building, the growing, the developing and the planning of urban space.

... the merging of planning and doing ...

My vision of urbanity is as an experiment, an attempt to picture and collect different ideas for urban life reduced to a minimum of elements. With the main focus being to merge planning and doing as similar parts. Generally it is impossible to draw a picture including all the facts and facets urban life has to offer, meaning the holistic and entire understanding of urban life is impossible. Describing and understanding such complexity is only possible with simplifications and narratives. In this case it is the reduction of urban life to the single point of view of one individual, and the assignment of a standardized space to each individual, to finally find a way to make urban life understandable for everyone. As soon people are able to understand, in this case their own urban surrounding, this will be the base for my ideal urbanity. Understanding ones surroundings, enables one to participate, and once an individual is participating, the individual can start being as active part of the place where they live. This might lead to a direct identification of a person with their surroundings; Achieving a cooperation of individuals towards small sized communities, communities which will work collaboratively, and so on, to create the essence of urban life. An ideal city is no longer a place defined by a set of theoretical perfect standards it is much more an urbanity defined and arranged by its residents, my city and your city, our city, an urbanity that could literally occur anywhere not bound only to one spot but also something that could disappear the next day, a city that could also be nowhere. Having an absolute freedom of mobility for the residents.

Ma.ad.man. Urbanization is an analysis, a vision and a utopia at the same time, with the focus on a human world at a scale that holds proportion to us as humans. The future will continue with the growing of the world's urbanities, humanity and the human as an individual remains a crucial part of this growth, just as one out of many examples, some socioeconomic groups are just not included in the planned development of our future cities.

With the year 2050 as much as 75% of the global population are estimated to live in so called urban agglomerations, to be prepared and enabled to properly deal with this challenges many different solutions should be at hand. This very personal and individual approach is a mind game towards a well-considered future urbanity, it is not primarily about the building or planning of entire cities. It is much more an approach to enable the individual with their solitary life to participate in the multitude of activities that urban life consists of. This utopia, is a tool for urban education rather than anything that we would like to have realized because idealized approaches quickly turn into the not so much appreciated dystopia. This utopia is also to be seen as a provocation of alternatives to the copy and paste trends, in the actual contexts of urban planning. This is achieved by the designs that have evolved for this thesis being based on randomly generated surfaces and structures, giving individual appearances to each unit - other than any copy and paste action, which would result in absolute regularity.

For a better understanding what urban life currently is/means, I started many years ago to collect information about many cities. I made excursions to these cities (some of which I inhabited) and I documented my experiences with pictures and records of the day-to-day of living in that city, and constantly extending my knowledge of urban life.

Table of Contents

Abstract

 *English*

 *German/Deutsch*

References

Preface

Introduction

 *How can a city or urbanity be characterised?*


Table of Contents

1


One Globe

Globalising World, Urbanizing Globe

Global Facts

 *World land use and coverage of
the earth's landmass*

 *Distribution of Urban Areas with a
Population Greater than 500.000*


 *Distribution of the World
Population between Rural Areas
and Megacities*

 *World Population Projections in
Billions*

 *Growth of Urban Regions*

 *Grade of Urbanization*

World Map


 *Selection of the "blueprinted"
Cities*

2

Cities

Urban Characteristics

 *Between plain Data and
Experiences*

 *We could let decide numbers, they are
never wrong?*

Bogotá

 *Into to the City*

 *What makes people move into cities.*

Vienna

 *Past and Present*

 *Cities have faced for a long period of time
all kinds of different difficulties.*

🏠🏠🏠 **New York City**

🏠🏠🏠 **The Big Apple**

🏠🏠🏠 *The “Mega City”.*

🏠🏠🏠 **Mumbai**

🏠🏠🏠 **Next Door City**

🏠🏠🏠 *Everything is around the corner.*

🏠🏠🏠 **Chandigarh**

🏠🏠🏠 **City Planning in Post Industrial Times**

🏠🏠🏠 *Cars and villages, a master plan?*

🏠🏠🏠 **New Delhi**

🏠🏠🏠 **Big Times Coming Up?**

🏠🏠🏠 *Prognoses make New Delhi the largest city of the future, meanwhile it turned into our planet’s dust-hole.*

🏠🏠🏠 **Barcelona**

🏠🏠🏠 **City Planning Habits**

🏠🏠🏠 *How to plan a city and the city planer.*

🏠🏠🏠 **Lima**

🏠🏠🏠 **What Makes the Difference?**

🏠🏠🏠 *Poor and rich areas separate themselves in a very clear manner.*

🏠🏠🏠 **Table: Summery of planning strategies and principles in Latin American cities**

🏠🏠🏠 **Quito**

🏠🏠🏠 **Linear Expansion**

🏠🏠🏠 *Qualities as disadvantages?*

🏠🏠🏠 **San José**

🏠🏠🏠 **Nothing Special**

🏠🏠🏠 *Proportions of a city to the size of the country.*

🏠🏠🏠 **Managua**

🏠🏠🏠 **Along the Ring of Fire**

🏠🏠🏠 *How bad things can become.*

🏠🏠🏠 **Medellín**

🏠🏠🏠 **Vibrant Cities**

🏠🏠🏠 *The metamorphosis of Medellín*

🏠🏠🏠 **Ahmedabad**

🏠🏠🏠 **The Perspectives for Future Megacities**

🏠🏠🏠 *Estimated future growth of cities.*

🏠🏠🏠 **Detroit**

🏠🏠🏠 **Let It Die?**

🏠🏠🏠 *Is the end of urbanity - Suburbia?*

🏠🏠🏠 **Dholera**

🏠🏠🏠 *How much planning is recommendable to build a good city?*

🏠🏠🏠 **Planning or defining a megalopolis**

🏠🏠🏠 *Thoughts about DMIC.*

☐.☐.☐ **City Network Maps:
Overview**

☐.☐.☐ *Comparing the available data from
openstreetmaps.org.*

☐.☐.☐ **Aerial Imagery: Overview**

☐.☐.☐ *Comparing the urban regions of the
selected cities by means of pixels.*

3

The Excitements of Urban Planning

☐.☐.☐ **Urban Planning is
Exciting**

☐.☐.☐ *So to say: Urbanity is something that
happens - excitement about the occurrence
of urbanity.*

☐.☐.☐ **The Search for Ways to
Plan (for) the Future**

☐.☐.☐ *is it possible to plan for the future or is it
planning the future, or is just planning in the
present?*

☐.☐.☐ *An ideal urban plan, not to
plan, just to let it happen?*

4

A Villager goes Megalopolis

☐.☐.☐ **From a Village to a
Megalopolis**

☐.☐.☐ *About the individual in a superlative.*

☐.☐.☐ **“Time-Lapse” – The
Occurrence of Megalopolis
(The Fictive/Timed
Occurrence of a Megalopolis)**

☐.☐.☐ **What is the difference
between the growth and
development of a village
towards a megalopolis
and the movement of an
individual?**

☐.☐.☐ **Earth City Lights**

☐.☐.☐ *... reveal the globe’s Megalopolises*

5

Urbanity is Thoughts

- ■ ■ ***Layers and Reasons Behind Urban Structures***
- ■ ■ ***Infrastructure from Local to City-Wide***
 - ■ ■ *Movement and transportation is a very visible layer within a city.*
- ■ ■ ***A City is Often Only the Result of Regulations***
 - ■ ■ *Developed in the cage of bureaucracy.*
- ■ ■ ***Magic 'DENcity', Density Defines Cities?***
 - ■ ■ *Another thing in urbanities which is not touchable, how one can say many or not so many people.*
- ■ ■ ***Specification of Density Definitions***
- ■ ■ ***FAR, DU, POP, BUVP, ...***

6

Physical Elements

- ■ ■ ***Elements/Units of Cities***
 - ■ ■ *The evidence of manifestation in space.*
- ■ ■ ***A Brick***
 - ■ ■ *A most versatile element.*
 - ■ ■ *Will there always be a limit?*

7

Techniques and Approaches in City Planning

- ■ ■ ***... Then and Now***
 - ■ ■ *The ones who plan and the ones who don't*
...
 - ■ ■ *Things urbanity should be stuffed with – superlatives in urban planning*
- ■ ■ ***... Then***

■ ■ ■ *A small excursus to the roots of urban planning.*

■ ■ ■ ***Utopia - not here, somewhere else, a perfect world***

■ ■ ■ ***PLANNING - IMAGINE - THINK UTOPIA***

■ ■ ■ *The dreams of a perfect world ...*

■ ■ ■ *Understanding the planning of an urbanity as a strategy, and what often happens.*

8

Grown and Blueprint(ed) Cities

■ ■ ■ *Between the Plan to Build a City and the Map as Guide to cities*

■ ■ ■ *Romanticized Growth*

■ ■ ■ *(In)formal*

■ ■ ■ *Zones of Integration*

■ ■ ■ *Where city happens?*

■ ■ ■ *Integration - Segregation*

u1

Designed Elements: Overview

■ ■ ■ ***The Idea: Worldblock.org***

■ ■ ■ *Interactive Participation*

■ ■ ■ ***An Evolving Idea***

■ ■ ■ *My very personal way in creating this manual towards urban awareness.*

■ ■ ■ *The Elements of worldblock.org*

■ ■ ■ *Overview*

■ ■ ■ *The extent of MA.AD.MAN. URBANIZATION*

u2

Utopia

■ ■ ■ ***Utopia as it Should Be!***

■ ■ ■ *Not here - some where else - every where.*

- ☐☐☐☐ *Special Qualities*
- ☐☐☐☐ **Simplification**
- ☐☐☐☐ *A unitary three dimensional grid, based on a simple cube.*
- ☐☐☐☐ **The City in a Cube**
- ☐☐☐☐ *The reduction of urbanity into a single cube.*
- ☐☐☐☐ **6D**
- ☐☐☐☐ *A single Cube with 3 + 1 + 1 + 1 Dimensions.*
- ☐☐☐☐ **First Clouds Arrange**
- ☐☐☐☐ **... and Rearrange**
- ☐☐☐☐ **... and Shrink**
- ☐☐☐☐ **The Main Technical Concepts**
- ☐☐☐☐ **From the First Layer to an Urban Cloud Population**
- ☐☐☐☐ *Code Overview*
- ☐☐☐☐ *A defined space that literally can move every where. It is autonomous, a space ship, individuals build an urban structure, the Urban Cloud.*
- ☐☐☐☐ *Defining the Extent of the Urban Cloud*
- ☐☐☐☐ *Further Handling*
- ☐☐☐☐ *Simulations, generations, chaotic things that arrange, ...*
- ☐☐☐☐ *Control of Details*
- ☐☐☐☐ *Bring some Colour to the Urban Cloud*
- ☐☐☐☐ **Cloud Structure in the Rhino View Port**
- ☐☐☐☐ *The Urban Cloud Moves Into Existing Cities*
- ☐☐☐☐ *Cellular Automaton, implementation of given algorithms*

- ☐☐☐☐ **Urban Cloud Script - Documentation of Different Clouds**
- ☐☐☐☐ *2015_10_14_22_8_10_UDI*
- ☐☐☐☐ *2015_10_15_10_54_5_UDI*
- ☐☐☐☐ *2015_10_15_1_38_3_UDI*
- ☐☐☐☐ **The Evolution of Different Urban Clouds**
- ☐☐☐☐ **A Gathering of Several Ma.Ad.Man. Urbanizations**
- ☐☐☐☐ **Vertical City-Cloud**
- ☐☐☐☐ **Utopian's Excitement in Experimenting**
- ☐☐☐☐ **Also, Mega Blocks Might Occur**
- ☐☐☐☐ *Social life turns into a homogeneous structure.*
- ☐☐☐☐ **Movement of Ma.Ad.Man into Existing Cities**
- ☐☐☐☐ *In this case New York City, in the back the World One Trade Center*
- ☐☐☐☐ **Ma.Ad.Manians Make New Space Accessible**
- ☐☐☐☐ *Not to far from Earth somewhere in the Milky Way.*

u3

As Simple as a Cube is

Diversity and Inspiration

 *The mass production of diversity.*

 *Main Control - Settings*

 *Manual Configuration of Urban Dice Script*

Rapid Manufacturing

 *Prototyping techniques turn into mass production.*

 *Script Elements that give Uniqueness to Every Urban Dice*

Different Sizes, Different Types, Different Scales, ...

 *S1, 1 to 1, 1_Pin, Bender, Zh10, SQ, S-A*

 *S1, 1to1, 1_Pin, Milli, Zh20, MixA, S-A*

 *S1, 1 to 1, 1_Pin, Soli3D, Zh20, OLD_V, S-A*

 *S1, 1to1, 1_Pin, Hinchey, Zh10, H_O, S-A*

 *S1, 1 to 1, 1_Pin, Hinchey, Zh10, MixB, S-A*

 *S1, 1to1, 1_Pin, Soli3D, Zh10, F_on, S-A*

 *S1, 1 to 1, 1_Pin, Milli, Zh10, V_O, S-A*

 *S1, 1to1, 1_Pin, Bender Zh05, OLD_H, S-A*

 *HS, 1 to 1, 1_Pin, Bender, Zh10, MixC, S-A*

 *X2, 1to1, 1_Pin, Hinchey, Zh10, MixC, S-A*

 *X2, 1 to 1, 1_Pin, Bender, Zh10, IMAGE, S-A*

 *HS, 1to1, 1_Pin, Milli, Zh10, MixC, S-A*

 *X4, 1 to 1, 1_Pin, Milli, Zh10, MixC, S-A*

 *Fit the Urban Dice Together*

 *Different Scales*

 *Things do not necessarily work at once.*

 *First Generation in the Final Design*


 *Communal Dice - Scale 1 to 128, Size 1_64*

 *Public Dice - Scale 1 to 128, Size 1_32*

 *Micro dices - Scale 1 to 128, Size 1_256*

 *Urban Dice - Bender - Scale 1 to 128, Size 1_128*

 *Line-Up on a Public Space, 1 to 128, Sizes 1_32, 1_64, 1_128, 1_256*


 *Urban Dice - a Comparative Study*

 *Urban Dice, with hinges, 1 to 64, frame only*

 *Urban Dice - With Scale Imprinted*

 *Close-Up, Communal Dice, 1 to 128, Size 1_64, double height*

 *Study of Different Dice*

 *The printing in progress of a small city, Scale 1 to 128, Size 1_256.*

 *The "Factory" of Urban Dice*

u4

Throw the Dice

■ ■ ■ **A Hub - Everything is Connected**

■ ■ ■ *About the understanding of virtual and real relations that urban life is based on.*

■ ■ ■ **A Simple Pin**

■ ■ ■ *Urban Dice-Pinboard*

■ ■ ■ *Urbanity: “A Stage for Utopians.”*

■ ■ ■ **A Stage for Urban Residents**

■ ■ ■ *Urbanity - a Central Processing Unit?*

■ ■ ■ *The CPU. Every thing is linked and millions of possibilities arise.*

■ ■ ■ **Watch out for Neighbours**

■ ■ ■ *Transfer of the Code from the Urban Cloud Script to the Urban Dice Script*

■ ■ ■ **The Game Can Begin**

■ ■ ■ *Play the Urban Dice, explore their possibilities.*

■ ■ ■ **Let's Shake the Dice!**



Appendix

■ ■ ■ **Résumé**

■ ■ ■ **Epilogue**

■ ■ ■ *“La Cuadra”, the creation of a font for the page numbering in this document.*

■ ■ ■ *Algorithmic and Parametric Design (in Grasshopper).*

■ ■ ■ *As a tool for many things.*

■ ■ ■ **List of Citations**

■ ■ ■ *Table of Figures, Maps, Aerial Views and Photos*

1

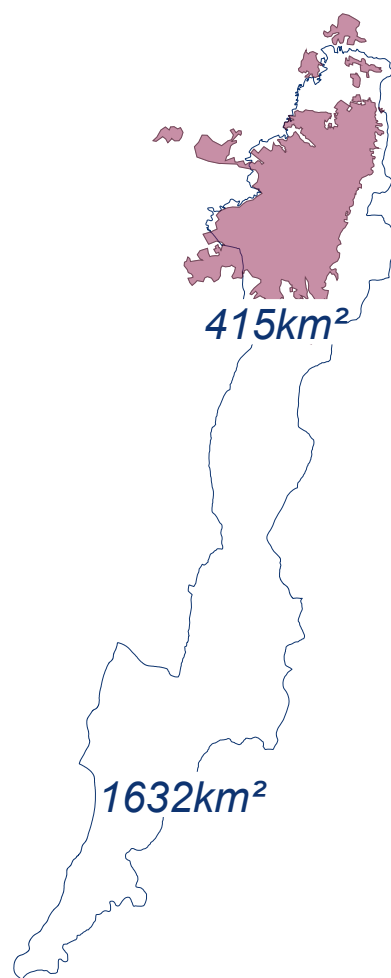
One Globe

Globalising World, Urbanizing Globe

Could globalization and urbanization be the same thing? They are not exactly the same but closely related and are totally woven together. So to say, urbanization is part of globalization and vice versa: globalization is part of urbanization.

Urban areas bring everything closer in a local context but the extent of urbanity is globalization. Globalization from a local point of view means to be connected to the world. Is a place urbanized as soon one has access to internet, connected to the world by a plug? Or, does it mean that one is no further away from an international airport then for example two hours? Would it mean, that I am no longer in an urban area if my ride across a city to an airport takes me more than two hours? Or, is urbanity simply defined by the population density, as a higher population density in our agglomerations means a more effective land use. An agglomeration would be classed as urbanity as soon it reached a certain density, which would make the term urbanity simply a description of a different kind of land use.

Currently the human population uses about thirteen percent of the earth's landmass as croplands. If land use rises in the same way, as some prediction methods have calculated the growth of our global population, will require much more effective land use than we have today. Due to these predicted land use changes the definitions of urbanity might also be altered. The definition of urbanity might only by a snapshot of a current state of the social formation in a defined area.



- built-up urban area of the city of Bogotá
- City of Bogotá

001 Date 30.09.2015, Graphic by author, Data Source. openstreetmap.org and publicly accessible aerial views

Definitions are not always as clear. In general the differences between a metropolitan area, an urbanized area and an actual city are not always as clear. And so it is that all-purpose definitions are not easy to make and the multiple definitions that exist will always vary. A definition which would find a general use depends on the way people are counted in the local census, but till today there is no global common method for the counting of a population. With the data provided by the United Nations the statistics show large inaccuracies following the differences and variety our world's cities have. Figures generated with this data are not suitable for clear comparisons, but still enable to make illustrate the main differences.

Technical solutions will properly generate more accurate statistics in the near future and currently research is being conducted to evaluate the population with the use of satellite imagery and mathematical approximations. By analysing the patterns of buildings, infrastructure and the light density at night, combined with very detailed population counts of small sectors in comparable areas the estimates are being harmonized. (Source and one city lights image) Maybe this data will help to generate more comparable numbers for the future. If the purpose of such estimates is to inform policy one could also ask "why not just visit a place?" look if there are deficits and try to improve the situation.

The following explanations are a personal examination of the key terms used to define our urban structures. As mentioned, they are usually complex concepts that do not lend themselves to any single description but for the context of this thesis I have stuck to the following definitions.

City - an area within an urban agglomeration defined by administrative borders, sometimes the area of the city can be larger as the actual urban area. These boundaries often build a virtual border. Historically many of our cities have been adapted with the growth of urban areas and the city borders have been extended from time to time. One of the goals is to provide clear land use perimeters and administrative integration as a shared base for the ongoing development of urban regions. Cities are further discussed in the part of this thesis dedicated to history.

Metropolitan Area - The area that is directly related to an agglomeration. The land use does not play any role in describing this area. A metropolitan area also appears if two cities close to each other, but with rural areas in between, as long as they show connections and are related to each other. It is hard to compare different metropolitan areas, as their constituent parts vary widely between farmlands, industrial areas, nature, and every other type of land use. For example, in talking of density, figures of population in a metropolitan area do not tell us much about the density as there are too many ways in which the overall population shares use of the land in all the different areas included. The comparison of metropolitan areas would be one between places with similar economic characteristics but with entirely different built up configurations/formations.

Urban zone, urbanized area, urban area - share much of their area with a defined city but might exceed the political borders of a city. Economically dependent, the identification is usually related to the “core city”. However, regulations about urban elements commonly vary widely within a single urbanized region as there are often various different political and administrative boundaries found in the middle of urbanized areas.

Urbanization - Urbanity - Is defined by certain characteristics. Definitions about what urbanity might be often vary and are related to the situation of the people and actors in an area. It is common to follow different rules in defining urbanization in different cases. The definitions are based on local rules about defining urbanity. For example an agglomeration of 200 individuals within a continuous built-up area is by the Swedish definition an urban area.

But a quiet densely populated area with 50.000 inhabitants in China might not be classified an urban area by their definition, in China this places could still be considered agricultural areas.

(The) Built Up Urban Area(s) - Is an area with continuous built up structures with no larger gaps. This is a rather new definition in the field of urban sciences and seems to be a step towards a more useable definition to compare urban areas. As all the other definitions do not lead into comparable statistics.

The Megalopolis - Is the superlative when talking of continuous extents of urban areas, without mentionable interruption of the urban elements and structures. The term megalopolis describes a sequence of urban

areas as a superlative without any exact definitions. Simply it is huge! To compare any two megalopolises would hardly make sense, as any known qualities will most properly be found in every megalopolis. For one who lives in a megalopolis it does not change much, if there are big transformations on the other end of the megalopolis maybe 500 km away. It is not more than information about urban areas which extended so much that they have grown together, the megalopolis. In the terms of planning it should remain a curiosity that can occur.

Urban life outside of our cities - Polemically one could say, all of Austria is urbanized, as almost every rural corner is connected with high speed internet, streets and travel to a larger agglomeration is as fast as it would be to get across some of our world's biggest cities. This would mean that urbanity would no longer only occur in cities.

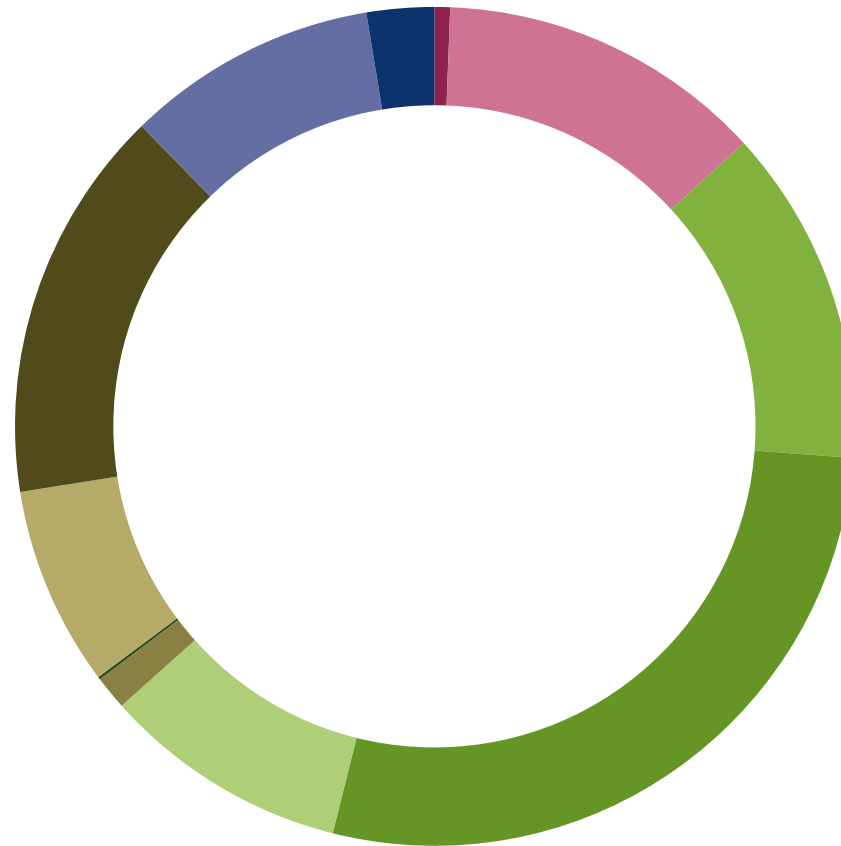
Finally there is the question of our one world, and by what means we might define globalization - currently the term cyber urbanity/globalization appears to be the most contemporary context.

The statistics used for the comparison of cities in this thesis are mostly taken from publications by the World Bank and the United Nations. The figures are widely comparable for the purposes of description in this thesis, in some cases there was the need to add individual additional information for a few of the cities introduced on the following pages. Sadly this are sometimes just approximations and could have unintended deviations.



Global Facts

World land use and coverage of the earth's landmass



- artificial surfaces (0.6 percent)
- croplands (12.6 percent)
- shrub-covered areas (9.5 percent)
- mangroves (0.1 percent)
- bare soils (15.2 percent)
- inland water bodies (2.6 percent)
- grasslands (13.0 percent)
- tree-covered areas (27.7 percent)
- herbaceous vegetation (1.3 percent)
- sparse vegetation (7.7 percent)
- snow and glaciers (9.7 percent)

002 Chart by author, World land use and coverage of the earth's landmass

This pie chart shows the global land usage. Humanity uses a total of ~13 percent of the land. The earth has a surface area measuring 510,000,000 km²; of this total, 29.2 percent is landmass and 70.8 percent is water. The landmass makes about 149,000,000 km². If we use thirteen percent of the entire landmass that humans actually use, this would amount to 19,370,000 km². Currently [October 2015], we have a population of 7,356,303,707 humans. This equates to about 2,633 m² overall used land per person.

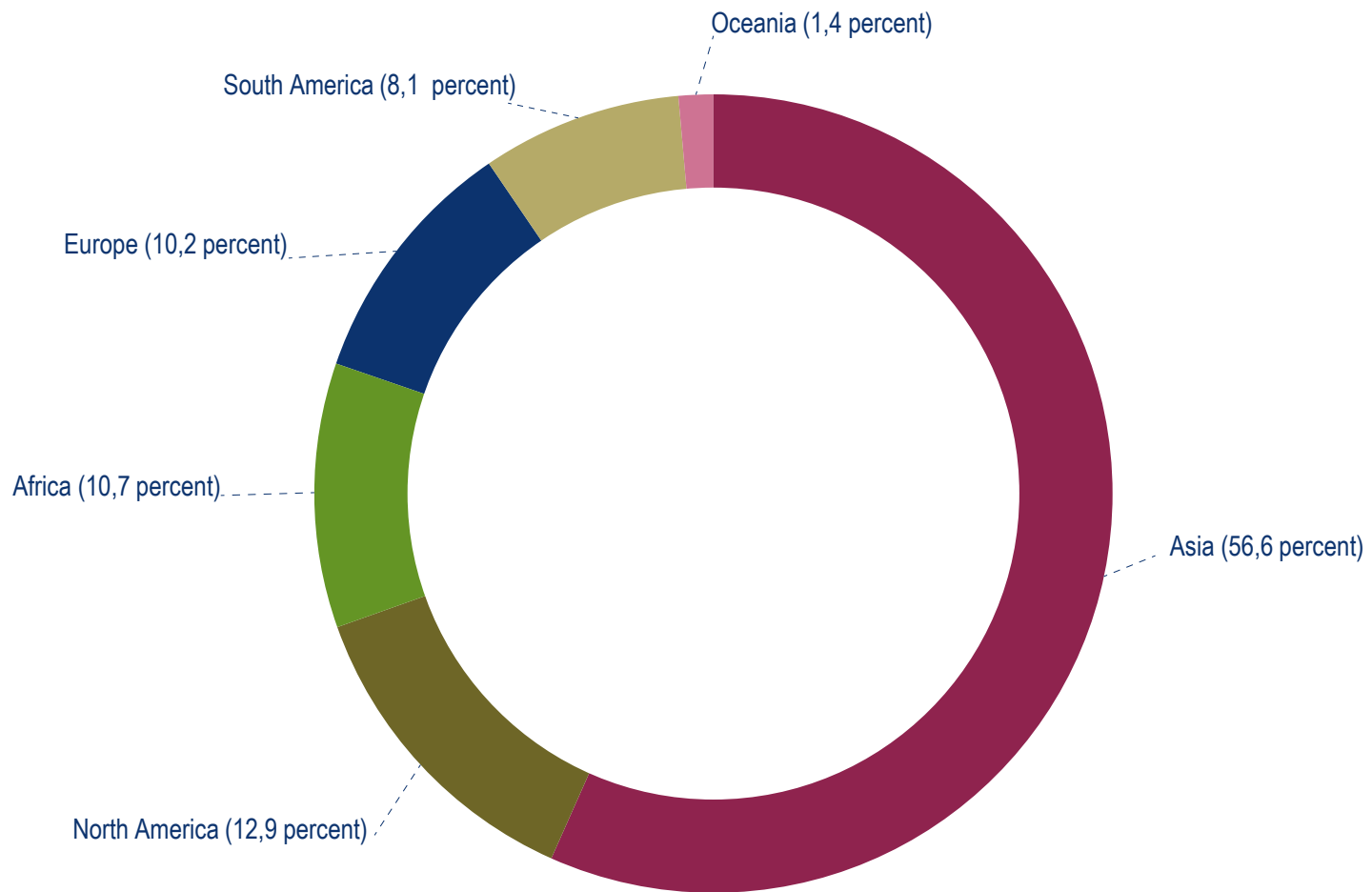
If we consider the number of the artificial surfaces—the equivalent of about 0.6 percent of the landmass with 894,000 km², this would mean that each person has approximately an average space of 121 m² in our

urban agglomerations, including all surfaces like transportation and streets.

Let us continue this extrapolation a little further, with the use of the prognosis for our future, to see in the figures on the following pages. So let's assume that the most probable scenario for the future will be the "high-growth" scenario: then the world would have a population of 36.4 billion inhabitants by the year 2300, five times as much as now (2015). That means that, if the average space use per person stays the same as now, we would need to make use of 65 percent of the earth's solid surface. And at least 3 percent of our globe would be covered with artificial surfaces, the equivalent of about 4.470.000 km².



Distribution of Urban Areas with a Population Greater than 500.000



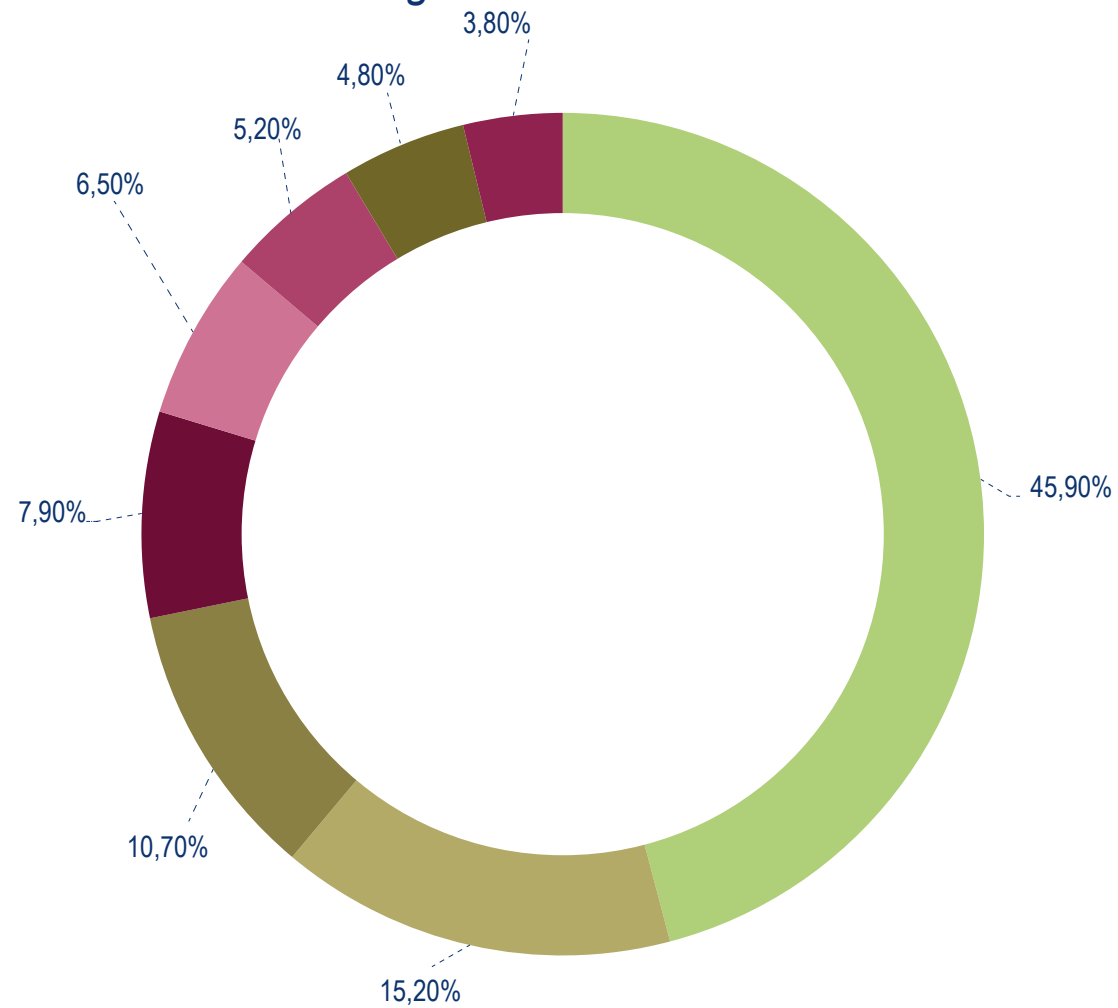
- Asia (56,6 percent)
- North America (12,9 percent)
- Africa (10,7 percent)
- Europe (10,2 percent)
- South America (8,1 percent)
- Oceania (1,4 percent)

This is a simple illustration about the distribution of large cities by continents. More than half of all urban dwellers live in Asia. All other continents have pretty similar shares.

003 Chart by author, Distribution of Urban Areas with a population higher than 500.000



Distribution of the World Population between Rural Areas and Megacities



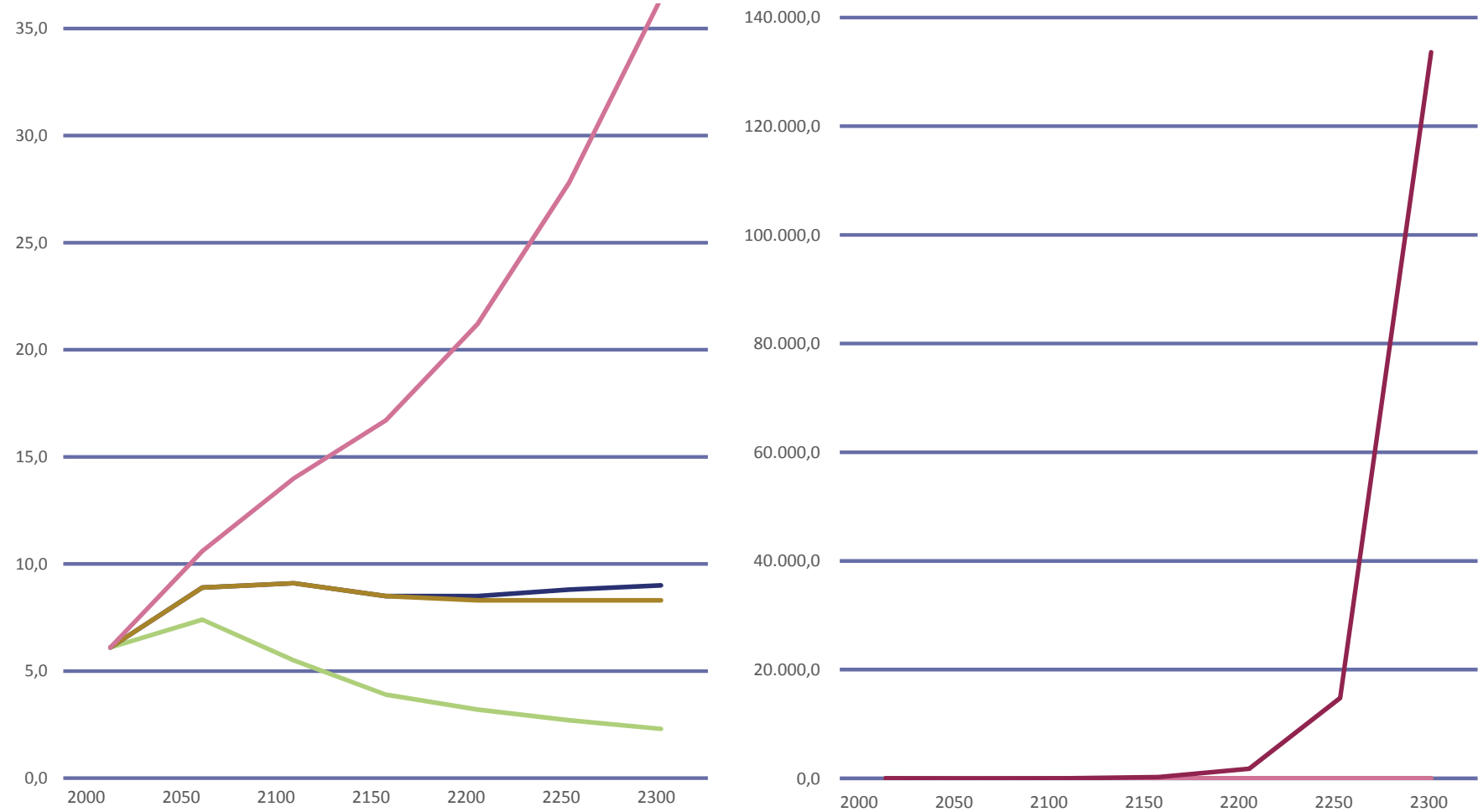
- Not Urban Rural
- below 100.000 Very Small Urban Agglomerations
- 100.000 to 499.999 Small Urban Agglomerations
- 10.000.000 plus Megacities
- 1.000.000 to 2.499.999 Medium Sized Urban Agglomerations
- 2.500.000 to 4.999.999 Larg Urban Agglomerations
- 500.000 to 999.999 Small to Medium Sized Urban Agglomerations
- 5.000.000 to 10.000.000 Very Larg Urban Agglomerations

Currently 54.1 percent of the world's population live in urban agglomerations. This diagram shows (clockwise) the share of each definition from the highest to the lowest share. The colours indicate the size of the defined agglomerations, dark red represents Megacities while light green represents rural.

According to the actual prognosis, the overall share of urban residents will be 75% by 2050.



World Population Projections in Billions

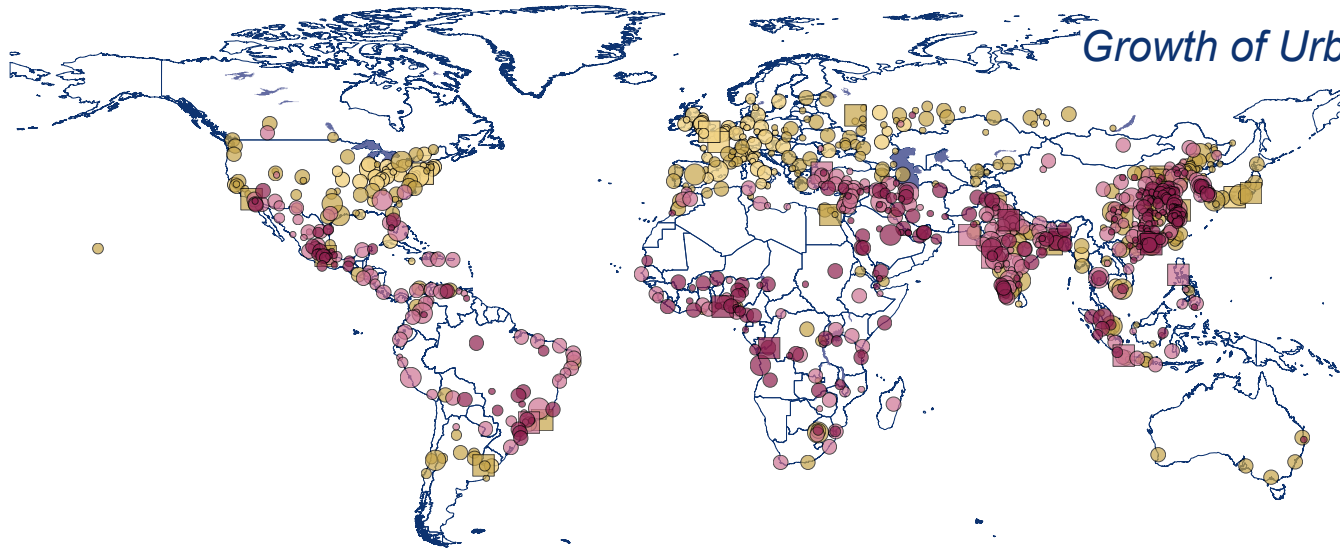


Year	Low	Medium	Zero- growth	High	Constant
2000	6,1	6,1	6,1	6,1	6,1
2050	7,4	8,9	8,9	10,6	12,8
2100	5,5	9,1	9,1	14,0	43,6
2150	3,9	8,5	8,5	16,7	244,4
2200	3,2	8,5	8,3	21,2	1.775,3
2250	2,7	8,8	8,3	27,8	14.783,0
2300	2,3	9,0	8,3	36,4	133.592,0

The hypothetical data are based on growth estimates from past population trends. The trends from a 100 year period with the lowest growth in the last some 2000 years is taken for the lowest projections and the high growth is based on the highest growth within 100 years from the last two millennia. The same was done with the 200 years period. The constant growth rate shows a rather curious figure that should never ever become reality.



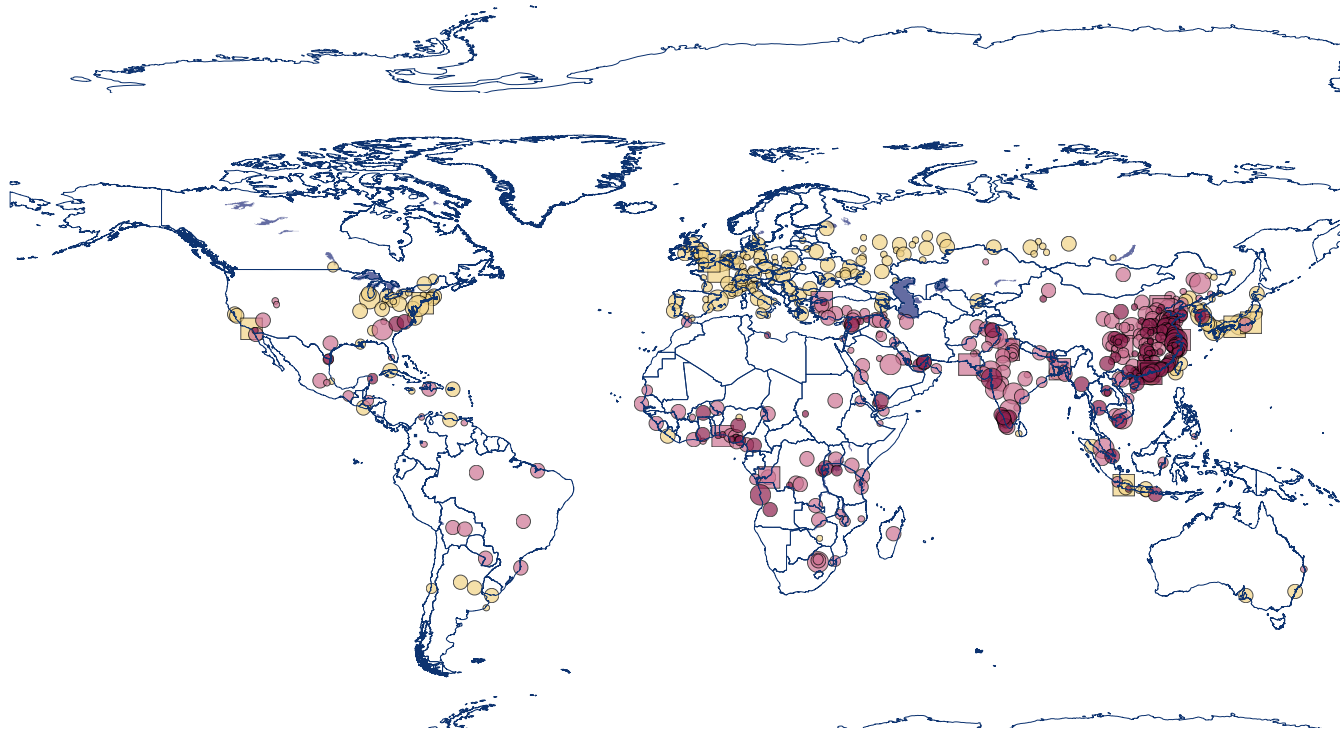
Growth of Urban Regions



Growth Rate

- < 1%
- 1-3%
- 3-5%
- 5% >

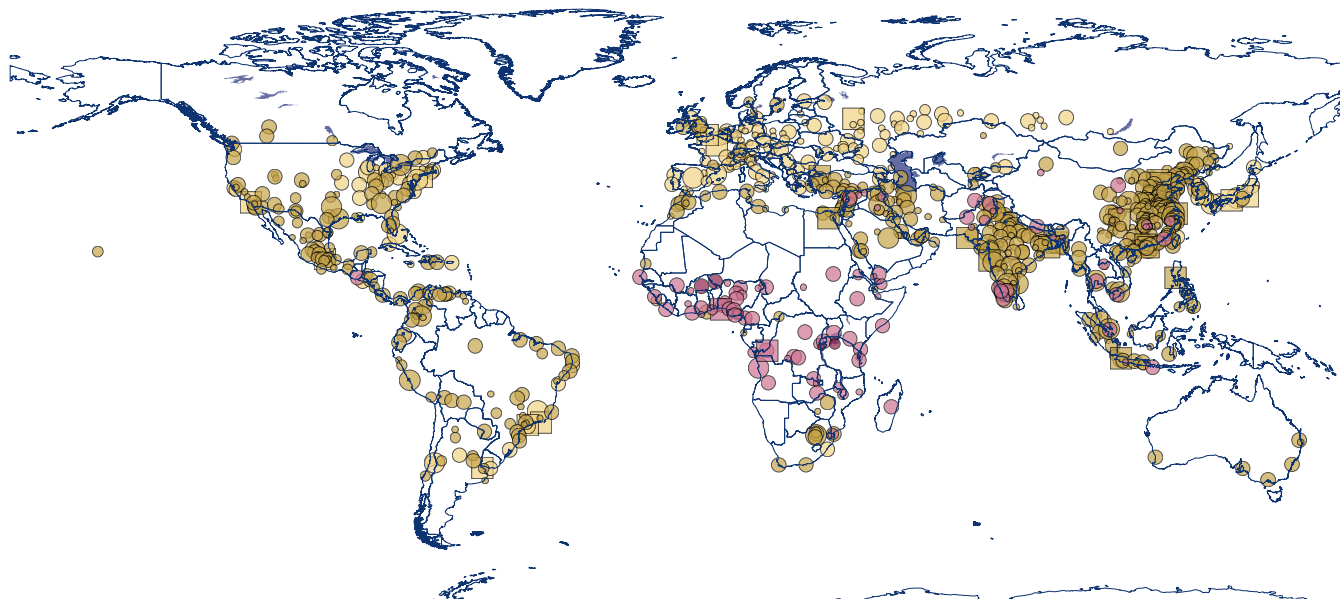
1970-1990



City Population

- 0,50 - 0,75 million
- 0,75 - 1,0 million
- 1-5 million
- 5-10 million
- 10 million or more

1990-2014



2014-2030



Grade of Urbanization

City Population

- 1-5 million
- 5-10 million
- 10 million or more

1970

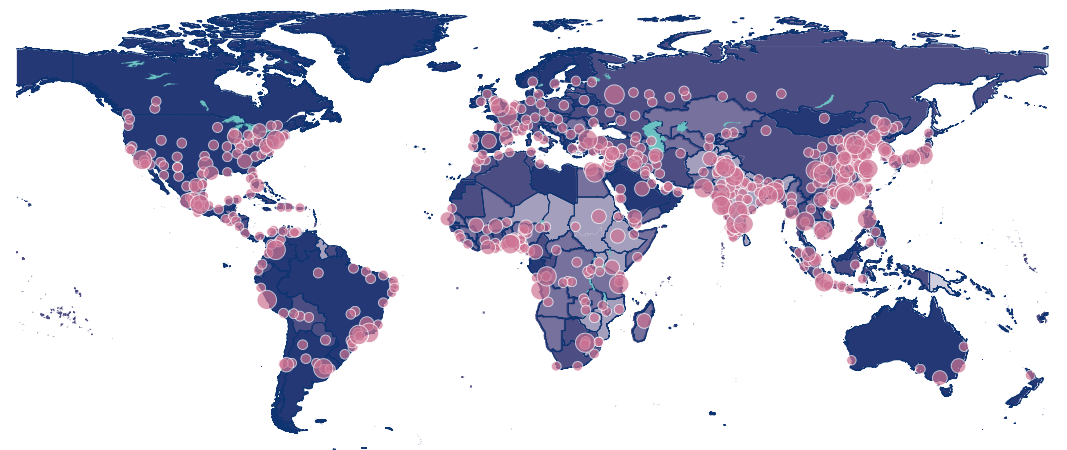
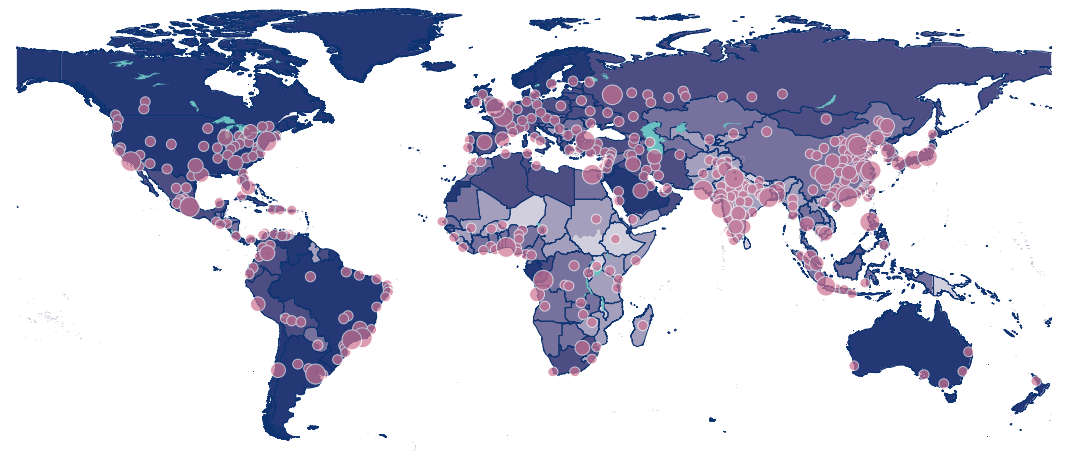
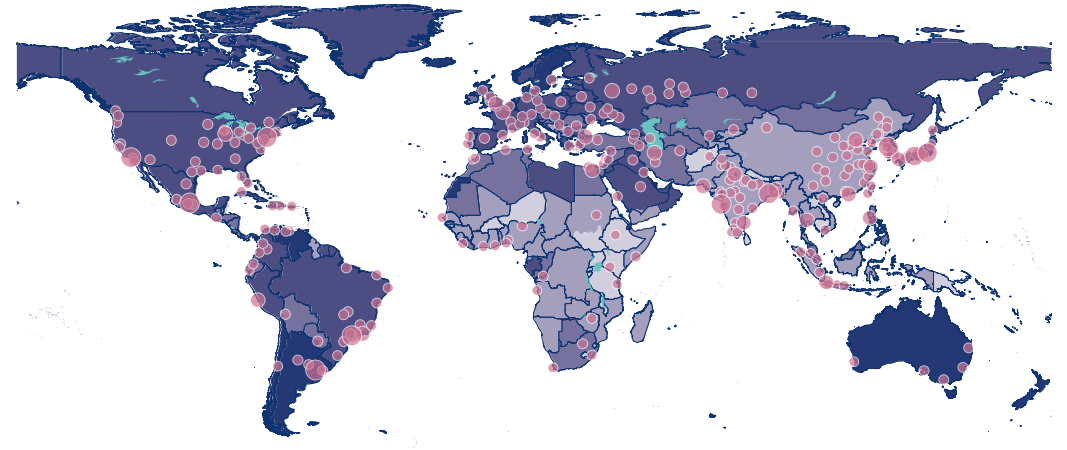
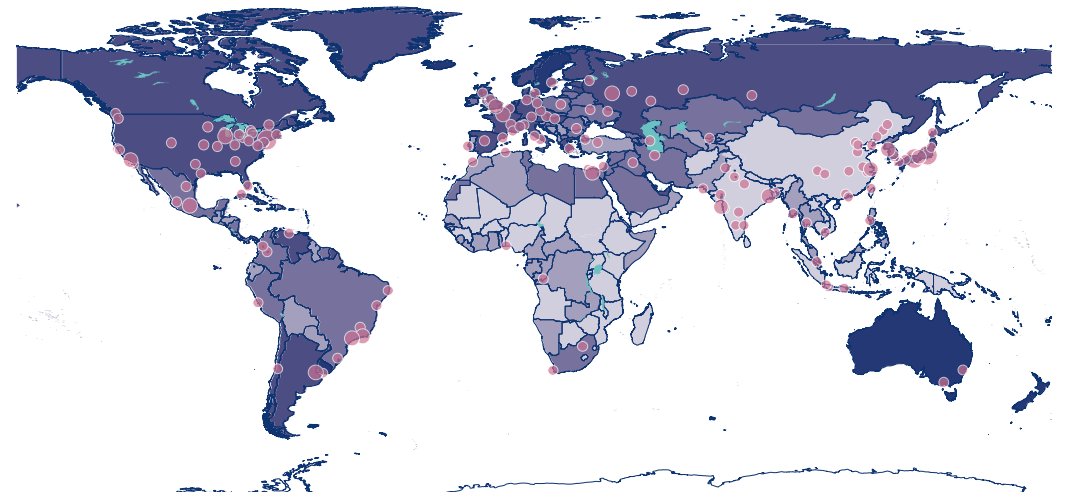
Percentage Urban

- 0-20%
- 20-40%
- 40-60%
- 60-80%
- 80-100%

1990

2014

2030



World Map



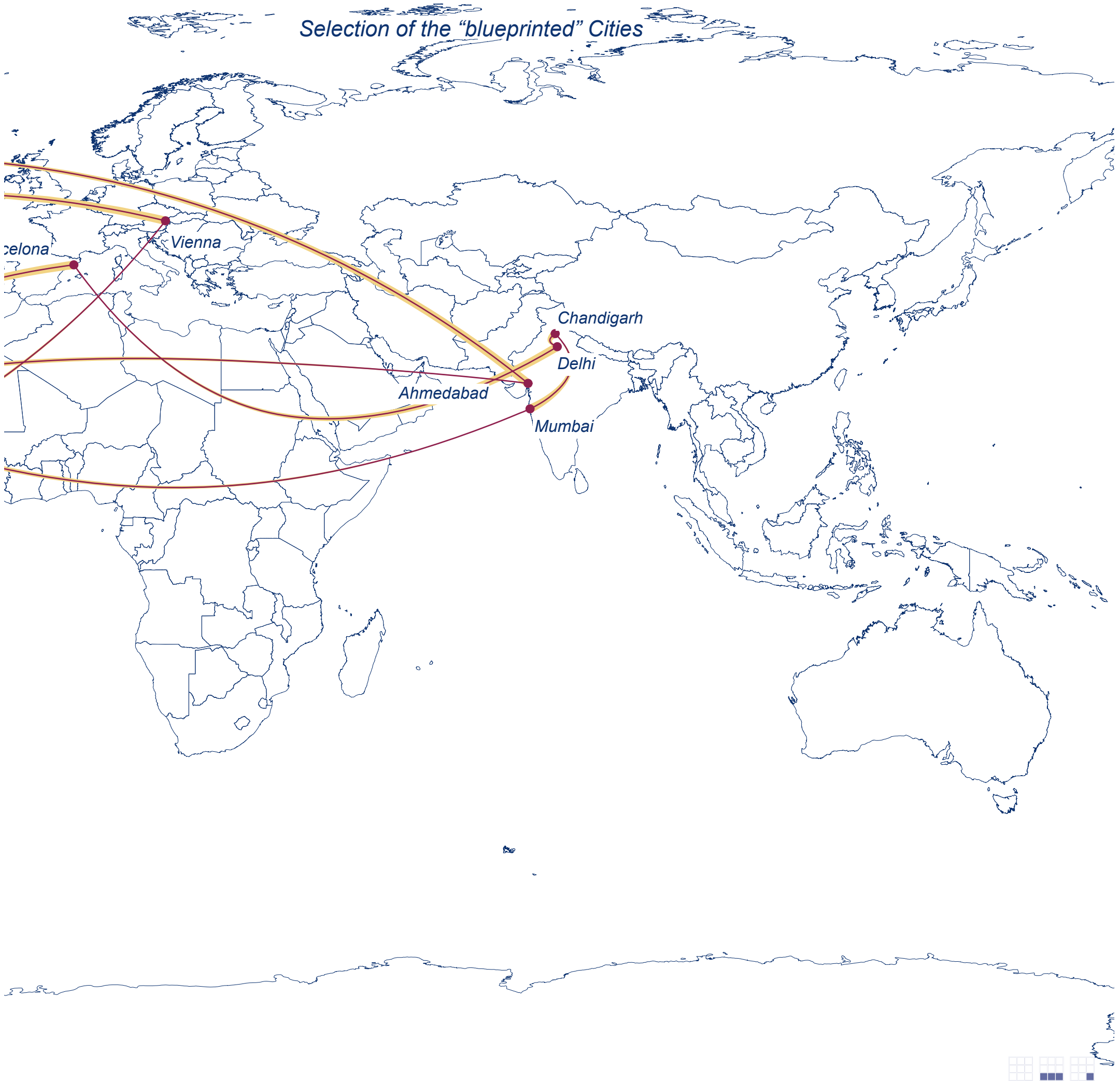
Journey to urbanity, urban life, mega-cities and many other superlatives one could think of, is projected in the context of the ongoing urbanization of our globe. This map does not show my own actual traveling route, but the journey towards urbanity on the coming pages.

The statistics used for the comparison of cities in this thesis are mostly taken from publications by the World Bank and the United Nations. The figures are widely comparable, in some cases there was the need to add individual additional information for a few of the selected cities introduced on the following pages. Caveat: these are sometimes just approximations and could have unintended deviations.

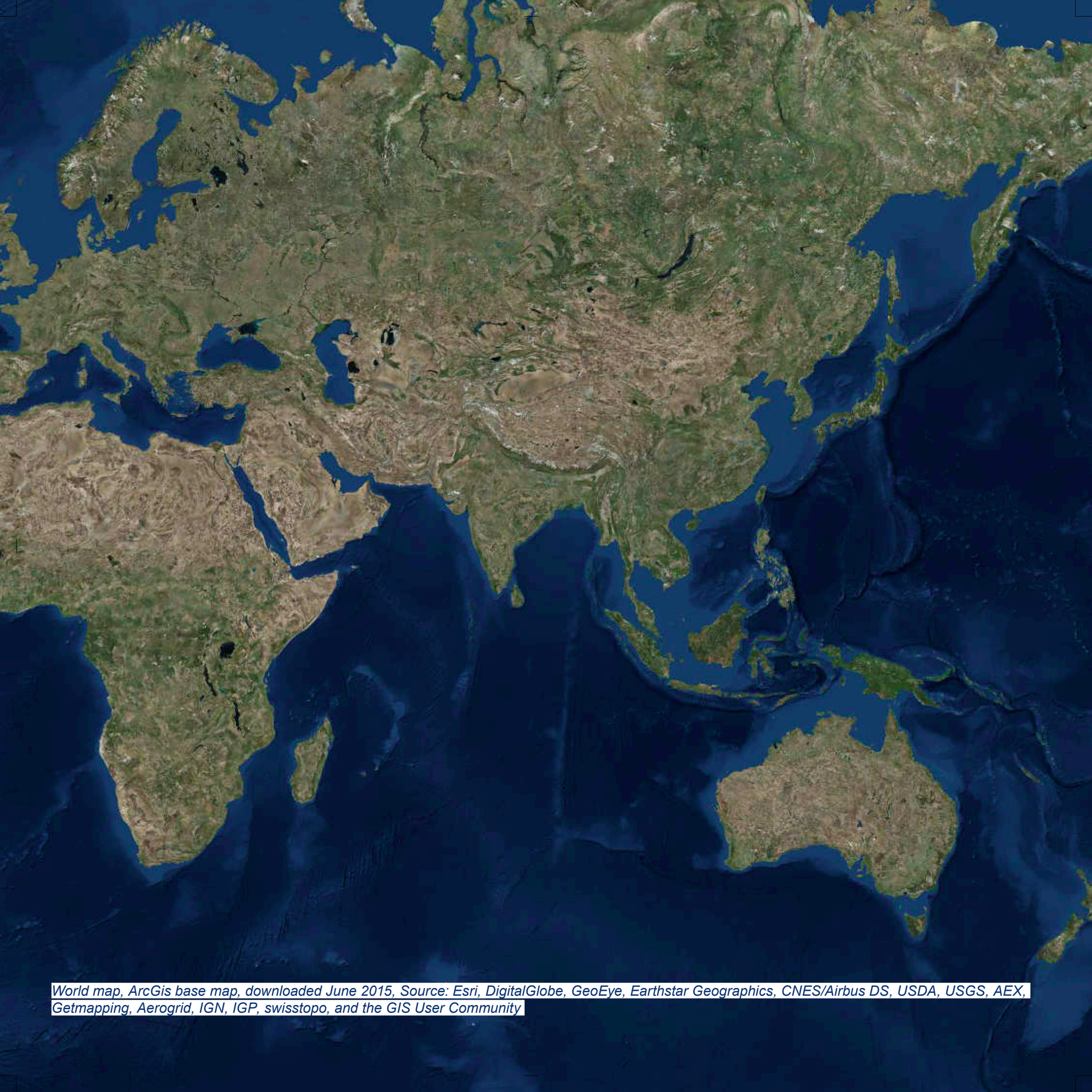
urban growth - rural - 75% - mega cities - urban future - humanity - future tendencies - capitol cities - land use - attractors - knowledge cities - concurrences - haphazard urbanisation



Selection of the "blueprinted" Cities







World map, ArcGis base map, downloaded June 2015, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

2

Cities

Urban Characteristics

There is an expression: you best understand if you have seen and experienced something on your own. Following this saying, I started to seek out my own explicit experiences with urban life. All the places I encountered left some impressions and thoughts about urbanity. These thoughts impressions and ideas coupled with statistics, other data and maps built an abstract sense of concern and apprehension about urban issues.

Each of these places show certain problems and advantages in urban life. These advantages and disadvantages might be results of both planned and unplanned urban development. But many of the solutions in our urbanities are a result of long term processes which cannot clearly be separated by these terms. To show certain results as an outcome of urban processes, this study is the consolidation of the stories of fourteen cities which are situated in very different areas of our globe. The locations of this study comprise of Detroit and New York City in North America; Bogota and Medellin in Colombia; San Jose (Costa Rica), Managua (Nicaragua), Lima (Peru) and Quito (Ecuador) in Latin America; it also includes some of the biggest cities in the World like New Delhi and Mumbai in India. As an aside, I also reference Vienna the city I live in and Barcelona as special historic examples in city and society planning.

The city portraits in this thesis refer to a different matters urban planners and dwellers face. Some of the matters are repeatedly affiliated. For example public transportation is a very important part in the development of cities and there are not many different solutions but those available have interesting differences in detail. As well, there is housing, a vital part of urbanization, the primary element linking people's lives and urban development. In several of the explored places one finds many different and independent processes in the field of self-built homes. These self-built structures directly lead to images and a manifestations in urban spaces, shaped by the builder's individual approach. This



Between plain Data and Experiences

We could let decide numbers, they are never wrong?

diversity in self-built structures can be seen as directly as urbanity forming an imprint of life, and makes it possible to identify the socioeconomic groups of the users; a type of urban story telling. At the first glimpse it might not look like the often very chaotic structures would not have anything to do with urban planning, but there are many things urban planning can't reveal about the way these individual and often informal processes occur. This is due to the complexity of social and economic processes shown in informal and non-planned urban development. Furthermore this often marginal structures are so rapidly changing that it is hard to recognize the current state these urban neighbourhoods find them self's in.

These portraits are not necessarily a continuous story about urbanity, as there are idiosyncrasies from one to another city. But the portraits follow the focus of understanding urbanity.

The facts are about matters that seem pertinent to me, some information is rather curious than of scientific importance. This curious information helps me to produce a more continuous image about the places I have been to. Always keeping in mind that I am one of the some 3 billion humans who live in our urban agglomerations, but also one who designated himself to work on the science around urbanizations, one who has knowledge of the ongoing discourses in the field of urban planning.



Bogotá

4km²

Bogotá Colombia

*
1 Coordinates 4,5980478 Lat
-74,0760867 Lon
2 Current Population 8,0 mil
5 Urban Population 13,0 mil
Area 1587 km²
3 Urban Area 804 km²
Density 11940 per/km²

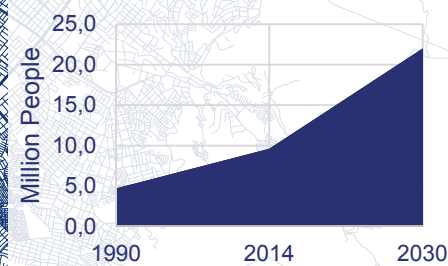
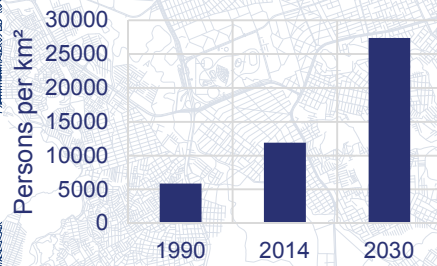
Population Trends

Year	mil.	World Rank
1990	4,7	34
2014	9,6	33
2030	12	32

Foundation
6 August 1538

Sources

1*openstreetmap.org, 4*Data refer to the nuclei of Santa Fe de Bogotá, Soacha, Chia and Funza.
2*<http://www.bogota.gov.co/ciudad/historia>, 3* approximate measured
5* http://www.lboro.ac.uk/gawc/datasets/da25_1.pdf



Into to the City

What makes people move into cities.

insecurities - informal settle-
ments - transportation - growth
- dealing with illegal housing - seg-
regation - skills from the countryside

It is pretty common that people move into cities, and there are many different reasons why people finally decide to do it. But what is it that these people are joining?

A city by its meaning is a gathering of people who find ways to organize in a collective life in a certain area, by defining values and the sharing of capacities towards a higher efficiency. Today, cities are known for their ability to provide great services to the community in a much higher density than we would find it in rural areas.

People move to cities for better healthcare opportunities, for education, out of economic necessity or the diversity of cultural activities, to name just some of the most common reasons. What most of these motivations have in common, is the search for a “better life”.

Bogotá is an exceptional example of an urbanity that was confronted with an unexpected wave of migration. One hundred years ago, Bogotá’s population counted about 130.000 people; it is now 66 times as large. In percent this represents an increase of 6600% (average annual growth = $4.3\% = ((8800/130)^{(1/100)} - 1) * 100$) and resulting in a current population of 8.8 million (by 2015). Sixty years ago vague prognosis estimated Bogotá to have a peak of 2.5 million inhabitants, but this was surpassed only twenty years later. So to say nobody expected this enormous growth, resulting in several fatalities in building the city’s

infrastructure. It is still that the city of Bogotá cannot keep pace with the ongoing migration into the city, and simply avoiding catastrophic fatalities will be a challenge to which the solutions are not yet known. The future will require solutions for all participants, as the city continues to grow some estimates forecast Bogotá to surpass twenty-five million in only twenty three years (compound growth of 4.6 to 4.7 %: $8.8 * (1 + 0.046)^{23} = 24.75$).

One of the main factors for these urban growth rates is the ongoing growth of our world’s population. But what are the specific reasons in Bogotá and what is the background of being a bigger attractor of migrants compared to the smaller cities in Colombia?

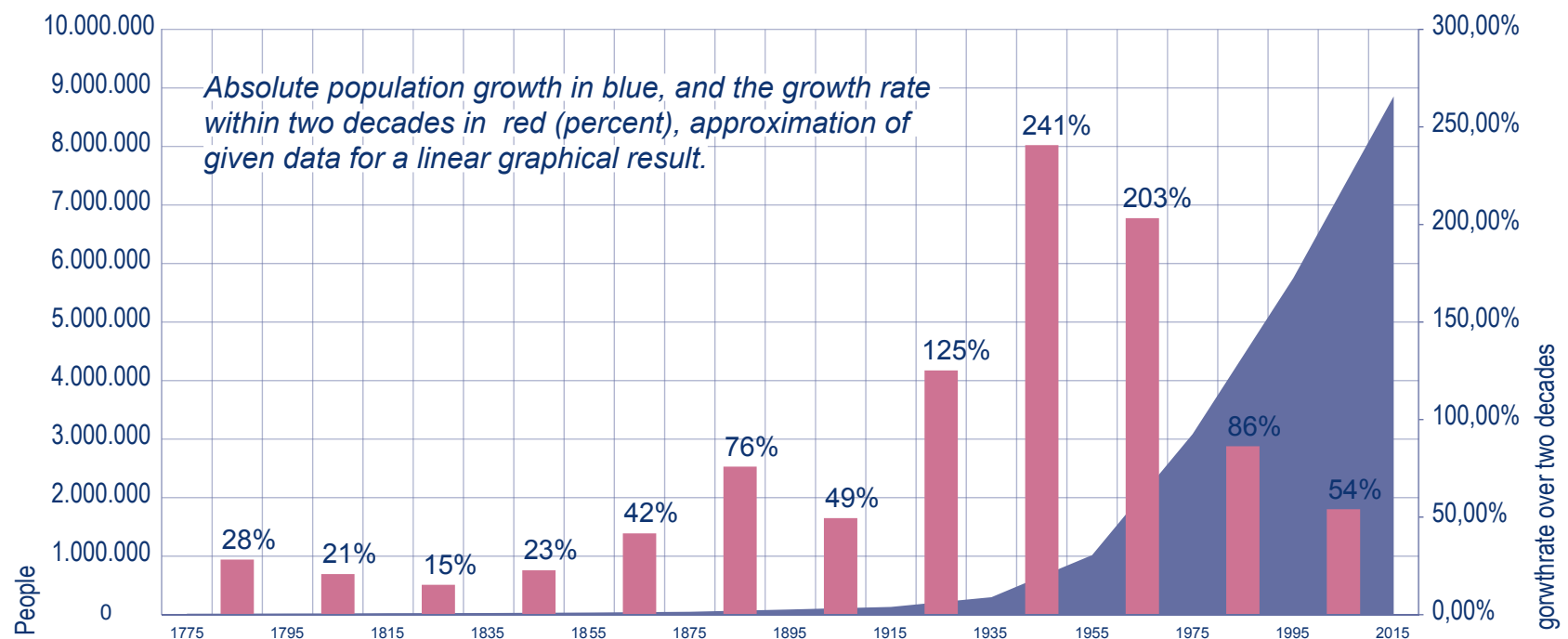
To reveal some of the factors a short overview on Colombia’s shaken past helps. Beginning with the arriving of the Spanish colonialists in the early 16th century CE, when the suppression of indigenous tribes and cultures started, an often violent act. Some years later in 1538 Santa Fe de Bogotá was founded and became the capital of the Spanish provinces. After a long fight for independence, Colombia became an independent state in the beginning of the 19th century with Bogotá as its capital. In the very beginning of the 20th century Colombia faced instabilities and a war, the “Guerra de los Mil Días”. Panama was subsequently forced to become an independent

state by the United States, and Colombia’s final borders were defined.

La Violencia (The Violence) is the name given to the Colombian Civil War, it was a result of deep mistrust between the two main political forces in the country; the liberals and the conservatives. 300.000 people died in the years between 1948 and 1958, the most violent time. Colombia’s society is still not ahead of “La Violencia” as there is no official peace agreement. In Colombia the four strong forces (Guerrilla (as FARC*), Militar, Para Militar and la Policia) have fought since then for their own interests. In the mid 80’s an additional force contributed to the country wide violence, the Medellín Cartel, which was formed from the drug production and distribution Mafia. The Medellín cartel influenced major politicians, police, military and Guerrilla groups, putting the country even further into chaos. Now, Colombia is steadily leaving its shadow times, as affection of the hard work for a more stable and secure country builds, putting its dangerous reputation into the past. Colombia is not to be considered unsecure/unsafe anymore.

Behind the migration into cities are many individual fates like:

There are many reasons why people move to the city: in the case of Bogotá these are often to avoid harassment and violence, due to poor har-



vests and rural opportunities and to seek a better Education:

Harassment and violence - A woman takes her children to move away from her violent husband and in an emerging country, there are often not many options of where to go. So the woman with her children moves to a city because the city always offers some kind of choice.

Poor Harvest - A family of growers has no chance to feed themselves due to a poor harvest or extremely low revenues from their products, amongst other problems which make life hard in the countryside. The conclusion is often to go to a city as there is always some kind of a work to be found. Quite often the family moves to the city in steps, this is often seen in migration processes. One person starts on her own and tries to find a place to stay and a job, once this person has settled other family members start to join them. There are also positive reasons like Education - As cities usually offer much higher quantity and quality of education, at all levels. Young people especially stand to benefit from a move into an urban agglomeration for educational purposes and depending on their situation they most probably will stay for a job.

Uncontrolled and unplanned growth has happened in Bogotá since the 1980's in several different areas, and is often seen as a threat to the city, especially reputation-wise. But all the squatters never intended to do wrong, they just tried and seek a chance towards a better life.

Informal growth does not have any culprits; it is often the only way that people can have something for their livelihoods. When in the 1950's Bogotá's population started to grow enormously, it was quite unexpected. This meant that to let the people use land they didn't own was often

the only way cities could offer support. To have a controlled method for dealing with growth it is necessary to know the future growth of the population, and such predictions are always vague.

On the one hand the government is asked to act if there are serious deficits with urban infrastructures, and on the other hand the general population has finally to make its own progress. Even though everybody has skills that are of need, many of the newly arriving do not have any knowledge of urban life: self-determination and government involvement are a balancing act.

Bogotá as a city took action in the densest informal areas to provide basic infrastructure such as water supply and sewerage systems. But once one area was upgraded a new area was already occupied: The actions have always been one step behind because uncontrolled and unplanned growth is often the only practical way, despite all its difficulties. The low quality of these early stage residences mean there is therefore little surprise in that a five floor building does not fit any of the static standards a new city dweller holds from his or her old life.

However, such disappointment can often mean "just" the absence of certain knowledge and not as often stated: the lack of financial resources. Despite these difficulties and the required adjustments to one's expectations in many ways the people generate admirable output resulting in distinct city districts, as time goes by many of the dwellings start to constantly upgrade (as money becomes available), processes that are certainly hard to plan in a proper manner. To me these city bags are vivid, and a direct output of life in a very simple way, but as all of us know life is never totally equitable. So it is only logical that in these informally grown neighbourhoods we also often observe a higher level of cruelty compared to other city parts.

Initiatives have been set to deal with the quick transformation of Bogotá into a mega city and begin with support providing building materials for construction. Advice is also available and can be simple, such as how to keep a roof waterproof or more complex, to offer help on how to advance buildings towards static stable systems. These initiatives go right up to big infrastructure projects as found in the south of the city. Current large infrastructure projects include technical infrastructure like wastewater systems and steps towards disaster resilience in the area by analysing slopes that tend to slide and would endanger residents living in the area. Providing low cost housing that meets certain minimum standards is another way that help might be offered.

Special qualities that have to be mentioned about Bogotá:

The successful project "Trans Milenio" a BRT system (Bus Rapid Transit) that was built as the first city-wide public transportation network since Bogotá became a megacity. The BRT enhanced the situation, especially for the poor areas as they now have a proper transportation links to places of work. The project, by offering transport across the city has thus reduced travel times from three hours to about one hour from the south from the city to the north.

Bogotá is a city of bricks, most of the buildings are built of clay bricks, while not all are built solely of bricks, many do only have a brick blended facade. The bricks are to be seen everywhere, several squares, roads and pathways are paved with bricks.

Ciclovia (literally the cycling path). Once a week, every Sunday between 7am and 2pm local time, Bogotá is transformed into a spare time Mecca. Hundreds of kilometres of the city's main roads are closed for spare time activities like cycling, skating, walking or running.





018 Date 06.04.2013A farm 30 minutes walk from Bogotá's historic city centre, A film about the family who lives in this house, <http://www.cultureunplugged.com/documentary/watch-online/play/9089/LA-CASA-THE-HOUSE->



020 Date 18.02.2013; rudimentary housing, Soacha, Suburbs of Bogotá



019 Date 18.02.2013; rudimentary housing, Soacha, Suburbs of Bogotá



021 Date 05.03.2013; The further extent of Ciudad Bolivar, Bogotá; Columbia's biggest informally built area



022 Date 18.02.2013; Informal settlements, Soacha - Bogotá, behind Ciudad Bolívar



024 Date 11.04.2013; Bogotá, View of the "Universidad Nacional sede Bogotá", a vital part in the middle of Bogotá,



023 Date 18.02.2013; Housing machinery in the middle of informal housing, Soacha south of Bogotá



025 Date 11.04.2013; Avenida Las Americas, Bogotá,



026 Date 03.02.2013; Bogotá, Ciclovía; About the half of the city's main roads are closed for cars every Sunday. The city turns into a huge place for spare time activities.



027 Date 07.02.2013; Transmilenio, Bogotá; To get from south to north took three hours, now it takes one.



028 Date 07.02.2013; Día sin Carro, Car free day in Bogotá takes place once a year, Bogotá Calle 26



029 Date 18.02.2013; A usual day in Bogotá, Calle 26 (Avenida El Dorado)



030 Date 06.04.2013; The future of Bogotá, View from the eastern mountains



25 km²

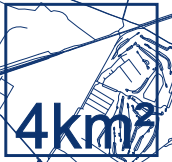
Aerial View of Bogotá
Scale 1 to 168.000

An aerial photograph showing a dense urban area with a grid-like street pattern, interspersed with green spaces and winding roads. A white square box in the upper right corner indicates a scale of 1 km². The terrain appears to be a valley with some hills and a river or stream winding through it. The overall color palette is dominated by greys and browns, with some green patches.

1 km²

Aerial View of the south of Bogotá, and Soacha
Scale 1 to 33.333

Vienna



Vienna Austria

Coordinates 48,2083537 Lat
16,3725042 Lon
Current Population 1,7 mil
Urban Population 2,6 mil
Area 414,87 km²
Urban Area 206,85 km²
Density 8219 per/km²

Population Trends

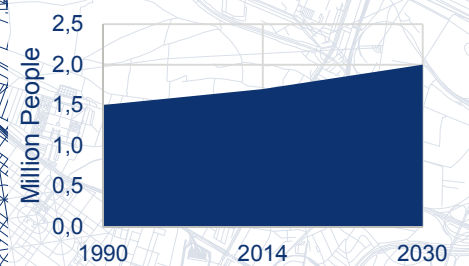
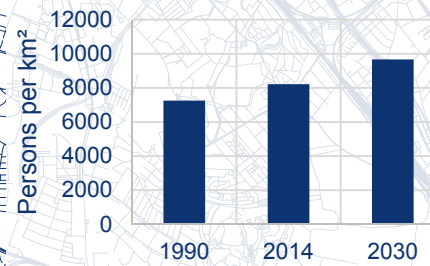
Year	mil.	World Rank
1990	1,5	158
2014	1,7	263
2030	2,0	315

Foundation

first settlements 2000 BC

Sources

1* OSM, 2* City of Vienna, 3* Area without forests etc., 4* WUP, 2014 Urban Agglomerations Wallchart.pdf
www.unpopulation.com



Past and Present

Cities have faced for a long period of time all kinds of different difficulties.

At the end of the 19th century, Vienna was faced with a significant increase in migration. This wave of migration resulted in certain difficulties for the city, such as being increasingly surrounded by larger areas of slums and causing strange behaviour in the housing market.

The need to find solutions to the major



036 Wien, Rosenhügel 1891

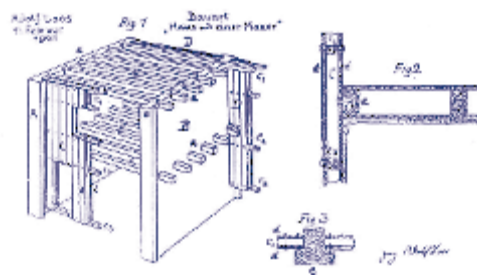
problems caused by the increasing population resulted in two specifically exemplar solutions being found in the early 20th Century.

Vienna's slums were located in its outskirts and it was this area that inspired a movement known as the Viennese 'Dwellers Movement' (Siedlerbewegung). The people of the slums had begun to build their own housing communities utilising simple, but unfortunately unregulated, solutions such as wooden barns have been built with no legal rights to use this land. This problematic situation led into large demonstrations, the city finally had to set action resulting in certain institution called the 'Siedlungsamt' (settlement office).

In the 1920's, as the head of architecture from the "Siedlungsamt", Adolf Loos was in charge of planning several neighbour-

hoods, one of his most notable design being the "Haus mit einer Mauer" (house with one wall). Most interesting to note during this time, were the integrative processes and ways that communities participated in building their neighbourhoods together, and how this saved them money when working on their future homes. The dwellers participated in the construction of a series of buildings for all of them self's, but they didn't know which would eventually be theirs. After the completion of the construction development, and the buildings were entirely finished, did the participants get their property by lot.

The Austrian "Werkbund" – a work federation of architects, artist and builders, was formed in 1912, with the goal to serve high quality industrial art for purse. In 1932, a building exhibition took place in Vienna, the so called "Werkbundsiedlung", the world's largest housing fair, with 70 fully furnished houses have been designed by 33 architects. Some of this architects have already participated in the design for housing related to the "Siedlerbewegung". Many of this architects had pro garden city attitude. The fair had to face criticism, for aspects like this very low density achieved by garden cities, now it is a piece of art/architectural history.



037 Haus mit einer Mauer, Sketch, Adolf Loos 1921

dwellers movement - museum
like inner city - adoption of the
city over time - newly developed
sub centres - early interventions -
recent interventions



038 Werkbundsiedlung, Advertisement 1932

. With this idea of garden cities, Vienna could not have provide enough Social Housing, leading to housing units like superblock architecture. The construction of Social Housing stemmed from the poor housing conditions faced by Vienna's citizens after the First World War. At this time, with no rent regulation, the price of rent for a room could change overnight. The city of Vienna came up with a wide social housing program to serve the market with new ways to offer living spaces for reasonable rent, with the addition of a new standard of amenities in all buildings. These building can be found all over the city and, to this day, number over 220.000 units.

Besides the housing program there have been a couple of other interventions that defined the current image of the city Vienna. The inner ring road, founded on the basis of the former city wall, together with all the buildings that run along it, defines the original boundary of historic Vienna. The ring road encloses the more or less museum



like inner city a whole district kept and preserved like a piece of art.

Danube Island, a more than 20 kilometres long man-made island, turned out to be a very functional flood protection for the city and adds a huge, public, green space for all kinds of recreational activities.

Since 1990, after a long period of shrinking and stagnation, Vienna's population started to grow once more. This resulted in the need for a huge expansion of suburban space. An example of this is the sub-city centre development "Seestadt Flugfeld Aspern", which is developed for about 20.000 people, with the goal not only having a sleeper city.

Till today the social housing remains very popular in Vienna. Nowadays, the social housing program has changed somewhat, moving towards ownership being split between the private sector apartments that are financially supported by the city. Just very recently the city of Vienna started again to build housing units directly with the goal of building at least 3.000 units owned by the city, annually.



040 Date 12.06.2015; Social or socialist housing, Karl Marx Hof, built by Karl Ehn between 1927 and 1930,



039 Date 12.06.2015; Werkbundsiedlung, Woinovichgasse 11, Vienna; Building designed by Hans Adolf Vetter, opened in 1932 as a model house settlement designed by 32 architects



041 Date 12.06.2015; Haus mit einer Mauer, design by Adolf Loos, was designed to be extended





042 Date 12.06.2015, Danube island, 20 kilometres of recreational area, about 40 kilometres of beach and in fact also serves as flood protection for Vienna.
In the Background Donau City an important area for Vienna's city development. About 1500 housing units



043 Date 23.05.2010; The preservation of Vienna,
Oberes Belvedere seen from the botanical gardens



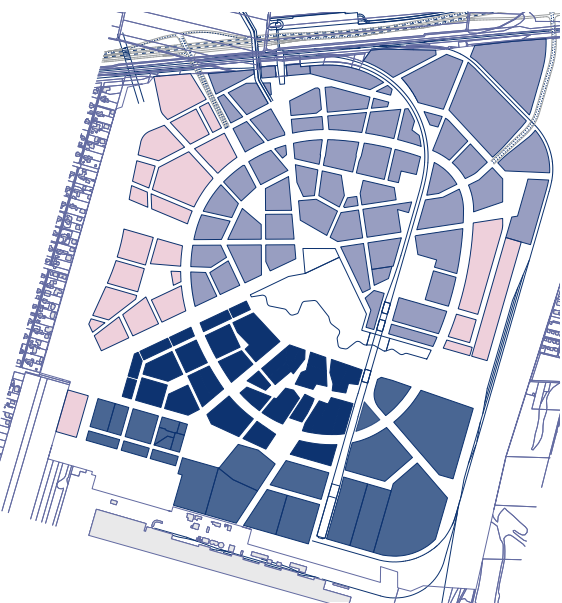
044 Date 12.06.2015; Wohnprojekt Wien, a residential joint building venture,
planned by Eins zu Eins Architects, finished December 2013



045 Date 23.05.2010; The tearing down of the "Südbahnhof" to make place for the new "Hauptbahnhof"



046 Date 13.03.2011; View of Vienna, from the 15th district towards the Quatier Belvedere, which is to be finished soon, after about 2 billion Euro of investment



- Phase I 2010 bis 2020
- Phase II 2015 bis 2023
- Phase III 2024 bis 2029



047 Date 02.09.2015; Seestadt Aspern, Development steps, scale 1 to 24 000, source: <http://www.aspern-seestadt.at/resources/files/2015653749150113-etappen.pdf>





048 Date 12.06.2015; Erste Campus, Area of the former "Südbahnhof", Quartier Belvedere, design by Henke und Schreieck Architects



049 Date 30.08.2015; Seestadt Aspern, ASP Wohnbau, design by Querkraft und Berger+Parkkinen



050 A satellite town for Vienna in the middle of crop lands, the first step from the development plans for the Seestadt Aspern. The development of commuter cities have often encountered difficulties and often resulted in sleeper cities. In Aspern, the planning and design professionals tried to get ahead of the known problems. Whether the planners, developers and architects have succeeded will shown the future. Maybe it takes a hundred years for the failing of this sub-city centre to finally develop into a well-used neighbourhood.



An aerial photograph of Vienna, Austria, showing the Danube River (Donau) flowing through the city. The river is a prominent dark green feature winding through the urban landscape. The surrounding areas are a mix of dense urban development with grey roofs and streets, and large agricultural fields in shades of brown and green. The Danube Canal is visible as a straight line crossing the river. In the bottom right corner, there is a white box containing the text '25 km²'.

25 km²

Aerial View of Vienna
Scale 1 to 168.000



1 km²

Aerial View of the City Center of Vienna
Scale 1 to 33.333

New York City

4km²

New York City United States of America

1	Coordinates	4,5980478	Lat
		-74,0760867	Lon
2	Current Population	8,4	mil
	Urban Population	18,6	mil
	Area	1214	km ²
	Urban Area	34490	km ²
	Density	539,3	per/km ²

Population Trends

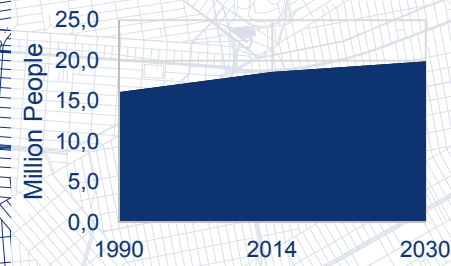
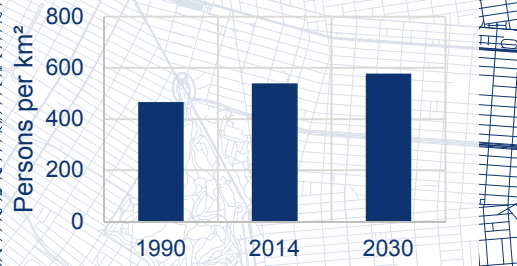
Year	mil.	World Rank
1990	16,1	3
2014	18,6	9
2030	19,9	14

Foundation

1624

Sources

1*openstreetmap.org, 4*Data refers to New York - New York 2* US Census 2013, 3*



The Big Apple

The “Mega City“.

air rights - strictly gridded - wide streets make tall buildings - the city to be? - bankruptcy? - Moses a sounding name ...



056 Date 1865; Viele Map - Sanitary and Topographical map of Manhattan by Egbert Ludovicus Viele, with the Central Park

The big apple, a vibrant city with as many faces / facades as people live in it, one of the best examples of multicultural and diverse urban life. People from all over the world have had easy access to the city, and it has always been a city built on immigration. This easy access was also supported by the very simple pattern of New York City's infrastructure. The NYC pattern helps one to easily understand the primary structure of the city. A quick look at the map of Manhattan is enough to orientate one's self. However, the diversity the city is truly not found in the straight and rigid grid that makes NYC so easily recognizable and understandable. This pattern of streets also belies the diversity of the architectural styles to be found in NYC. One of the most important factors within this rigid urban structure, is the rule governing the usage of space as there are regulations for the size and extent of buildings. This rule defines the maximum volume developers may build upon a lot. If one likes to build higher, it is necessary to buy some rights from your neighbors or a developer could add some “public space” to the city in the bottom stories of their building. Both possibilities enable a developer to build higher or at least allows the developer to extend the volume of a building.

These rules are not only used to predefine the city's vertical dimensions, with some more sophisticated rules for developers, the city of NY also takes the opportunity to generate affordable housing. To build a certain or greater amount of high value housing units a developer has to provide a certain amount of affordable housing units within a predefined area.

The Central Park of NYC was not always part of the plans for the city, first ideas in 1807/1811 showed a city that spans a carpet of the same grid network all over the island of Manhattan, the commissioner's plan of 1811. In 1853 after the population of NYC quadrupled in only 30 years, first visions for a huge park in the centre of Manhattan, came up. The first part of the Central Park was then opened in 1858. New York's Central Park is today seen as one of the most important factors why NYC works so well. This huge green lung right in the middle of Manhattan is now the most important place for free time activities like sports and brings major

advantages in terms of quality of life right into the middle of the city.

The phenomenon of Cony Island has been referred to as the “Technology of the fantastic”*. This this term occurred as an observation of the industrialization at the junction of the 19th and 20th centuries where technologies developed quickly. The first elevators were built in New York City which indirectly lead to the first ever skyscrapers being built here too. The advances in technology not only led to an entirely new city, the vertical city: technology was more than a means to a practical end, it was a paradigm of the society. Inventors have been looking forward to invent machines for pleasure and entertainment, to build the fantastic. Cony Island as we know it, was formed, and a new nature was invented at NYC's former natural resort Coney Island. This technical and human generated new nature of fantastic technical inventions with millions of lights that glittered in the night, mobilized millions to seek some pleasure and a break from the rough life in the over populated and hyper dense city of New York.

New York City seems to be purpose built to provide the proper infrastructure to serve the needs of a mega city, and yes if you take a look into the history, the early subway or the size of the streets and avenues in Manhattan or the mostly simple technics used for infrastructure, allow this highly dens city to flourish. If any city was built and has grown to be a mega city, New York City is this mega city.

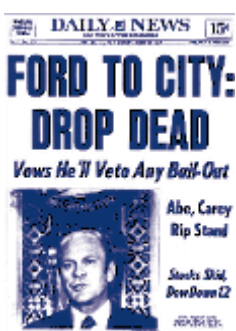
The complex utilities and services every big city needs are well-structured and span the city beneath the street grid. Although it may appear so, the huge streets and avenues of Manhattan were not built for cars, as there were none in 18xx, when the final plans for Manhattan were defined. In general the implementation of NYC infrastructure was not always perfect, as there have been necessary additional infrastructure projects such as the planning and building of the highway network with all its bridges and tunnels. In the context of the car,



057 Date 1811, The Rendel Map, Similar to the known remake of the Commissioners plan



one name stands out, Robert Moses, who had major influence in making NYC a car city. Robert Moses lead up to twelve different departments of the city of New York at the same time, which made him one of the most influential city builders (planners) in history. His influences between 1924 and 1968 are not exclusively viewed as positive. For example, as head of the State Park Council and the chairmen of the Triborough Bridge and Tunnel Authority during the same period he was able to easily realize also unpopular streets and bridges. From the current knowledge about cars in cities, many of Mr. Moses' actions are to be questioned, and the dense network of subways is a much greater accomplishment compared to all the highways Moses was responsible for in the state of New York: "Those who can, build," Robert Moses said. "Those who can't criticize." Illustrating his self-assuredness and ambitious nature. The low point of New York City's history



058 Date 1975

may have been the 1970's, when the crime rate exploded and the city almost faced bankruptcy. Gerald Ford, the American president at this time, refused to help New York City financially at the beginning of this crisis. 1975 Newspapers quoted him as stating: "Let the city go broke." But after difficult times for the New Yorkers, a state loan, a shrinking of the cities administration and many initiatives that were found to solve housing problems and bring balance into the social inadequacies eventually provided a solution. From then on New York City changed from an industrial and steel city into a service-city. Not only from a very technical point of view does this city serve its citizens, New York City provides social and health programs. For example, the fresh food policy, with the goal to serve fresh fruits within walking distance of each city resident's abode. "A city is meant to serve all of its residents."

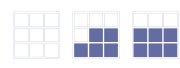


059 Date 12.10.2012, New York City, Brooklyn, new waterfront development, shiny housing, seen from Manhattan

may have been the 1970's, when the crime rate exploded and the city almost faced bankruptcy. Gerald Ford, the American president at this time, refused to help New York City financially at the beginning of this crisis. 1975 Newspapers quoted him as stating: "Let the city go broke." But after difficult times for the New Yorkers, a state loan, a shrinking of the cities administration and many initiatives that were found to solve housing problems and bring balance into the social inadequacies eventually provided a solution. From then on New York City changed from an industrial and steel city into a service-city. Not only from a very technical point of view does this city serve its citizens, New York City provides social and health programs. For example, the fresh food policy, with the goal to serve fresh fruits within walking distance of each city resident's abode. "A city is meant to serve all of its residents."



060 Date 19.12.2014, Source Openstreetmap.org, as-built map, prepared by the author





061 Date 15.10.2012; Detailed, balanced and sustainable architecture in the Times-square district, New York Times Tower, opened 2007, Design by Renzo Piano



063 Date 16.10.2012; Imagine - imagination of the future, John Lennon Memorial, Strawberry Fields, Central Park, New York City, Designed by Naples/Italy based artists



062 Date 12.10.2012, Brownstone Building, Market St. Two Bridges, View from the Manhattan Bridge, Location:<https://goo.gl/maps/mgnYu>



064 Date 25.09.2009; People view the construction site for the new World One Trade Center, Downtown Manhattan, New York City



065 Date 15.10.2012; Coney Island the industrialized amusement park



066 Date 16.10.2012; New York City, Manhattan, Chelsea, designed by Diller Scofidio + Renfro, James Corner and others



067 Date 12.10.2012, The layers of our cities, Brooklyn Bridge and Manhattan Bridge, seen from Columbia Heights, Brooklyn, New York City





068 Date 05.10.2009; New York City, Central Park, seen from the Rockefeller Center



An aerial photograph of New York City, showing the Hudson River on the left, the city grid, and the East River on the right. A white rectangular box in the upper right corner highlights a specific area of the city. The text '25 km²' is written in white inside this box.

25 km²

Aerial View of New York City
Scale 1 to 168.000



1 km²

Aerial View of NYC, Center of Manhattan
Scale 1 to 33.333

Mumbai

4km²

Mumbai India

- *
 - 1 Coordinates 18,9834 Lat
72,8435 Lon
 - 2 *Current Population* 12,4 mil
Urban Population 20,7 mil
Area 603 km²
 - 3 *Urban Area* 4355 km²
Density 4753 per/km²

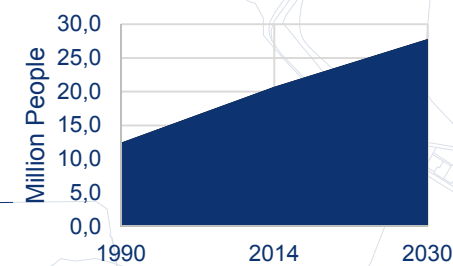
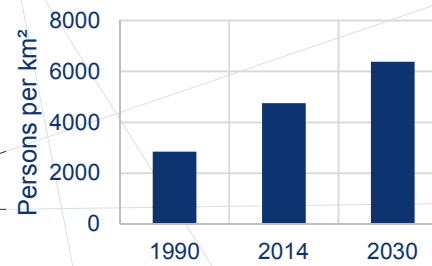
4

Population Trends		
Year	mil.	World Rank
1990	12,4	6
2014	20,7	6
2030	27,8	4

Foundation
first satled 1507

Sources

1*openstreetmap.org, 4*Data refers to the Mumbai Metropol area, 2* <http://censusindia.gov.in> , 3*



Next Door City

Everything is around the corner.

crowded - next to next - diverse
- poor and rich - city of short distances - no need of a car by now

"This is at once a city of paradise and of hell. But Mumbai's paradox is that it is often the dwellers of paradise who feel themselves in hell and the dwellers of hell who feel themselves in paradise." (Giridharadas, NYTimes)^{*1}

The gate of India, the entry to the crazy but incredible nation. Bombay as the city was called till 1996 is home to about 20 million people who bring the city to life. The island of Mumbai, which was seven natural islands in the Indian Ocean, are historically known to have been settled since 600 BC. Archaeologists have found proof of simple fishing settlements dating from this time. Colonization and the initial steps for the greater Mumbai as we know it today was initiated by a Portuguese trader (Francisco de Almeida), who landed first in 1508. After 1661 Mumbai was a British colony. In the colonial historic city centre there are several important buildings built in the Victorian style. Like the Victorian Museum of Arts. Currently we find the urban planning patterns from the Victorian age in some of central Mumbai's areas, defined by widely arranged alleys and huge streets. In between of the planned network of streets in Mumbai one finds (densifying) unplanned areas almost everywhere. Approximately 2000 Slum Pockets exist within the City of Mumbai and make the city what it is. These areas are dispersed so that for most residents every kind of service like street food is to be found in the local vicinity; often at the next door.

Mustansir Dalvi, Professor at the Sir JJ College for Architecture said: Areas with slums in their closer neighbourhood tend to gain higher values in the real estate market, than neighbourhoods that are not surrounded

by slums. Being close to a slum means having (cheap) hands for simple labour in the neighbourhood. So to say the diversity is fully implemented in the makeup of the city. Simple housing brings as well street food. Denser informal structures started to be autonomous business sectors and serve people not only as a home.

Dharavi - one of the most popular and biggest slums known is part of Mumbai. The beginnings of Dharavi started in the middle of the 19th century.^{*2} The techniques of early settlers who made pottery still exist in much the same fashion today. Since the beginning Dharavi has grown a lot, and became one of the most densely populated areas ever seen. This remarkable density has led into many problems; epidemics and human tragedies happen frequently. Hygienic standards are far short of what we would call healthy. Thousands of residents use public bath facilities which fall well short of the required capacity. Besides all of these inhuman conditions and problems some really fascinating things are going on in Dharavi. It is not only a slum and housing area but also turned into a business district. There are jobs for many in a huge variety of professions. Pottery or leather production in traditional handcrafts, plastic or aluminium recycling facilities recycle up to 60% of Mumbai's plastic waste.^{*3} Besides the named professions you can find business for almost every kind of manual labour in two square kilometres. In fact, these two square kilometres contain the homes and the work places of about 750.000 people. Density figures for Dharavi vary between 400.000 and 1.000.000 per km².^{*4}

Currently, some alarming processes are go-

ing on in Mumbai as the city municipality starts to adapt Mumbai towards the global tendency towards a growing middle class, which is widely defined by the owning of a car. The administration of Mumbai decided to spend most of the money from the pot for infrastructure into the building of highways and car infrastructure. Currently Mumbai has the base for a well working infrastructure in public transportation. No doubt, Mumbai's city railway network is soon to be running at its capacity. It will eventually be required to run over capacity and is also coming to the end of its life span. The need of adaptation and renovation for the city wide train network is pronounced, currently the suburban railway network serves about 7,5 million commuters.^{*5}

Mumbai will face major traffic issues, with the ongoing segregation as result of slum clearing. The city of short distances will need a much higher capacity for people's transportation as the current mixed nature of the cities make up is formalised. As parts of the city are divided people will be required to make longer journeys. The ongoing growth of Mumbai and the lack of capacity in public transportation will lead into catastrophic traffic situations. It is not that Mumbai municipality isn't acting to extend the public transport sector, but there are problems with the scale of this intervention. As we see with the newly built mono rails. If the car policy does not change, Mumbai soon will be the hell of the car driving middle class.

Mumbai is also Bollywood, in the western world known as the Indian film genre takes its name from Bombay. These Indian movies mostly tell a love story, and are full of

Sources:^{*1}, http://www.nytimes.com/2008/11/09/weekinreview/09giridharadas.html?pagewanted=print&_r=0, 2015 09 28; ^{*2}, <https://en.wikipedia.org/wiki/Dharavi>, 2015 10 28; ^{*3}, <http://www.waterandmegacities.org/a-tour-through-dharavi-%E2%80%93-one-of-south-asia%E2%80%99s-biggest-slums/>, 2015 10 25, <http://www.theguardian.com/environment/2007/mar/04/india.recycling> 2015 2025; ^{*4}, <https://en.wikipedia.org/wiki/Dharavi> 2015 10 28; ^{*5}, <http://www.theguardian.com/world/2013/oct/29/india-mumbai-population-rail-accidents> 2015 20 20; ^{*6}, Harvard Business SchoolProduct #:610059-PDF-ENG, 2015 09 28; Other sources: [http://www.mcgm.gov.in/irj/go/km/docs/documents/MCGM%20Department%20List/City%20Engineer/Deputy%20City%20Engineer%20\(Planning%20and%20Design\)/City%20Development%20Plan/Urban%20Basic%20Services%20in%20Slums.pdf](http://www.mcgm.gov.in/irj/go/km/docs/documents/MCGM%20Department%20List/City%20Engineer/Deputy%20City%20Engineer%20(Planning%20and%20Design)/City%20Development%20Plan/Urban%20Basic%20Services%20in%20Slums.pdf); 2015 09 28

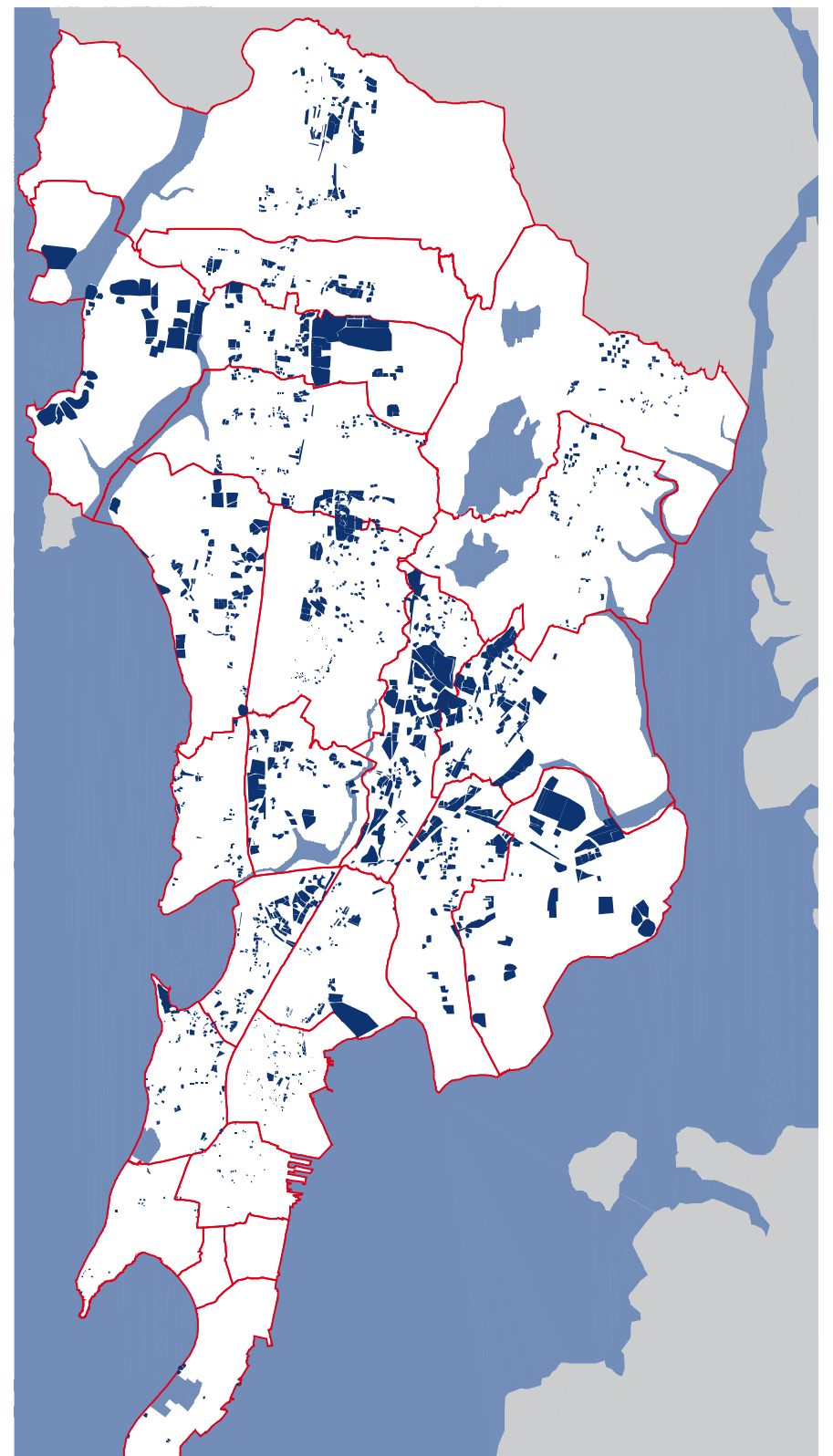


dance performances. Mumbai is not at least because of Bollywood, a magnet for people seeking their chance with a job in this vibrant and city of short distances. Everything is kind of next door. The street life is as colourful as is India. You find most things within walking distance. For people who work away from home a food delivery network, the “Dabbawala*” developed around Mumbai. About two hundred thousand meals are delivered daily from the kitchen at one’s home, to one’s office or working site. The Dabbawala is known for its performance, its low cost and a very simple logistical system.* The literal translation of the word dabbawala is “one who carries a box”

1885 a banker hired a man in Mumbai to deliver his food from his home to his office following this single incident one of this first deliverymen founded the Dabbawala business around Pune in 1890. *6



073 Date 18.02.2014; Welcome to Dharavi: View from the flyover close to the Mahim Phatak bus stop, Mumbai, Maharashtra, India



074 According to the 2011 census 6.5 million lived in the approximately 2000 Slum Pockets of Mumbai, map adapted by author; Source: <http://www.pkdas.com/published/PK-Das-Slums-Redev-and-Affordable-Housing-Integration.pdf>, SLUMS REDEVELOPMENT AND AFFORDABLE HOUSING INTEGRATION THE CASE OF MUMBAI PART - 2, P.K DAS & ASSOCIATES; 2015 09 28

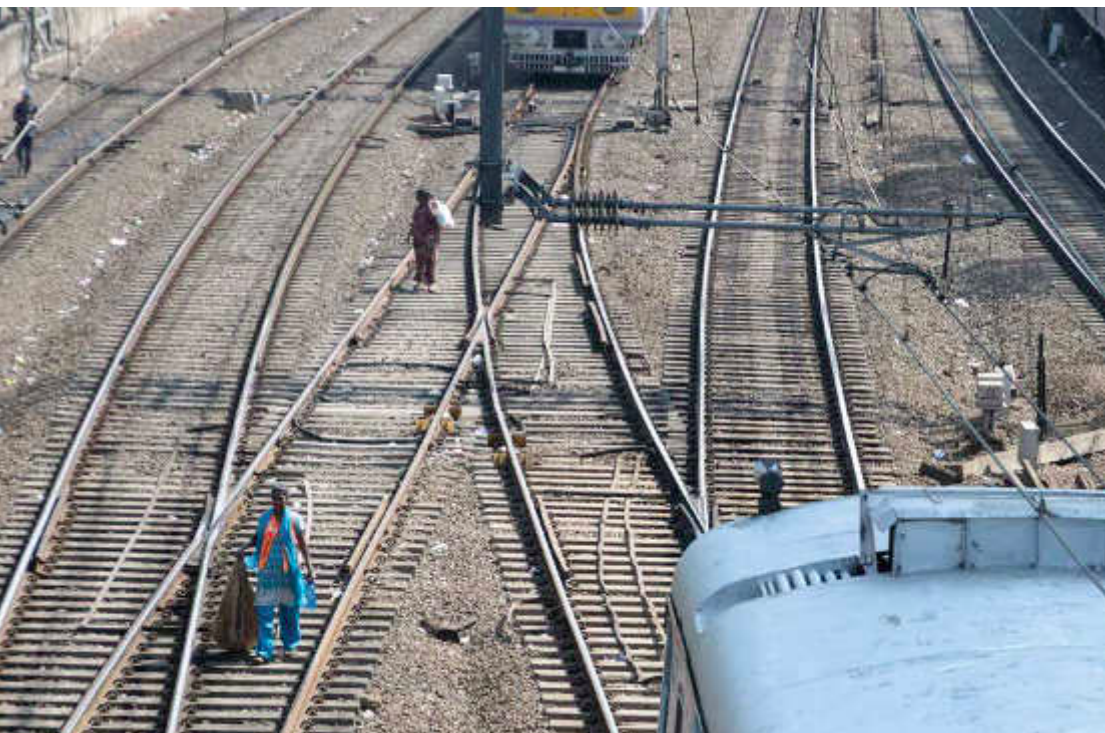




075 Date 13.03.2014; Mumbai, Kurla Railway Station, aerial view from the plane South



077 Date 03.03.2014; Andheri Railway station, aerial view from the plane North



076 Date 16.02.2014; Mumbai, Waste collecting, City Railroad Network of Mumbai, transports around 7.5 million passengers daily



078 Date 13.03.2014; CST Road, aerial view from the plane West



079 Date 12.03.2014, Mumbai, The next door city. Slums, housing, and offices right around the corner, close to the beginning of the Marine Drive



081 Date 12.03.2014; One of the many marginal settlements on the seaside, Mumbai, Colaba



080 Date 17.02.2014 ; Mumbai, Monorail columns, the capacity of this Metro/High-Line might not have enough capacity for the densely populated city of Mumbai



082 Date 12.03.2014; Mumbai, hard to say, weather this is a slum clearing or civil works to secure the coast line



083 Date 03.03.2014; Aerial view close to the Mumbai Domestic airport

An aerial photograph of Mumbai, India, showing the city's urban layout, the Arabian Sea to the west, and the surrounding region. A white rectangular box in the upper right corner highlights a specific area of 25 km². The highlighted area includes a large, irregularly shaped water body, likely a reservoir or a large pond, and the surrounding land. The land appears to be a mix of urban development and natural terrain. The water body is a dark, almost black color, contrasting with the brownish and greenish tones of the land. The surrounding land is a mix of brown and green, suggesting a combination of urban areas and natural vegetation. The overall image is a high-resolution aerial photograph, providing a detailed view of the city and its surroundings.

25 km²

Aerial View of Mumbai
Scale 1 to 168.000



1 km²

Aerial View of Mumbai with Dharavi in the centre

Scale 1 to 33.333

Chandigarh

4km²

Chandigarh India

1 Coordinates 30,7349 Lat
76,7594 Lon
2 Current Population 1,1 mil
Urban Population mil
Area 114 km²
Urban Area km²
Density 9649 per/km²

Population Trends

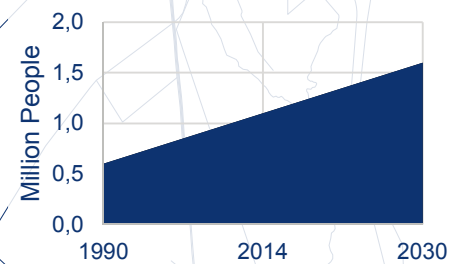
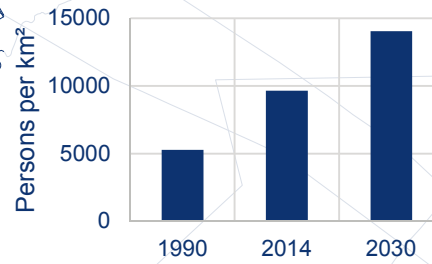
Year	mil.	World Rank
1990	0,6	405
2014	1,1	425
2030	1,6	388

Foundation

1. November 1966

Sources

1*openstreetmap.org, 2*
<http://censusindia.gov.in>



City Planning in Post Industrial Times

Cars and villages, a master plan?

planned - Le Corbusier - different socioeconomic groups - informal growth on the city boundaries - very not Indian - car city from the fifties

Chandigarh serves the users, for whom it was planned, quiet well but is criticised in that this group appears to consist of the richer parts of Indian society.¹ Does Chandigarh represent the search for a perfect city for the well-to-do and the middle class? If so then it is a precisely defined example of a changing Indian society, which may be only the translation of the western ideologized car city, into an Indian reality. The housing is categorized and assigned by the state based on the economic position of its residents.² The rich live in the districts in luxurious and huge villas, the size of the housing units and their quality gets smaller and lower with the social ranking of the people they have been planned for. And so are the neighbourhoods formed; poor or very well to do but always homogeneous. But somehow the city left out one part of the Indian society: the very poor, the poor of the poorest. Those who do not have any property, only their hands to search for the daily meal. Many of those whose hands built Chandigarh have never been allowed to live in this city. Almost as if they are not existing beyond the initial requirement of cheap labour. Today, in Chandigarh, it is strictly prohibited to set up any kind of marginal homes outside the basis of formal planning. Ironically, Le Corbusier designed one of his hands for Chandigarh, a hand that is a peace pigeon as well. Is this hand a symbol for freedom, or is it a symbol for the handmadeness of Chandigarh? Hard working hands that never have been able to live in Chandigarh worked for a society that negates them, a society that is still not ahead of the history of their casts. Not by intention, but also not determined enough to leave

this era entirely behind.

Chandigarh's founding has political backgrounds. After the partition of India in 1947, Punjab was split and one half is now Pakistan, the capital of Punjab (Lahore) is part of west Punjab and was no longer part of India after separation. East Punjab has since been without a capital. And due to political reasons, not one of the existing cities has been given the administrative role. It was decided to found and build a new city. Later, Punjab was split into two states, Punjab and Haryana, what makes Chandigarh the capitol of these two states.

To plan a city one needs plenty of professionals. These professionals were found in Europe and North America and the initial planning team was led by Albert Mayer and Mathew Novicki. After Mathew Novicki died in a plane crash and Albert Mayer discontinued his work on the city, so it was that Le Corbusier was asked to continue the master plan for Chandigarh. The final master plan shows many similarities to the first designs by Mayer and Novicki. This master plan of Chandigarh comprises of 56 sectors, urban neighbourhood units, and these were built in three phases. With each sector having a hierarchical street network of seven levels, arranging around a centre in the middle of each sector.³ The grid and the sectors are continued towards Mohali a satellite city in Punjab.

Besides the negation of the existence of the poorest, Chandigarh has quiet some qualities other cities do not have. Each of the blocks has a small centre around which the built up structures arrange. It almost appears

like the arrangement of several towns in a matrix, towns that finally lead to be Chandigarh. Each of these townships has individual qualities, all are part of the planned matrix for the social model Chandigarh. This is the mix of a colourful Indian culture and the very technical and straight paradigms of the planning in the global west in the late 1940s. The atmosphere is in many parts calming and brings the feeling as there is a lot of nature. The variations in ideas of how space could be used are some of Chandigarh's greatest qualities. The housing is well facilitated, even the simplest buildings have all amenities like water from the tap and a related proper sewage system. Initially Chandigarh was planned to be home to 0.5 million, now 1.1 million people live in Chandigarh and it is still growing.⁴ When the first step of Chandigarh's development plan was realised and built, most critics never would have thought that Chandigarh would ever be home to more than 300.000 residents.

Planned for cars and individual traffic, Chandigarh has as only one type of public transport, buses. A subway is proposed and should be built by 2018.

The gridded network of main roads separate the urban units of Chandigarh, in some places the sectors on the left hand side seem to have nothing to do with the sectors on the right hand side and they appear isolated. A typical circumstance, in cities intentionally planned for cars.

The best qualities Chandigarh has to offer are the very well designed units. To the





089 Date 28.02.2014; Ramp – a house at the Civil Secretariat Punjab and Haryana, design by Le Corbusier, Chandigarh, India



090 Date 28.02.2014, Small informal area, Chandigarh, India

last detail, all the required things fit in the thought matrix of Chandigarh. The regulations define the allowed building heights, and the assigned land use is very detailed, till today it is not allowed to build other types of buildings than those defined in the Chandigarh master plan. There is the block with all the government buildings. This district is a playground of Le Corbusier, and is all very brutal but in appearance but also soft concrete buildings show of the qualities of the master planner and architect Le Corbusier. As much as one could like his architecture, it still is a very polarizing and is splits the world into those who like Le Corbusier's work and those who do not. So it is with Chandigarh, some see it as the best master planned City and others see no city at all.

Chandigarh is not so much about conventional urban planning; it is much more about planning society. Putting all wanted and liked things into a utopic and perfect matrix. Finally planning for poor and rich with a clearly defined separation.

Is this the biggest deficiency of master-planned cities: that they always show tendencies towards an idealised perfect system which does not include the poor? So to say planning for idealistic societies that might not come to exist tomorrow.

The problem that a plan will never include every possibility and serve all participants of society to the same the same extent and in the same ways. This problem leads like it did in Chandigarh to the planning of inadequacies and the leaving aside of an entire social group of society. Almost like someone forgot to plan the door for a house, those responsible forgot to give space to the ones who built Chandigarh with their bare hands. Despite all the shadows realized utopias draw, Chandigarh seems to be liveable for those who can afford it.



091 Date 27.02.2014; Manhole Cover with the city map of Chandigarh, India



092 Date 28.02.2014; Repetition - Rest-rooms in middle class housing areas, Chandigarh, India





093 Date 28.02.2014; Aerial View from the Civil Secretariat Punjab and Haryana, Chandigarh, India



094 Date 28.02.2014; Residential Area, Chandigarh, India



095 Date 28.02.2014; High Court Chandigarh, design by Le Corbusier



25 km²

Aerial View of Chandigarh
Scale 1 to 168.000

An aerial photograph of Chandigarh, India, showcasing its iconic grid system. The city is built on a plateau, with a dense, rectangular pattern of buildings and streets. The grid is composed of numerous small, uniform blocks, creating a highly organized urban layout. A prominent diagonal road, the Le Corbusier Promenade, runs through the city. The surrounding landscape is a mix of urban development and open spaces, including parks and green areas. A white box in the top right corner indicates a scale of 1 km².

1 km²

Aerial View of the Grid of Chandigarh
Scale 1 to 40.000

New Delhi

4km²

New Delhi India

*
1

Coordinates	28,6650 Lat
	77,2266 Lon
2 Current Population	18,0 mil
Urban Population	25,0 mil
Area	1.484 km ²
Urban Area	46.208 km ²
Density	541 per/km ²

Population Trends

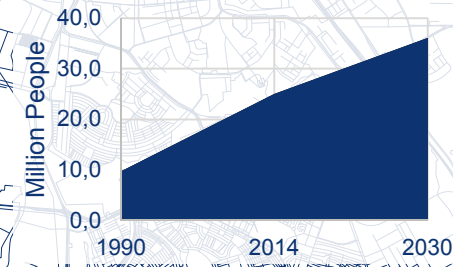
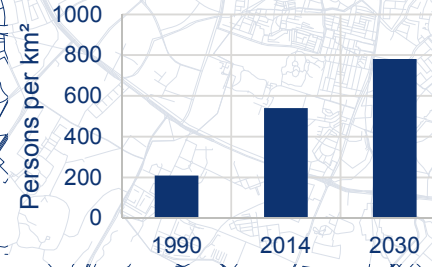
Year	mil.	World Rank
1990	9,7	12
2014	25	2
2030	36,1	2

Foundation

1857

Sources

1*openstreetmap.org, 2*
<http://censusindia.gov.in>



Big Times Coming Up?

Prognoses make New Delhi the largest city of the future, meanwhile it turned into our planet's dust-hole.

Indian capital - subway with a high standard - "slum clearing" - privately developed sub centres - air pollution - individual traffic?

Following the prognosis of the World Bank, New Delhi will become world's largest mega city in less than 20 years. New Delhi will surpass Tokyo's metropolitan area, which is counted as 37.5 million inhabitants by 2014.*¹ Currently New Delhi metropolitan area is inhabited by 25 million*², and still shows a very high growth rate, about one million new inhabitants annually. This enormous growth in the last decades has challenged all who participate and life in New Delhi and brings difficulties to dwellers and planners alike. Some immanent causes like the unregulated development of informal neighbourhoods and marginal settlements like slums are a crucial chapter in New Delhi's past and future. Slum clearing and replacement often takes away the livelihood of the poorest of the poor.*³ Slums have this dirty and bad image, and many do not want to accept these often well-organized micro structures. The reality is often different from preconceptions and most of the people do not live in a slum by choice; these marginal settlements are their only chance to survive economically. In New Delhi efforts are made with the provision of flats to those who are expelled from their homes in slums. These affordable houses are small in number, and mostly do not allow users to continue their business they ran in their previous surrounding. Therefore, to relocate or upgrade these marginal quarters, it will be necessary to provide better solutions in the present and future, not at least to manage the inadequacies between India's socioeconomic groups.

There is no other place to be found on our planet with air as polluted as in New Delhi.*⁴ And this is the future too since more and more people will own a car, as the status symbol of the uprising socioeconom-

ic middle class. 25 million live in a place where the pollution of the air is a risk for the health of each resident, and still everybody who can afford to will have a car. Public transportation is taken very seriously in New Delhi, and the ongoing extensions of the already existing subway network make the city more accessible than it ever was before, and hopefully leads to a revision of the internalized status symbol cars embody. The understanding that cars in a city as huge as New Delhi will cause more problems than they will ever solve.

The traffic on the roads is not the only reason that New Delhi's air is so bad however. Many of New Delhi's residents do not know better or do not even have another chance, as to do their cooking with an open fire. The summation of this knowledge gap and the lack of other viable alternatives is compounded by the geographical circumstances as New Delhi has poor natural air ventilation.*⁵

New Delhi's climate is often also a disadvantage, as the temperature surpasses 35°C several months of the year, and the built up structure of the city causes the temperature to stay high during the night as well. This means for all who have only sufficient capital to get enough food, to keep up working on a daily basis, is going to be impossible. As this temperatures do not allow one to sleep well anymore the human body is forced to its limits. It leaves one with the question why do people move to this city with bad air, way too high temperatures and often over crowded streets. There are still reasons that the life in New Delhi with all its disadvantages is a better chance as it would be to live in the rural areas of India. Old Delhi is an example of early Indian urban/city development, and stands so to say

on the beginning of the evolution of Delhi and later New Delhi. In the area of Delhi the ruins of seven different cities have been found and the earliest remnants date back 3000 years. In the beginning of the 20th century when Delhi should replace the former capital Calcutta, the city centre was planned with the paradigms of a British garden city by the British architects Edwin Lutyens and Herbert Baker. In 1947 New Delhi finally became India's capitol and the enormous growth and expansion of New Delhi started.*⁶ Since 1900 New Delhi's population increased by one hundred times, and the development of the city could not keep with this growth. The enormous size of New Delhi demands for many different solutions for its future urban development and the implementation of sub-centres.

Gurgaon is one of these newly developed sub-centres within New Delhi. Gurgaon is privately financed and built and is an island within Delhi, clean and polished where the Indian culture is somehow excluded. There is comparatively no life in the semi-public space, and even outdoor spaces are cleaned with mops. Gurgaon is known for being home to the Indian head offices of internationally operating enterprises, which makes Gurgaon an important economic hub within New Delhi, without being part of New Delhi. Will this be the future in urban development? Is this it? Improvement where the only driving paradigm is economic growth.

The planning does not stop at the cities borders, and is a crucial part of the development of the DMIC – Delhi Mumbai Industrial Corridor, the development of 25 new to-be-built cities will generate the world's biggest megalopolis – a continuous urban structure, connecting Delhi and Mumbai.





101 Date 25.02.2014; New Delhi, highway, fighting the air pollution in New Delhi is on of the biggest problems. No other megacity is known to have such bad air



103 Date 23.02.2014; New Dehli, men in front of their trucks, cooking over an open fire. Are people just not aware how bad the situation with the air is, or don't they see another opportunity to cook? (as I took this picture the truck drivers were blinking their lights in greeting)



102 Date 26.02.2014; New Dehli, highway; What steps will be made to change the air in New Dehli?



104 Date 25.02.2014; New Dehli, Slum, colourful and full of life -, that is how it might seem to some: No problems at all, at least at first glance.



105 Date 23.02.2014; New Delhi, Subway station. New Delhi's subway network is state of the art. Will the planned subway network be enough to get cleaner air for New Delhi



107 Date 23.02.2014; New Delhi, subway station; Small informal structures around the subway station.



106 Date 23.02.2014; New Delhi, raised subway station



108 Date 01.03.2014; DLF City, A man mops the public square, a place between office towers at DLF City.



109 Date 02.03.2014: Street life Old Delhi, around Chandni Chowk





110 Date 02.03.2014; Street market, Close to Nehru Place. Delhi

An aerial photograph of New Delhi, India, showing a dense urban area with a grid-like street pattern. A large, irregularly shaped area in the upper right quadrant is highlighted with a white border. The highlighted area contains a mix of urban buildings, green spaces, and a winding road. The surrounding area shows more extensive urban development and some open land. The overall color palette is dominated by greys, browns, and greens.

25 km²

Aerial View of New Delhi
Scale 1 to 168.000

1 km²



Aerial View of New and Old Delhi
Scale 1 to 40.000

Barcelona

4km²

Barcelona Spain

Coordinates 41,3927 Lat
2,1407 Lon

Current Population 1,6 mil
Urban Population 5,2 mil
Area 101 km²
Urban Area 803 km²
Density 6476 per/km²

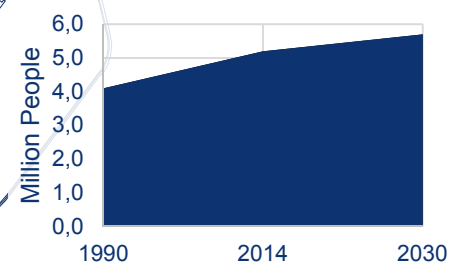
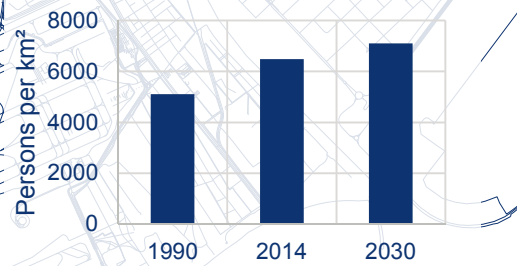
Population Trends

Year	mil.	World Rank
1990	4,1	40
2014	5,2	69
2030	5,7	89

Foundation
as a roman city

Sources

1*openstreetmap.org,



City Planning Habits

How to plan a city and the city planner.

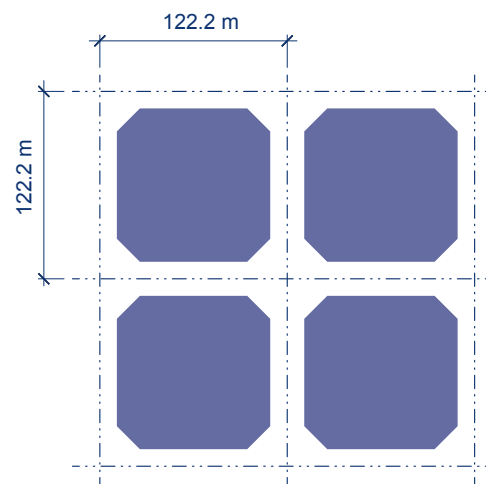
The urban planner, many architects, engineers, scientist and planners have all tried to design their ideal city, to formulate a utopia. In the case of Barcelona, a trained civil engineer, Ildefons Cerdá, planned wide parts of Barcelona as we know it today. His urban plan was not a simple combination of urban elements. It was much more of a holistic plan and utopia.

The planning for Eixample - Catalan for extension, a extension of the formally walled city. During the 19th century the over populated walled city had extremely poor living conditions that were widely catastrophic for its inhabitants. When the city wall was demolished (1859) a competition was held to identify future desirable extensions to Barcelona. Ildefons Cerdá who made his first explicit urban design approaches for Barcelona in 1855. Cerdá's design strategy included a social and technical functional approach. This meant that with the planning of Eixample, Cerdá gave attention to many different perimeters. A standardized grid pattern, and square city blocks with chamfered corners, this regular pattern built the base unit for the urban extension of Barcelona. These 900 units - urban blocks, were assigned clear definitions regarding the allowed height, and the amount of built up area of each of this blocks.

Cerdá made clear definitions in his urban space plan including: sun-light parameters, air ventilation, plants, effective waste management, wastewater systems, transportation, public transportation, provision of goods, energy supply and the goal to provide affordable housing within each of the urban blocks. The affordable housing did not work out, it was developed pretty fast that the qualities of this newly defined urban area lead into speculation. Instead of a diverse area in terms of a social mix, the blocks (Manzanas) have been privately de-

veloped and the area turned into a magnet for (richer people) for the well to do.

A "Manzana" (urban block) in Eixample usually has an extent of 113,3 meters along each side. The initial spacial plan by Cerdá defined the different Manzanas with two or three sides of buildings with a maximum depth of 20 meters and a maximum height of 16 meters. The unbuilt area including the core of each Manzana were to be designated as recreational space. Currently almost all of this Manzana's are built on four sides and much higher than 16 meters. At the moment there are only some 35 out 900 Manzanas offering the people public parks in their courtyards. An organization called ProEixample, a joint venture from the City of Barcelona and local monetary institutions, are trying to increase the number of publicly usable courtyards. This endeavour has the goal of providing one public Man-



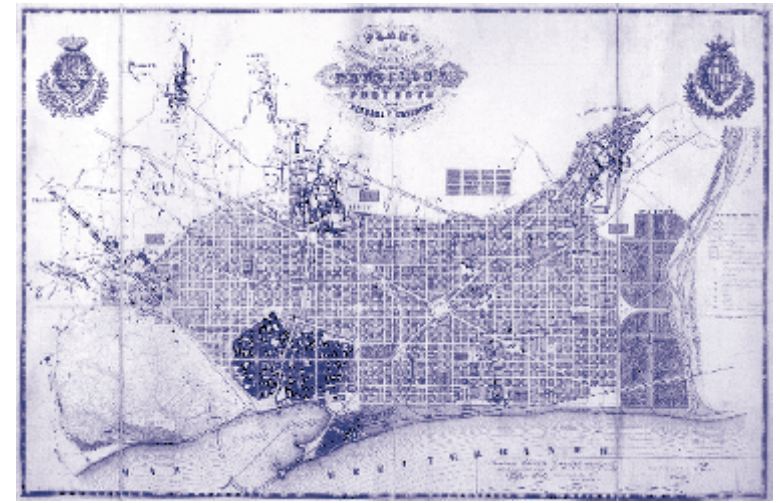
116 The standardized Manzanas

zana core for every nine blocks.

The grid which embeds the Manzanas is mostly uniform, except some larger main roads and diagonal streets/boulevards.

The mastermind Ildefonso Cerdá y Suñer was born 1815 in Catalonia, later he was

the urban planner - Social design - city wide infrastructure - how quickly plans change - tramways and transportation - reintroduction of old plans



117 Original "Eixample" concept of 1859, Plan de los alrededores de la ciudad de Barcelona y del proyecto para su mejora y ampliación de Ildefonso Cerdá y Suñer

trained in Madrid as a civil engineer. After he inherited the family fortune he stopped working as a civil engineer and started to engage himself in urban planning. He set up his own guidelines as he couldn't find suitable precedents for his idea of urban planning.

Teoría de la Construcción de Ciudades ("Theory of City Construction", 1859) was written to support his 1855 preliminary project for the Barcelona extension.

Throughout his life, Cerdá continued to improve his utopia, and died as a poor man in 1876 without ever being paid for his masterpiece; the plan for Eixample.

Eixample is to be considered as a failed urban master plan, as the social mix never occurred, the planned qualities of life never were not delivered in the way they were proposed, the only thing left is the visionary utopia from Ildefonso Cerdá. However, some argue that it succeeded eventually, especially compared to other master plans for cities as it is a very well working and vital part of Barcelona today: The utopia failed but the city somehow prevailed.





118 Date 10.10.2008; Sagrada Família, Eixample Barcelona, Photography by Gabriel Doblinger



119 Date 11.10.2008; Eixample, Photography by Gabriel Doblinger



120 Date 11.10.2008, Panoramic photography Barcelona, seen from Montjuïc Castle



Urban grain plan of Eixample
Source: [Openstreetmaps.org](https://www.openstreetmap.org), adabted by the author



An aerial photograph of Barcelona, Spain, showing the city's urban layout and surrounding terrain. A white rectangular box in the upper right corner highlights a specific area of 25 km². The city is situated on a coastal plain, with the Mediterranean Sea to the east. The terrain is a mix of urban development, green spaces, and hilly areas. The highlighted area is a dense urban zone.

25 km²

Aerial View of Barcelona
Scale 1 to 168.000



1 km²

Aerial View of Eixample

Scale 1 to 50.000

Lima

4km²

Lima
Peru

Coordinates -12.04543 Lat
-77.02901 Lon

Current Population 8,8 mil
Urban Population 9,7 mil
Area 2672 km²
Urban Area 800 km²
Density 3630 per/km²

Population Trends

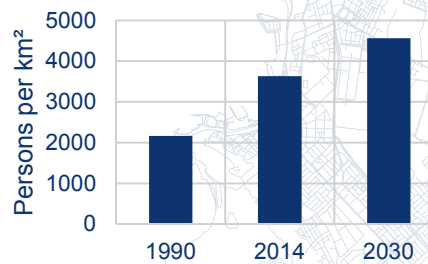
Year	mil.	World Rank
1990	5,8	28
2014	9,7	30
2030	12,2	30

Foundation
18 Januar1535

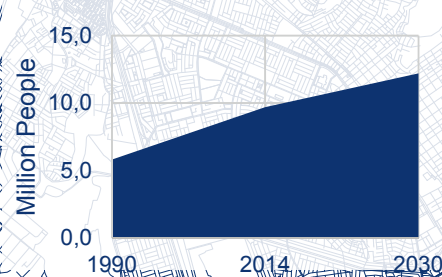
Sources

1*OSM, 2*WUP_2014 Urban Agglomerations
Wallchart.pdf www.unpopulation.com Refers
to Gran Lima, which consists of the capitals
of the departments of Lima and Callao and
surrounding populated centres.

125 Lima Density Chart, by author, based on
data provided by www.unpopulation.org



126 Lima Population Chart, by author, based on
data provided by www.unpopulation.org



What Makes the Difference?

Poor and rich areas separate themselves in a very clear manner.

A city with two faces. Seeing the city from above, allows one to realize, how it might feel, moving from the coastline of Lima to the centre and further to the city boundaries placed in the desert. Feeling the increasing temperature and how much this city changes with these external climatic influences. The aerial view shows that the coast of Lima lies under a bit of haze and only some of the taller buildings show of their rooftops. There are many newly and well developed buildings built with the highest standards. Only some kilometres further is historic Lima with its colonial buildings which fades into a more and more informally grown structure. And then one sees the “End” of the city, the buildings get smaller, at this point it is hard to recognize the difference between the mountains, the dessert and the built up structures. Many of the buildings on the fringe of Lima are not more than a wooden barn, roofed with sheet metal and covered with sand. And the only value of these barns seems to be their closeness to the urbanity of Lima.

What opportunities do people see to accept these almost unliveable conditions? The circumstances are not easy to understand, especially for one who was born, and grew up in a country in the global west. To understand, it helps to know, why one would anyhow like to live in Lima. There are many who like to life in Lima, people who are not the poorest of the poor and also wealthy people who come from Europe or North America chose to make their lives in Lima. The coastline of Lima has huge qualities. The whole year is like summer, never to hot and we can find all the expected amenities of western cities, sitting on the top of this 80 meter high cliff. There are

two districts, Miraflores and Barranco that have everything that a modern citizen could ask for. Is it the dream to have this life, the dream of wealth that so many people want to live in Lima, whatever it costs?

In Lima affordable housing policies have never brought a sustainable solution for the socioeconomic groups with low income, like the lower middle class and below. The first significant changes in the Peruvian society were in the 1920's when the migration towards Peru's cities started to rise significantly. At this time the municipalities acknowledged that action must be taken. In the 1940's the population of Peru rose again and a next wave of migration was heading towards Lima, resulting in an enormous growth of the informal housing sector. In 1949 an initial, very functionalist urban plan for the city of Lima was made with the idea of a modern city, not many of this plan's goals have been realized but this plan also had no real solutions how to deal with the uncontrolled growth. In the 20th century the city of Lima had no real policies to deal with the growth and the resulting need of affordable housing for the socioeconomic groups with low incomes, as most of the policies for affordable housing were addressed to the upper middle class. In the 20th century the responsibilities of state, cities and municipalities changed several times, and the strategies towards a formal urban growth did not follow any constant policy. The only mentionable thing that happened, was the giving of land to the indigenous population, by the municipality.

In the 21th century Lima started to open up more towards a privately financed housing sector, leading to several very well de-

veloped sub centres of the city. The private market for (affordable) housing addressed again only the middle class and the well to do. The only chance for newly arriving migrants with no financial possibilities is to squat on land, leading to an ongoing and constant increase of informal growth of Lima and the socio spatial divide has no end in sight; Lima will keep its two faces. The characteristics of this squatter's land is a general insufficient quality for a satisfactory urban life. The upgrading of this slums will cost around 7.5 times more than a structured development from the very beginning would have.

There are many reasons, besides the glamour cities seem to sparkle, like economic, humanitarian, protection from violence and the chances for better education why people move to Lima. Mostly it is simply the search for a better life. These people choose rather to live in front of the city in the dessert and to take their chance, than stay in the countryside on their farms. The climate and harsh surroundings on the urban fringe of Lima are just a small part of the difficulties, these dwellers face.

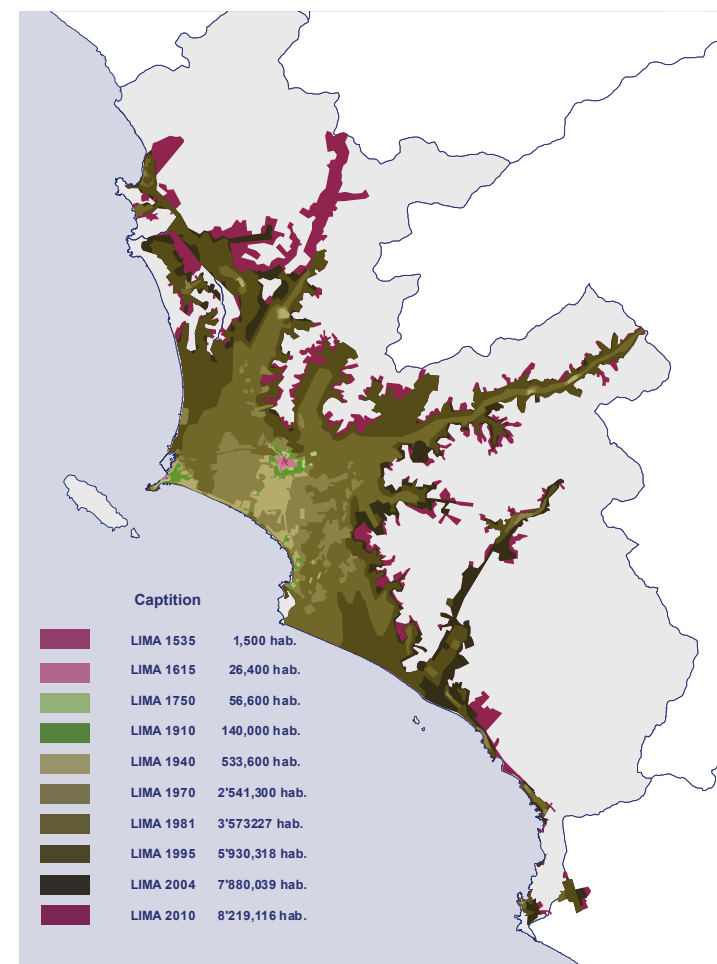
For example one problem with life on the fringe is the commute to work. If you have a job somewhere in Lima, it might take one hour to get to work because of the enormous extensions of the low rise informal areas. The solution as so often, is a proper public transportation network. The first step towards a proper public transportation network was made with a single metro line from the south to the east of the city, which was first opened in 1990 having an extent of seven stops, and has been extended to a length of 34 kilometres and 26 stations.

hot or mild - international development - wonderful coastline - hot desert - poor or rich - huge bus station



With the knowledge of the need for a denser public transportation network, municipalities of Lima choose the pretty common public transport solution, BRT - bus rapid transit system. A system that has been introduced in many cities of South America due to its short term cost efficiency. In Lima there was already a dense network of individually run buses, but on the often over crowded streets these buses were not reliable. So the first step was to build a fast connection from west (on the coast) to east Lima, with a huge hub in the middle of this main route. Almost in the historic and colonial centre of Lima there is now a subterranean bus terminal that allows 15 buses to be loaded at the same time. The Metropolitano in Lima was first operated in 2010 and is practically a subway like infrastructure with buses, having a subterranean main terminal, Estación central, with the extent of 200 meters to allow several buses to board at the same time.

After the first routes with their stations of the Metropolitano were finished, the introduction of the first users was on a step by step basis: Only invited persons were allowed to use the buses in the beginning. The invited people were well introduced how to use the buses. They were told how to behave at the terminal, and it was clearly explained how to behave while getting off and how to stand in a line before getting on the bus. In Lima they had been ahead to other places where people force their way onto and off the buses in a very incautious manner, which causes (especially in rush hours) long delays on individual busy routes, and slows down the entire system.



127 Urban evolution of Lima, By Author based on http://eudora.vivienda.gob.pe/OBSERVATORIO/mapas/LIMA_EVOLUCION.pdf and http://eudora.vivienda.gob.pe/OBSERVATORIO/mapas/LIMA_EVOLUCION.pdf, downloaded 2015 09 16

Table: Summary of planning strategies and principles in Latin American cities

Period	Planning principles	Effects in the cities
1500 - approx. 1850 Colonial rule	Spanish urbanism principles	The compact and concentric colonial city model
approx. 1850-1920 Immigration from and trade with Europe	French urbanism principles (Haussmann)	First peripheral developments, preceded by road, and railroad networks
1920-1950 Change from European to US capital	Modernist planning (CIAM principles).	Suburbanization of the elites soon followed by the middle classes. North American type of modernization
1950-1990 Industrialization and urbanisation	Comprehensive government-centred planning. Self-help housing	Proliferation of informal areas in the peripheries. Socio-spatial segregation.
1990-onwards Changed political-economic context	Strategic and market-oriented planning. From government to governance.	New wave of suburbanisation, fragmentation into islands of wealth, preceded by road and telecommunication networks



128 Date 27.02.2013; Lima seen from the plane; the city fades into dust





129 Date 27.03.2013; North-West of Lima, marginal structures?



131 Date 27.02.2013; Huaca Pucllana an adobe and clay pyramid built during the Lima Culture about 1500 years ago, Miraflores, Lima



130 Date 27.03.2013; A part of Lima's housing agenda was and is to give land to those who have at least a little bit of wealth, the built-up structure is to be considered informal.



132 Date 27.03.2013; South-West Lima, the city grows up the slopes, often informally



133 Date 27.03.2013; Bus stop of the Metropolitano, the Lima BRT - Bus Rapid Transit System



135 Date 23.02.2013; A "modern" development, close to European standards, Barranco, Lima



134 Date 27.03.2013; A shopping centre for the well-to-do built into the cliff line of Lima, Miraflores, Lima



136 Date 24.02.2013; The coast of Lima is becoming a more and more attractive as a local recreational area.

25 km²

Aerial View of Lima
Scale 1 to 168.000



An aerial photograph of a city, likely Lima, Peru, showing a dense urban grid. A white square box in the upper right corner is labeled "1 km²", indicating the scale of the view. The city is situated along a coastline, with the ocean visible in the bottom left corner. The grid pattern is very regular, with narrow streets and small buildings. There are some larger, more prominent structures and open spaces scattered throughout the grid.

1 km²

*Aerial View towards the Lima Coast Line
Scale 1 to 25.000*

Quito



Quito Ecuador

1

Coordinates	-0.22075 Lat
	-78.51340 Lon
Current Population	1,7 mil
Urban Population	3,0 mil
Area	372 km ²
2 Urban Area	4217 km ²
Density	4570 per/km ²

Population Trends

3

Year	mil.	World Rank
1990	1,1	237
2014	1,7	274
2030	2,2	276

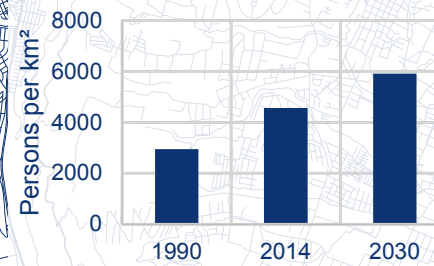
Foundation

6. December 1534

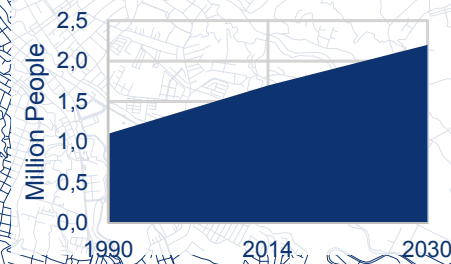
Sources

1*OSM, 3*WUP_2014 Urban Agglomerations Wallchart.pdf
www.unpopulation.com

170 Quito Density Chart, by author, based on data provided by www.unpopulation.org



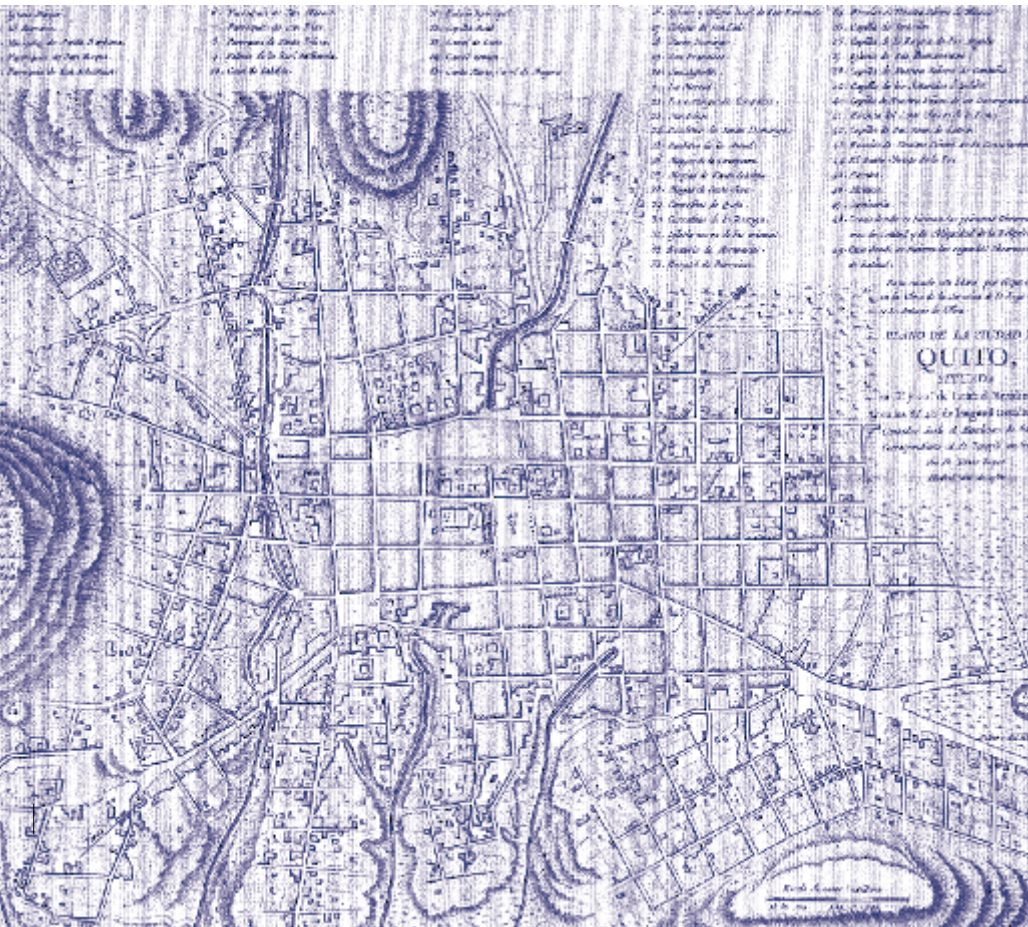
171 Quito Population Chart, by author, based on data provided by www.unpopulation.org



Linear Expansion

Qualities as disadvantages?

subway is on the way - comparable to an organism - in between the Andes - one main traffic axis - remarkable solutions - layering



142 Date 1786; Colonial center of Quito with typical Spanish colonial style grid pattern

Linearity is simplicity, in the case of Quito the linearity is defined with the valley the city is built in. The boundaries are defined with the surrounding of the mountains and the city expansion happens mostly south and north. The whole city is developed along a main axis for public and individual transportation. This axis connects the whole city of Quito with the BRT (bus rapid transit) system, and soon will be expanded with a metro, which is currently under construction. Wide parts are built on slopes along the main axis of Quito and it takes only short cross connections to link these neighbourhoods to the main axis, this would make Quito an easily accessible city in general. But, being 2850 meters above sea level in the middle of the Andes is a challenge itself,

and to make and keep Quito a resilient urbanity, requires big efforts. Earthquakes, Volcanoes and heavy rain are the biggest difficulties that the people of Quito have to deal with and due to climate change, floods and resulting slope sliding are expected to happen more frequently. The disaster risk management asks for clear future strategies and the incorporation of many actors at the same time.

Ideally the resilience is achieved before it is needed, with the inclusion of risk management into future spatial planning and development by having appropriate prevention mechanisms. This makes it necessary to have the public involved, to reach a commitment to future strategies. Communication, information, education and training help to form cooperation between institutions, communities and individuals to mobilize all available resources. This raises the chance of external support. In the case of disasters the need of monitoring and eventual evacuation are essential elements in terms of mitigation of the consequences. This need for quick responses stands at the beginning of the recovery and reconstruction of the affected areas. The resilience of a city is closely related with the distribution of the socioeconomic groups within the society. The risk of hazards in Quito is rated as high as 9 out of 12 in a global hazard index*, this indicates that Quito is relatively vulnerable.

As the city is situated in a valley, the Guayllabamba river basin, wide parts are built on the hillside, and the city gets vertical devel-

opment without building high buildings, this makes it difficult to build efficient and resilient structures. However, these naturally given qualities make the appearance of Quito very organic and the widely used Spanish grid pattern seems to disappear in between the built up structures of Quito. This leads to the conclusion that the given natural situation predefines qualities of liveability and usability of an urban region quiet a lot, especially here.

Quito as the capitol of Ecuador and is the economic center of the country. Modern office towers mark the financial district in the north of Quito, a modern 21st century city.

A city arranging itself into a valley in the Andes. The expansion of development up the mountains generates in many cases beautiful structures in a vivid colourful hill side arrangement. Great efforts are need to be taken to put up buildings in this rugged terrain. The sometimes “wild” looking structures build a frame for the old Spanish city centre, with many beautiful cathedrals and other great imperial architecture. In many cases the city is very tight for space which leads sometimes to obscure details but also to clever solutions, like a market that grew vertically.

The new airport of Quito is far out of the city and not as well connected, you can either take a taxi ride for about 45 minutes or the bus that takes at least one hour to connect to the city. For all the inhabitants it is an advantage not to have the noise pollution above their heads but the distance could be covered more effectively; the more or less continuous BRT system is not connected to the airport. The inner city transportation and public transportation follow a very simple logic, as there is just one central axis that succeeds in connecting all of the city. The rest can be easily linked to the centred axis if this axis offers enough capacity.





143 Date 22.02.2013; Colourful development on a slope towards the south east of Quito:
The rainy season could cause troubles, Seen from the Virgin of Quito



145 Date 22.02.2013; Eastern central slopes of Quito



144 Date 22.02.2013; The northern part of Quito, seen from the historic centre, the paradigms of
contemporary cities start to transform Quito



146 Date 22.02.2013; Buildings arranged like stairs on the slopes of Quito, Calle de la Ronda, Quito



147 Date 22.02.2013; Up-front the historic Quito and behind the “modern” Lima with high rising buildings, Seen from the Virgin of Quito.



149 Date 22.02.2013; The buildings are arranged like they have been naturally grown on these slopes, They are however endangered by slope slides, central west of Quito, Seen from the Virgin of Quito.



148 Date 22.02.2013; Very common, structural steel for the next story, in- years can pass between phases of building, in the centre of Quito



150 Date 22.02.2013; On the right, a bus-stop of “El trolebús de Quito” of the Quito BRT system, Underneath, the construction site for the Quito Metro



151 Date 25.03.2013; Aerial view of northern of Quito facing East, taken from the plane





152 Date 22.02.2013; Like something organic? These buildings are green as well. Quito, Ecuador



25 km²

Aerial View of Quito
Scale 1 to 168.000



1 km²

Aerial View of the Centre of Quito
Scale 1 to 33.333

San José



San José Costa Rica

Coordinates 9.9335 Lat
-84.0231 Lon
Current Population 0,35 mil
Urban Population 1,2 mil
Area 44,6 km²
Urban Area 992 km²
Density 1210 per/km²

Population Trends

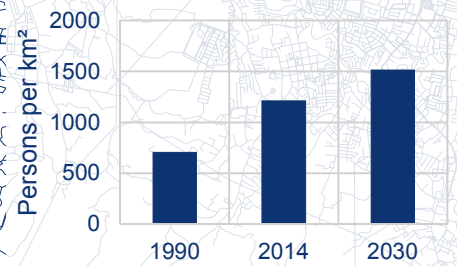
Year	mil.	World Rank
1990	0,7	341
2014	1,2	403
2030	1,5	417

Foundation
May 16, 1823

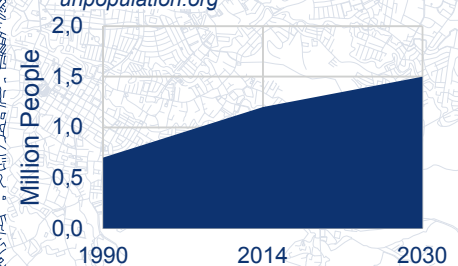
Sources

1*OSM, 2*WUP_2014 Urban Agglomerations Wallchart.pdf
www.unpopulation.com Data refer to the urban population of cantons. 3* measured approximately

San José Density Chart, by author, based on data provided by www.unpopulation.org



San José Population Chart, by author, based on data provided by www.unpopulation.org



Nothing Special

Proportions of a city to the size of the country.

Costa Rica - rich in natural capital - lack of public transportation - emerging economy - fences - gated communities

Costa Rica is at the fore of emerging countries in Latin America, and is known for its beauty. Tourism is one of the main economic sectors and tourists from all over the world people visit Costa Rica to see the diversity of flora and fauna. Most certainly the tourists do not visit the country to see San José, the capital. The city is rather unattractive and has not much charm. Its problems include too much traffic and the suburbs turn into gated communities and private property is often enclosed behind fences.

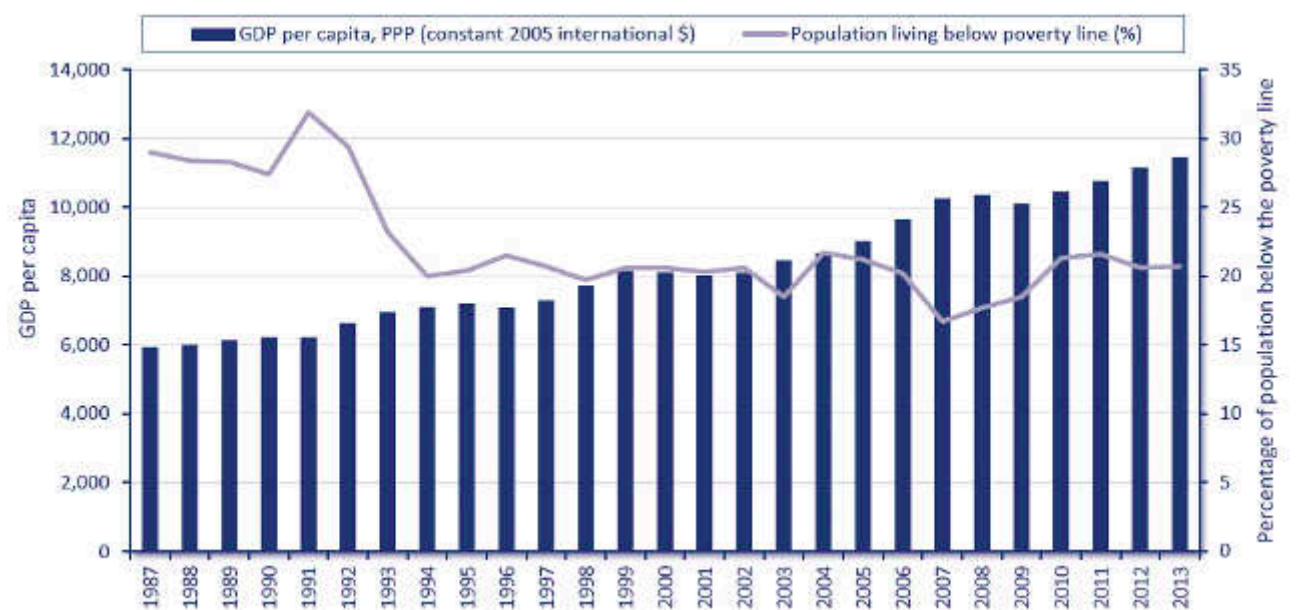
The development of the city could not keep pace with the growth of the so called middle class. Generally, it can be said that the middle class is to be defined by the ownership of a car and a house. Both of these things are easily managed, but speedy appropriation of this things by a large proportion of the population is not conducive to a controlled urban expansion. Often it is impossible to cross the city by car, and residents do not consider to use public transport to be an option, preferring to tolerate the traffic. Detached houses are seen to need an enormous amount of land with a garden up-front. This leads to rather haphazard development with the associated problems related to low density. Low density makes it impossible to have a proper public transportation network, which makes owning a car "essential". Furthermore, it leads to expensive infrastructure and getting somewhere by walking is impractical: A development seen in many cities, it does not matter where.

Costa Rica's urban population makes up a share of 76.8% of its total, following this numbers, in San José's urban area live more the one fifth of the country's population.

Most social and economic trends in San Jose stand in direct connection to trends seen in the rest of Costa Rica. In addition, San José is the country's economic and intellectual centre. The city serves the ones who can afford it, although there are plenty possibilities for education like international universities and schools there are burdens to get good education which makes the city a place with huge inequalities. Costa Rica is a well performing emerging country, compared to its neighbours. Costa Rica's per capita income rose steadily over the last twenty years, but there was almost no empathy to the situation of the poorest. Since 1994 about 20% percent of the Costa Rican population lives in poverty. As the country's economy changed somewhat towards technology the jobs for the uneducated sank steadily. This was compounded by agricultural protectionism which reduced the income of small farmers, as this ordinance mostly serves huge industries who mostly export their products.

Segregation and the exclusion of socioeconomic groups from the welfare system or the denial of the existence of entire groups in

urban development plans, sometimes constitutes a direct threat to their lives and livelihoods. The poorest including migrants, originating from Costa Rica's countryside and Costa Rica's neighbouring countries are a very vulnerable to hazards. For foreigners it is additionally hard to achieve legal status like a residency permit and are moreover only able to work illegally. There are also different threats like active volcanoes, frequent earth quakes and heavy rains causing slope slides in the area of San José. Migrants who arrive in the city often only find place where no one else ever would ever consider building a home, putting them into a dangerous situation without any other options. San José does not need big changes to be a vibrant city, but there is a long way to go. This changes are mostly not related to built-up structures, it is much more about education and the building of a consciousness of an environmentally friendly evolution of urbanity and considerate of inclusion of all socioeconomic groups: To learn from the countries beautiful nature and the things we admire from this naturally given diversity.





158 Date 19.10.2012; Walls and fences, an emerging neighbourhood in San José



159 Date 19.10.2012; Street close to the University Campus, San José



160 Date 20.10.2012; Brutalism meets diversity? Caja Costarricense de Seguro Social, San José, Costa Rica. Architect: Alberto Llinier.



161 Date 20.10.2012; One of the main roads of San José , a lot of traffic, a lot of noise, and not many positive qualities



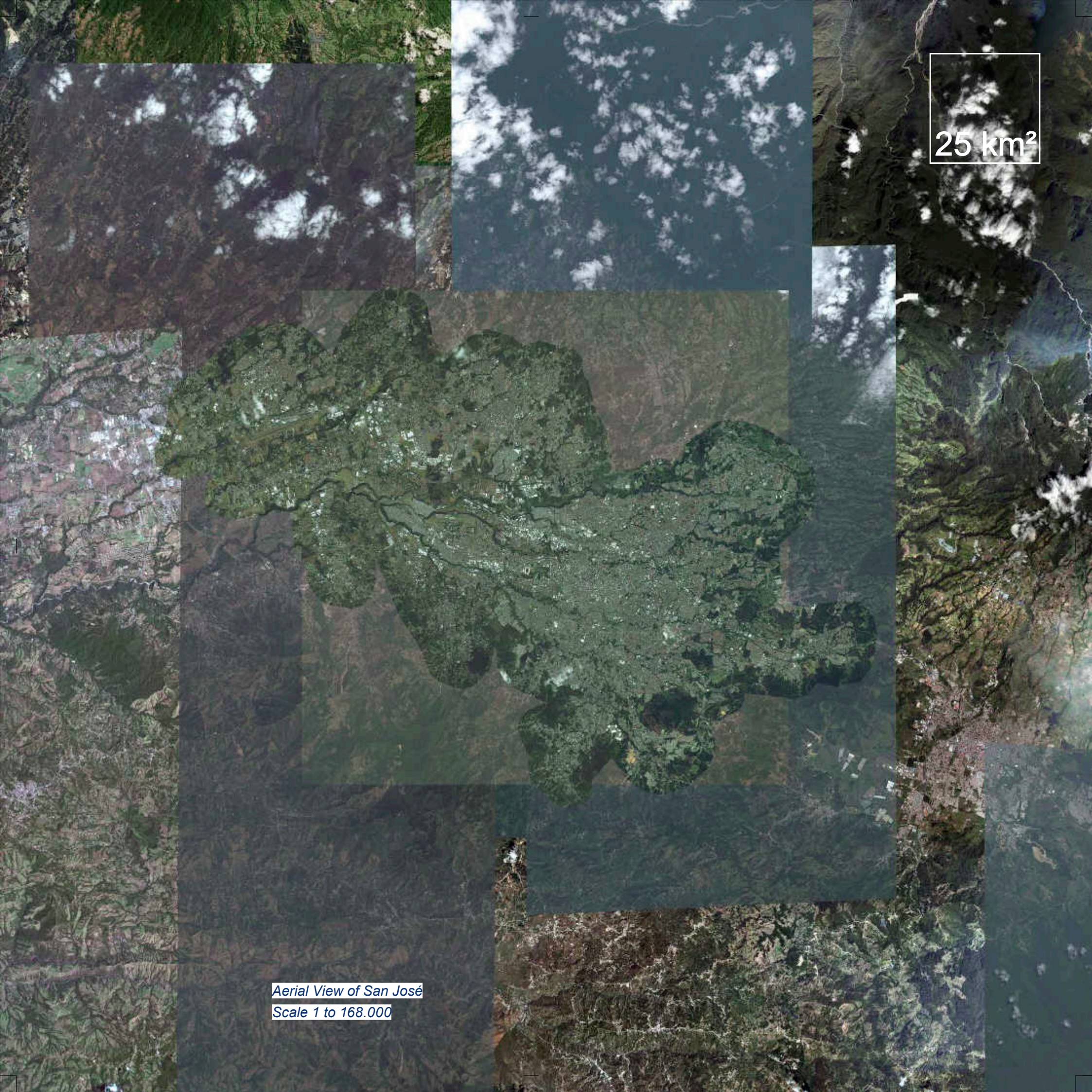
163 Date 20.10.2012; Seldom, a street without traffic, San José



162 Date 20.10.2012; In San José almost every private property is behind a fence, mostly these fences look frightening.




164 Date; Central San José

An aerial photograph of San José, Costa Rica, showing a dense urban area with a grid-like street pattern. A white rectangular box highlights a specific area in the upper right quadrant of the city. The surrounding landscape is a mix of green vegetation and brownish terrain.

25 km²

Aerial View of San José
Scale 1 to 168.000



1 km²

Aerial View of San José
Scale 1 to 40.000

Managua

4km²

Managua Nicaragua

1 Coordinates	12,1462 Lat
	-86,2737 Lon
Current Population	0,951 mil
2 Urban Population	1,753 mil
3 Area	3,672 km ²
Urban Area	173,7 km ²
Density	5475 per/km ²

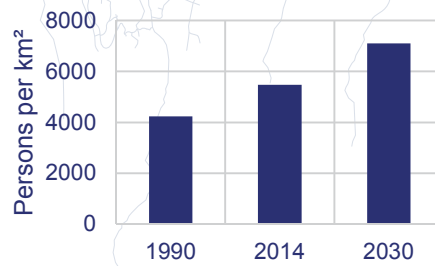
4 Population Trends		
Year	mil.	World Rank
1990	0,735	-
2014	0,951	-
2030	1,232	-

Foundation
24 July 1846

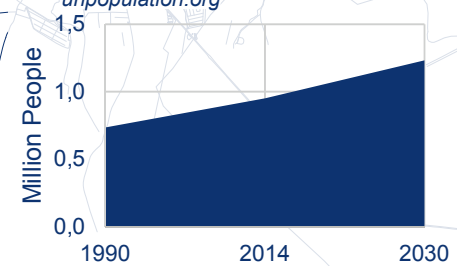
Sources

1*OSM;2*<http://www.wolframalpha.com/input/?i=what+is+the+population+of+managua%2c+nicaragua%3f>;3*http://www.cancilleria.gob.ni/tmp2007/docs/manual_opertivo.pdf;4*<http://esa.un.org/unpd/wup/DataQuery/> Annual Population of Urban Agglomerations with 300,000 Inhabitants or More in 2014 (thousands)

168 Managua Density Chart, by author, based on data provided by www.unpopulation.org



169 Managua Population Chart, by author, based on data provided by www.unpopulation.org



Along the Ring of Fire

How bad things can become.

earthquake - volcanoes - not
rebuilt - poor residents - two
floors - lack of security

Technically it is clear what an earthquake means, the ground and the built-up structure start to shake, the stronger and the longer an earthquake is, the higher is the probability that everything starts to crack. Buildings, streets or infrastructure are wiped out in just moments. The less we are prepared the more hazardous it is to our lives... But what happened in Managua?

It was common knowledge that Nicaragua faces great threats from earthquakes. Historical records have frequent notes from many different earthquakes that happened in the area of Nicaragua. Even so, it was not possible to prepare the city of Managua in front of this huge Hazard.

In Managua, at twelve a.m. on December 23 1972, everything was quiet and no one was prepared for what would happen during the following hours. At 12:30 a.m. the first of three major shocks happened, followed by one at 1:18 a.m. and one at 1:20 a.m. The magnitude of 5.6 on the Richter scale was measured for the first and also largest shock with the epicenter most probably very close to the surface north east of the city under Lake Managua. The entire infrastructure collapsed, no more electricity, broken sewerage systems, cracks in the streets and collapsed buildings. The city was only lit because of the many burning buildings, but it was too dark to see the real extent of the disaster. When the sun rose on the morning of the 23rd of December the devastating magnitude was revealed.

Almost two percent of an estimated population of 420.000 lost their lives. Not fewer than 20.000 were injured. In the aftermath 50 percent of the employed lost their jobs, 60 percent fled the city and 70 percent were

made temporarily homeless. These ruinous circumstances affected the entire nation of Nicaragua (with a population of two million in 1973) tremendously. At least ten percent of the country's industrial capacity, 50 percent of commercial properties and 70 percent of governmental facilities were left inoperative.

A text passage out of a technical report about the Managua disaster:

"... the extraordinary quality of the 23 December earthquake in Managua cannot lie in its magnitude, physical mechanisms, impact on the crustal structure, or assemblage of seismic observations. An estimated 1000 shocks of equal or greater magnitude occur each year, the fault traces and mechanisms are unexceptional, and, the seismic record is sparse. What brought at least 114 geophysicists, seismologists, and engineers to Managua in the month following the earthquake was the extraordinary destruction wrought by this earthquake, the potential for recurrence, and the hope of gaining from the Managuan experience insights that would reduce earthquake loss elsewhere in the world. We share this hope and consider this article complementary to the extensive geophysical, scientific, and engineering documentation that will surely appear. But we also place our brief and hurried observation of human response in the context of the major questions of natural hazard and disaster research: How do men survive and even prosper in environmental settings of high risk and recurrent loss? What is the nature of human response to catastrophe?"^{*1}

But who helped Managua? The quotation, "gaining from the Managuan experience insights that would reduce earthquake loss elsewhere in the world"^{*1}, seems to tell a lot about what was going on. It almost appears



170 Aerial view after the Managua earthquake of 1972,

like Managua was treated as an observational study, to help "elsewhere" but not in Managua. To determine what was going on is hard to say, as there was much corruption in the country at the time but this does not change the situation of the dwellers for the better. It should not have been possible study peoples utter destitution had the right

¹⁷⁰ Source: http://earthquake.usgs.gov/earthquakes/world/events/1972_12_23_photos.php, 2015 09 30

^{*1} Human Impact of the Managua Earthquake, Kates, R. W., J.E. Haas, D. J. Amaral, R. A. Olson, R. Ramos and R. Olson, 1973. "Human Impact of the Managua Earthquake", Science, Vol. 182, No. 7, pp. 981-990. <http://www.rwkates.org/pdfs/a1973.02.pdf> 2015 09 22

^{*2} <http://earthquake-report.com/2014/04/10/strong-earthquake-nicaragua-on-april-10-2014/>

^{*3} The Ring of Fire is a string of volcanoes and sites of seismic activity, or earthquakes, around the edges of the Pacific Ocean. Roughly 90% of all earthquakes occur along the Ring of Fire, and the ring is dotted with 75% of all active volcanoes on Earth. Source: <http://education.nationalgeographic.com/encyclopedia/ring-fire/>

Sources: http://earthquake.usgs.gov/earthquakes/world/events/1972_12_23.php, 2015 09 22

Engineering Report on the Managua Earthquake of 23 December 1972: A Report, <https://books.google.at/books?id=8z4rAAAAYAAJ&lpg=PR1&dq=managua&hl=de&pg=PA13#v=onepage&q&f=false>, 2015 09 22



help been offered, but this happened. The once devastating destruction remained in the city's mind, physically and mentally. In the formally colonial centre, at least until 2012, the clocks of the old cathedral of Managua still stand and show the time of the earthquake. Further, many of the colonial patio houses were destroyed and many of the ruins of old Managua, remain - in-between informally built homes.

A whole country was set back. Nicaragua was one of the most flourishing countries in Central America in the 1960's and the 1970's prior to the earthquake. The once emerging country is now known as the poorest in Latin America and faces big troubles after 40 years of unsteady political conditions. Managua still remains in this debilitated state, it was never rebuilt, and there was never a proper urban development plan or a spatial plan that would redefine the city. But Managua is growing, and is now home to about two million people. But it is rather a rural densification than an urbanity. The only mentionable achievement is that this built-up area is low, most of the buildings are no taller than two stories and relatively stable to earthquakes. As a series of earthquakes, with a magnitude of 6.1 50 kilometers north of Managua, in April 2014 "only" some 1500 houses have been damaged and about 3.200 people have been affected in and around Managua. Generally showing a much reduced effect as was seen in 1972. But this city of low rise buildings has a lack of density, the missing center and proper public transportation are just some of Managua's deficits. Therefore, Nicaragua was targeted by the World Bank as one of the countries most in need of assistance. Now there are many projects on going to develop urban strategies towards Managua's future that might contribute to make Managua a

city again. The most important thing will be to strengthen the communal consciousness towards a resilient city with the promotion of a participative process for current and future residents to be prepared for the hazards that might occur in this hazardous area.



171 The heavily affected area of the 1972 earthquake, in the dark area most of the buildings have collapsed.



172 Date 15.11.2012; Art critical of society in Nicaragua, Galería de Arte Contemporáneo Códice, by Fredman Barahona*Elyla Sinvergüenza who grew up and lives in Old Managua



173 Date 20.11.2012; Natural hazards are mostly invisible or look harmless if there is for example not an eruption, fuming Volcano San Cristóbal, Nicaragua





174 Date 09.12.2012; Old Managua, Ruins of colonial style patio houses filled up with marginal housing



175 Center of Managua after the earthquake in 1972



176 Date 11.12.2012; View of buildings which endured the earthquake of 1972, In the centre, the former Bank of America building built in the 60's cracked but did not collapse, statics by Lin Tung Yen, Managua





177 Date 06.12.2012, Old Managua on the top right, on the left the pier on lake Managua



An aerial photograph of Managua, Nicaragua, showing a large urban area in the center, surrounded by greenery and a body of water. A white box in the top right corner contains the text "25 km²".

25 km²

Aerial View of Managua
Scale 1 to 168.000



Medellín

4km²

Medellin

*
1

Coordinates	6,2499 Lat
	-75,541 Lon
2 Current Population	2,441 mil
3 Urban Population	3,9 mil
Area	360,64 km ²
4 Urban Area	1.152 km ²
Density	3385 per/km ²

3

Population Trends

Year	mil.	World Rank
1990	2,1	104
2014	3,9	97
2030	4,7	115

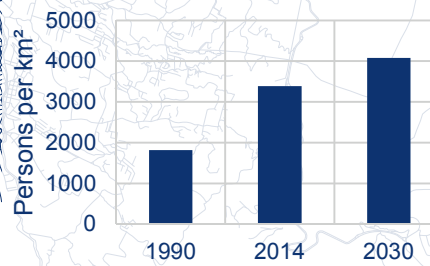
Foundation

2nd november 1675

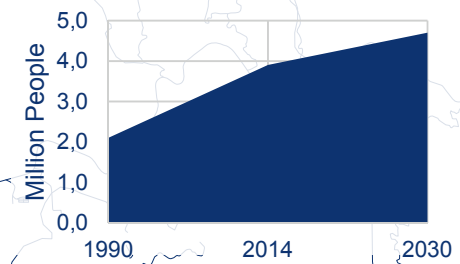
Sources

1*OSM;2*http://www.dane.gov.co/files/investigaciones/poblacion/proyepobla06_20/Municipal_area_1985-2020.xls;3*http://esa.un.org/unpd/wup/wallcharts/WUP_2014%20Urban%20Agglomerations%20Wallchart.pdf;4*<http://www.medellin.gov.co/irj/go/km/docs/wpc/content/Sites/Subportal%20del%20Ciudadano/Plan%20de%20Desarrollo/Secciones/Informaci%C3%B3n%20General/Documentos/POT/medellinPoblacion>.

82 Medellín Density Chart, by author, based on data provided by www.unpopulation.org



183 Medellín Population Chart, by author, based on data provided by www.unpopulation.org



Vibrant Cities

The metamorphosis of Medellín

spring time - cable cars - Latin American subway - questionable interventions - state of the art technology

In recent history, some what was the last 30 years, Medellín became one of South America's most developed cities. The second largest metropolitan area of Colombia has a population of ~3.5 million. The so called Área Metropolitana del Valle de Aburrá with Medellín as its centre is now a technology and knowledge hub in Colombia and destined to be a very innovative city.

Between the 70s and the 90s Medellín was controlled by a drug cartel, the Medellín Cartel, with its head Pablo Escobar who had major influences in the city. Medellín was known as the most violent city in the world. Violence was used to intimidate the city, and many of the city's officials were either bribed or killed, with time this became common all over Colombia and Escobar was even elected into Colombia's parliament. In Medellín Escobar financed the building of a neighbourhood for the not so well-to-do and the stadium of the local soccer team. This era is a very controversial part of Colombia's history and affects Colombia's reputation till today.

Medellín's qualities are many, one of the most important things was the building of a Metro, planned and built between 1979 and 1996 when the first metro train travelled across the city. The metro consists of two lines serving 27 stations, the metro was extended with the so called "Metro Cable", public transportation with cable cars serving additionally seven further stops. A BRT (bus rapid transit) system, the Metroplús, and other local buses densify the public transportation network. All elements of the public transportation are fully integrated, physically and by uniform fares. Currently the metro is being extended to make more of Medellín's suburbs better connected to

the city's flourishing centre.

Medellín is placed in the Aburrá Valley, about 1500 meters above sea level in the Colombian Andes, surrounded by several mountains. For this terrain the Metro Cable is a reasonable approach for public mass transportation and has many advantages like being easy to build, consuming little space and being cost efficient. Medellín is a great example for the implementation of cable cars as part of the public transportation system especially because the areal passenger line links marginal settlements. There are many places that would benefit from such a system as much as Medellín does, by having cable cars for public transportation.

Named the city of the eternal spring, the mild climate of Medellín is a big advantage and is a reason why this city is so green. It helps the city to also be a magnet for well educated people and makes the life for the well-to-do generally an easy one.

Medellín's fringe consists widely of informally built up structures, and poverty still remains one of Medellín's major challenges. As Medellín has the highest unemployment rate of Colombia's urban regions to date (date). In the future the communities and municipalities in Medellín have been asked to provide appropriate and well facilitated housing in the marginal settlements of the city.

Medellín made major transformations the last decades. In 2013 Medellín was awarded and honoured as the most innovative city of the year 2013, beating New York City and Tel Aviv. This contest, where 200 cities participated, was held by Citi, the Wall Street Journal Magazine Marketing Services Department and the ULI - Urban Land Institute. Medellín won due to many rea-

sons and factors like public transportation, free to use bicycles, intense engagement with education and the lowering of the homicide rate.

Participatory budgeting was also introduced successfully, which allows the citizens of Medellín to define priorities and allocate a portion of the municipal budget, in the case of Medellín 5%. With this money neighbourhoods and local communities can decide whether they have the need to invest more money into education or if there is a greater need for more health care, housing or other public facilities. It is a direct empowerment of the citizens of Medellín.

*"Medellín stands today as an example for many cities around the world, because despite having lived very dark and difficult times 20 years ago, we have been undergoing a true metamorphosis," said Mayor Aníbal Gaviria. "Going from pain and fear to hope, and now from hope to be a place filled with life, the city has known how to innovate in every step, both in social programs, urban developments, or the combination of both, and this has been key in the success of this process. In this sense, I would like to thank Citi, the Wall Street Journal and the Urban Land Institute for allowing us through the City of the Year to show to the world the things that are happening here and the tremendous challenges that lie ahead."*¹

Medellín still is in a metamorphosis, and has some crucial years coming: To finally get a head of the many disparities between the socioeconomic groups and to make the vibrant and innovative part Medellín accessible to all of the city's residents. The mind-set of Medellín's communities and residents are clearly interested to invest into Medellín's future, and are willing to make this happen.





184 Date 24.04.2013; Medellín's expanding skyline, some 140 new high rising buildings are under construction, seen from Diez Hotel Categoría Colombia, CI 10A #34-11, Medellín, Antioquia



185 Date 24.04.2013; View towards the south west of Medellín, seen from Diez Hotel Categoría Colombia, CI 10A #34-11, Medellín, Antioquia



186 Date 21.04.2013; View towards the South of Medellín, seen from the Biblioteca España





187 Date 21.04.2013; The main bus terminal, Terminales Medellín, in the centre with the subway station up front,



188 Date 22.04.2013; Seen from the "Metro-Cable" station Santo Domingo Savio, Medellín



189 Date 21.04.2013, The metro of Medellín, actually a high line



190 Date 22.04.2013; Marginal development, central-western part of Medellín



192 Date 21.04.2013; Metro Cable Linea K, gondolas and pillars



191 Date 24.04.2013; View towards south-eastern Medellín



193 Date 21.04.2013; Metro Cable Linea K, view from the inside of the cabin



194 Date 21.04.2013; One of the neighbourhoods around the Metro Cable



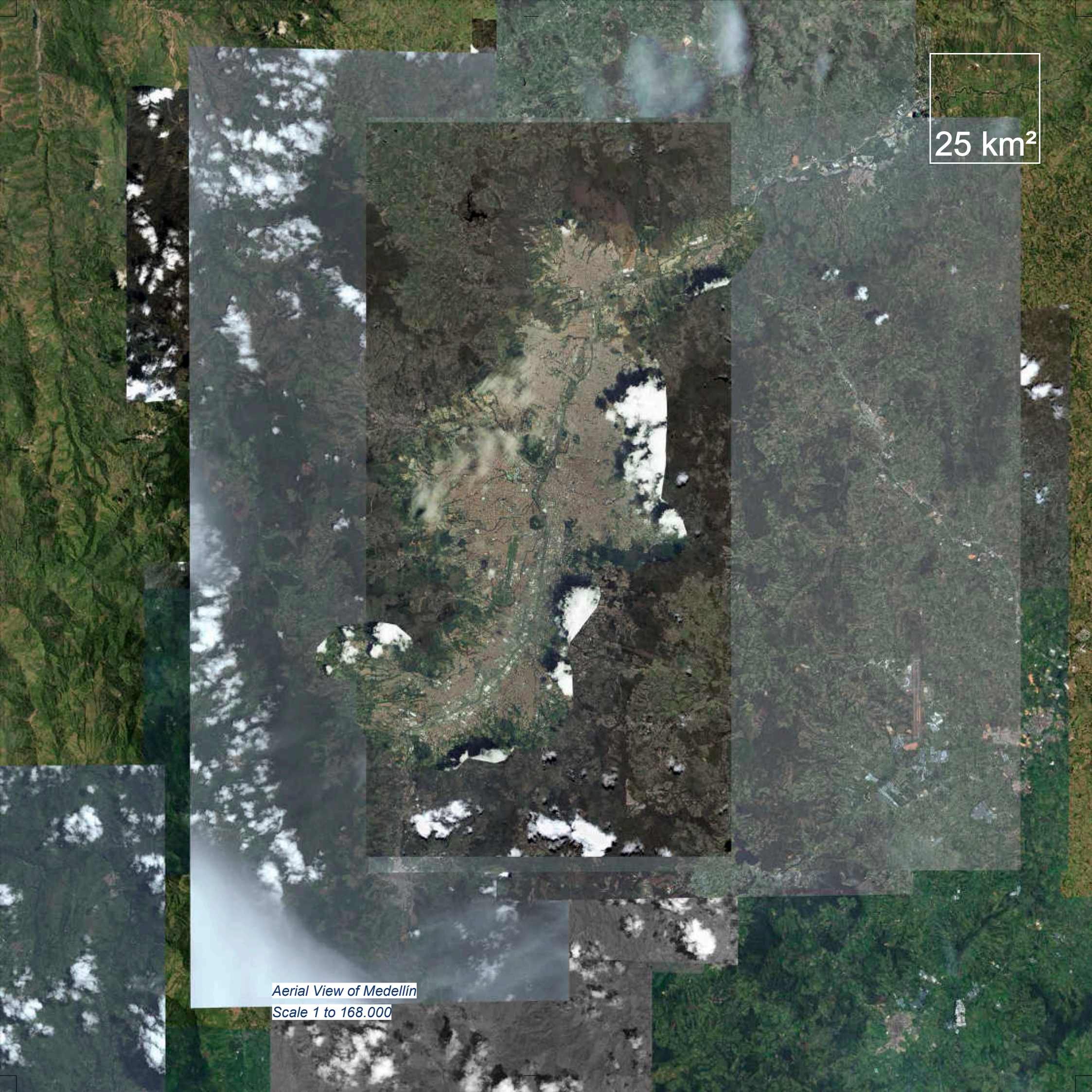
196 Date 21.04.2013; Adaptation of the public space beneath the Metro Cable



195 Date 21.04.2013; Biblioteca España, one of several architectural interventions in Medellín



197 Date 21.04.2013; Public space originated with the development of the Metro Cable

An aerial photograph of Medellín, Colombia, showing a dense urban area with a grid pattern. A white rectangular box highlights a specific region in the upper right quadrant. The surrounding area is mostly green, indicating forested or undeveloped land. The text '25 km²' is written in white inside the box.

25 km²

Aerial View of Medellín
Scale 1 to 168.000



1 km²

Aerial View of the Centre of Medellín
Scale 1 to 25.000

Ahmedabad

4km²

Ahmedabad
India

*
1 Coordinates 23,0216238 Lat
72,5797068 Lon
Current Population 5,57 mil
2 **Urban Population** 7,1 mil
Area 190 km²
Urban Area 464 km²
Density 15302 per/km²

Population Trends

Year	mil.	World Rank
1990	3,3	59
2014	7,1	46
2030	10,5	38

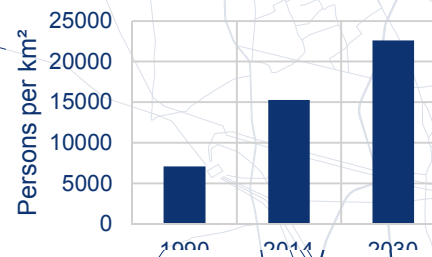
Foundation

inhabited since the 11th century

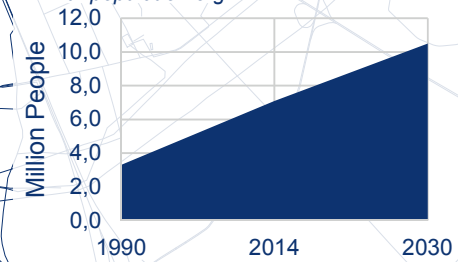
Sources

1*OSM;2*http://esa.un.org/unpd/wup/wallcharts/WUP_2014%20Urban%20Agglomerations%20Wallchart.pdf

201 Ahmedabad Density Chart, by author, based on data provided by www.unpopulation.org



202 Ahmedabad Population Chart, by author, based on data provided by www.unpopulation.org



The Perspectives for Future Megacities

Estimated future growth of cities.

mega city- historic city - acceptance of changes in public infrastructure - cultural meet up - precaution in emerging countries - bus rapid transport, BRT a magic word? - not yet a mega city

Mega Cities are usually cities with more than ten million inhabitants. This is not yet the case for Ahmedabad. Currently 5.6 million people live in Ahmedabad, and it is still ranked as a mega city, but why? The former capital city of Gujarat, is predicted to be one of the fastest growing cities^{*1}, and already shows many significant criteria known from other mega cities. For the citizens of Ahmedabad the future begins now and will require the city to be better prepared for upcoming challenges connected with enormous size such as traffic.

With the predicted annual growth rate of 3.5%, Ahmedabad will be a mega city in less than 15 years. What does this mean and what steps can be taken? It is known that the city will grow a great deal from its current size and the responsible parties in the city planning divisions now have the possibility to plan and begin reasonable developments. This premonition of growth brings the opportunity to raise the awareness of all dwellers and users of Ahmedabad. If things go well, Ahmedabad will not have as much trouble as other (mega) cities have had.

Ahmedabad is not only a city of the future of India, it is also a city with a rich cultural history. The foundation of the walled city dates back about 600 years.^{*2} The urban development's inside the walls of initial Ahmedabad has shown, until today, a very functional infrastructure to its users. The narrow streets are formed between the patio houses, so called pols, to protect them from the heat and direct sunlight.^{*3} And rich ancient wooden decoration tells the story of affluent times. The cultural buildings have always offered many amenities to the dwellers, like the silence within the walls of the Jama Masjid (Friday Mosque) at the walled city of Ahmedabad: A peaceful place creating a wide and quiet area in the midst of this busy Indian city. The Walled City measures 5.9 km² and about 203.000 people

live within this area, this equates to makes 34.993^{*1} inhabitants per km².

Traffic and transportation in Indian cities will increase significantly. Following this commonly known development, the administration of Ahmedabad set out their first steps and started to implement a BRT (Bus rapid transit) system as a kick-off towards a formal public transportation network. But as everywhere, when implementing a new system, there is a long way to go. It is first of all necessary to get acceptance from within Ahmedabad's residents. What helps a properly planned transportation system are good ideas about how the dwellers of Ahmedabad will travel across their city in the future. If finally no one will use this infrastructure it will not be accepted. Currently the BRT is in the very beginning and is set to extend the existing informal public transportation. It is good to see that Ahmedabad will get a public transportation network, but it is far behind what could be possible in an urban agglomeration of six million. The MEGA – Metro Link Express for Gandhinagar and Ahmedabad, a real approach for public transportation, is of greatest need. December 2018 is the expected completion of the first stage,^{*4} and this new service will serve a current and growing need.

Till 2018 the increase in the number of private car owners will increase significantly, and it will become important to understand the forthcoming general mind-set about individually motorised transportation. Everybody who can, will buy a car. Public transportation will be one of the key factors, as to whether Ahmedabad transforms into liveable city or not.

Figures of the change in the Indian mobility:

Big planning is ongoing and the regulation of the semi dry river Sabarmati is an example, of planning big. The banks of the Sabarmati were straightened and furnished

with a very monotonous dam/wall. This wall looks today like a huge line of separation straight across the city with the only effect of regulating the water stream that periodically dries due to use by agriculture during dry periods.^{*5} The result does not look much different to river regulations of one hundred years earlier, and has needed to be adapted quite a lot.

Knowledge and technology are already present in Ahmedabad To name some renowned institutions; one will find the headquarters of the Indian space program ISRO (Indian Space Research Organization) and one of India's best known universities for management the IIM (Indian Institute of Management) – a huge campus designed by Louis Kahn in 1974.

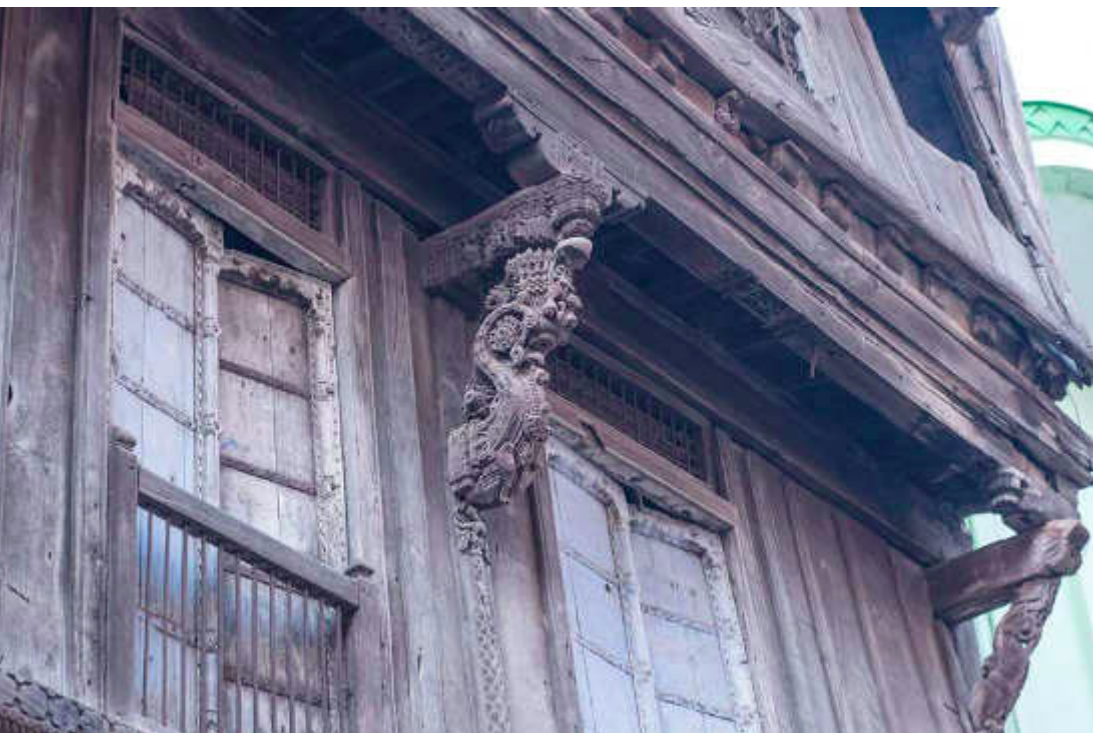
Gandhi's retreat, the Sabarmati-Ashram is located towards the river Sabarmati not far from the core city of Ahmedabad. As well as several well-known buildings designed by famous architects, like Le Corbusier's Mill Owners Association or the campus of the CEPT (Centre for Environmental Planning and Technology) University designed by Ahmedabad based architect Ar. B V Doshi around 1962. Ahmedabad has many renowned institutions, neighbourhoods and other notable locations like those listed above. To feel like in a mega city however, Ahmedabad is missing many. There is currently a lack of taller buildings and a lack of metropolitan characteristics. Travelling across the city does not show much more than an aggregation of multiple villages and towns to an agglomeration of six million individuals. But perhaps Ahmedabad will show a different face of a megacity in the future. It is hard to predict if Ahmedabad will be, as the prognoses tell, a megacity as we might imagine, in this respect it stays almost mystic but speculative.

Sources: ^{*1}, http://www.forbes.com/2010/10/07/cities-china-chicago-opinions-columnists-joel-kotkin_slide_4.html, 2015 08 10; ^{*2}, Gazetteer of the Bombay Presidency: Ahmedabad. Google Books 2015 (Public Domain text). 7 January 2015. pp. 252–253., 2015 08 12; ^{*3}, <http://architectureindevelopment.org/project.php?id=492>, 2015 08 06; ^{*4}, Ahmedabad" (ebook), by Ragesk Sarjun, AnVi OpenSource Knowledge Trust, p. 27, e-book link: <https://books.google.at/books?id=y06dCgAAQBAJ&lpg=PA27&ots=C1CjzrVWqr&dq=Metro%20Link%20Express%20Gandhinagar%20and%20Ahmedabad%202018&hl=de&pg=PA27#v=onepage&q=Metro%20Link%20Express%20Gandhinagar%20and%20Ahmedabad%202018&f=false>; ^{*5}, archplus 185 "Indischer Inselurbanismus", 2007, p. 52-53; General Sources: http://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Ahmedabad_bw.pdf, 2015 08 07; http://cept.ac.in/UserFiles/File/CUE/Working%20Papers/Revised%20New%26CUEWP%2026_City%20Profile%20Ahmedabad.pdf, 2015 08 08; http://www.ahmedabdbrrts.org/web/About_JanMarg.html, 2015 08 07;





207 Date 20.02.2014; Jamad Masjid, in the centre of the formally Walled City of Ahmedabad, behind these walls is the smell and the noise of a crowded Indian city, built in the early 15th century



203 Date 20.02.2014; Rich wooden decoration, the Walled City of Ahmedabad



204 Date 20.02.2014; A cow in the courtyard of a "Pol", as these patio houses are called, Walled City Ahmedabad



205 Date 20.02.2014; The colourful life, dens and partly vertically arranged stalls in a market within the Walled City of Ahmedabad



206 Date 20.02.2014; A another arrangement of "Pol's", Walled City Ahmedabad



208 Date 20.02.2014; A bus stop and the separated bus line of the Janmarg or BRTS Ahmedabad, Bus Rapid Transit, first operated in 2009, running some 160 buses by now



209 Date 21.02.2014; Sabarmati River Front, one of the top goal-developments in Ahmedabad, entirely straightened river banks can cause problems in high rain seasons

25 km²

Aerial View of Ahmedabad
Scale 1 to 168.000

210 *Ahmedabad Aerial View Scale 1 to 168.000, an
ArcGis base-map download, August 2015*



1 km²

Detroit

4km²

Detroit United States of America

Coordinates 42,3528 Lat
-83,0992 Lon

Current Population 0,8 mil

Urban Population 3,7 mil

Area 359,75 km²

Urban Area 10.130 km²

Density 365,3 per/km²

Population Trends

Year	mil.	World Rank
1990	3,7	49
2014	3,7	104
2030	3,9	145

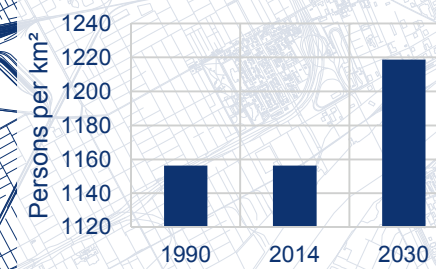
Foundation

1701

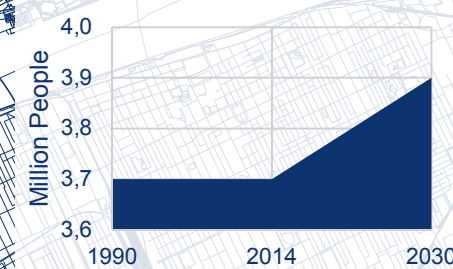
Sources

1*OSM;2*http://esa.un.org/unpd/wup/wallcharts/WUP_2014%20Urban%20Agglomerations%20Wallchart.pdf;3*<http://quickfacts.census.gov/qfd/states/26/262000.html>;4*Metropolitan Area

Detroit Density Chart, by author, based on data provided by www.unpopulation.org



Detroit Population Chart, by author, based on data provided by www.unpopulation.org



Let It Die?

Is the end of urbanity - Suburbia?

never ending suburbs - once
a city - car industry - a restart?
- Bankruptcy - the end of public transportation - the 100% car city

Detroit lost has lost its shadow and much of its urban population: the suburban belt is home to four times as many people as people live inside the city boundaries. Even if Detroit has some urban elements left, most of the so-called urban area has turned into suburban street grids. Including the urban area of Detroit this is a suburbia with a total size of 3.319 km², which no longer has a real urban centre. In the inner city centre with only 33km², only a few taller buildings are left which can throw shadows on the streets, it is now often the case that a building's neighbouring lot is only used for car parking. Is this the perfect car city? And does it represent how the dystopia of car cities, often planned and thought out in the fifties, came to be a reality.

From this point of view, it is widely known that the car city Detroit is no longer a city, rather than a gathering of some taller buildings. Once the centre of the motorcar revolution, a place renowned for the manufacture of cars. This created what we often see today as the nightmare of any urban citizen, making all those who cannot afford a car a handicapped person.

There are a number of reasons for the stagnation and then shrinking of Detroit.

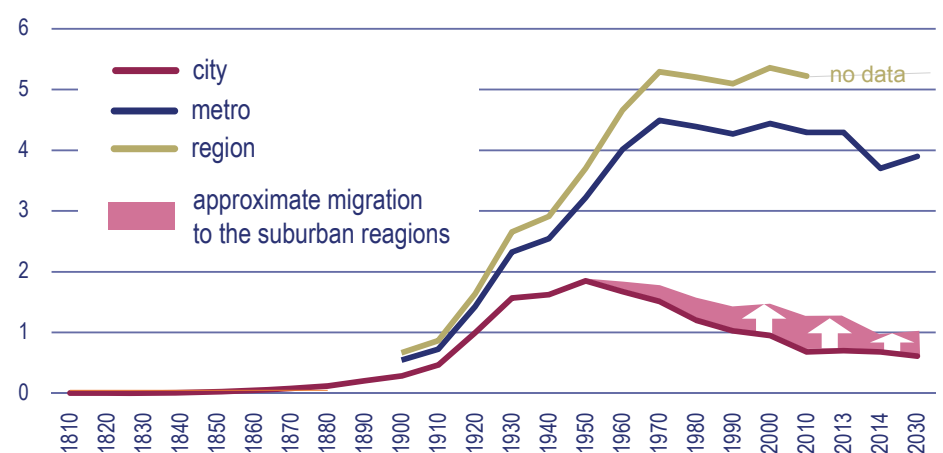
Freeways cut the centre of the Motor City apart and fragmented formerly well working neighbourhoods. The car, that once was Detroit's engine, turned into a fatality and shows that individual motorization in big cities might not be a solution. In addition, increasing the number of car users could not stabilize the already financially stricken city or bring it out of the general economic crisis in the 1950's. Education steadily worsened within Detroit during its years of decline, if a family could somehow afford to send their children outside the city to school, they would do so and this is still the case today. This is because the education system within Detroit is known to be inadequate and itself in financial crisis. Detroit has comparatively highest tax rates for the owning of land for a US city. Two cities being incorporated within Detroit with lower taxes. These cities: Hamtramck and Highland Park (the latter was incorporated as a city by Henry Ford), were formed based on the desire

to pay lower taxes. This fragmented approach to tax policy contributed in part to the decline of Detroit. Poor implementation of laws; Universal design is a huge effort that for a city and involves applying certain features or policies city wide. Even so this effort often is made in urban development with positive results. In Detroit however universal design resulted in wasted resources when it was decided to adapt all the sidewalks to be wheelchair accessible, regardless of whether the effort was needed or appropriate. Ongoing social segregation, shows hidden racist facets of the society – as the poor. Those who couldn't afford to leave, stayed in the city and within Detroit 80% to 90% of the residents have Afro-American roots. This is a known occurrence around the rust belt (the industrial area between Chicago and New York City), and was given the name "White Flight", when the well-to-do left into suburban homes and wealth diaspora between citizens of different racial backgrounds meant that mostly white people could afford the flight. Lack of a functioning public transportation system has also been a problem for Detroit – a public good that negates the necessity of those on low incomes to buy a car. With the shrinkage the city also became more insecure, as the empty lots and scattered population became more difficult to police. At the peak of criminal activity Detroit was amongst the most violent and dangerous cities in the world. Finally, it appears that in the US nobody wants to live in a city any more, everybody who can afford it wants to have their house and a garden, and any known quality development of urban density seems to be obsolete, at least in Detroit. As some of the most expensive luxury houses from all over the United States of America are to found in the suburban neighbourhoods of Detroit, does this represent the American dream?

Stagnation and shrinking have crucial effects, these are eco-

economic as well as human and they identify social imbalances. Those for whom life is hardest are left behind in a system that has collapsed and it is therefore difficult to attract investment and change paradigms. The shrinkage of Detroit went totally out of control, and for a long time successive administrations did not make any controlled effort at downsizing and or implement adaptations to the ongoing transformation. Like nobody really wanted to face the reality of declining Detroit. Does the change needed in Detroit demand a revolution or is progress else how possible?

Detroit might not be the last city that will shrink as much as it did. This raises the question of if it is possible to implement thoughts about shrinking, right at the beginning of urban planning processes? And, how can the idea of shrinking fit into a society and social system that is only oriented in growth and expansion? It is possible that modern/Industrial cities vanish and turn into concrete desserts driven by the ongoing transformation to a suburbia as happened in Detroit? In such a case the desert fate of the city centre seems unlikely but the use of the internal infrastructure remains unclear if nobody wants to live there. In Detroit the fate of the city centre cannot be known but as time passes without change the unused structures will surely become ruins. In such a situation the city will have no functioning centre and the functioning of suburbia without



215 Detroit Population trends, Data: World Bank and <http://www.somacon.com/p469.php> 2014 12 03, Chart by author



a central hub is untested. With the term shrinking city, many questions are to be asked, but not many solutions are at hand.

Finally, the administration and the government had to accept the decline, and so it was that the city of Detroit filed for bankruptcy July 18, 2013, having about 18 to 20 billion dollars of debt. What should follow are many trials how to handle the debt. To achieve this a bankruptcy lawyer or emergency manager, Kevyn Orr, was placed to oversee most of Detroit's finances. The problems faced are manifold: The city of Detroit once with an urban population of a 1.8 million urbanity could not downsize its infrastructure as quickly as the population declined. In addition, a huge amount of money is to be payed to former city employees like firefighters, police etc as pensions. And at the tip, how else could it be, there was corruption. In December 2014 the proceedings around the bankruptcy have been

brought to an end, and the city is officially liquid again. But the finances are to be controlled by state officials at least for three years. Detroit needs now to restart with many development projects, like public transportation, computerisation and the organisation of the water supply. Unemployment must also be tackled, with rates double that of the United States' average.

The future might be the people who stayed in Detroit, believing in their achievements, without the need and help of an obsolete city administration. Creative people who find their challenges in solving the problems of the declining city of Detroit. MoTown (motor town) or better MowTon (mown down town) – Stands for a long history of subculture in Detroit, while Mow Town records did leave the city, the spirit was left behind, and new things will happen and transform Detroit.



217 Date 24.04.2012, A randomly chosen picture of a gutted building, which could have been nearly anywhere in Detroit



216 Date 26.04.2012; Seemingly at random one comes across vacant buildings, half of this building no longer exists the other half has been renovated, Atwater Street 1801, Detroit



218 Date 25.04.2012; The Heidelberg Project, an artistic way of dealing with decline, Heidelberg Street Detroit



219 Date 23.04.2012; Not everywhere in Detroit is to see vacancy, a vital part in the middle of Detroit, Lafayette Park, Designed by Mies van der Rohe, 1958-1960.



221 Date 23.04.2012; The Packard Plant, luxury automobiles were built here until 1958 when the plant was closed, since then this complex, designed by Albert Kahn, became more and more vacant, in 2010 the last remaining users moved out, in 2014 renovations started to bring new uses.

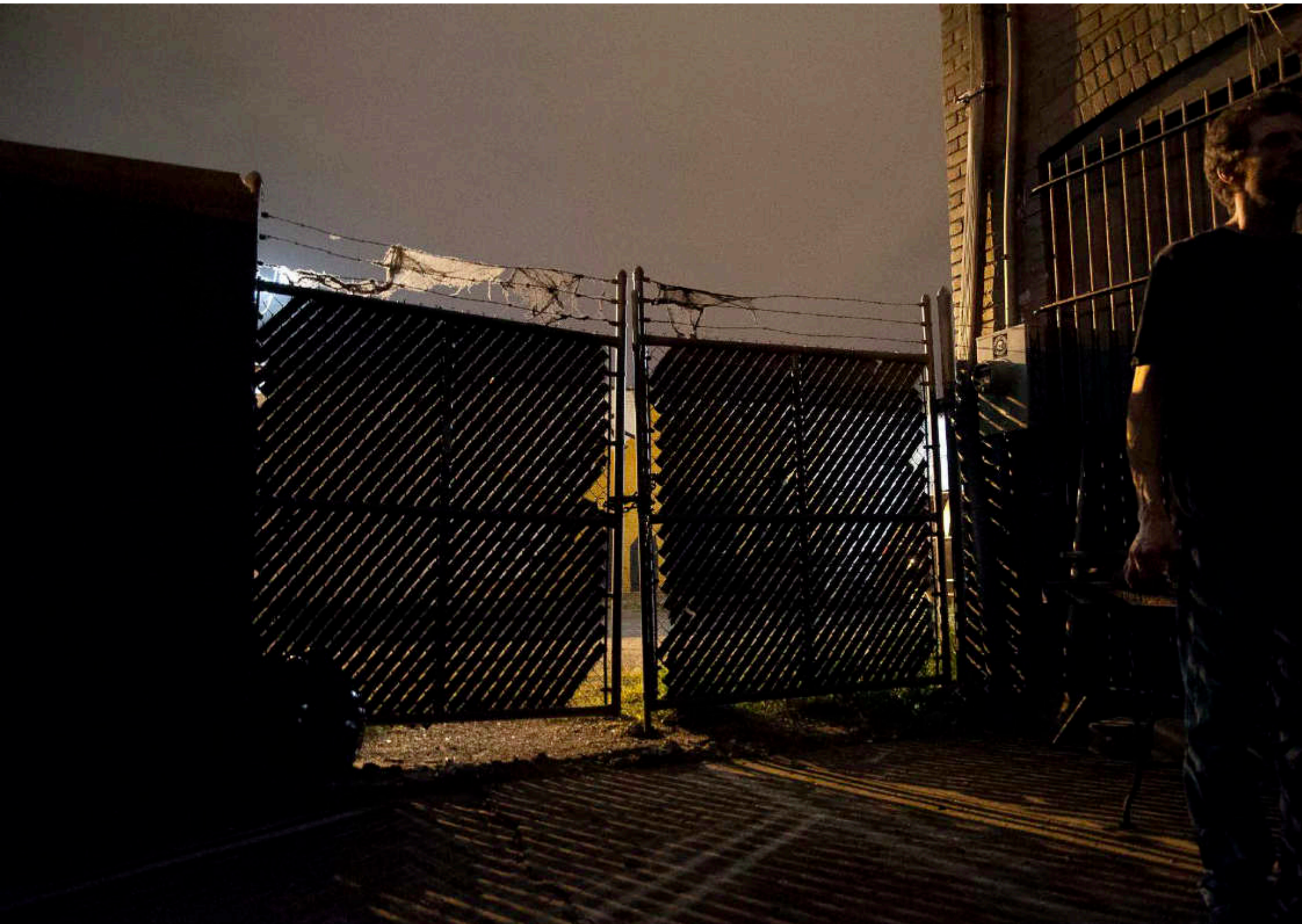


220 Date 23.04.2012; In 1913 the first passengers boarded at Michigan Central Station, the last trains left the station in 1988, since then there have been several plans for a new use, it was eventually in 2014 when renovations started, but the further use stays uncertain.



222 Date 23.04.2012; Urban farming? Or is it already ordinary farming? Detroit Earthworks Urban Farm, a cooperative that serves food to indigent people.





223 Date 26.04.2012; Behind PJ's Lager House, will Detroit be again what it was once?





1 km²

Aerial View of Detroit 1949
Scale 1 to 25 000



*Aerial View of Detroit 1961
Scale 1 to 25.000*

An aerial photograph of Detroit, Michigan, showing a dense urban grid. A white rectangular box in the upper right corner highlights a specific area of the city. The text '25 km²' is written in white inside this box. The city's layout is characterized by a regular grid of streets, with some larger commercial or industrial areas interspersed. The River St. John is visible on the right side, flowing into the larger water bodies of the city.

25 km²

Aerial View of Detroit
Scale 1 to 168.000

226 *Detroit Aerial View Scale 1 to 168.000, an ArcGis
base-map download, August 2015*

1 km²

Dholera

How much planning is recommendable to build a good city?

smart - eco-friendly - built out of
nowhere - master plan - social -
economy driven - future of cities?

An entirely planned city in the DMIC (Delhi - Mumbai Industrial Corridor) will be Dholera.

Dholera is to be built from scratch, and is just one out of 25 cities that are planned to be on the map by 2030 in the area between Delhi and Mumbai. All over India there are ideas for about hundred cities to be founded. All the cities in the DMIC should provide the infrastructure for 500.000 to 2 million people. Driven by the idea of economic growth, and supervised by a private company with no more than 25 employees. This office of 25, is supervising the general administration for the building of the DMIC and its cities. The detailed planning of these cities is forwarded to international companies each as Siemens, Cisco or IBM. These companies' interest is to build so called "Smart Cities", smartness driven by digital technologies. Smart City as marketing strategy. The planning of Dholera has a lot in common with simple project development and the planning paradigms are based on math. On the plan for Dholera we can see that quite an effort has been made to plan this city. It seems like a proper masterplan, with a detailed time schedule for the different development stages. If it comes to the visual design studies, the 3D visualizations come right from the developer's catalogue for fancy cities, and could literally be anywhere. A copy and paste action in the architectural design software.

Dholera is politically charged, it is one of the most important projects for the current Indian Prime Minister Narendra Modi, who was elected in 2014. It is the kick off for a hundred other cities that should be built in India in the next decades. It will be

exemplary for all the cities that are currently planned for India, exemplary in the sense of how to handle land rights, the selling of land, and the planning processes.

One of the biggest challenges currently is not to find with the procedures of planning, it is about the acquisition of the land. The farmers clearly are not willing to give away their land for cheap, and as long the Indian government and the state of Gujarat cannot manage the land ownership rights, the new city of Dholera will stay on paper.

The land rights of the most vulnerable group of Indian society, the farmers, will face big changes and challenges. They will have a long way to go to get rightful compensation for their land. The weakest of our societies can only lose with this kind of mega project. In the worst case their land will just be taken away with no compensation and any proper basis for their future subsistence. These kinds of mega projects always have dark sides and many individual existences are destroyed over and over.

Dholera is also the first big step towards the DMIC. The city of Dholera stands at the beginning of the definition and implementation of the future of DMIC. For what is soon to be known as one of the world's largest megalopolis, the built up urban area is going to weld two of our world's biggest cities together, Delhi and Mumbai.

It is not possible to tell if Dholera will be a well-functioning city from the very beginning. There are just too many factors that will influence the development of this project. It might be best to wish all the participants good luck.

DMIC is planned to be a boost for India's economy, so this area will be mostly devel-

oped to make India a stronger competitor in international markets. For example the associated planned high-speed railroad is not intended to transport people, it is meant to transport goods quickly from New Delhi to the sea.



228 The current village of Dholera, Aerial View, Source: ArcGis

Planning or defining a megalopolis

Thoughts about DMIC.

Himeconomic project - state of
 Pra the art technology - bring Delhi
 closer to the see - high speed
 train connection - socially problem-
 atic - SMART?

1483KM

**EXTENT OF INFLUENCE:
 UPTO ABOUT 150KM-200KM*
 ON EACH SIDE
 OF DFC ALIGNEMNT**

**(200km in the vicinity of Madhya Pradesh)*

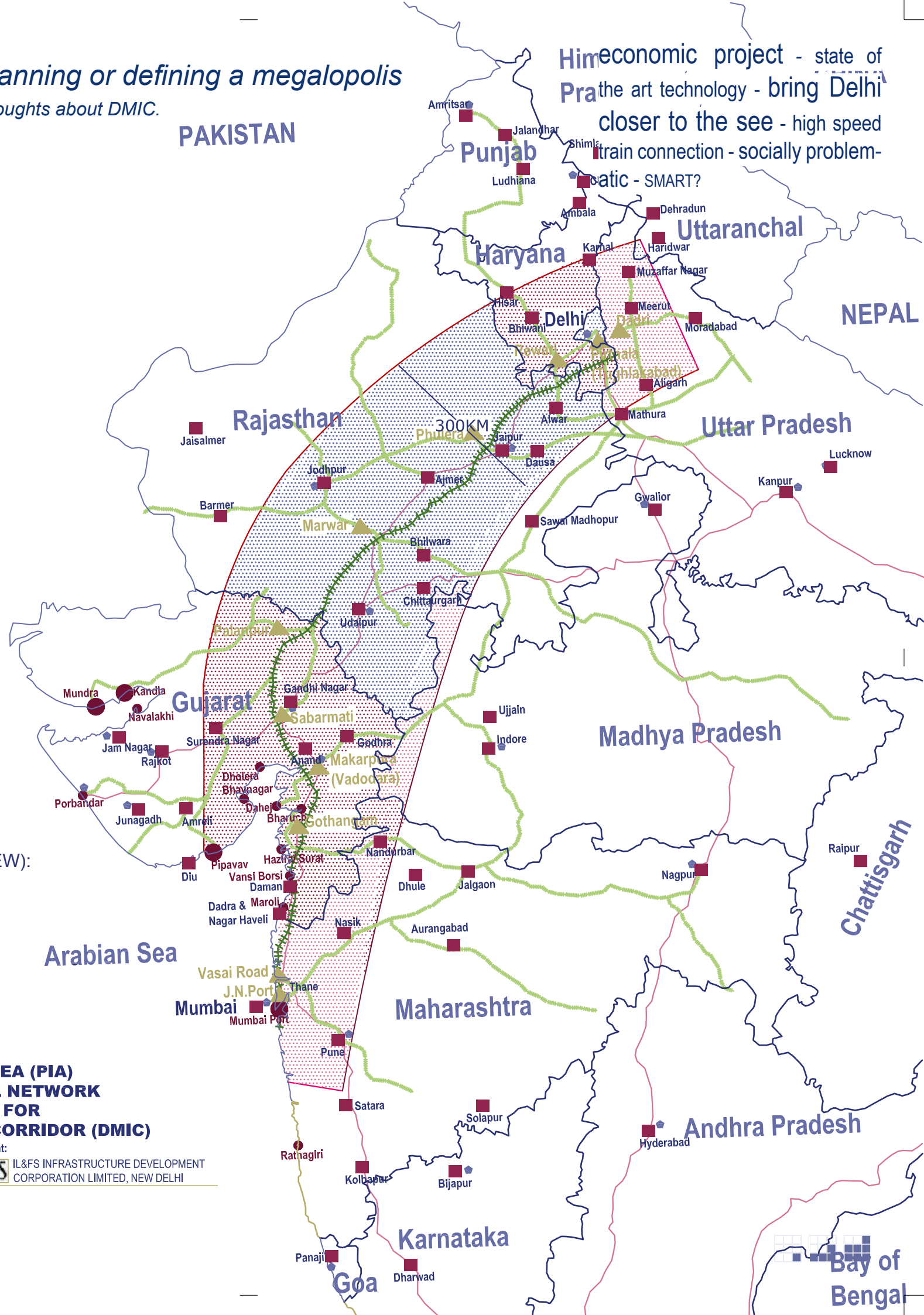
Legend:

-  State Bounderies
-  International Boundery
-  Alignment of Dedicated Freigh Corridor
-  Major Cities/Towns
-  Feeder Rail Network
-  Project Influence Area
-  Location of Major DFC Junctions/Stations
-  NHDP Corridor (GQ & NS-EW):
-  Locations of Major & Minor Ports / West Coast:
-  Locations of Airports:

**PROJECT INFLUENCE AREA (PIA)
 WITH NHDP & FEEDER RAIL NETWORK
 CONCEPT PAPER FOR
 DELHI-MUMBAI INDUSTRIAL CORRIDOR (DMIC)**

Client:
 Department of Industrial Policy & Promotion
 Ministry of Commerce & Industries, Government of India

Consultant:
 IL&FS INFRASTRUCTURE DEVELOPMENT
 CORPORATION LIMITED, NEW DELHI

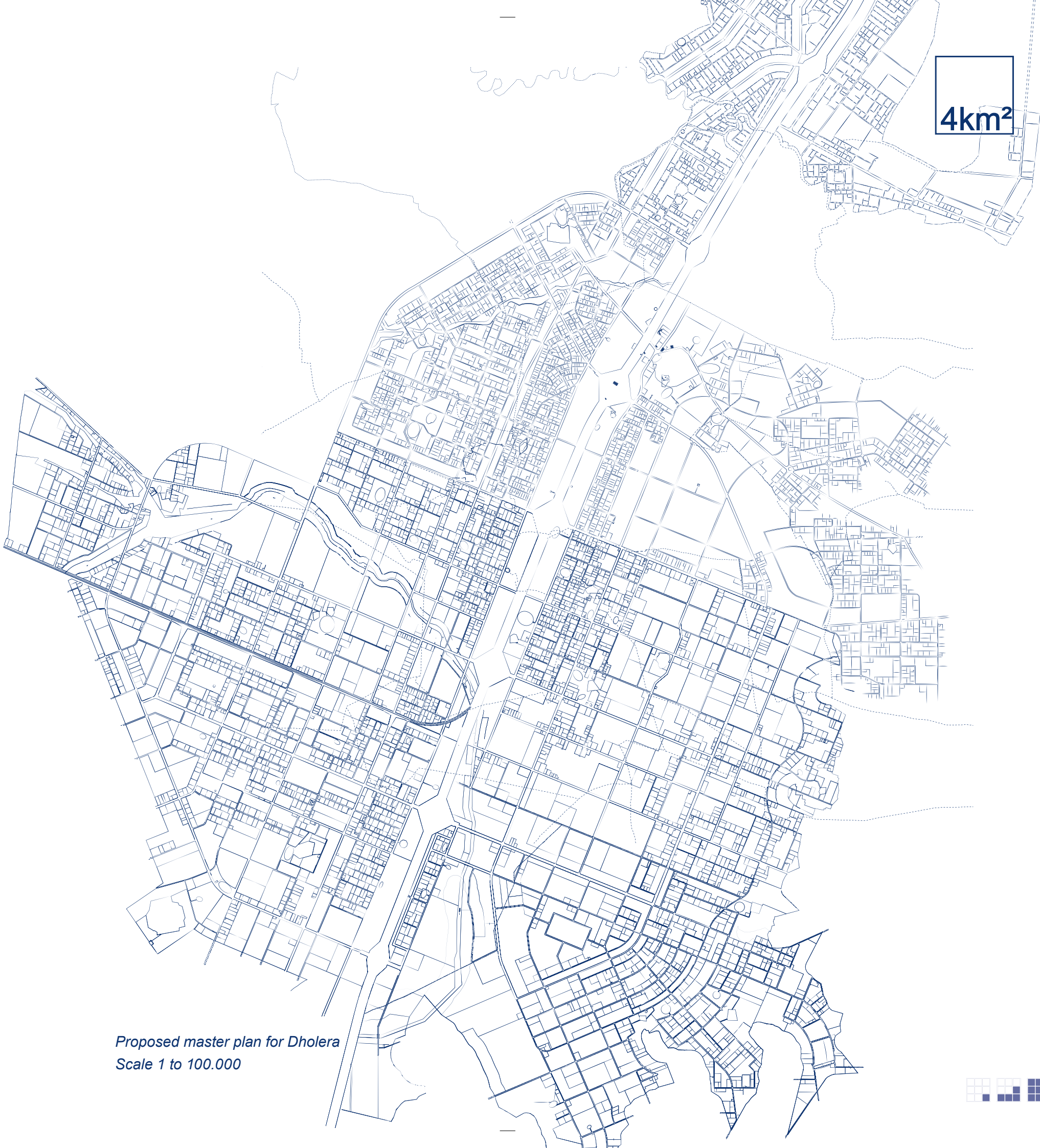


4km²

Aerial View of the area where Dohlera will be built
Scale 1 to 100.000



4km²



Proposed master plan for Dholera
Scale 1 to 100.000



City Network Maps: Overview

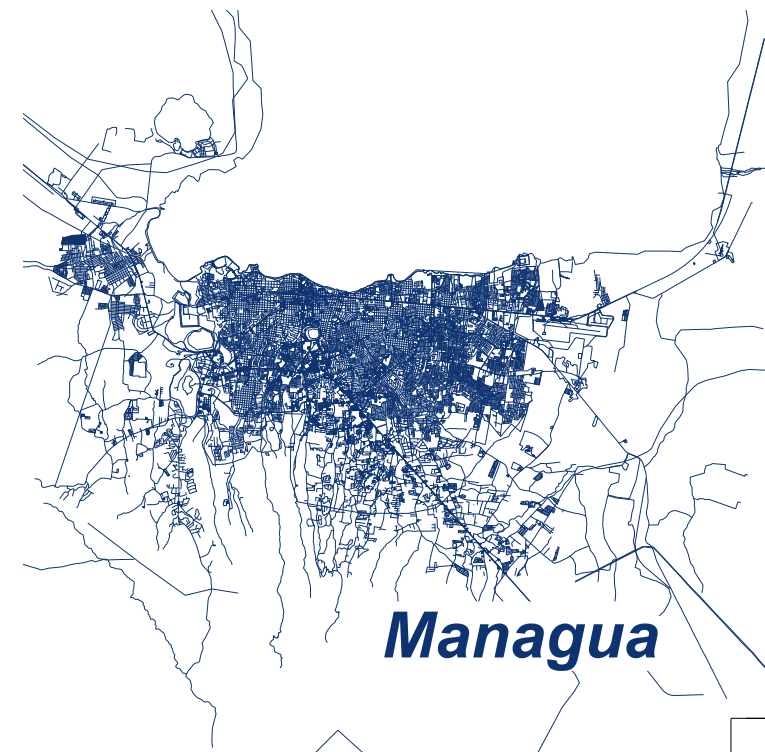
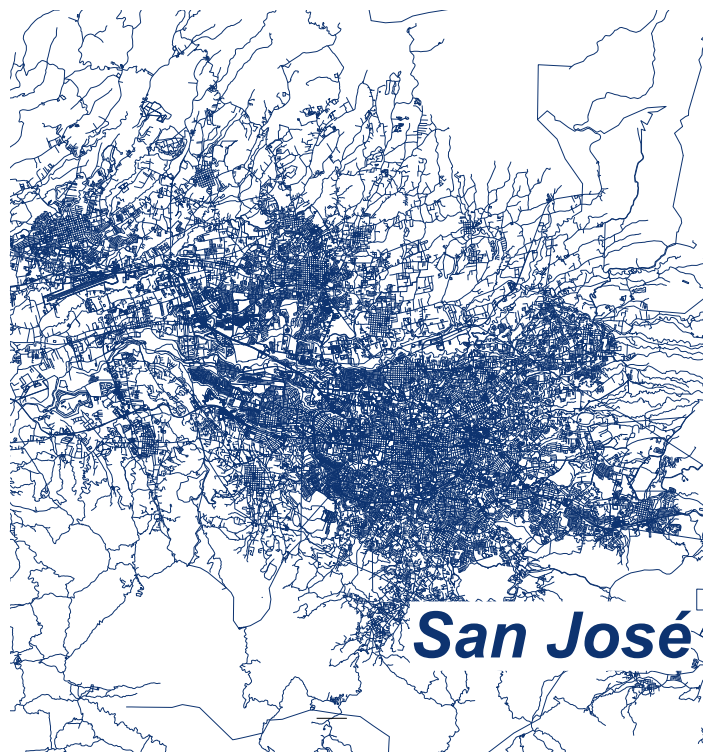
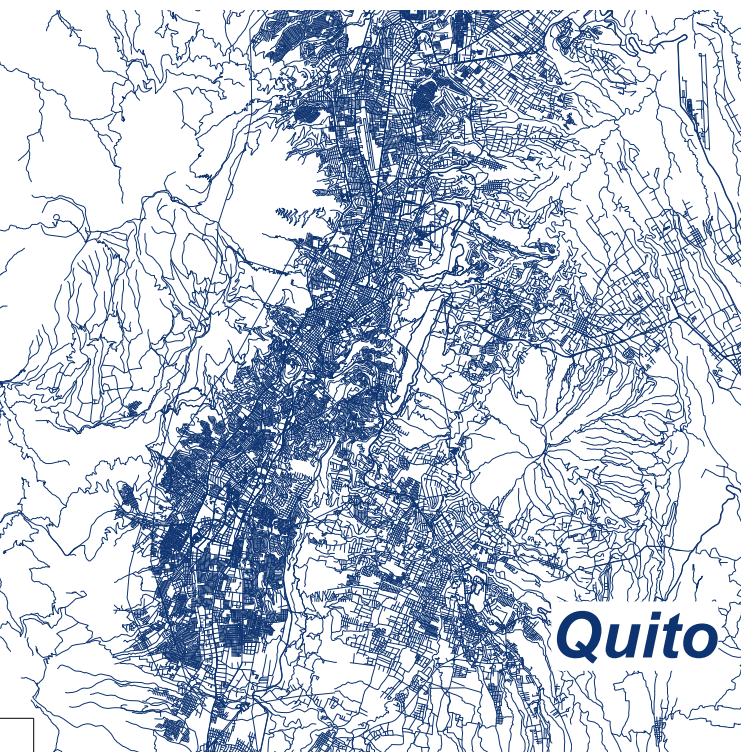
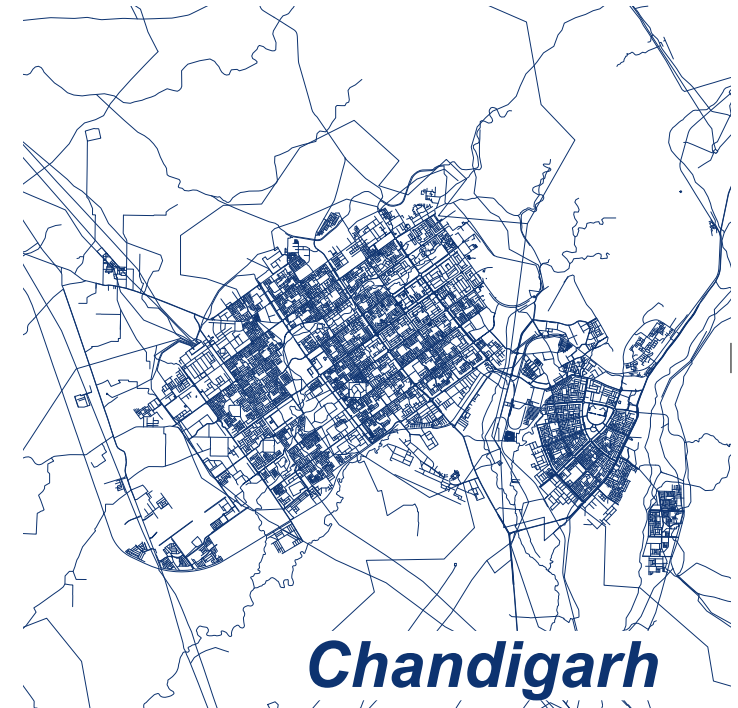
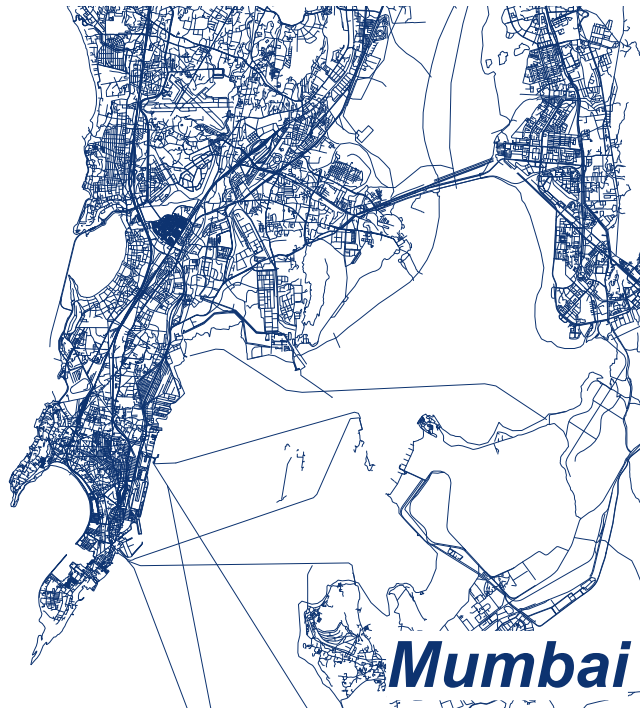
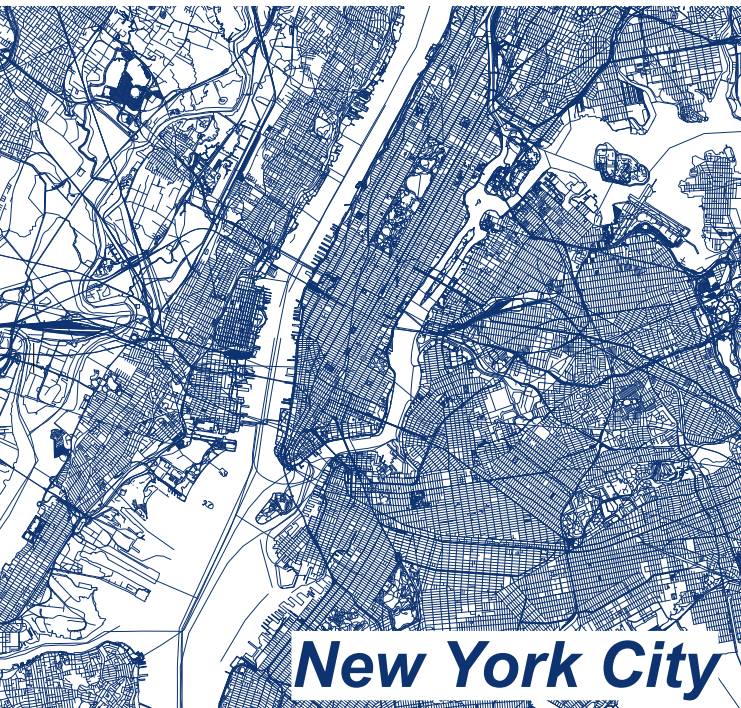
Comparing the available data from openstreetmaps.org.

These maps show a network of tracks available through OpenStreetMaps.org. These tracks are not altogether complete, which makes them an interesting measurement about the amount of available information. Literally everybody who owns a smart phone can access this database with simple applications. This open source project offers anybody the possibility to participate in the mapping process, to map their neighbour-

hood and mark bus-stops while traveling. Maps are information about places and the more detailed maps are, the more everyone can profit, as knowledge and information is a clear advance.

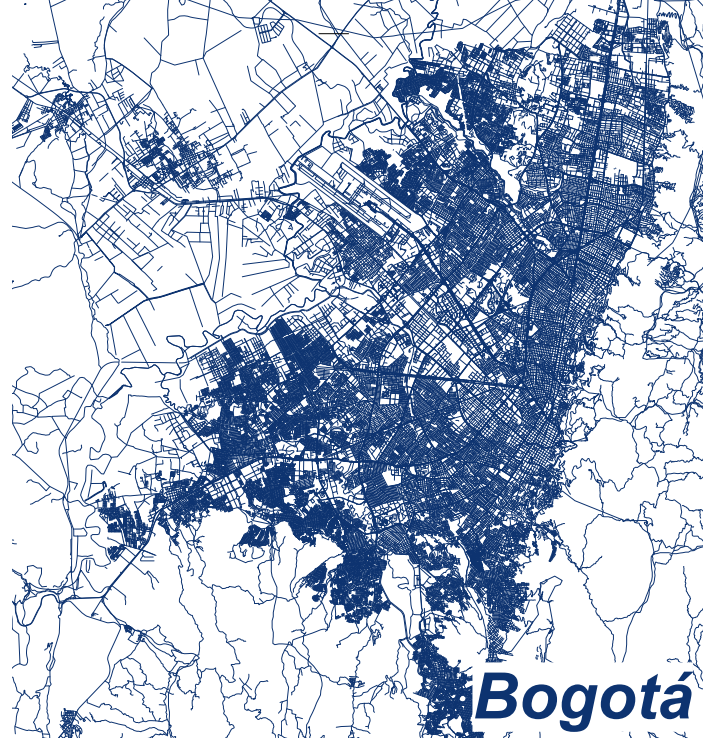
This fourteen maps show clearly the differences in the mapping progress. Clearly, well-mapped places like New York City have much more detailed information compared to Managua or Chandigarh. But it

is only fair to say that these maps improve steadily, and in some not so well-mapped areas, openstreetmaps.org offers a more detailed information compared to third party services that provide similar maps.



100 km²

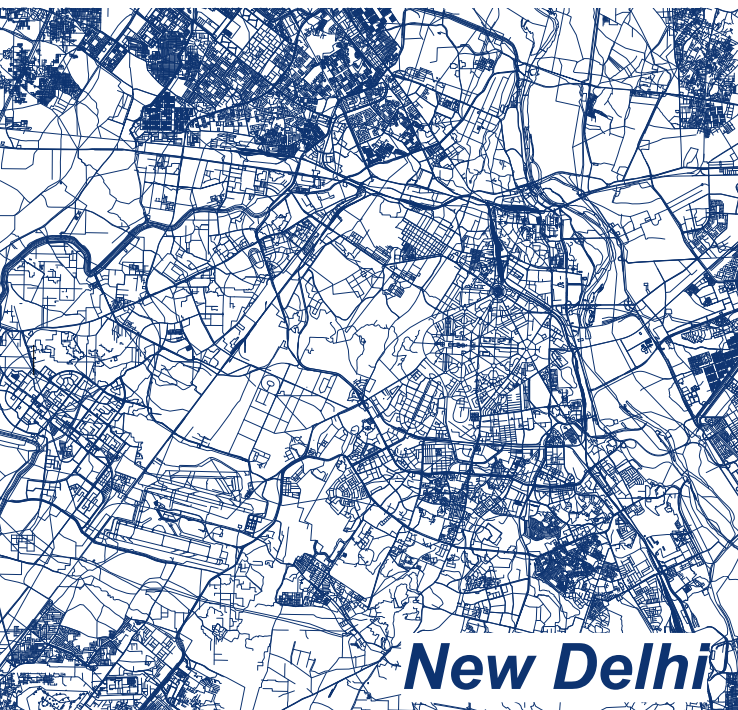
1 to 333 333



Bogotá



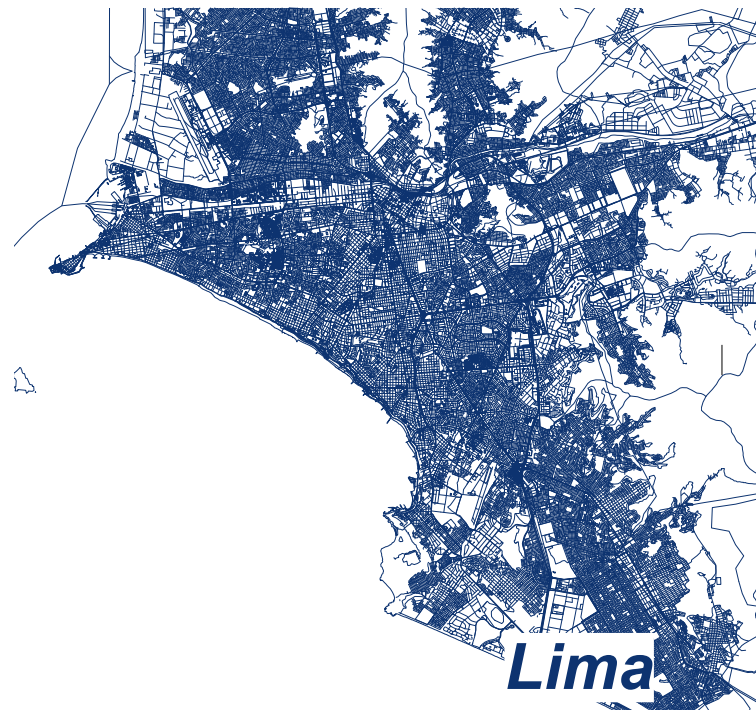
Vienna



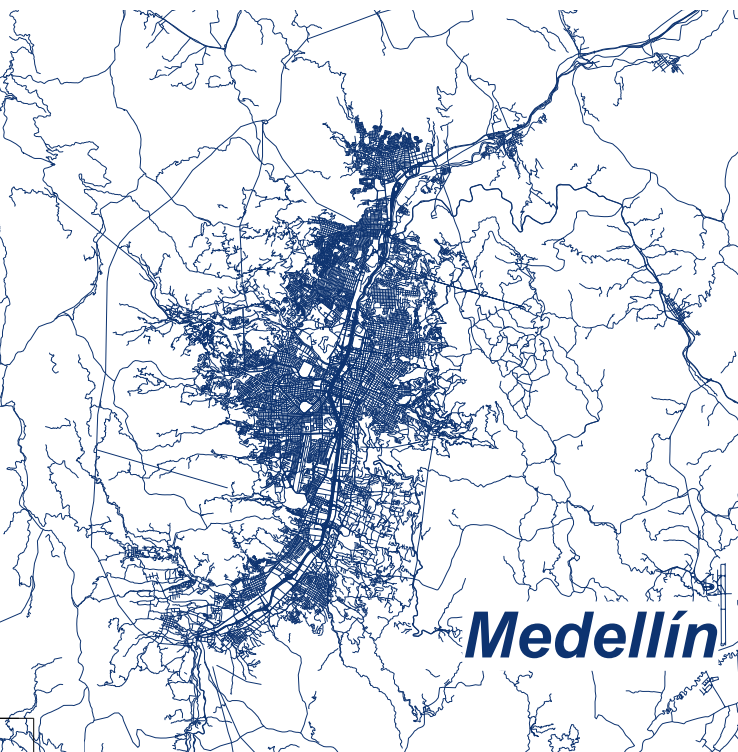
New Delhi



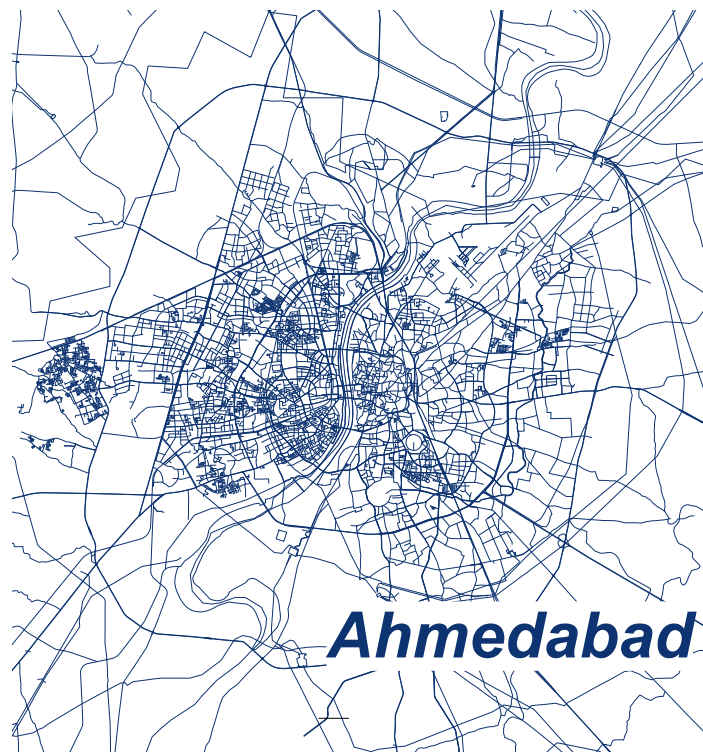
Barcelona



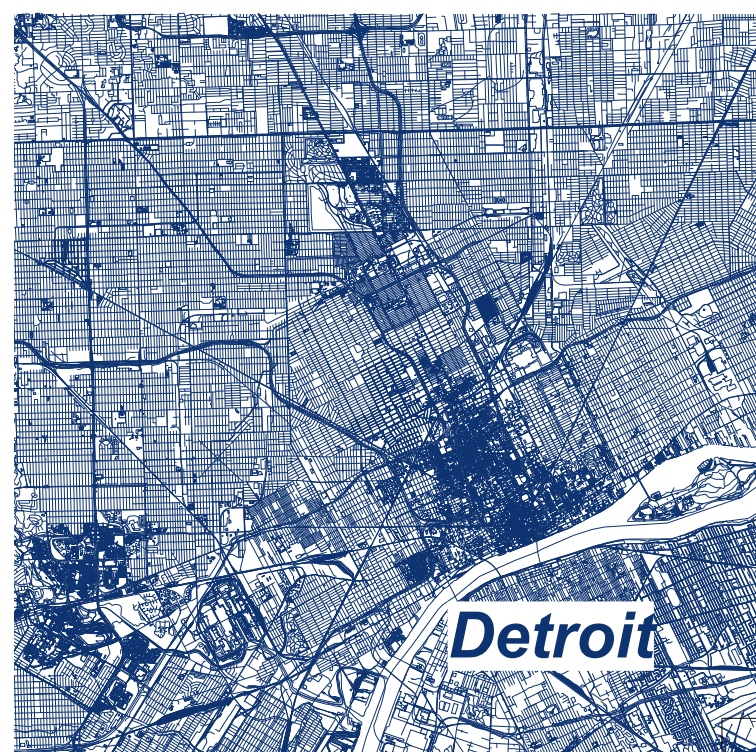
Lima



Medellín



Ahmedabad



Detroit

Aerial Imagery: Overview

Comparing the urban regions of the selected cities by means of pixels.

The resolution and the extent of aerial imagery detail is easy to compare with our eyes. A one dimensional pixel layer reveals (depending on the scale) various circumstances about given areas.

The images below are some of the most recent aerial view images available through common GIS (Geographic Information System) software.

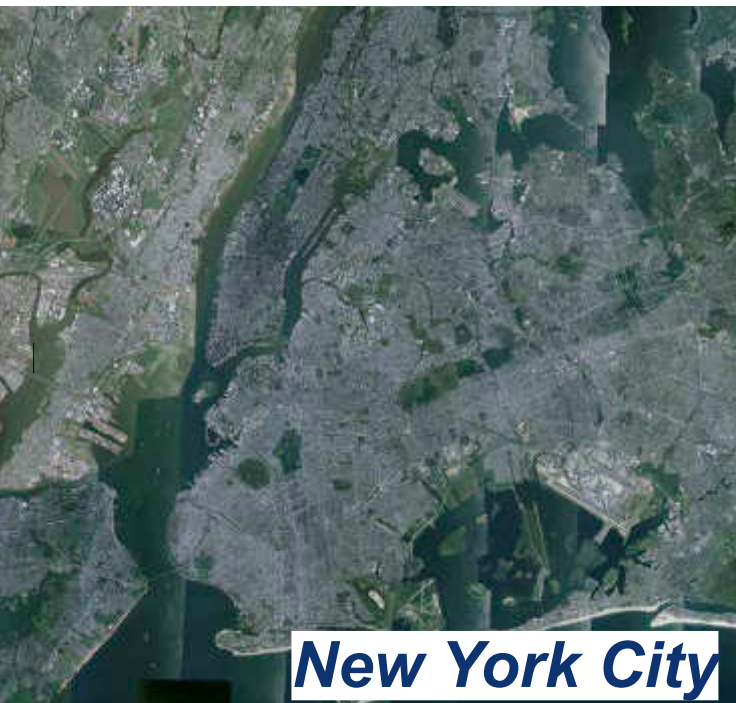
Analysts use the given data from aerial views to determine information about population

density or simply to get information about land use. This “one dimensional” projections of our globe can be processed in many different ways until, finally, it is not a one dimensional image any more. For example, with date and time information of a satellite image of a given area and the shadows thrown on this aerial image, it is possible to obtain height information about a given built-up structure. To obtain even more information, aerial view imagery is shot from four directions and di-

rectly allows the generation of three dimensional structures of entire cities.

All topographic-aerial images are under various licences:

World map, ArcGis base map, downloaded June 2015, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aero-grid, IGN, IGP, swisstopo, and the GIS User Community





100 km²

1 to 500.000



Bogotá



Vienna



New Delhi



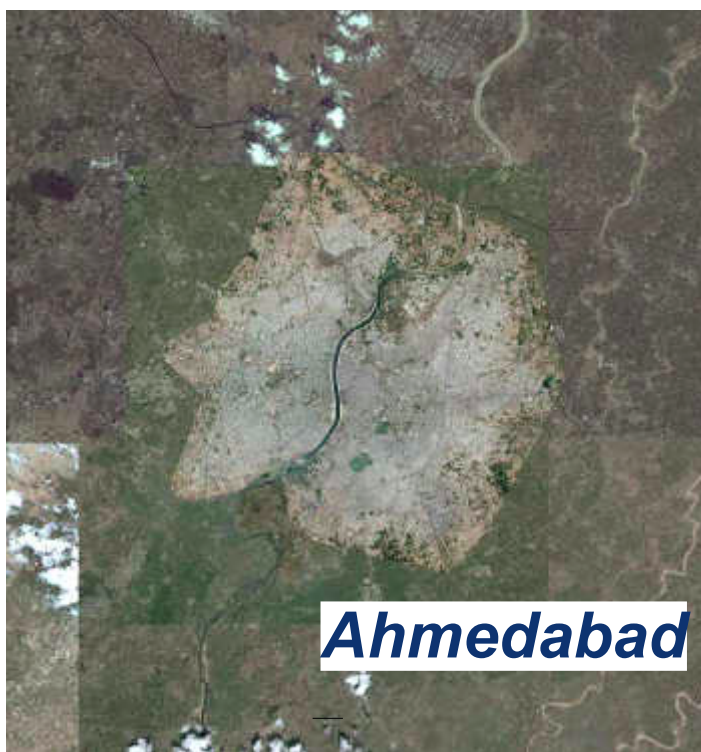
Barcelona



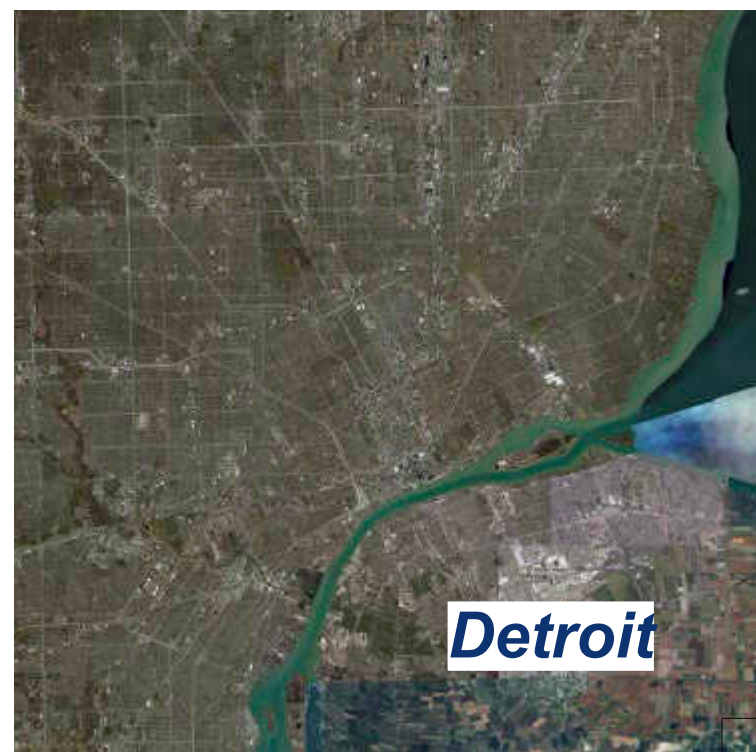
Lima



Medellín



Ahmedabad



Detroit

3

The Excitements of Urban Planning

Urban Planning is Exciting



Knowledge ...

259 Date 17.02.2014; Sir J.J. College of Architecture, Mumbai, India

The seemingly “trivial” factor of one single person’s life in relation to the complexity and permanent need for change that our cities ask for illustrates, at closer inspection, how the continuous interaction between residents and planning mechanisms can serve our future in a positive way. This interaction enables a clever implementation of our frequently changing needs into urban structures; the detection of problems and the recognition of smoothly functioning mechanisms. The future of urbanity and how urban life will be, need not be just one vision; everyone’s vision is needed.

From knowledge exchange to great food

Whether we talk about knowledge sharing or just about great food amongst tons of other things, cities are the places to go. The best of each is usually to be found in our cities. In order to share all these unique experiences, we create complex structures. Understanding and improving these struc-

tures are the major motivations in city planning. Nevertheless, there are in virtually every city many things that are more impulsive than well thought-out and these often produce very problematic results. Many qualities of urban life and the things that occur almost out of nowhere to make our life more liveable need to be cultivated. It will be hard to tell if the small restaurant that’s about to open around the corner will be good or not. If it is bad or we just like another better, we will continue to walk two streets further ... because we know what we want, and we know where to find

it. Life in a city is intimately connected to our knowledge about our city, and how we orient ourselves.

All of this leads to the crucial question:

Can we plan and make it happen that our (urban) environment will provide the best for all of us?



... great food ...

260 Date 20.02.2014, Ahmedabad, Walled City, at daytime a market, at night time a kitchen



... literally everything

261 Date 20.02.2014, Ahmedabad, Walled City, wire and motor workshop

So to say: Urbanity is something that happens - excitement about the occurrence of urbanity.

As we might (or might not) control the way urban life unfolds—even if we have a look into a well-planned city—it does not mean that this city will still meet tomorrow’s needs. No matter how well we planned (or we think we planned) a city, no matter how well all the regulations have been set up, we always need to be open-minded to quickly adapt towards liveable cities. To take a detailed look into the current needs of citizens and the needs that will be presented by future citizens.

Urban life does not happen at once more over it will never emerge “all at once”. Urban life will remain a process but in a city everything often does happen at once; you get offered whatever you might like.

Therefore, an example: if a city faces enormous growth, the need for changes will become more imminent than in a conservatively established, traditional, well-to-do society.

Considering cities where freshly arrived migrants will find an existing urban life to connect to, the processes and the related needs for change are oversee able as long as the number of new dwellers (immigrants) stays low.

However, once the city population explodes, as with several cities in the past (e.g. Bogota, Delhi, Mumbai, just to name a few), the infrastructure cannot be built and extended fast enough to deal with such great numbers. The informal sectors will take the lead, at first. Well-regulated and controlled cities can often not deal effectively with challenges beyond the known and typical development for a city.

The exigencies of everyday life will overtake and will change a city much faster than a well-planned and developed extension could ever do. But this might lead to the question of

whether a too well controlled city could lose its quality of life. ?

Is the identity of a city more influenced by its structures than by its residents? This is a hypothetical question ... but let’s have a look at two extremes: 1) a city entirely planned by a master planner, with all details as to how its society has to work; and 2) a residents’ city, built by the city’s individuals, using democratic and socioeconomic tools to find agreement for how the city should function in order to fulfil the needs of its citizens via an authentically developed social system.

Both of these cities exist now for some time, and have the built structure as we know it from any city. The one design was dictated while the other design developed, but all the buildings are static elements in both of these exemplary cities. But both cities have the problem that the built structure cannot keep the society stable, as most buildings are just a snapshot of a given moment in time. And both of these cities need to be adaptable to social change. Mostly, we will not tear down the cities if this society changes all at once. Instead, both of the cities will be modified towards the actual needs, but substantial parts of these two cities will stay the same, although some parts will be erased entirely. All the buildings built for a certain ideology are now home to a very different society than the society it was created for. But whose identity do these cities carry now? The old identity the cities once represented or the contemporary identity that is related to the current state of society?

What do these cities’ dwellers identify with: the built structure or with its society, the people who inhabit and organize the city, so that one says: “*I love my city!*”

But it should be kept in mind that, if the number of migrants exceeds the existing current population of a city, the identity of this city might change rather drastically. Then it will be hard to see which culture will provide the identity for this urban area and the identity options for new immigrants. New York City is a good example: segregation and inclusion happen the same time. For good Chinese food, one will go to Chinatown, for example. Israel is a more ambivalent example where the identity of the newly arriving people and the resident locals was, from the very outset, a collision of two very different identities.

Most cities that are considered liveable carry both their histories and their present day in equilibrium. Really old cities (e.g. Byzantium/Constantinople/Istanbul), which have gone through hundreds (even thousands) of years of changes reflect the diversity of all these different periods, like a museum might show evolution. Many of their buildings are no longer in any context to the contemporary society; still, many would say this makes a good city. To be honest, its historical buildings and elements make it an interesting city, but not automatically a good city that makes people feel comfortable. There are some really special places—like the colonial centre of Bogota or Quito or the historical centre of Vienna, —that have had a nice ambiance, small roads with many different buildings that have been adapted many times over. Hence, a very romantic perception of a city. Many of these things, buildings and (ancient) processes will not happen in European cities anymore, because all the regulations do not permit the building of such nice places. Instead, society moves towards “perfect order”, ostensibly because we have regulations for everything now! But still, it takes time till new things change by their use and start to carry some patina of life.



The Search for Ways to Plan (for) the Future

is it possible to plan for the future or is it planning the future, or is just planning in the present?

Excitement about the future means being able to let urbanity happen in a way that keeps open a maximum of possibilities for the future and allows easy adaptation.

The determination and analysis of the inner mechanisms of urban regions demands an understanding of their structures and the deduction of weaknesses and strengths of different neighbourhoods. The search for answers involves finding ways to help urban neighbourhoods respond successfully to future challenges. To find out who has to make the next move: are the residents to be invited to state service?

Is there a lack of green or urban open space, public space to give residents and certain groups of users possibilities to follow their life habits?

Many things that might be planned are just things we missed at the present, and we think that we will have use for them in the future, but it is seldom that we see a need for things we do not know.

We can't predict future in general, but we might be able to foresee some of the future's challenges. If we really want to make a difference, we as human beings are asked for visions and not for the correctly planned and built detail we anyhow know from the past.

Diversity makes a city feel alive and liveable. Excitement and emotions are catalysed by vibrant urban diversity.

The point where things get really challenging (and exciting) is when it comes to diversity within a city, how people mix and segregate at same time to find a proper way to share their urban space. This challenges each single one of the inhabitants and engages everyone's energy for a future in diversity.

To keep up the idea of an ideal city, plentiful in different cultures, people with roots from everywhere, the accrument of melting pots (theory or actual) has to happen. Hard to say if this ideal society is a theory or something that still needs to occur in our world's megacities, megalopolises or towns. We need to find ways to share and deal with diversity so that cities work well in the context of ever-increasing urbanization and globalization.



An ideal urban plan, not to plan, just to let it happen?

It is essential to ask oneself what could be an ideal urbanity, referring to the personal whereabouts to life. Followed by thoughts about the meaning of the term home, and what would make a place a real home, that is often a huge part of one's identity.

Is there something like a perfect city in today's world? Urban life is not much different to describe than life as it is. Each of us needs to adapt and share space and room; Stake out our own space in a way that does not disturb our neighbours, indeed, all the people we share our city with. Sure, the bigger urban regions get the more possibilities for parallelism but we still have to breathe the same air.

The Ideal urban plan. What could that mean?

Perhaps the ideal urban plan is not to be made at one point in time and not as a "master plan"; it might be much more like a "user's guide", a map to our cities, a blue print that evolves with the changes in our cities. It is a continuous challenge to keep up with these quick changes. But digital maps and tools allow us to record changes instantly. Our computerised world started to open new possibilities in accessing our urbanities. This kind of information is a clear advance and theoretically accessible to everyone. A kind of a reluctant new systemic layer. Sadly, mostly of this data is used to gain control and power. And in speaking of the term "Smart City", frightening developments are made. Like the centralised city management of Dubai.



4

A Villager goes Megalopolis



262 Date 15.02.2014; Strawberries being sold in Mumbai, India



From a Village to a Megalopolis

About the individual in a superlative.

From a village to a megalopolis is a very striking characterization of what many individuals will face over the next decades.

The dimensions and extent of urbanities vary, but all these places have in common denominator: organizing the process of living together. The range between the definition of a village and the definition of a megalopolis includes most existing ways of organized living together. (e.g. town, city, urban agglomeration).

The frameworks are quite different; for example a Megalopolis can itself consist of all these smaller layers of organization. And the individual has to deal with its surroundings whether someone lives on a farm or in a megacity. And if a person moves from a rural village to a metropolis, his world may be “standing on its head”, presenting a challenge, not only for this individual, but also the people who later on share this city.

Basic needs have to be satisfied, no matter where one lives, and if things are not satisfying, it is most likely that there was no choice.

A narrative in the context of moving into a city:

To get, for example, to work on a farm, one needs a path to the field; in the city as well, but the “paths” will be very different. The farmer leaves his house, building or hut, and crosses two fields to get to his land. The farmer in the city cannot work any longer as a farmer, his path to his job changed the moment he arrived there. His way to work changed somewhat like, leaving the flat, using the stairs, leaving the house then cross-

ing a street with heavy traffic, walking five blocks south to the next subway, driving across the city and hoping the whole way that you still have a job to go to! At the moment the farmer arrives at the other end of the city, he would have done half of his day’s work in the field already and would be sure that he has food to put on the table. But now, someone else grows the food that the farmer hopes he will have to eat.

The farmer no longer is directly dependent to the outer influences the weather brings. But now he is dependent to the climate of a city, an urban agglomeration; a place where individuals often tend to lose their relevance, a city as the assumption of all (often faceless) individuals.

These are the biggest challenges in the upcoming growth and development of many cities: especially the challenge that an individual finds his way in the city, and the collective consciousness of the city stays aware of being a concentration of individuals.

Between Village and Megalopolis

- *The basic needs have to be fulfilled in both.*
- *The complexity of things increases enormously.*
- *The scale of things changes in some parts.*

Although the daily needs and function of a single person does not change so much between a town and a mega city, the overall scale of things is significant. Using the public bus in town is similar to using a subway in a bigger city. And instead of five subway lines in a medium-sized city, we find twenty lines in a megacity. The size of a supermarket, for example, does not matter much,

as one can get food in a small place as well as in a gigantic shopping centre, maybe the impression of variety in products increases and one can buy fifty different kinds of rice.

Behind relentless growth

In our current global economic system, we are indoctrinated with the mantra that growth is the only thing that counts. And cities work well as long as they grow, as the economic system demands continuous growth. So it is no wonder that cities never stop growing and current and previous urban regions that ended at some point, grow now into never-ending urbanities, the Megalopolis.

Megalopolis - mega region / giga city / metropolitan area / never-ending city. No matter what we call it, it is a rather new circumstance occurring in our recent past (and present). Some of the world’s biggest urban regions are already connected and grow into each other while the once rural areas between megacities, which are close to each other, tend to vanish more and more and often turn first into industrial and other quick-build-up zones. So, step by step, these areas turn become urbanized as anywhere else in a city.

The first megalopolis areas highlight this process.

Current megalopolis around the globe: Single points of interest like Delhi, D.F. (Distrito Federal, Mexico City) – Melting of several cities and megacities into one big megalopolis like Tokyo and Rio de Janeiro and those somehow in between like New York City.

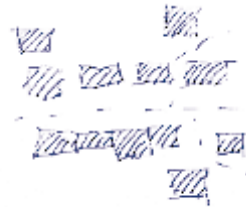


“Time-Lapse” – The Occurrence of Megalopolis (The Fictive/Timed Occurrence of a Megalopolis)

Hamlet



Village



A village grows into a town; towns and villages merge into cities; cities append towns and villages and grow into megacities. The areas between megacities turns into a metropolitan area of megacities; and finally metropolitan areas join due to constant growth in the surrounding of megacities, forming megalopolis regions.

Town



City



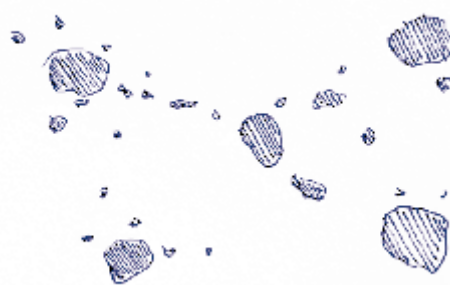
On the left is a simple overview of the most important forms of human settlements. The interesting thing is that we might find the smaller units replicated over and over again within cities and megacities. That is, we might find any of these forms of settlements in a metropolis region of a huge city.

Metropolis



Developed environments

Megalopolis



What to imagine in terms of where all this growth is leading us? A short explanation is in order, Megalopolises are areas that include usually several huge, interdependent cities. It is not necessarily a continuous built-up urban area but with a certain closeness of this cities. And it does not necessarily adhere to the “traditional” definitions of a metropolitan area.



What is the difference between the growth and development of a village towards a megalopolis and the movement of an individual?

Most commonly, both have to deal with some changes. For example, the villager is now no longer a “villager” but a “citizen” in terms and meaning of a person living in a city.

In the process of the transformation towards a megalopolis, the biggest difference is that it is not one individual; now there are millions of individuals who seek ways and means of organizing their lives “together”

in a designated area. Mostly the transformation into a megacity took some generations, but with the swiftly increasing world population, it only takes some 30 years. In this short time, remote farmland may be transformed into the centre of a megacity that is part of an even bigger megalopolis. Heretofore unknown opportunities—but also challenges—await all these individuals who, together, form a city.



264 Date 11.01.2013 A film about the family who lives in this house. <http://www.cultureunplugged.com/documentary/watch-online/play/9089/LA-CASA--THE-HOUSE->

“La Casa” - The House “Una Casa”
A House, the home of the Mendez family. Having a life between a megacity and the countryside, on occupied land in a reservoir in the eastern mountains of Bogotá. The family “survives” by farming and the search for recyclable material in the city of Bogotá. Sometimes Senior Mendez gets a job as a construction worker for road works. They have a walk of only 30 minutes to the centre of Bogotá, and have the milk from their own cow.

Mr. Mendez proudly wears his work clothes with the yellow helmet, at that time he was injured and out of work, which means no income. Mr Mendez and his family are in between, they are stuck



Earth City Lights

... reveal the globe's Megalopolises

This Earth's city lights are a stunning illustration of our planet. This images and the seen light are moreover analysed to make more precise population estimates based on the brightness of predefined patches and compared to similar areas.



266 *Credit: NASA Earth Observatory image by Robert Simmon using NASA Earth Observatory/NOAA NGDC images. Source: http://eoimages.gsfc.nasa.gov/images/imagerecords/79000/79765/dnb_land_ocean_ice.2012.54000x27000_geo.tif*

5

Urbanity is Thoughts

Layers and Reasons Behind Urban Structures

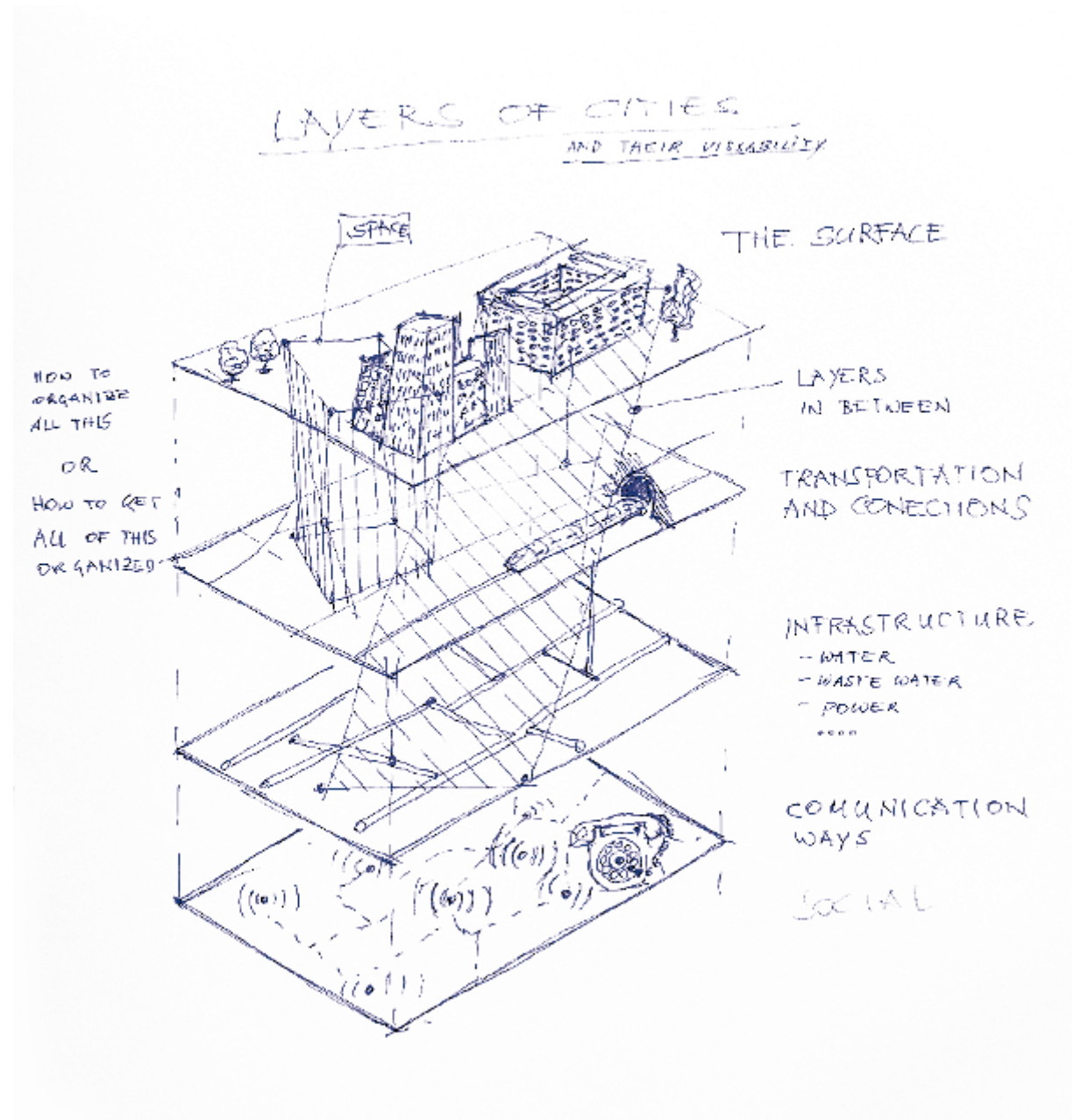
This chapter is actually not about the built-up structures in our urbanities, nor the physical appearance of a city. It is about the ideas behind things, the needs that call for certain functions, a kind of meta-layer in our cities. Organization and communication, and the realization of ideas, and, last but not least, optimization of the serving of daily life needs.—one of the initial reasons for the building and development of cities.

Throughout history, many definitions of urbanity have been formulated; then things happened and they turned into rules: some things have been forbidden while others have been forced. For example the maximum height for buildings or the maximum use of land of a lot to be built-up.

These layers are usually invisible, yet they form the constant framework for what happens, like the organization of public transportation or a general commitment to polite behaviour; not to mention the general mental state of a society and the public awareness about hazards.

A grown city generally is a manifestation of all these mental states, idealized behaviours and artificially set-up rules. A master planned city can only learn from these processes, but can we pre-plan this occurrence?

Many of these layers can be analysed to contribute to better: things like population density values, organizational infrastructures or mobility tendencies, just to name few. Finally the effectiveness of a built-up city depends a lot on the functionality in practice of these many layers.



267 Layers of urbanities and their (in)visibilities, sketch by author

Infrastructure from Local to City-Wide

Movement and transportation is a very visible layer within a city.

For example, we can trace all the public transportation routes throughout a city, we see the bus stop and the bus itself, but actually we do not see how many buses have been in operation over the last twenty four hours. Means the same thing has twenty layers if twenty buses are underway over two hours, the time makes it invisible for the moment, and so it is for many other things that happen steadily but not simultaneously. For a better understanding of the meaning layer in the context of urbanity.

- *Walking distance to (machine-aided transportation) motorized (traffic)/transportation*

- *The small in-house water pipes to the huge city-wide water supply systems*

- *From the toilet flush to the purification plant*

- *From the light bulb to the power plant*

- *Transportation of goods in the neighbourhood and across the city*

Transportation and mobility are a most exceptional layer. They matter to all, and, especially in urbanities, mobility can be a challenge to each individual if there is no proper understanding of mobility in terms of public transportation.

Cars can be toxic for all urban residents: too much individual traffic causes enormous air pollution and often provokes traffic-jams. A time-killing and frustrating alleged “freedom”.

A sensible understanding of individual traffic and mobility will be a crucial point in

the way big cities are going to succeed in the near future. As a prognosis, tendencies for cities with a growing middle class show an enormous increase in cars. Policies (in most countries) in many ways force this increase by putting the car into an untouchable position. But it does not matter if this is the result of intense lobbying of the car industry or oil-producing countries, or if there are some real aspects. Cars appear to make us independent individuals.

Hermann Knoflacher once said something like: “Wir denken als wären wir Autos“, “We think as if we would be cars”. And our “public face” is not infrequently the prestigious silver Mercedes we drive ... even if we’re standing stock still, imprisoned in a traffic jam! There have to be better solutions and policies around the issue of individual transportation, a least in cities: Our car-defined society is not an option for the future.

A city is no bigger than an individual's reachable radius.



268 Date 21.05.2010; Cycling, maybe the most efficient way of increasing mobility in a city, Critical Mass - Vienna



A City is Often Only the Result of Regulations

Developed in the cage of bureaucracy.

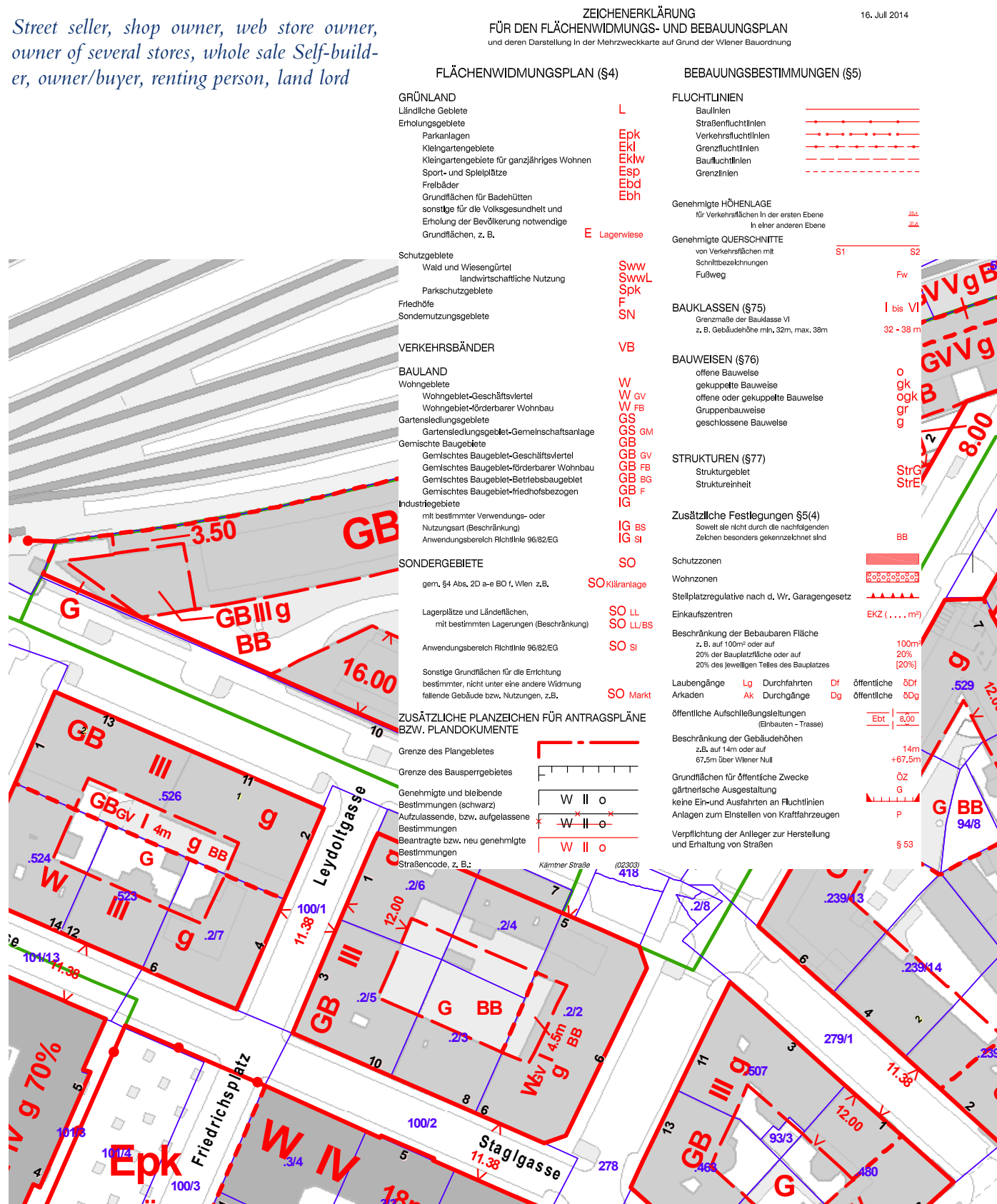
As a lay person, the regulatory framework is a difficult matter and often hard to understand. And these are only the rules defined by governmental administrations. Others might include economic prognoses or social inclusion, etc. Not infrequently the regulations imposed by governments exclude substantial segments of the society by setting standards that a simple citizen could never fulfil.

One huge component is economy and its influence within the development of urbanity, from micro-economies to macro-economies to global players. The current formal development of cities often involves major international corporate partners. In such a scenario, small groups or individuals generally have no chance to fulfil the stringent and/or financially-intensive obligations. It should be mentioned that crowdfunding allowed a group in Bogota to build an entire skyscraper, without the need of an international corporate partner, a chance for individuals to participate in the development of their city. So, to say that money always has a quiet precious role in the occurrence of urban life, whether it is a planned city or an area developing over time. In the informal sector, individuals () add something to their house as soon they have some money; or in a planned area where everything is about cost optimization and realizing profits. Two quite different positions where the influence of money in the building of our urban worlds plays a major role.

Economics is certainly not the focal point of this thesis and is beyond its intended scope. And yet economics is certainly a big part of urbanization as we know it.

Globalization, through its broad definition, often refers just to the global exchange of goods and services as measured in terms of money and efficiency. Using this parameter, a city will only be part of globalization if it has a substantial share in the global economy.

Street seller, shop owner, web store owner, owner of several stores, whole sale Self-builder, owner/buyer, renting person, land lord



269 Space plan of the city of Vienna, close to Westbahnhof, Source: www-wien.gv.at/flaechenwidmung/public/



Magic 'DENcity', Density Defines Cities?

*Another thing in urbanities which is not touchable,
how one can say many or not so many people.*

How many people should live in a certain area? How many people are needed to maintain certain infrastructures? Most importantly, how many people are enough and how many are too many?

Average population density in our global urbanities

With an estimated global urban population of 3,880,128,000 by 2014 and 894,000 km² sealed and built-up land, the average population density is about 4,340 inhabitants per km².

In urban planning professions, density is a very important figure in the analysis of functions/processes in urban quarters and neighbourhoods. Many of the qualities which advance urban life require a certain density. Education, socioeconomics, transportation and many other component function better as the density increases (in so called dense areas). Population-dense areas bring possibilities or opportunities like infrastructure in a very local walk-able area; further, it enables more efficient public transportation and helps reduce dependence on cars (e.g. inefficient high personal effort to run a car; the misleading marketing idea of the independent life a car might bring becomes irrelevant).

Density does not define cities or urbanities, but urban areas usually show a comparable band-width in density.

Density definitions are calculations. The most common terms:

Floor area ratio: **FAR** (area built on in relation to the buildings floors in a lot or a block)

Dwelling units **DU** (dwelling units per km² or ha)

Population density **POP** (inhabitants per km² or ha)

The world urban **POP** = 4,340 inhabitants per km²

Assuming that population density is the basis for a design approach, what might be the upper barrier for density without creating (very) inhuman circumstances?

It is not possible to easily solve this question, as one needs to know how much space a single person has to have as their private space, which is related to the cultural and social environment.

A further question is how a person uses his/her assigned space.

Examples about housing in a minimal space with attached working space. After defining the minimal space a person supposedly needs, there is still the question about typology. How tall can buildings be, how much light is the lower limit in the rooms to order to stay healthy, how to provide enough fresh air and the maximum distances to the next exit of a building.

Further questions:

Is higher really better? When is the maximum reached, what "rule of thumb" can serve as a mean for maximum density? What are the common numbers in density?

Sustainability is related to density

Higher density brings the initial possibility for higher sustainability in urban areas. The use of resources is limited and a poor use of resources can directly lead to problematic and inhuman situations. A certain density helps to build social and human urban neighbourhoods.

Density definitions also help with the understanding of urban advantages and disadvantages.

Problems with too low density:

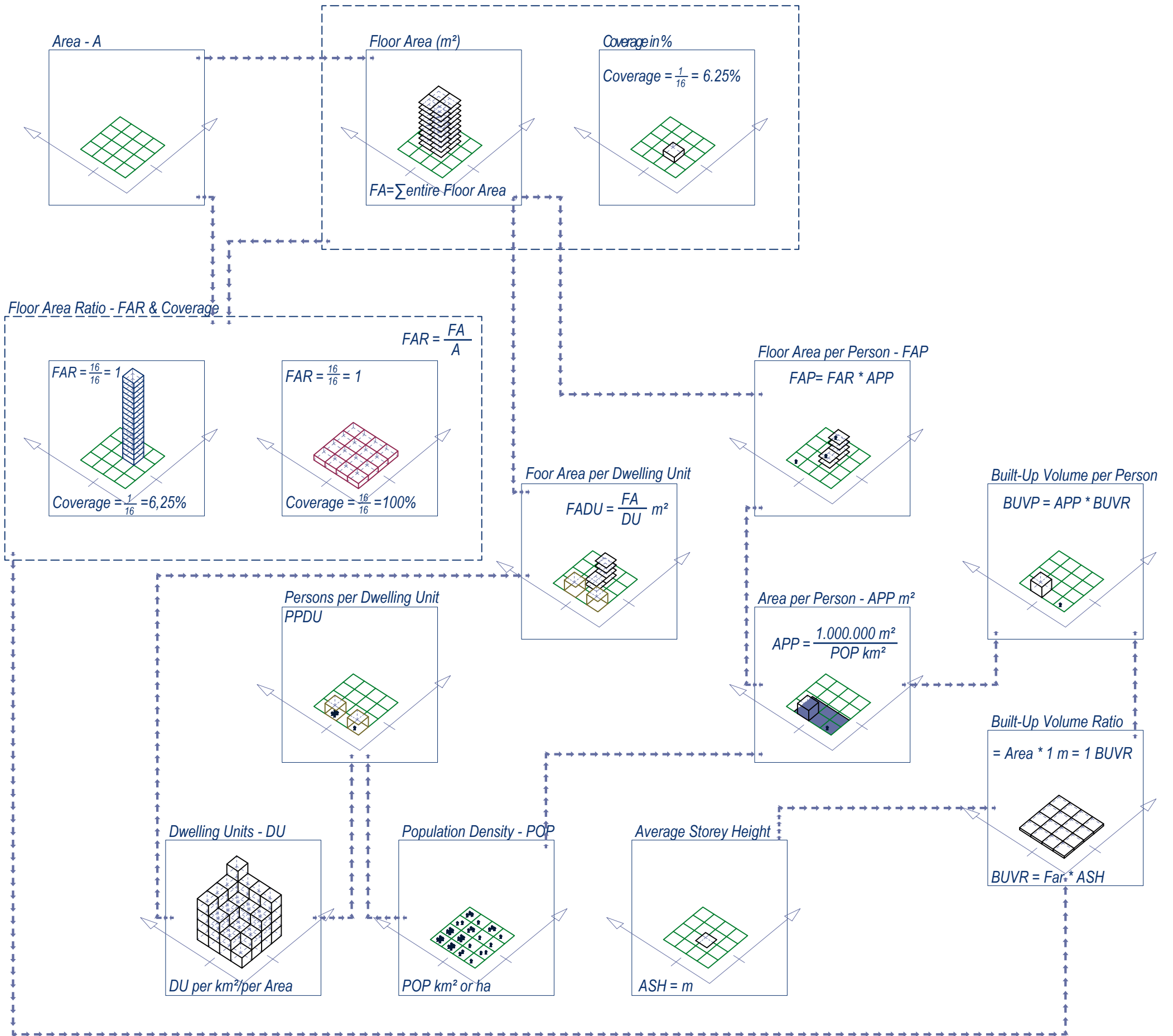
- inefficient infrastructure;
- public transportation, if at all, will have low intervals; and
- institutions like schools etc. are then often far away.

Problems with too high density:

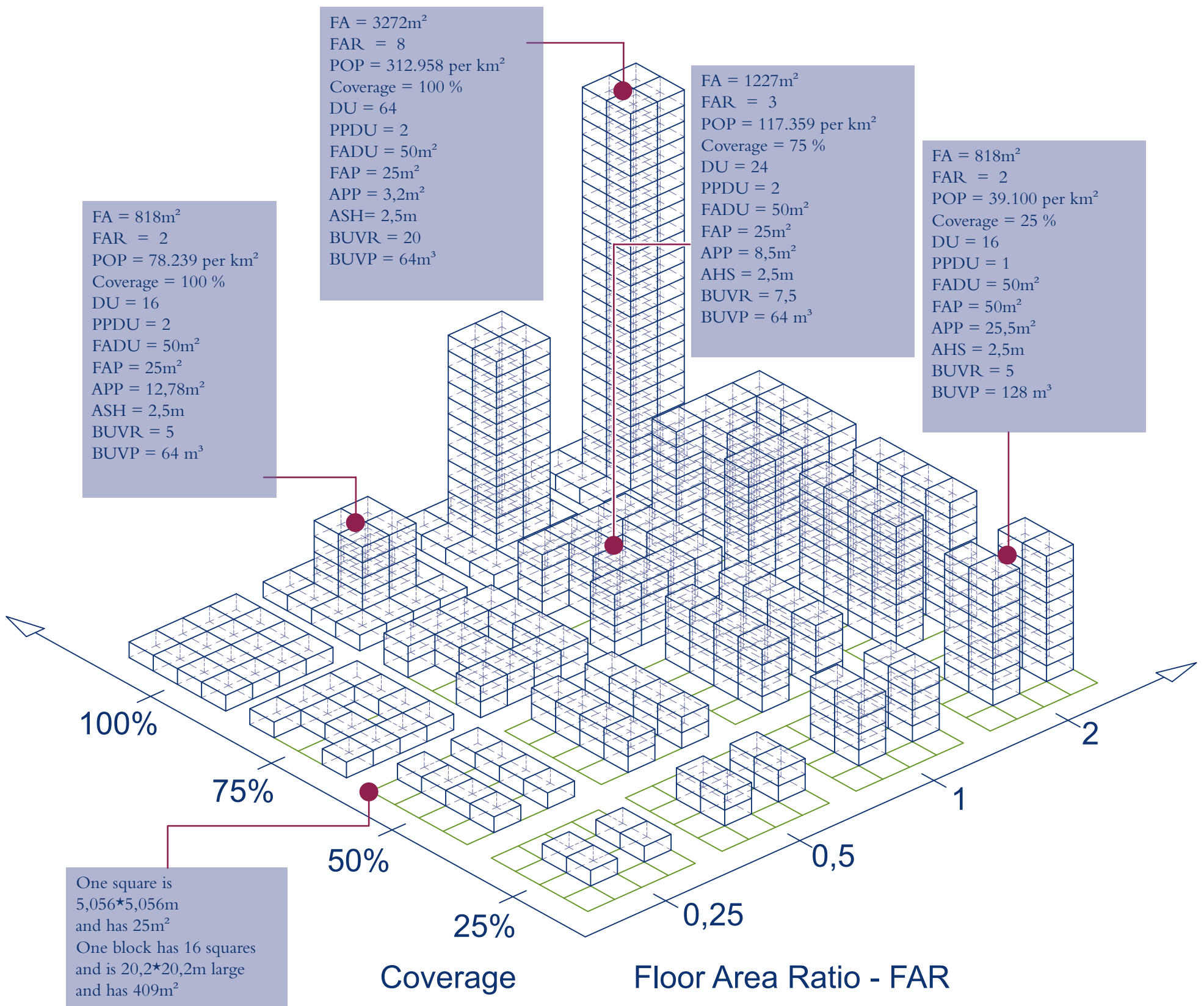
- air ventilation can be poor;
- sewage capacities can be overrun; and
- lack of natural light.



Specification of Density Definitions



FAR, DU, POP, BUVP, ...



271 Examples of different densities, by author.



6

Physical Elements

Elements/Units of Cities

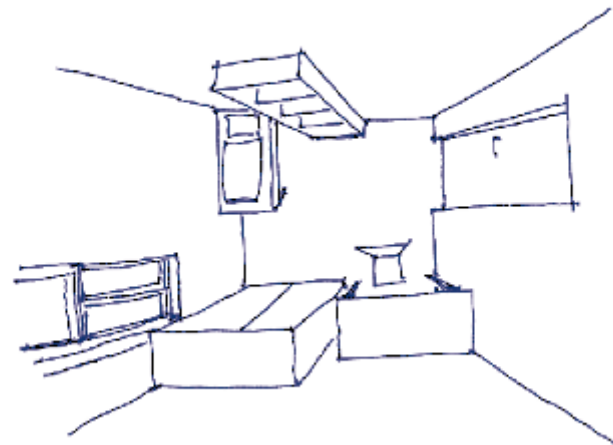
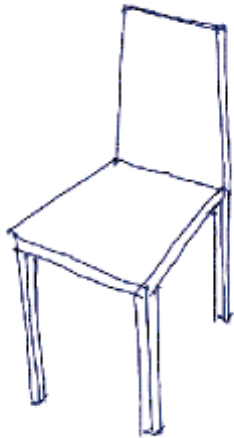
The evidence of manifestation in space.

Amongst the myriad elements in urbanity, perhaps the most important might be the people who actually live in the city. But this section is not about interacting. Most of these city/urban elements—like buildings and constructions, and their functions—are static and/or not really flexible in themselves. Such structures house schools or public transportation depots, just to name two. But all these things are built to serve the multiple functions that a city should be able to provide. . And all these elements are measurable units.

To point out what these physical units are, below a personal overview. All the things a single person might need as a minimum on a daily basis. And these basic needs determine the space around us.

- a bed and places to sleep (settled bed or something more “interesting”); a place where every normal day starts and ends.

- a room
- a flat
- a house
- a town house
- a working space, industrial, office, handicrafts
- buildings
- markets
- parks
- squares
- alleys
- blocks, urban blocks
- sports fields
- railway stations
- churches
- schools
- minor streets
- main streets
- shopping malls
- a “quarter”, natural and man-made city parts
- an urban quarter
- urban townships
- a city within the city



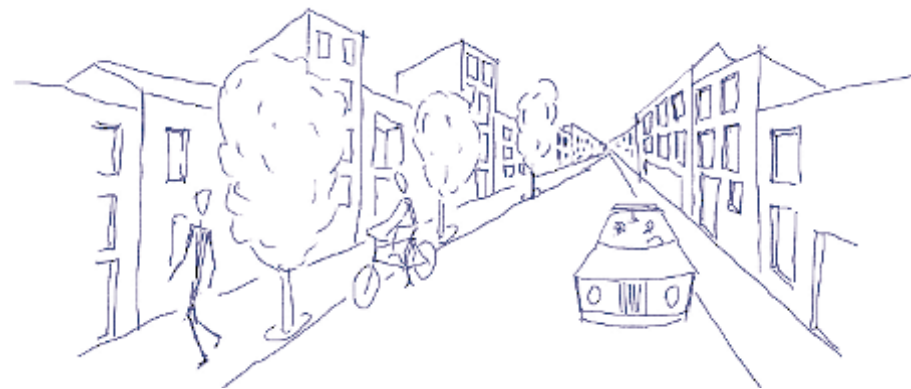
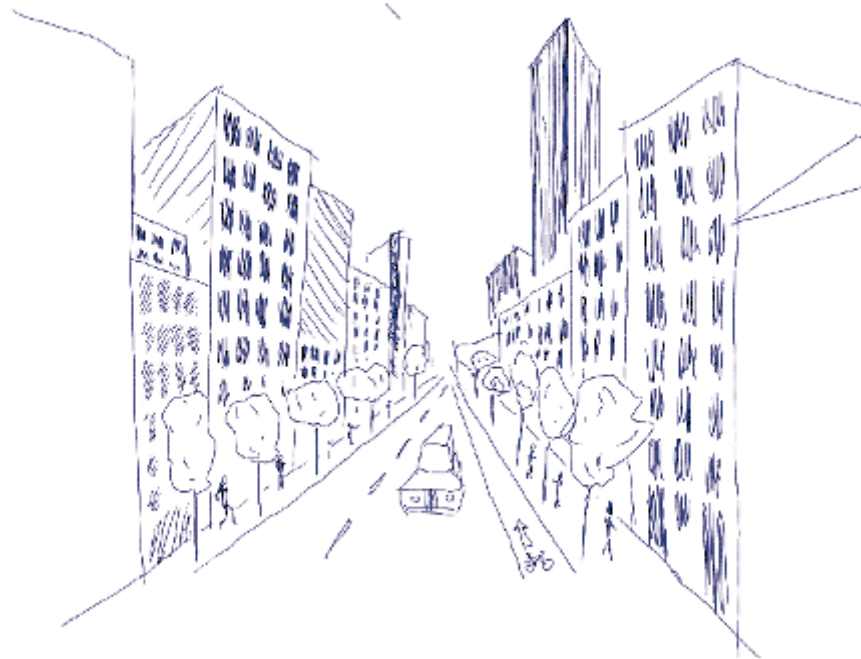
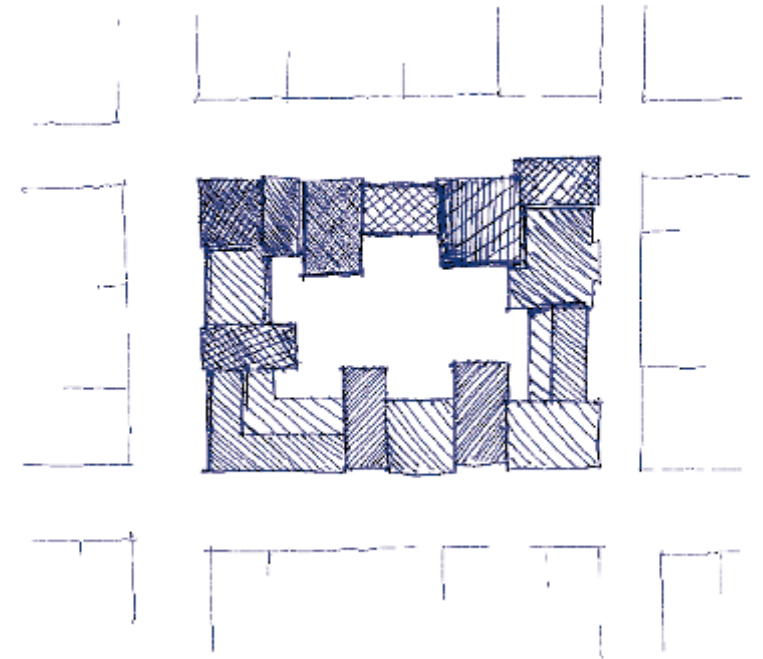
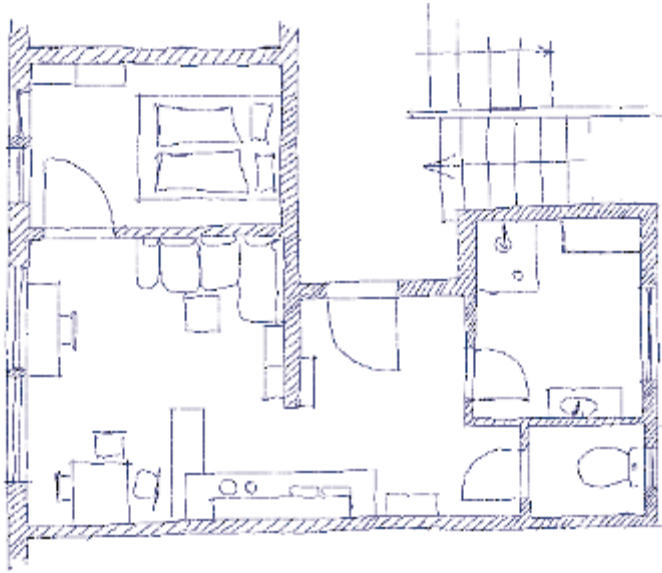
Every single construction, every manifestation in space, in an urban neighbourhood or in a mega city could be listed here, but all these single elements don't tell much about a city; still, they are an intrinsic part of daily urban life.

Some of this listed expressions are a group of smaller units. For example, a quarter” consists usually of several streets. Or a neighbourhood where every basic function cities usually serve are at hand, and can be described in terms of urban township.

That would indicate that the unit “urban township” is the biggest in a city, and a huge city generally consists of many townships.

Built-up infrastructure usually has a specific assigned use. But it is only the facade of a city, and does not necessarily reveal what is behind these walls. Those would be the multiple layers of an urbanity (i.e. see the chapter on “layers”).





A Brick

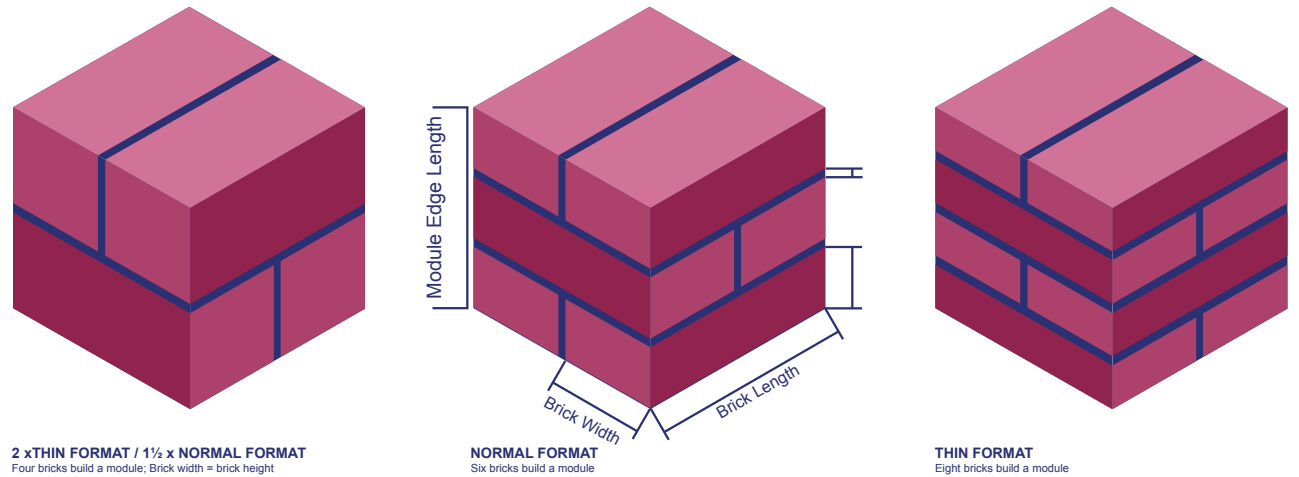
A most versatile element.

Bricks are perhaps the most universal element in city building history; the Romans built everything out of this small unit. A brick is easy to understand. Once one knows that bricks have to overlap, it is possible to build every physical element a city would ever need. And the limitation given by the building techniques of nesting and pyramidal things mostly remain on a very human scale. If we use concrete, steel and other highly sophisticated materials like carbon fibres, things often lose the relationship to our simple human life.

I would say a brick is a brick but Wiki explains it as:

*A brick is a block or a single unit of a kneaded clay-bearing soil, sand and lime, or concrete material, fire-hardened or air-dried, used in masonry construction. Lightweight bricks (also called "lightweight blocks") are made from expanded clay aggregate. Fired bricks are the most numerous type and are laid in courses and numerous patterns known as bonds, collectively known as brickwork, and may be laid in various kinds of mortar to hold the bricks together to make a durable structure. Bricks are produced in numerous classes, types, materials, and sizes which vary with region and time period, and are produced in bulk quantities. Two basic categories of bricks are fired and non-fired bricks. Fired bricks are one of the longest-lasting and strongest building materials, sometimes referred to as artificial stone, and have been used since circa 5000 BC. Air-dried bricks, also known as mudbricks, have a history older than fired bricks, and have an additional ingredient of a mechanical binder such as straw.*1*

Modular concepts for brick sizes



2 x THIN FORMAT / 1 1/2 x NORMAL FORMAT
Four bricks build a module; Brick width = brick height

NORMAL FORMAT
Six bricks build a module

THIN FORMAT
Eight bricks build a module

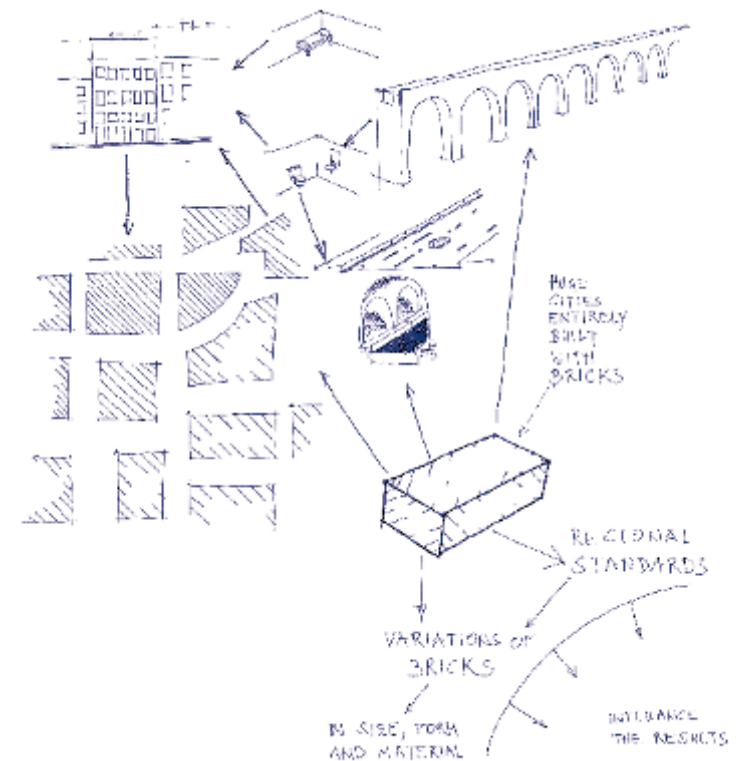
273 *The modular concept of bricks, by author*

Brick Standards:

Standard	Metrics	
Germany	240 × 115 × 71	mm
India	228 × 107 × 69	mm
United Kingdom	215 × 102.5 × 65	mm
United States	194 × 92 × 57	mm
Egyptian (at the palest of Marqata 18th Dynasty)	330 × 160 × 100	mm
Old Austrian	290 × 140 × 65	mm
Waalformat - Netherlands	200–210 × 10 × 50	mm

Most formats listed in the brick standards table show similar proportions. This proportion is:

One time the length = twice the width + once the seam thickness = three times the height + twice the seam thickness



274 *A Brick - most versatile, sketch by author*



*1 Source: <https://en.wikipedia.org/wiki/Brick>; 2015 07 21
Source: <https://de.wikipedia.org/wiki/Mauerziegel>; 2015 07 21

Limitations

Will there always be a limit?

There will always be a limit, though “superlatives” try to push them away.

Bricks clearly have their limitations. That is one of the reasons why most buildings currently use concrete and steel since these materials can be brought into almost any form.

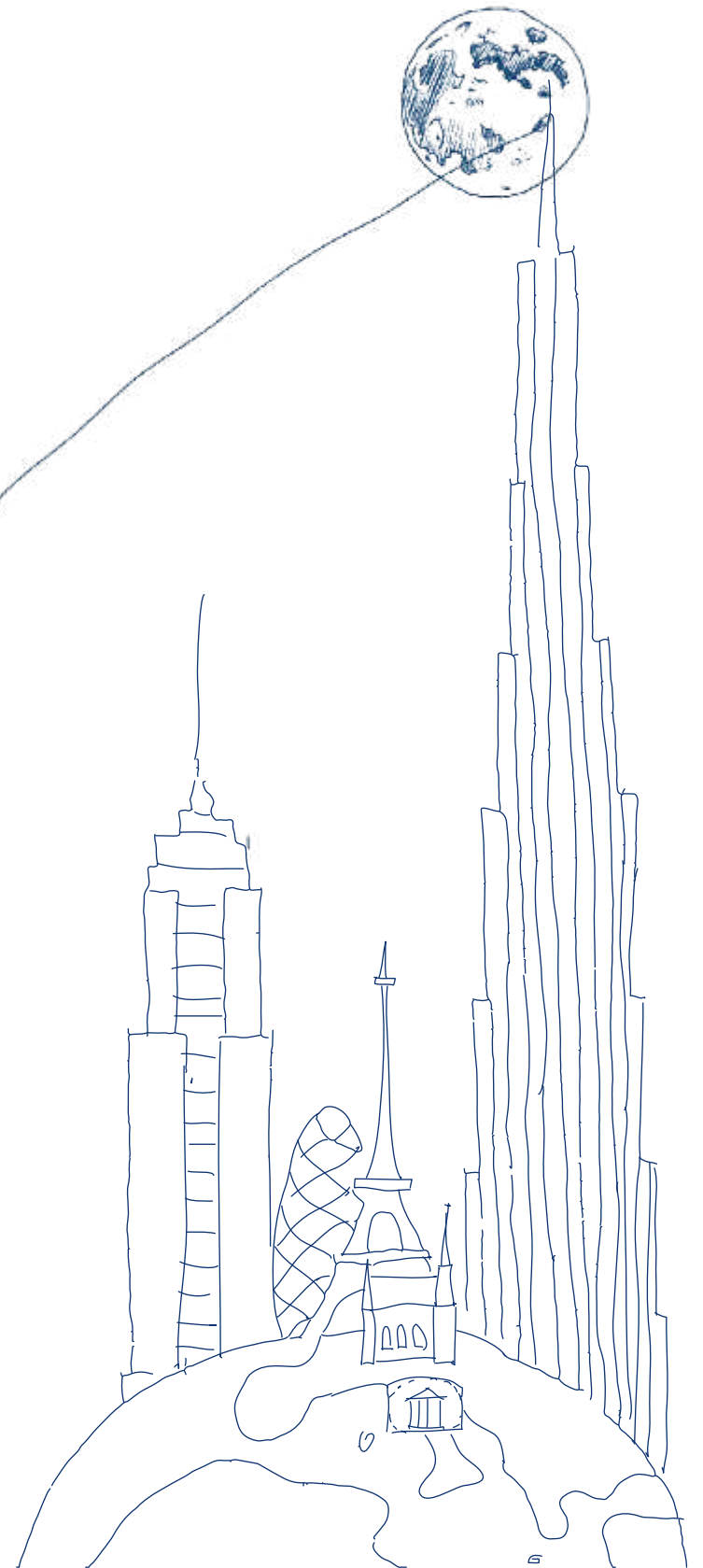
Does it make sense to construct buildings higher than maybe ten floors? Most certainly it would not make sense with bricks since the statics of these layered structures soon reach their limits, such as the limits to everything built prior to steel and concrete and the mix ferroconcrete, and some more advanced materials like carbon fibre compound.

But due to these static limitations, brick constructions have a self-defining standard. And everybody can easily understand how to interlock bricks to construct build a building. Difficulties (e.g. emergency evacuation from a skyscraper) do not arise due to the natural limitation of bricks. But even if we posit that bricks have limitless options, can we use them?

Limits are not only technical in nature, we also have “limits” in our minds and thoughts, limits in our own possibilities, and often limits due to certain mind-sets. Breaking through these mental barriers is often much harder than finding a technical solution to push things a little bit further than the last time.



276 *Elevator to the moon, by author.*



275 *No Limits, by Madlyn Miessgang*



7

Techniques and Approaches in City Planning

... Then and Now

The ones who plan and the ones who don't ...

Cities and urbanity are basically something that occurs as a natural outgrowth of expanding population, but it has taken quite some time for first thoughts about better (i.e. more intelligently) developed cities to emerge. For example, ancient Greek cities were built with basic functions that provided infrastructure for several specific functions, such as communication, trade, entertainment or religious institutions.

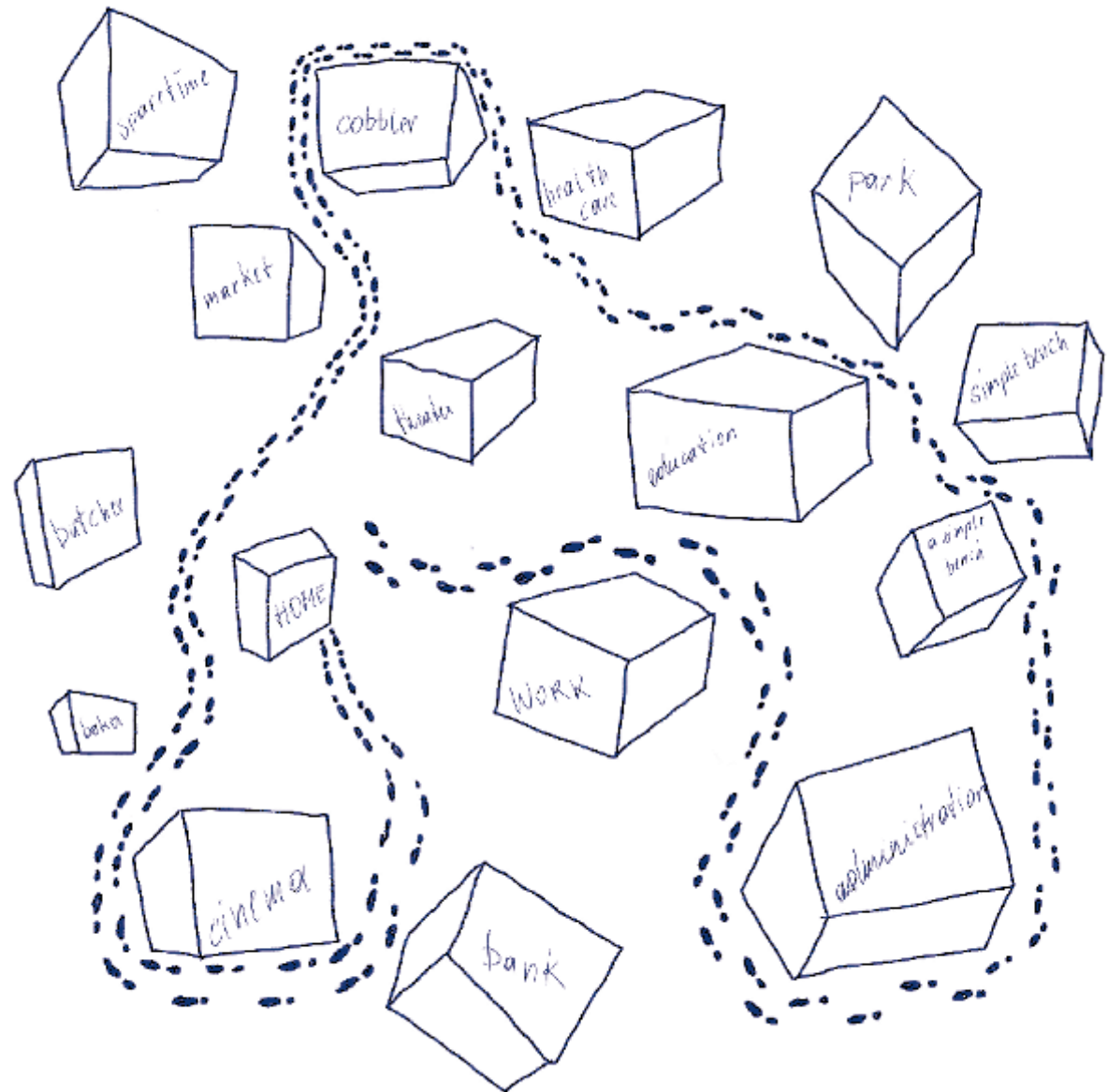
Over time more and more different qualities are required by a modern urbanity. There is a wide diversity of special fields in urban planning, along with numerous professions that make our cities usable and accessible. To plan or improve a city nowadays, the first steps would involve an assessment of the needs, goals, advantages or disadvantages or competitive proposals, just to name a few. These could be followed by community-designed elements, built and maintained within a participatory process.

But still, it is about the organisation of communities, groups and individuals who “meet” each other in the city; like at the very beginning of cities when people started to organize around small areas to share services. Also informally built areas were organized around the sharing of specific services; not just planned as we are now used to doing in our bureaucratic societies.

Nevertheless, over time many different solutions for the development of cities have been put forward. Some of these ideas show very strong and regulated grids while other systems are based on concentrically arranged streets but all have had some essen-

tial elements like markets for the exchange of goods and services, and shared space to accommodate social networks.

Professions that must be considered essential in future urban development include Sociologists, architects, technicians in a multitude of professions, anthropologists, urban planners, traffic planners, and—crucial to realization of all urban planning projects—the policy advisors and politicians who supposedly make it actually happen.



Now ...

Things urbanity should be stuffed with
– superlatives in urban planning

In the current discourses about urban planning, we find concepts based on many different paradigms. These concepts often cover only narrow aspects of the multitude fields that urbanities involve.

But generally, one could say that any urbanity should address all of the following concepts in order to retain as much diversity as possible.

Below is a listing of the most common strategies:

- **just city**, just refers to justice, concepts about a more social urbanity in the context of neo liberalism and the “free market”

- **smart city**, a city digitally accessible. Smartness, by definition, could mean a lot, superficially the term smart city is branded by marketing of major companies: smartness are technical tools (e.g. Smartphone, smart watch, etc.). Everyone can have any information anywhere, smart city for the citizen?

- **smart City**, with a capital “C”. Behind the façade, smartness turns into surveillance of the residents’ every step and communication is somewhere written on a hard disk. In this understanding of smartness it smart city is ethically questionable. Currently, “smart city” turned to be a kind of technical utopia. Is this then a fully realized utopia of the twenty-first century? A real utopia or rather a dystopia, as this concept of smart city gets more frequently implemented to control major cities centrally.

- **Smart City** in the terms of clever well working concepts do not rely on technology, the term smart city could have a much wider meaning as it branded for.

Further meaningful terms around urban planning structures:

- *Entrepreneur*

- *Knowledge city*

- *Ecological city, resources*

- *Renewable- Tactical Urbanism*

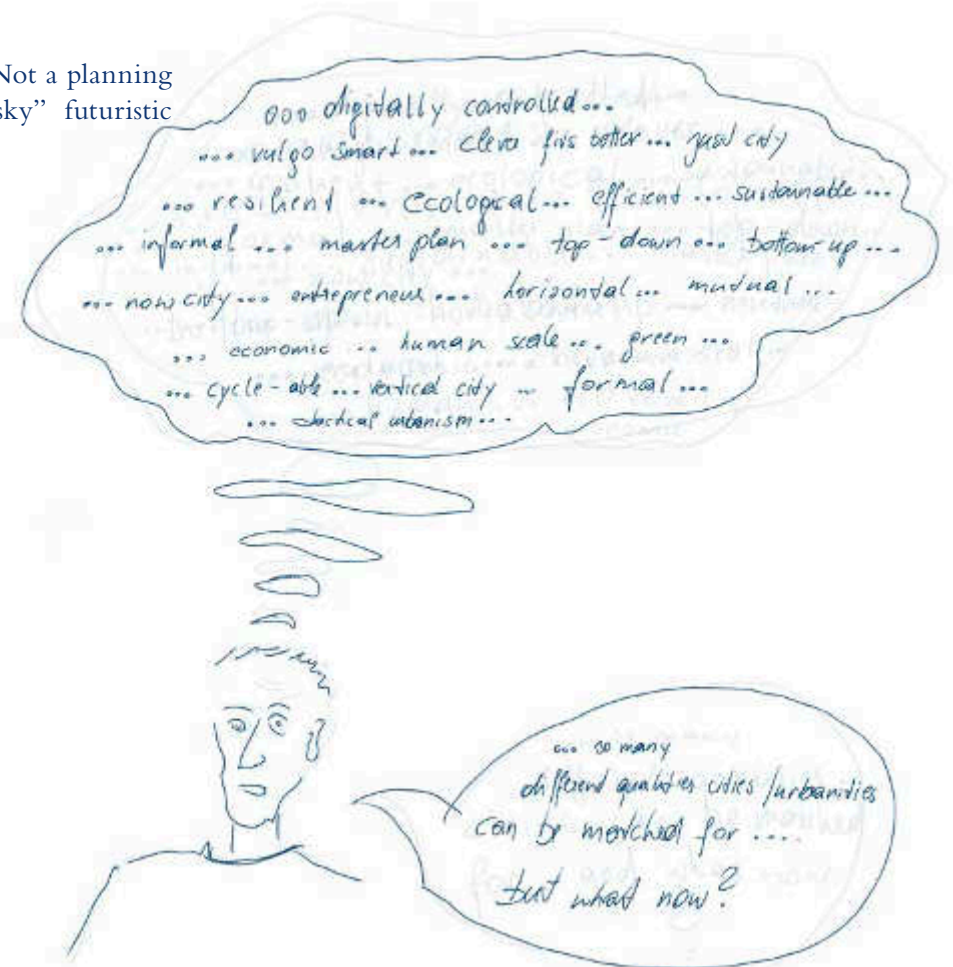
- *Green City (Green Grid City)*

- *Resilient city*

- *Futuristic cities:*

to force our imaginations, Not a planning approach, rather “pie in the sky” futuristic movies or images.

To quote traffic planners or sociologists regarding the complexity of modern urban life, we might speak of the “bones” or the “skeleton” of urbanity, just as the architecture represents the skin (and partly the flesh) of the organism that a city represents. But they will not all be uniform. Each city would be its own “organism” and have its own “personality” and “identity”. “Talking” to such a city would be like talking to real people.



... Then

A small excursus to the roots of urban planning.

Polis, the Greek word for city, defines the roots from which we discern that a city was a gathering of people who formed a “polis”. It was not defined by a geographic territory; rather by the people who participated; thus, it did not matter if the people lived in denser centres or in rural surroundings as long as they were part of the polis community. These were mostly autonomous states, but the exact definition may not be comparable to what we know today as sovereign state.

Politics and (the co-relations of) its influences on urban planning

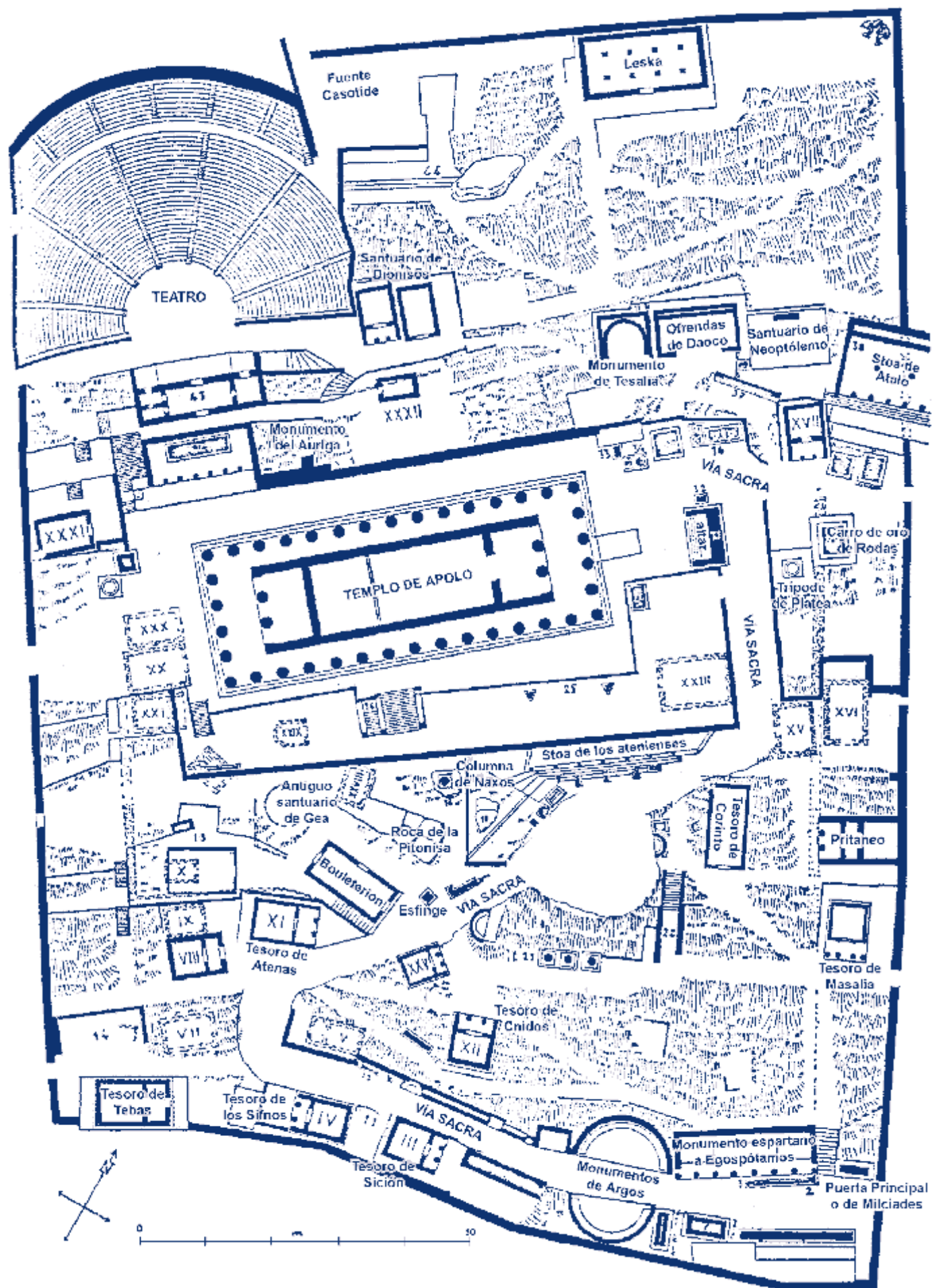
Polis/city was, ever since then, a political construct, and it still is. So it is no wonder that the “movers and shakers” of big cities are found within the group of most powerful and influential politicians. But hence the power-wielding person should only be representing and carrying out the mandates of the city/urbanity expressed through all its residents. This is true democracy, not autocracy.

The basis of cities is closely related to the representation of a certain state of a society, and is part of the representation of this society. Have it been temples in ancient Greek representing the power of gods, and theatres to represent the rich culture. Both things took a very strong position in a city as in society.

What changed radically during the Industrial Age?

The Industrial age changed both our society and our habits. Before, most people lived in rural areas; after, more of us live in cities. Cities started to grow as never known before and their residents' lives were changed to the core. Finding proper ways to manage these cities became more important. To secure liveable conditions, which—, due to this enormous growth rate— not always the case, the first thing we must do is to take on the biggest challenges that urbanization demands. To date, however, the exclusion of many from a system that was initially formed for inclusion has been a “collateral damage” of unfettered growth.





Utopia - not here, somewhere else, a perfect world

When Thomas Morus (More), born in 1478, wrote the book *Utopia* in around 1515, he placed this perfect world onto an island where no one outside this bubble knows even about its existence, only the wanderer who tells the story is the only person who knows about it.

Utopia following to Morus, is also not generally about perfect constructions, no it is about a perfect social system, and the idea of equality of all, and everybody had at least to do everything that is necessary to run a community, once a lifetime. Morus did not make many friends, with this idea, that everybody should have equal rights, and finally was hanged (or so) as a political enemy. In the global west most of the countries have a democratic government, a society ruled from the folk. Everybody can participate, and has the freedom of expression, and public representatives are elected. And some

general ideas of Moruse's *Utopia* are reality now, but things are far from perfect, and there are many advances to make.

Utopia is the/a concept of a perfect world, and to make this perfect world possible it is necessary to put it somewhere else. A perfect system by its meaning is almost impossible, if not impossible. Utopia always indicates that there are things in our surrounding that are not so good. And yes there are many things that are not good at all. Especially in this very holistic way that utopia usually suggest a perfect world, things are getting complicated. Because there are always things that are good for one person and can mean something bad for another person, so utopia can only be a perfect world for the one person who thought it.

To finally transfer the idea of this perfect world to an entire society is to be considered as a dictatorship, and easily could end in a dictatorship, and would mean that only one true way of living exists. So only by the approach to realize utopia, we would fail the whole concept of this better world. So utopia should be considered to be something that opens us new ways of how to see and how to understand things. Something that generates real images to arbitrate our thoughts a possibility to find better solutions as we yet know. And finally utopia is the place where we can find solutions that are not at hand in our imperfect world. To stay ahead of thinking that everything is fine as it is and no changes would be of needed, there are many things.

PLANNING - IMAGINE - THINK UTOPIA

The dreams of a perfect world ...

Utopia, as perfect as it could be, never was built or lived in reality, but it is part of many visions and ideas that have been developed. Any given utopia and idea to change something for the better by influencing what we are able to realize.

The ideas for utopian projects in architecture and urban planning exist since we had the ideas for a superficial organization of society and the dream of a world with no problems.

As easy as it is use the expression "Utopia", in its concrete expression Utopia is also used to describe things that are impossible to realize. If someone cannot rent a room because of lack of money, that does not mean that it would be utopic to have a room rented.

Real-Utopia, the built Utopia, clinical and calculated, mostly with no charm.

A frightening thing, if things are realized towards ideals. Too often it is not about a perfect solution. Often a technical solution that appears to be universal and perfect is a control mechanism, and instead of giving more freedom, it takes that freedom away.

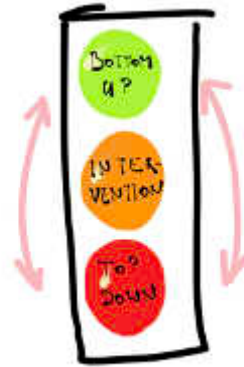
If we put utopian ideas into practice, we face the problem that theoretical models can never encompass every eventuality.



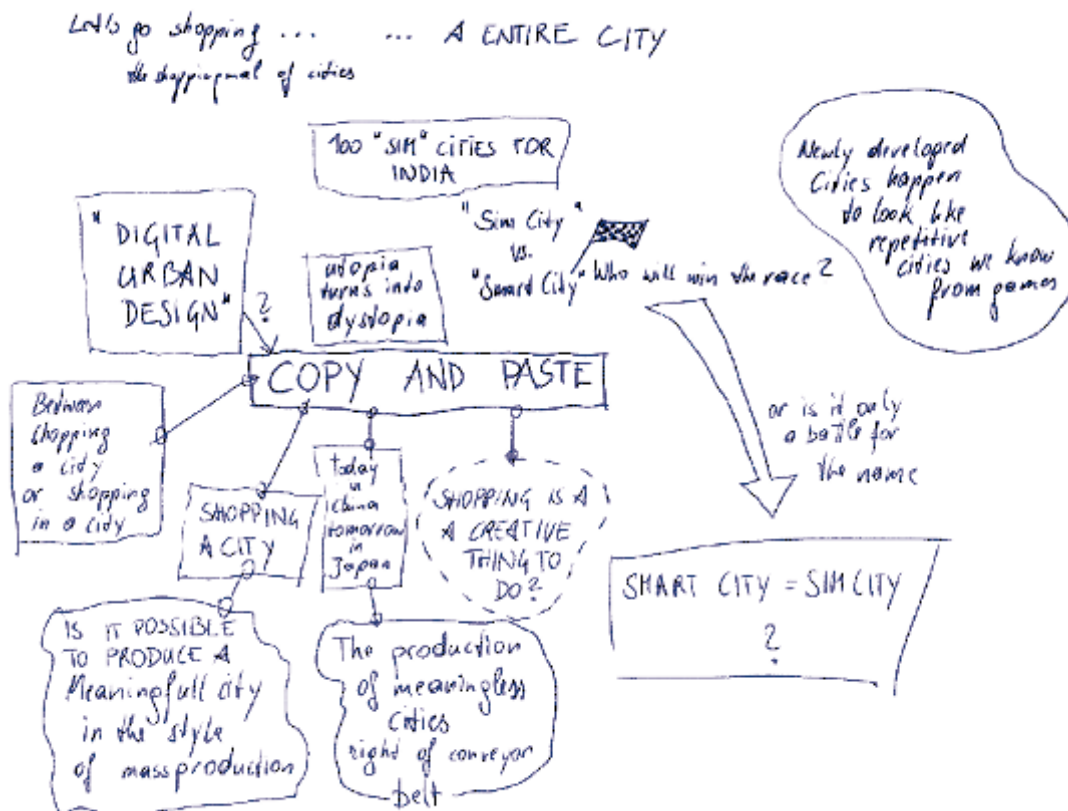
Understanding the planning of an urbanity as a strategy, and what often happens.

There Are Many Nice Approaches Like: Bottom Up – Top Down – Horizontal Hierarchy - Anarchy?

Improvement: There might not be one single urban place that does not have areas that could be improved. So it does not matter where we start to understand that a certain urban area could also have existed before a city emerged, in the stage of planning. There always will be problems and we just can try to find solutions. Grown cities are not much more than a progress in permanent improvements or adaptations which tell the satisfying stories or the stories of failings.



280 Urban Signal lights, sketch by author



281 Copy and Paste Urbanity, sketch by author

Copy and Paste, Copy and Paste ...

The maybe worst scenario for our cities is the role model that games like “Sim City”, are setting, and yet many cities are no different from this copy and paste design that the buildings in games like “Sim City” have. This would be a house and a garden, no city actually. And if it comes to urban buildings, they looked in “Sim City” 15 years ago like some newly developed cities look nowadays. The planning and designing of urbanity no longer seems to be a process towards identity; much more like picking buildings out of a catalogue. Without identity, functionality is reduced to a technical functional system.



8

Grown and Blueprint(ed) Cities

Between the Plan to Build a City and the Map as Guide to cities

Planning a city from scratch will always be difficult, and often it is a far cry from what the built city finally is for its citizens. There will always be things that are hard to plan, as that would imply being able to predict the future.

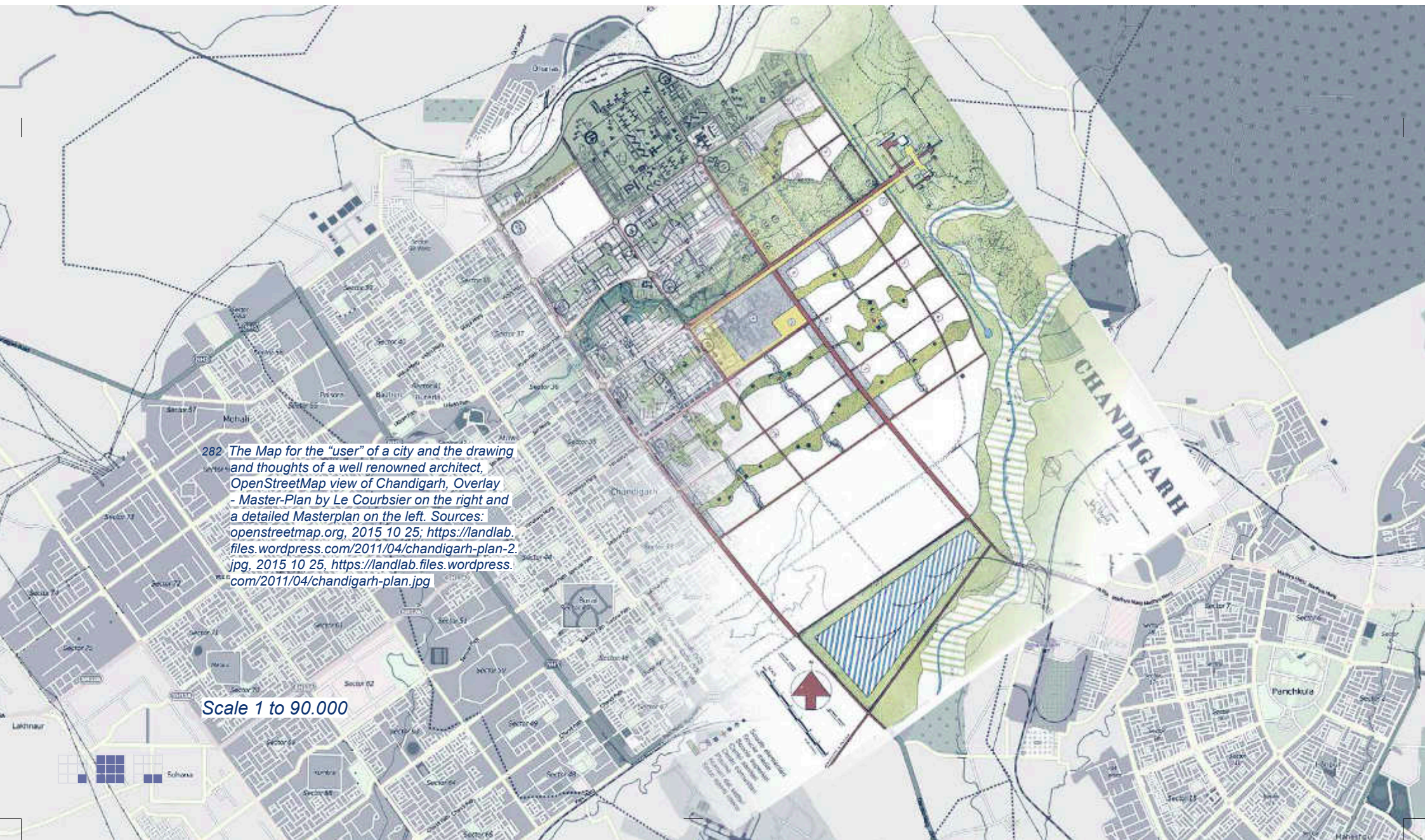
We can try to simulate, to calculate, to predict, to have visions or plan our future, but what will actually occur remains unclear. We can analyse processes and make approximations about future growth and shrinking, and try to be prepared for upcoming difficulties. But more important will be to look at the current performance and our awareness of all that problems and difficulties that occur in a city.

We, as human beings, are able to cope with many different situations, one could almost believe that it does not matter how a city looks, whether it is planned or not. Keeping this in mind, urban planning would be easy, if it would not matter what and how we plan.

But it would be foolish to say everything is just right as it is. Whether there are some professionals who are designing an urban master plan or just some city dwellers who would like to improve their life's situation just by adding little upgrades to their micro home, we have to keep up with the changes and need a guide, a map to this city.

Chandigarh and its urban functions are arranged like a human body from the head downwards, a very clear top-down structure. But other than with our body, where everything is included, the weakest socioeconomic group is excluded from such a city. Thus, the top-down master plan remains questionable.

To have an accessible city for everyone means to have map for everyone, for this is a step towards the inclusion from every socioeconomic group into the city. A "user guide", so to speak. Openstreetmap.org reaches this goal in many ways.



Romanticized Growth

(In)formal

Anarchy? Some things might look a bit like anarchy but if one takes a closer look, there are always different forces and mechanisms that build a certain type of control within an urban quarter

So there might be not so much difference in comparison to cities that have good or formal governance. What mostly is absent in informal processes is the superficialities like governance and the related bureaucracy. Generally to find in every big city. These regulations have tendencies to make everything a bit inhuman and slippery, over-planned; easily promised but often not kept. .

Small-scale forms of organisations as found in informal areas preserve a certain relation

and proportion to their neighbourhood, what one could call a “human scale”. Not to mix up with the Vitruvian men by Leonardo Da Vinci that somehow makes the human body measurable and puts the human body into proportional relations or the “modulor” from Le Corbusier that shows the “right” proportion/scale for the use and planning of things in his mind.

It is more about things/corners/walls in our cities that help us understand our surroundings, help us with orientation and allow us to keep things as simple as possible. A “human scale” helps us stay clear for the fulfilment of our simpler needs, not controlled by a superficial bureaucracy.

Life cycles of cities and their users (from the beginning of the Industrial Age)

Sit and settle, not nomadic, everything organised to the right place, a pre-defined identity.

The life cycle of urban townships/quarters varies between the walls of buildings that have been of use for hundreds of years and have been very adaptable.

Cities turned out to have a much shorter life-cycle of just some 30 years of “modern” skyscrapers/buildings and structures, often because there is no way to use these very inflexible constructions.

And there is the continuously changing adaptation of buildings such as those found in urban slums, things that might only last for a couple of days.

Static structures will not suffice for a society that runs and asks constantly for more flexibility and freedom.

Stand up for yourself and walk, travel, and see the world and all the variations from wildlife to urban life.



Zones of Integration

Where city happens?


Neighbourhoods start to be cities/urbanities, when communication starts to connect those previously isolated or unify urbanized life.

Bridges bring us closer, walls keep us apart. Walls obviously are a symbol of separation. In the Middle Ages, cities built their walls in front of their surroundings, so that, as the cities grew, they happened to have a clearly defined outside and inside. So there was a clear difference made in who was worth living within the secured walls and who was not. After this era, many of these city walls have been removed and the land formally used for the city walls turned into connecting sites for the inner and outer city and became really popular areas. For example, Vienna gained a huge portion of its positive qualities in turning the city wall into a Ring road having all along a series of public and cultural buildings.

The borders of most modern cities are rather political borders than any physical wall, but often lead to a barrier or an intersection. Maybe this is best seen in Detroit, MI (USA) where life within the inner city no longer had any benefits to a life outside (for more see “Detroit”). So in Detroit it was neglected to bring the outside of the city and the inside together in terms of governance, public transport and many other things.

Cities’ urban plans and urban regions should not be interrupted by anything, as they are simply the same area.

Very local, found in many cities, cutting/intersecting sites. Barriers that separate space into two sites like: railroad tracks, highways Detroit, huge building complexes, military areas, etc. However, often a simple “fly-over” for cars or pedestrians would be enough to put two sites artificially separate closer together; almost comparable with the tearing down of a wall. But bridging is not only a physical thing; it is a lot about working to bring down mental barriers. Give space to bump into each other and start talking.



284 Date 07.08.2015; Small square in a fishing village in Croatia, an inviting place to bump into each other and start talking. Fažana was discovered in the 19th century as a summer resort and soon became very popular as a starting point to travel the Briuni Islands. It still has this charming centre with several small squares.

Integration - Segregation

Segregation and separation and no will to build bridges—or are there just missing abilities?

Bogotá, Quiantas De Santa Barbara and Suba between this “informal-urb” and the city parts flows the Rio Bogotá, a small river. And there are no intentions to have a bridge over the Rio Bogotá to connect this district to other parts of the city although it could be easily done and the reason is most certainly not a technical one.

Walking on the river bank in Quiantas De Santa Barbara is a walk in between two worlds. On one side of riverbank lies the well-developed housing for the socio-economic group of the middle class, mostly built by the government. On the other riverbank, a really dense informal area, housing mixed with small businesses, a vibrant city life, but informal.

“Institutions” Behind So-Called “Informal” Cities

This is very vague, but there is organisation hidden also in informally growing structures. And there is found some way of organisation for everything, as urban life is.

Informal urbanization usually is not dependent on formal superficial governance or bureaucratic processes, but there are mechanisms that enable these areas to be well-functioning economic and social communities.

The developed housing area represents modern life in a mono-functional structure with housing only, it is hard to just find a small supermarket or a restaurant without driving to a shopping mall or leaving the area to elsewhere. In contrast, the multi-functional informal area seems to work as a city, there is housing, there are jobs, it happens to have city life on the streets.

It is worrisome that there is no will to connect these two sites. To have a bridge would help the ones who don't want it. They could get and buy everything right around the corner. And bring the efforts of a city much closer. But the meaning of an act like this would be much greater than any other advances ever could be.

Formalities and expression in the state-of-the-art

Formality often calls for strict and rigid plans, once built, it is hard to change anything. It is hard to find structures or ideas that allow the changes, although most structures need to change from time to time.

During the period of “Promoter-ism” around the beginning of the twentieth century, Vienna's buildings are quite well-adapted for our current use. Sure, the façades are no longer state of the art, but in the interiors we find room qualities scarcely to be found in newly built housing structures. With our focus on optimized space, there is hardly an opportunity to build rooms with higher ceilings, for example.

The retrospective blueprint - Make a city usable - strategies for education

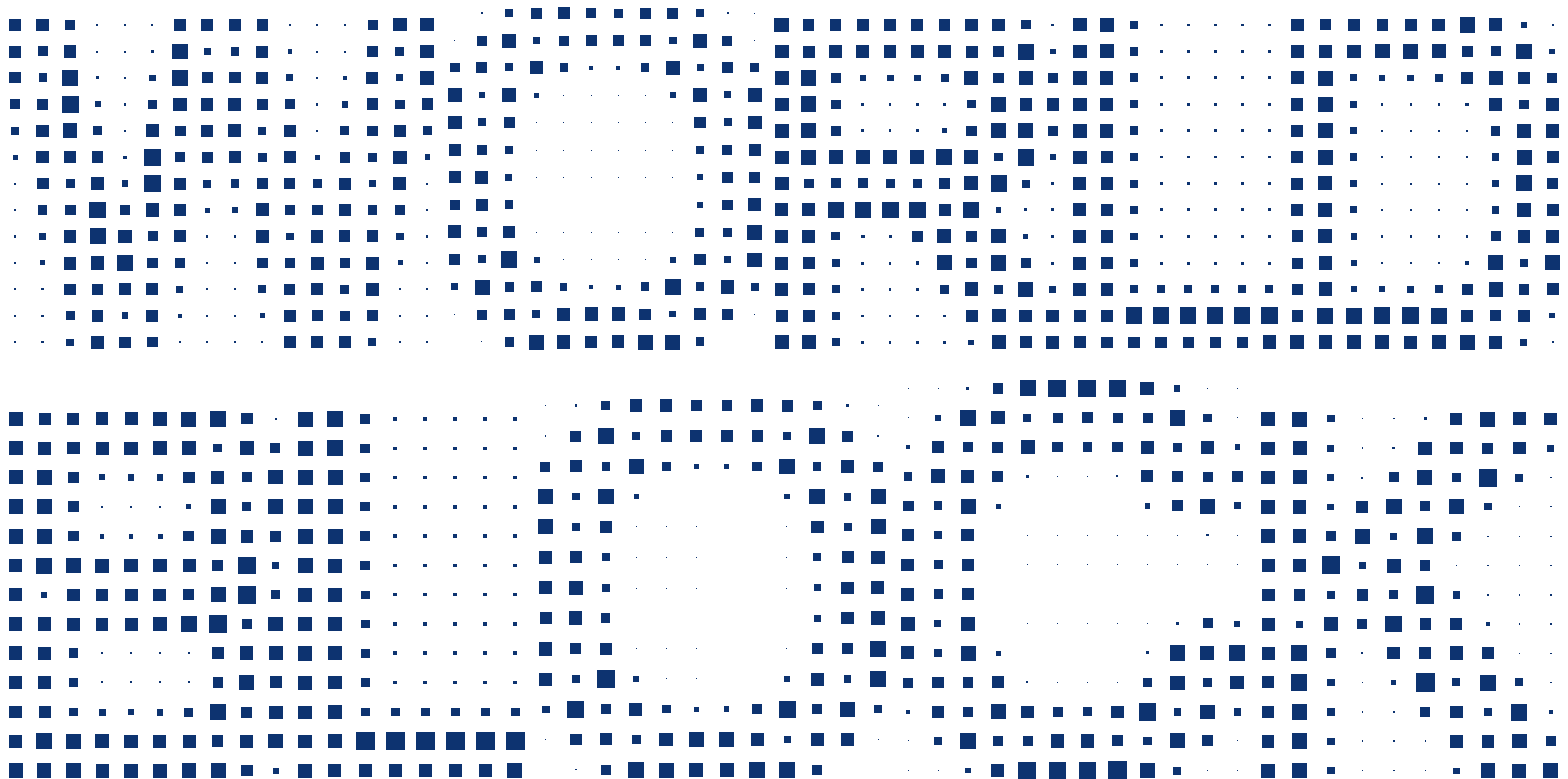
As soon as people are capable of understanding their city, they will have a clearer view of its needs. And the whole city will experience a tremendous improvement towards becoming a “proper” city.

As for a city's citizens and stakeholders, if you participate, you are part of something and/or you are starting to be part of it. It is your/our city and I would rate this as one of the highest goods in terms of talking about proper cities. Ma.ad.man city is a utopia of a city that should represent a personal approach for formulating needs for a perfect city.



u1

Designed Elements: Overview



The Idea: Worldblock.org

Interactive Participation

Urban planning often is not about defining, designing or planning urban structures. Especially in informally growing areas. It is not possible to have a plan realized. Mostly, it is an effort if newly arriving squatters only build in designated areas and get an uplink to the city's infrastructure.

To help people by building their home, it should be possible to provide information on a website/platform about simple technical solutions; information about static needs and other relevant technical elements that are necessary to guaranty safety to the users.

Needed is a collection of know-how from the builders themselves, based on their own daily experiences from building their own buildings: pictures of details, the facade, whatever a builder likes to share. Finally, the goal is to provide guidance with best practice examples for whatever it is that can be self-built.

Taking Mumbai (India) as an example, a major goal is that one who arrives in one of the city's slums can easily look up how someone managed to build in a faraway place, for example in Lima. And most importantly, it should encourage the participants to exchange, to find out which building materials are best and cheapest in the local market.

But how can a platform like this be exciting enough that it will be used?

The drawing on the left shows the initial ides for worldblock.com, a web-based platform that allows home builders to share and show their homes. On the one side, it is a lot about awareness of what it means to build a home; on the other, it is the possibility to learn more about built-up urban structures. Furthermore, it could be a tool to encourage the participation process.

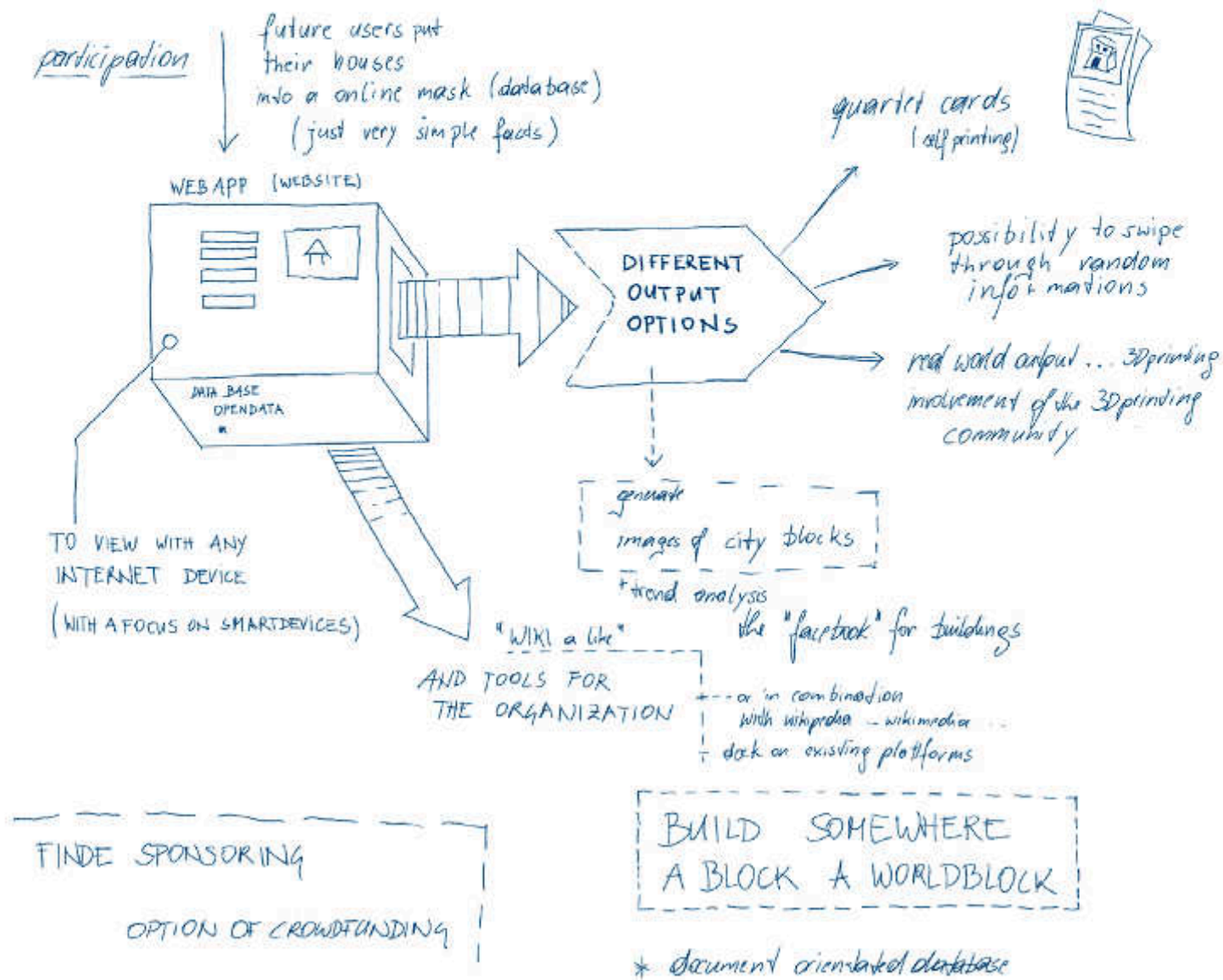
Perhaps it is the internet transformed into a city?



thoughts that stood on the very beginning of No. Ad. Man. urbanisation

WORLD BLOCK . org

it is not only about diversity or formal structures
it is a lot about learning from each other



285 A sketch of the initial ideas about worldblock.org, by Author



An Evolving Idea

My very personal way in creating this manual towards urban awareness.



287 Duplo bricks with a Lego brick on top

I was playing Lego as a child, trying for hours to see in which different ways I could assemble these plastic pieces. I never was much into building the forethought models that came with the Lego box out of the shop. After some years, we—me and my brother—had quite a collection of different “LEGO - stones and elements” and we used Lego and Lego-Technic for every idea we had. It seemed like we had limitless options

to build everything. We used the pneumatic elements as water pumps and built a kind of electric water gun for fire-fighting and everything else little boys could think of. So when it came to me to plan a city in a very basic and easy to understand way, also knowing that I didn't want to plan a city or urbanity, I started to make constructions with a virtual Lego designer. No, I didn't build it straightaway from real stones as that would have limited me to the number of Lego stones available so wouldn't have been so much about planning anymore. It would have been too nice to just play with my most favored childhood toy (besides the baby doll I owned as a small boy).

That is where I should bring in the human aspects in the story of all of this, and the scale I have chosen in the designs I finally made. For me, it is always important to treat my surrounding fairness and with respect. This means that I prefer structures that could be significantly influenced by a single person on site, showing this unique “signature” that happens if we build things on a step-by-step basis.

Once I started to build these structures, it soon became clear that this might not bring the result I wanted. And finally, it was not any different to any other common city planning approach. So I left the Lego digital designer tool aside and tried my best with a virtual-only game, almost as good as a toy, also for grown-ups.

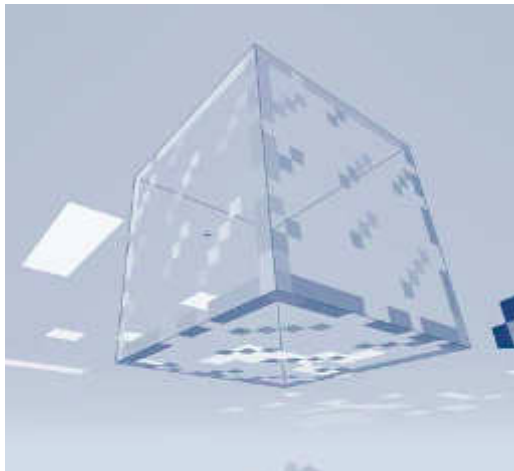


286 Design approach with Lego Digital Designer, an informal city block, one grown over time



The Elements of worldblock.org

Overview



288 The unit of Minecraft, a 3 dimensional pixel, a block with 1 x 1 x 1 m translated to the real world

I started to play “Minecraft”, because it is known for its simplicity and the chance to build whatever structure you want. I was playing the game for about a month but I came to no solution or any other good idea

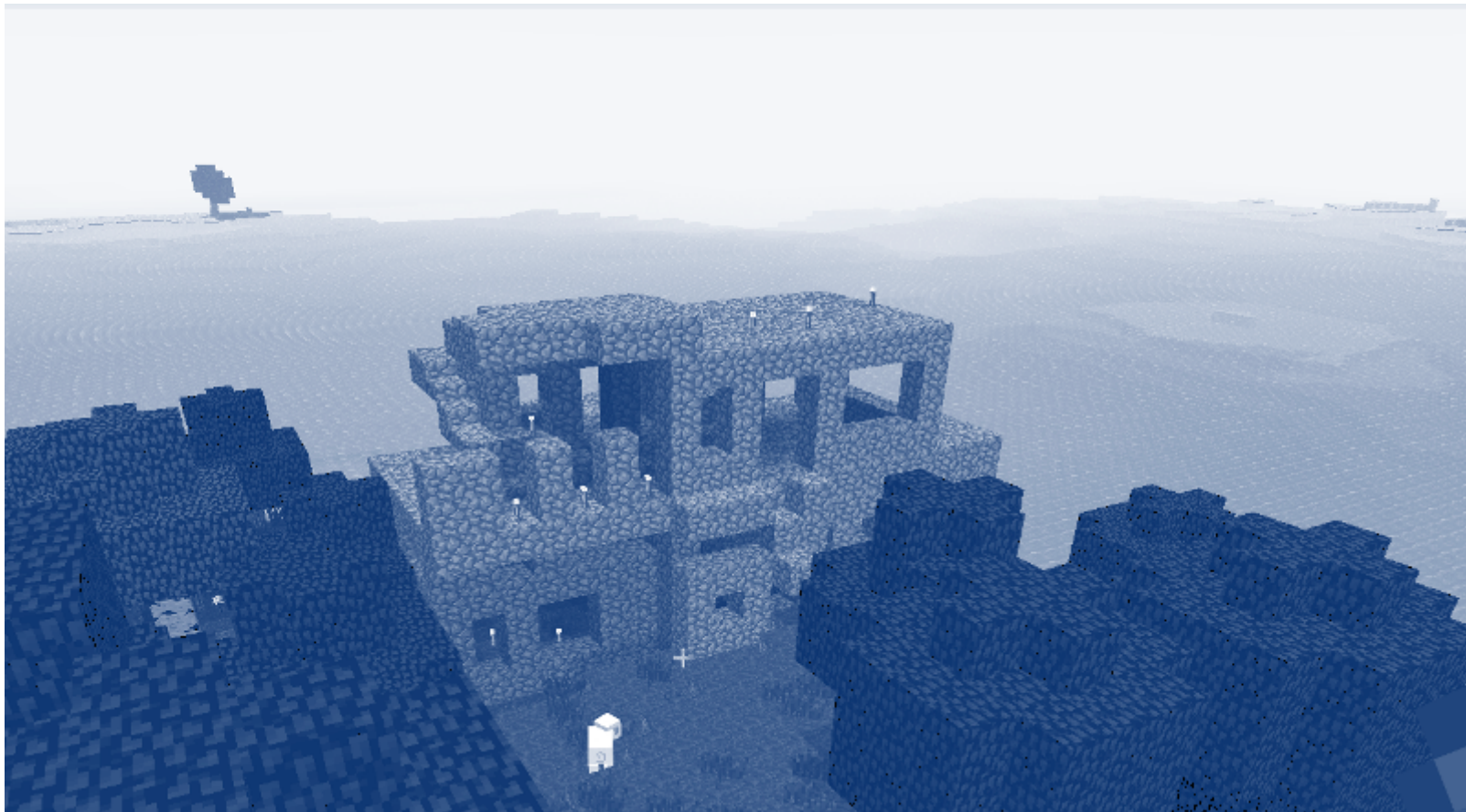
at that time. I just had another month with too much time in front of my computer. The only really inspiring thing was the cube the game is based on, the whole game is just based on this three dimensional “pixel” that can have different colours and textures.

I came no closer to planning a city or urbanity with these three dimensional pixels; all I knew by that time was that I still didn’t want to plan a city. So I went back to the most traditional tool architects had always used, the pen. Well not entirely, I used my digital paper, my tablet PC, and started to draw city blocks, like “cuadras“, known from the Spanish city. They should look as diverse as they were, collections of buildings built with knowledge acquired from all over the world. A city block that shows diversity and stands for a human scale; things that do not seem superficial but mirror what we know from patterns to be seen in slums

or other old settlements that formed cities in the continuous process of adding and removing. So to speak, a man-made and manually built city adapted and rebuilt over time. Hmmmm ...

But if I would plan this city, I would end up having a very half-baked image since, it is not possible to just plan and design things that already have a complex history and the “handwriting” of millions of individuals from the past. It never would look as it could if it had just “grown” over time. Further, it would not have been the result I was looking for.

So I came up with the idea and need for a computerized “platform”, which is able to collect all the individual solutions for one’s home, one’s shop, and all individual and communal things we find in cities. Everything I could have planned would have been facade.



289 Minecraft 3D Block game, a design approach for a building, generally there is one standard size

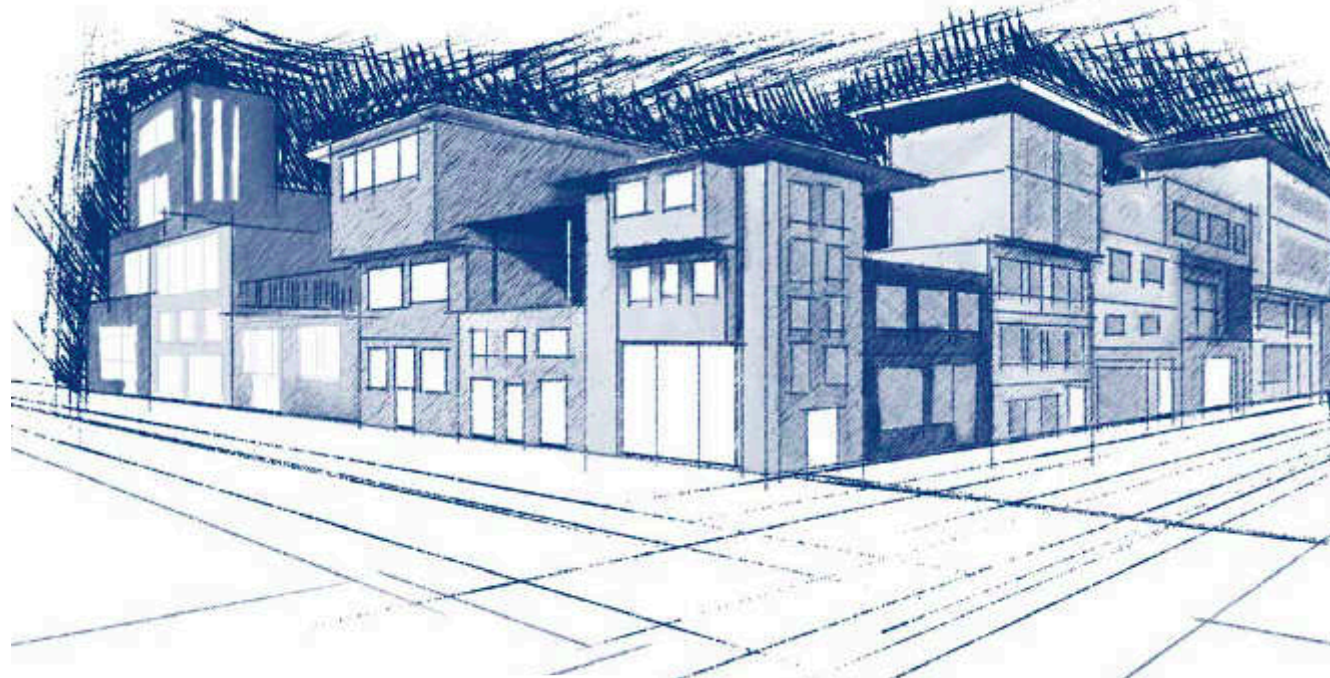


After going through this series of curious design approaches, I figured out that I would need a way for people to share their individual homes, the facades. I came up with the idea for a “World Block”, an on-line platform that enables people to share their home with images and plans: a place where we can share all kinds of solutions for simple home building, curious details in built structures or just the facades, which all tell different stories.

Having this idea led me into buying the domain www.worldblock.org. Knowing that this is what I want to do, not to plan a city; knowing that the first thing is to share all of the already existing solutions in a very basic and simple way in a way that does not require any special education and inspires the simple building of a small informal home prior to the ones who plan and design huge housing complexes.

But why should anyone be interested in sharing his home or solutions that ask for quiet some skills, thoughts or efforts. Maybe a card game would help? I spent hours and hours playing Quartet with my brother and friends. (The rules in a brief) Each added building, home or construction has a short vitae about hard facts and will be used to generate individual sets of game cards for quartet for self-printing, as well for ordering. Everybody can contribute and use this data, view and review it, use it, similar to Wikipedia.

Starting to use these data, that, in fact, do not yet exist, I came up with various ideas. At that point I decided to take initial steps for the “Urban Cloud” (short UCL). And finally started to plan a city, something I had always wanted to avoid. But hence, things are sometimes a bit wired, I found a way to eliminate all my doubts about planning with some simple steps.



290 Sketch of an “cuadra”, Spanish for urban or city block, by author

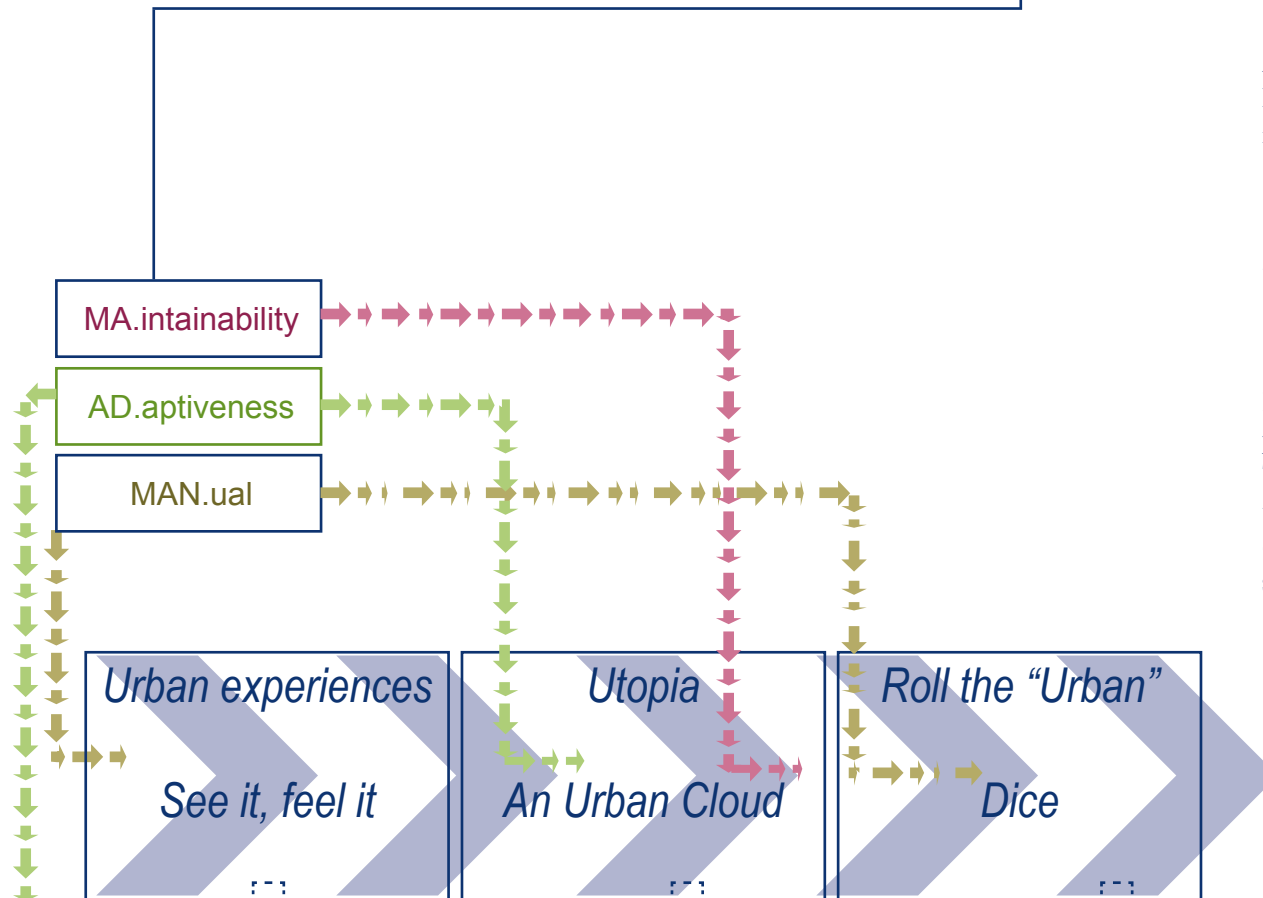
The extent of MA.AD.MAN. URBANIZATION

And the final realizations of worldblock.org.

My approach is continuous with the idea of having such a database, a database that does not yet exist due to a lack of resources.

How can data about this multitude of individually built structures be of use?

I started to search for ways to evolve urban planning with this idea of global exchange. To raise awareness about urban matters and to involve people more sustainably. Finally coming to the point where cities plan themselves on the basis of this information.

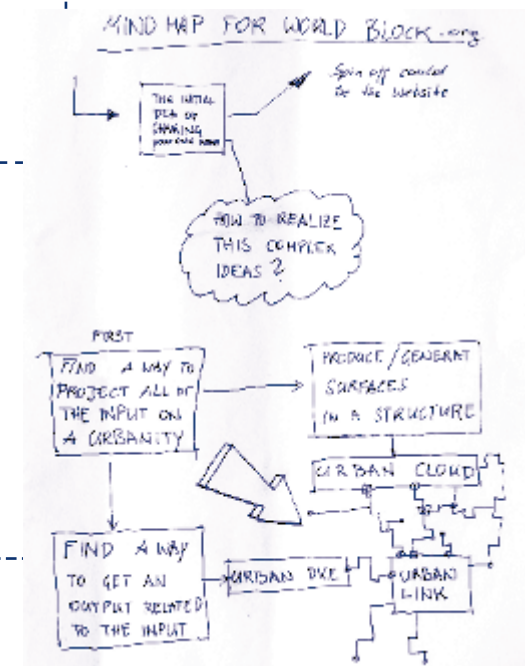


A collection of experiences, fascinating facts and the question if planned is better than not planned?

equality, diversity, individuality, anarchy, communism; utopia can be a lot - and easily flips into a dystopia...
- equal rights to own space-

There are many things that are maybe not meant to be planned, the simulation randomness like rolling the dice.

Urban Link - Everything? Is/needs to be connected!

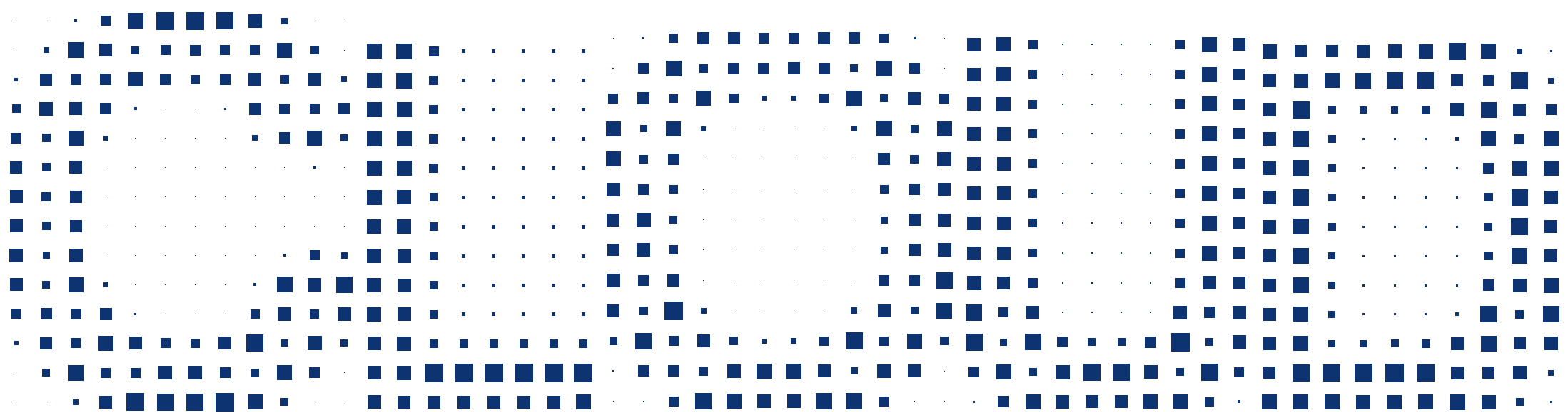
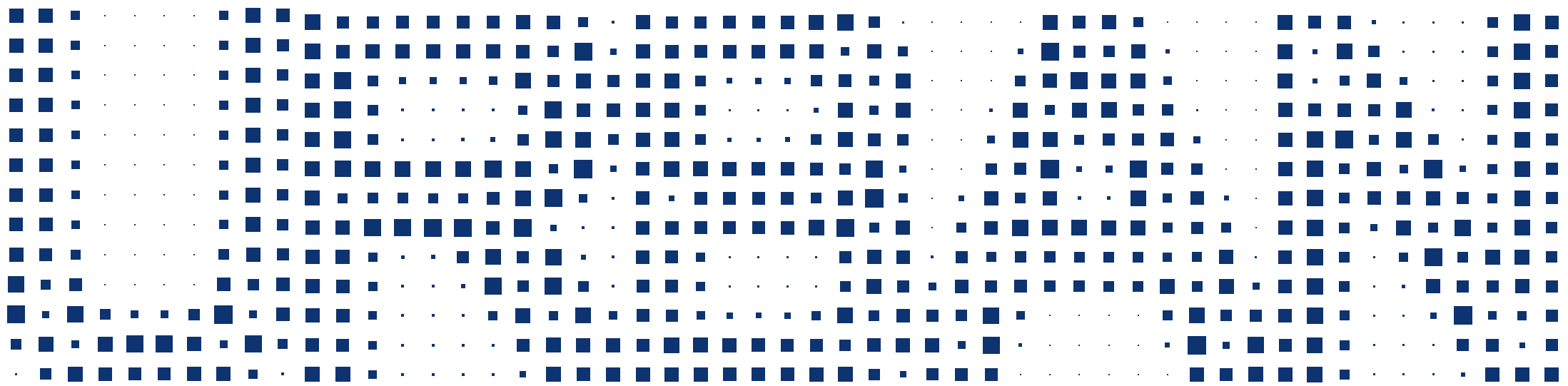


291 worldblock.org mindmap, by author



u2

Utopia



Ma.Ad.Man.

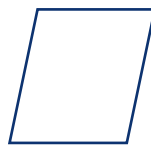
no

gravity

**flexible and ad-
aptable**

resilient

supportive for
individuality



NOMADIC

social
equality

equal amount of
space for each
MaAdManian

**a
process**

**possibility to
move your life
and home where
ever you want**



Utopia as it Should Be!

Not here - some where else - every where.

If we take a look at the known beginning of human settlements we do not see static infrastructures, we see mobility, they have been nomadic. So to say everybody was his own home, flip together your tent and walk. If we take a look into our current society, an average person has to move around a lot, and if we do not need to move, many of us choose to do so, to see as much of this planet as possible. This leads to exchange of values and cultural habits which brings us the human mankind closer together. If all of us would have stayed static, globalization would not yet have begun.

Utopia: It needs to be full of the biggest ideals that drive a democratic, human world with the greatest biggest respect to human individuals.

Utopia based on a cloud, the urban cloud, originated with the idea that every individual is able to move wherever one wants to go to. Every individual gets to use the same amount of volume, a standardized simplified built up space. Every individual can make the use of this space as one wants, which will generate surfaces with similarities to surfaces we see in an informally built up urban areas. This finally results in a very diverse and most creative urban surface. To fulfil the needed quest of mobility it is possible to move these units in space, eliminating gravity.

The term space can describe different meanings, the personally used built-up space in the form of immobile property, a place to sleep or where we work. There is space we have in society, our action radius and our appearance, described by “Pierre Bourdieu” as the sociological space.

These two spaces combined, sociological and built up space, are one unit in the principle unit of the Urban Cloud, and it is in this space we introduce Urban Dice. Putting us all as equals, and reminding us that we are not equal at all. As nature usually does not give us equality.

Urban dice, is finally the way to make the Urban Cloud touchable, a way to show individuality in each die. Resulting in a toy.

The initial paradigms for this Utopia are:

1st

plan something that most probably never will be built

2nd

do not plan

3rd

and if I would plan something, it should not be static, as society is no static incident, and cities need to be flexible to fit our needs.



No gravity ...

Social equality

...

... reached with the same amount of space for each of us. Equality, we the human mankind understood that all humans are equal and worth the same.

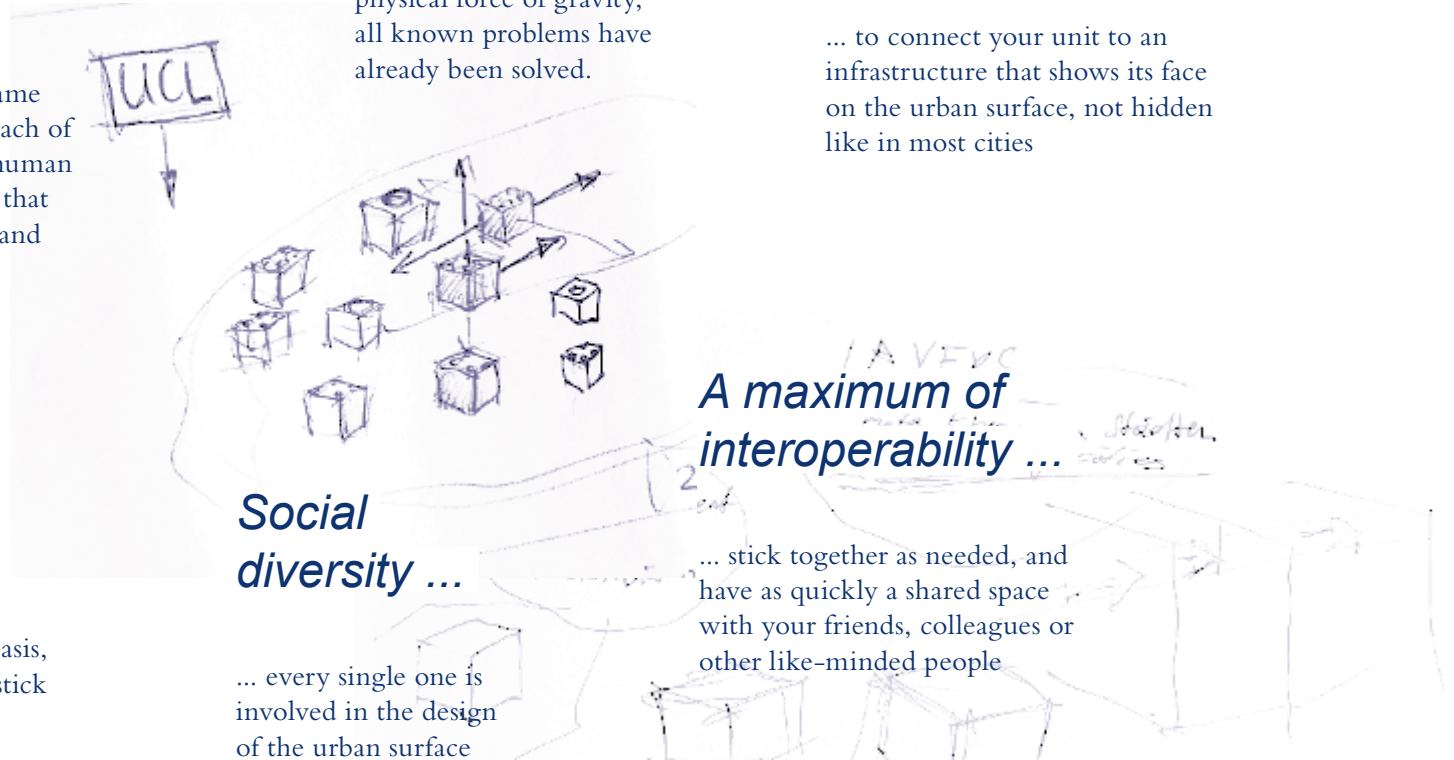
Be where you want to be ...

... choose on a day to day basis, where to go and where to stick your home

... the time has come that we are able to surpass the physical force of gravity, all known problems have already been solved.

Easy standards ...

... to connect your unit to an infrastructure that shows its face on the urban surface, not hidden like in most cities



Social diversity ...

... every single one is involved in the design of the urban surface

A maximum of interoperability ...

... stick together as needed, and have as quickly a shared space with your friends, colleagues or other like-minded people

The manifestation in space and the possibility to lift this manifestation away from the known boundaries like gravity. Combined with the situation that every individual has this one (own) space representing one's self as part of a city. Showing that every person is part of urban life, and urban life generates the city that is currently needed. This is decided by individuals. Nobody needs to buy land as it is only about space, and you can change your space if you are not fine with the current location or you just generally want to stay mobile.

The thoughts around any utopia reach out for a highly idealized perfectness but it is always in mind that we are living individuals,

bound to certain habits and physical limitations. As there are always things that would make life easier, utopia is the place where we can find convenience, if we found it we might be able to get it.

This Utopia, the Urban Cloud, has highly idealized values and perimeters, these perimeters should rather be considered to be an inspiration than a real world realization. Many of the factors could be interpreted incorrectly and would easily cause a dystopian nightmare with horrible consequences.

But, these thought models help us to solve real world problems. For these urban cloud structures it will be easy to be resilient, as if there is an natural hazardous threat, the

city can just move away with little inconvenience. Eliminating gravity enables many of our main issues in urban planning to be switched off.

These units can move around, yes they also can be in outer space and tingle around in our solar system or even galaxy. One of the most interesting things is to form urbanity with these space units. The use of these highly mobile bricks allows us to simulate many different situations. Whether it is about planning and simulating a master-plan city, the growth of exciting urban area or even the shrinkage and converting of now dense urban area into future a rural area.



Certain standards for an easy understanding.

These three terms stood at the beginning of this thesis. To simply describe and point out important matters in the field of urban planning.

MA.intainability

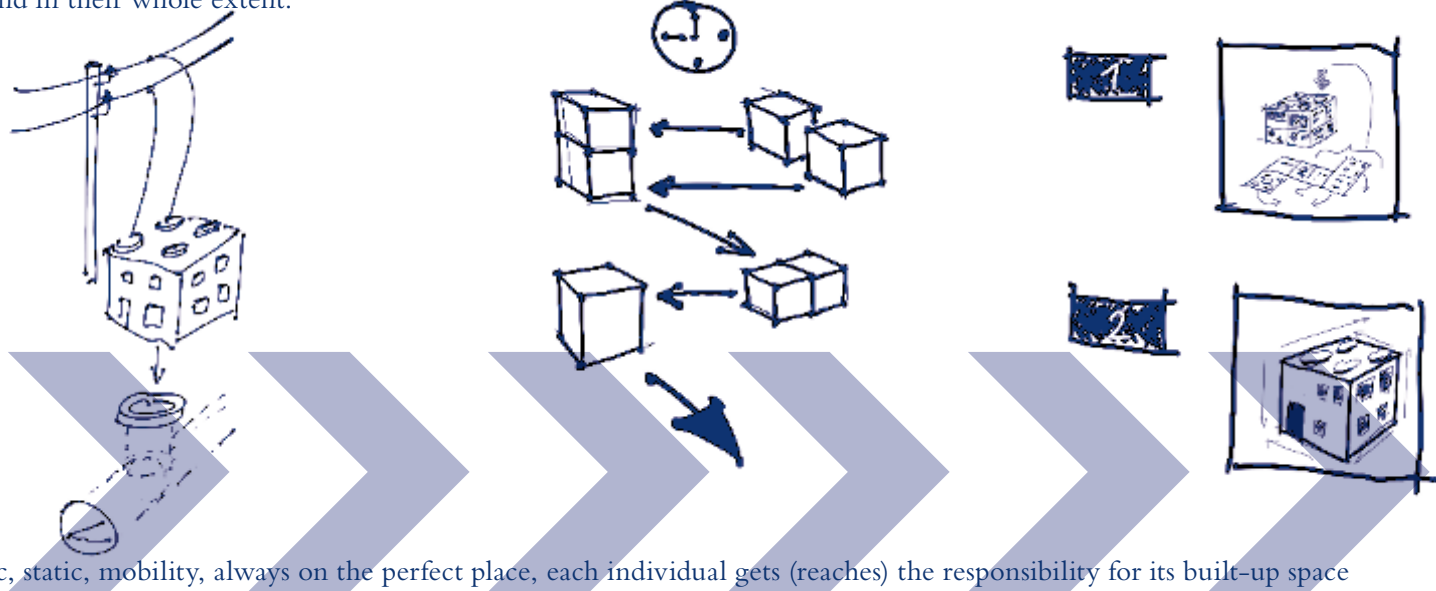
of infrastructure and all other built-up structures that are used in daily life, with this use it is necessary to maintain and to preserve the useability. If things are hard to maintain it will quickly lead to lacks in certain functions, causing deficits for the city's residents. Infrastructure in cities will never be finished, it is an ongoing process to provide all kinds of services. As much as for example a water pipe seems a static element, the water from the tap needs to be prepared and pumped into the city, shared and distributed to the different neighbourhoods. The same applies for electricity, sewerage, internet and transportation. This leads to the idea that the concepts of city and urbanity are not static systems, they are much more like something flexible and difficult to understand in their whole extent.

AD.aptiveness

by its meaning could be the simple extension of a home with the growth of a family or the adaptation of capacity of public transportation if the numbers of commuters change. To be able to deal with enormous growth in the urban population within the area of a metropolis. This means to resize administration according to shrinkage but it also stands for resilience, the ability to react after hazards, to be able to keep up all basic services for the affected society. Adaptiveness therefore means to be aware of changes and demands solutions that have flexibility and mobility in their thoughts and built-up structures.

MAN.ual

To be able to change things with bare hands but also a manual like we would know it from Ikea. A manual can be a lot, and we also can do a lot with our bare hands. In this case bare hands mean to individually influence the perceived surface of a city or urbanity. Each resident of this Utopia is in charge of his own home. The manual is to be considered in the form of an urban tool, to learn and understand urbanity by playing. And having both the virtual and the analogue possibility to show and explain links in the field of urban occurrence and development.



Nomadic, static, mobility, always on the perfect place, each individual gets (reaches) the responsibility for its built-up space

Ma.Ad.Man. Urbanity is an Utopia, with the concept of this newly defined Urban Cloud



Simplification

A unitary three dimensional grid, based on a simple cube.

To cut the space into equal parts helps to manage space. And especially when it is coming to simulation and modelling it is helpful to have such a simple and well fitting unitised space.

Socio-economical spoken the space is cut into equal shares, and everyone gets to have ONE of this shares, during ones lifetime. This is the first step towards a socially balanced society, and Utopians in urban clouds do not have the need to think about buying land or ownership, every one has his/her space.

Cutting the space
into shares of $129,25 \text{ m}^3$.



The City in a Cube

The reduction of urbanity into a single cube.

A cube with the dimensions of 505.6 centimetres is the primary unit on which the entire Urban Cloud is based on. Smaller and bigger units can have dimensions either double or half as large. Which means an eighth of the initial size or eight times as big as the main unit.

A unit from which any conceivable structure can be built, simply said a kind of urban brick, as bricks have been the unit which was used to build entire cities.



296 *A city inversed inside of a single cube, by author*



6D

A single Cube with 3 + 1 + 1 + 1 Dimensions.

Ma.Ad.Man. Urbanizaion and Urban Cloud
are based on a six dimensional concept.

Y axis

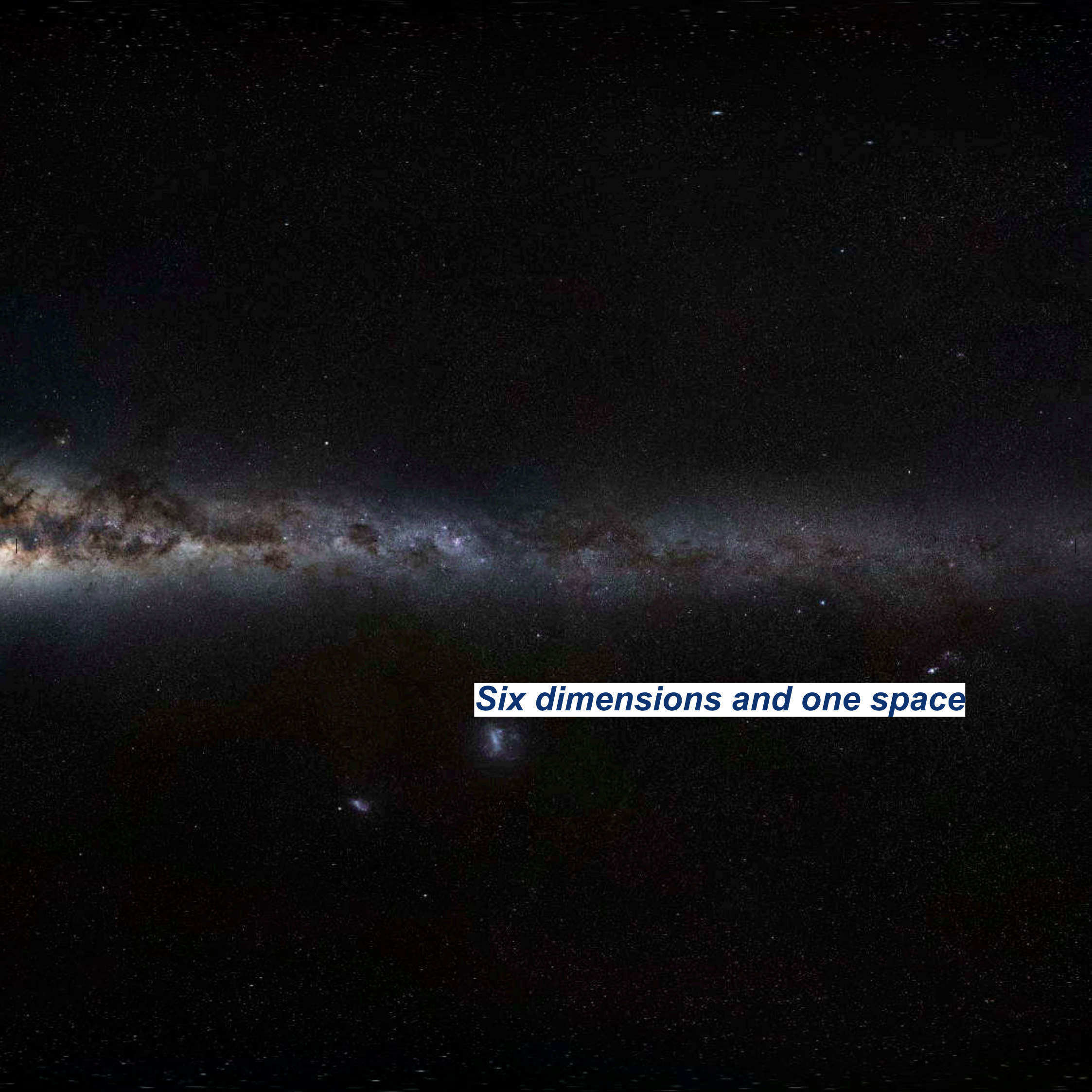
X axis

Z axis

Time

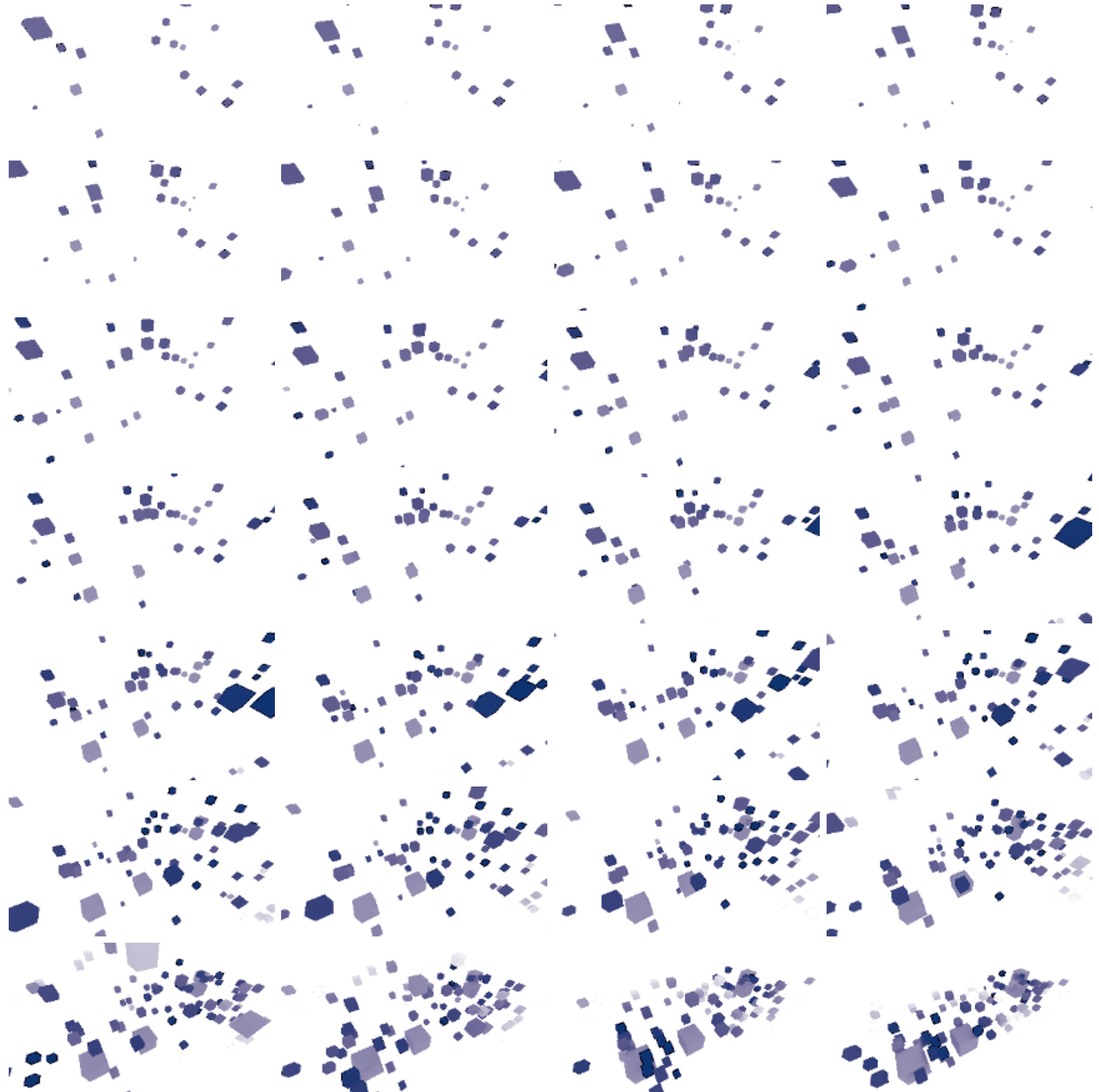
Social Space

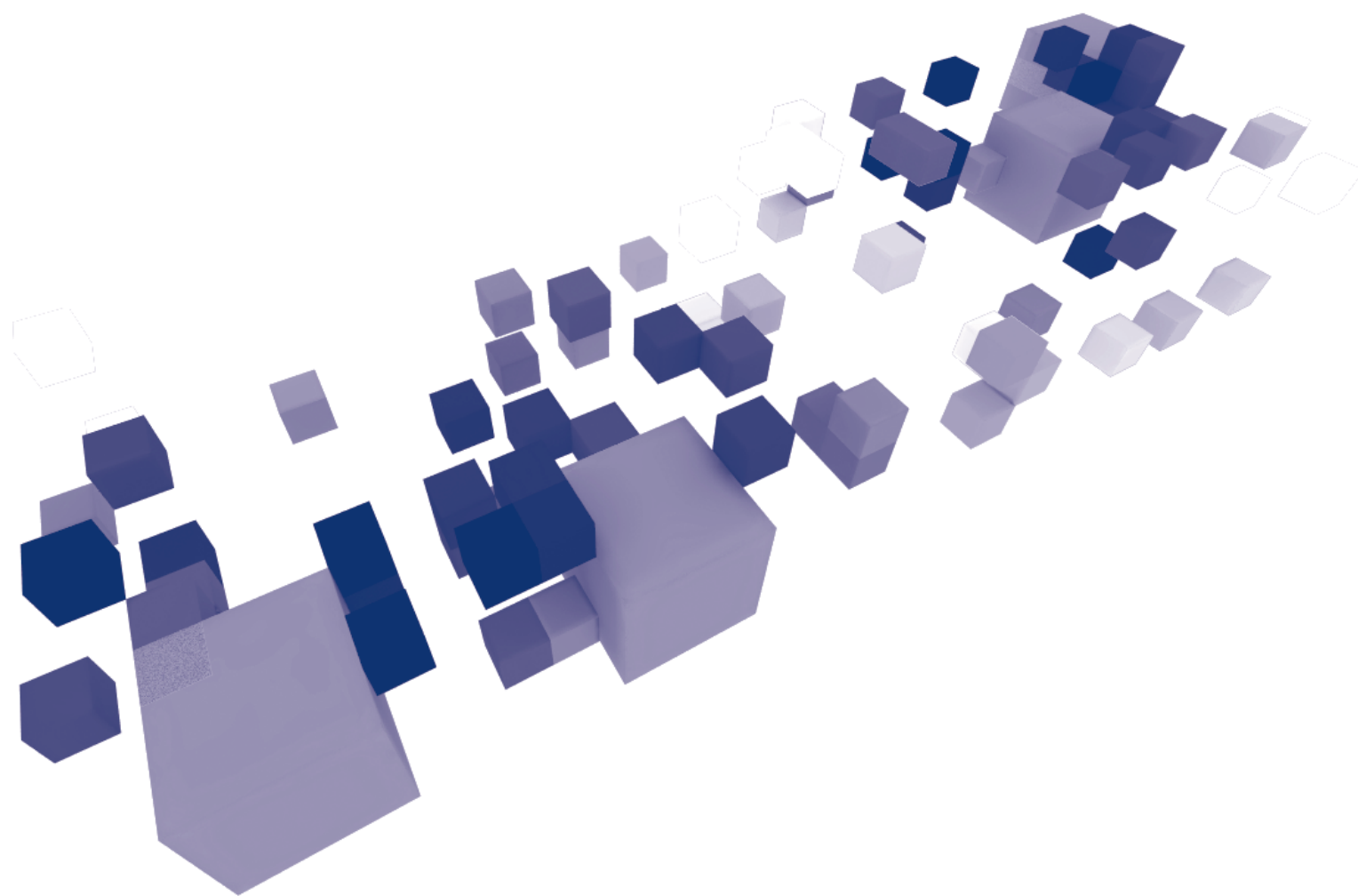
Individual Space



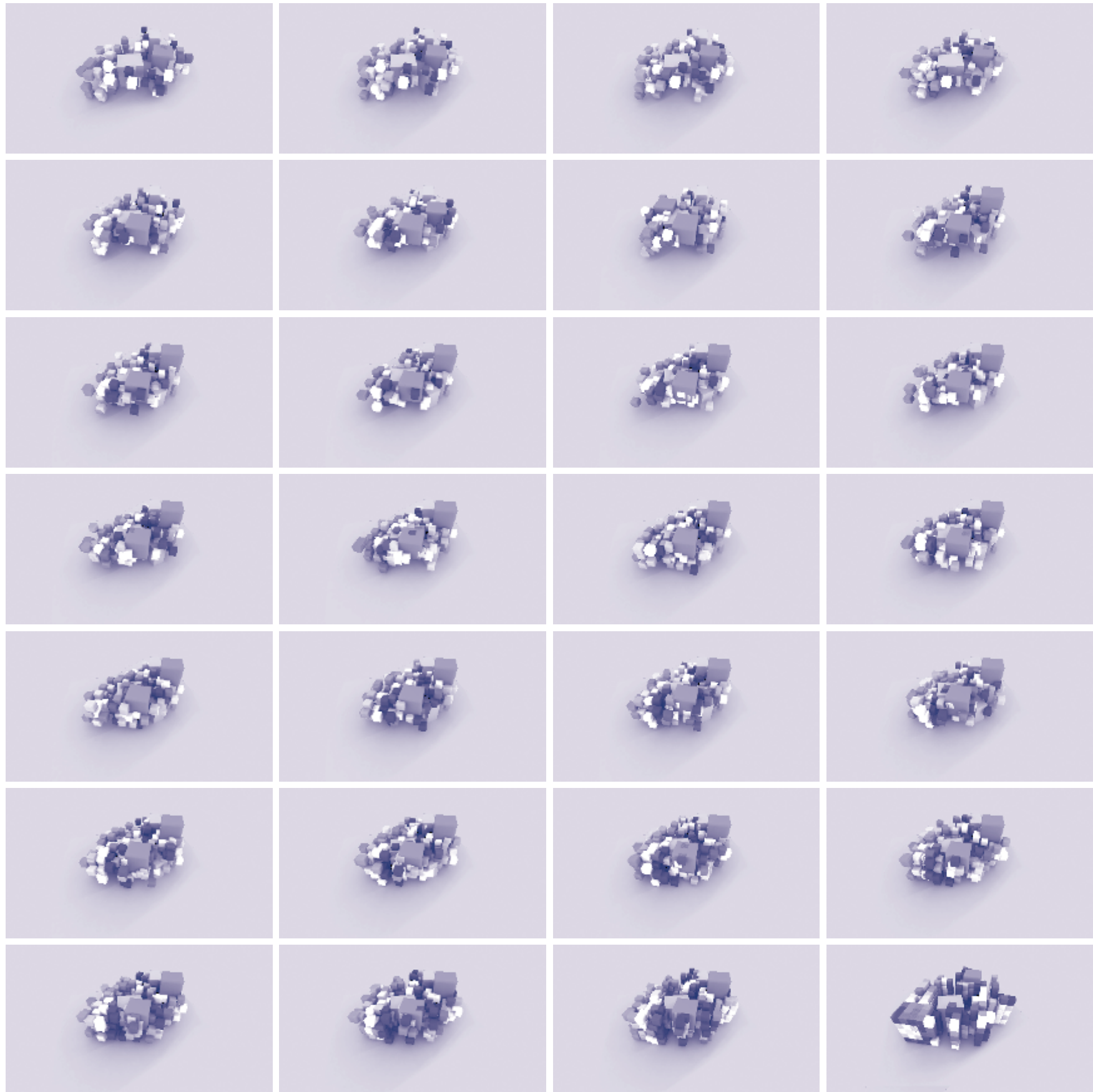
Six dimensions and one space

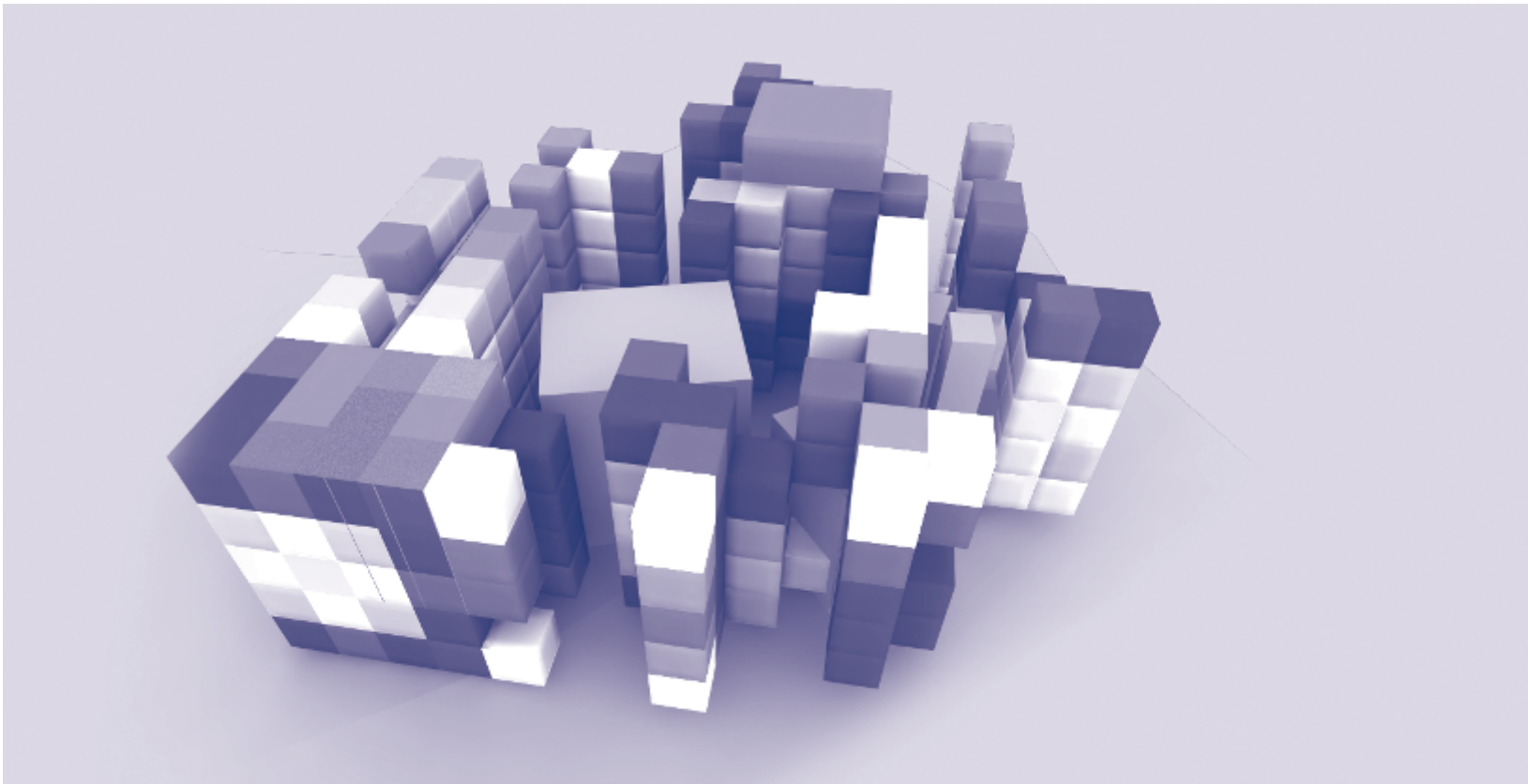
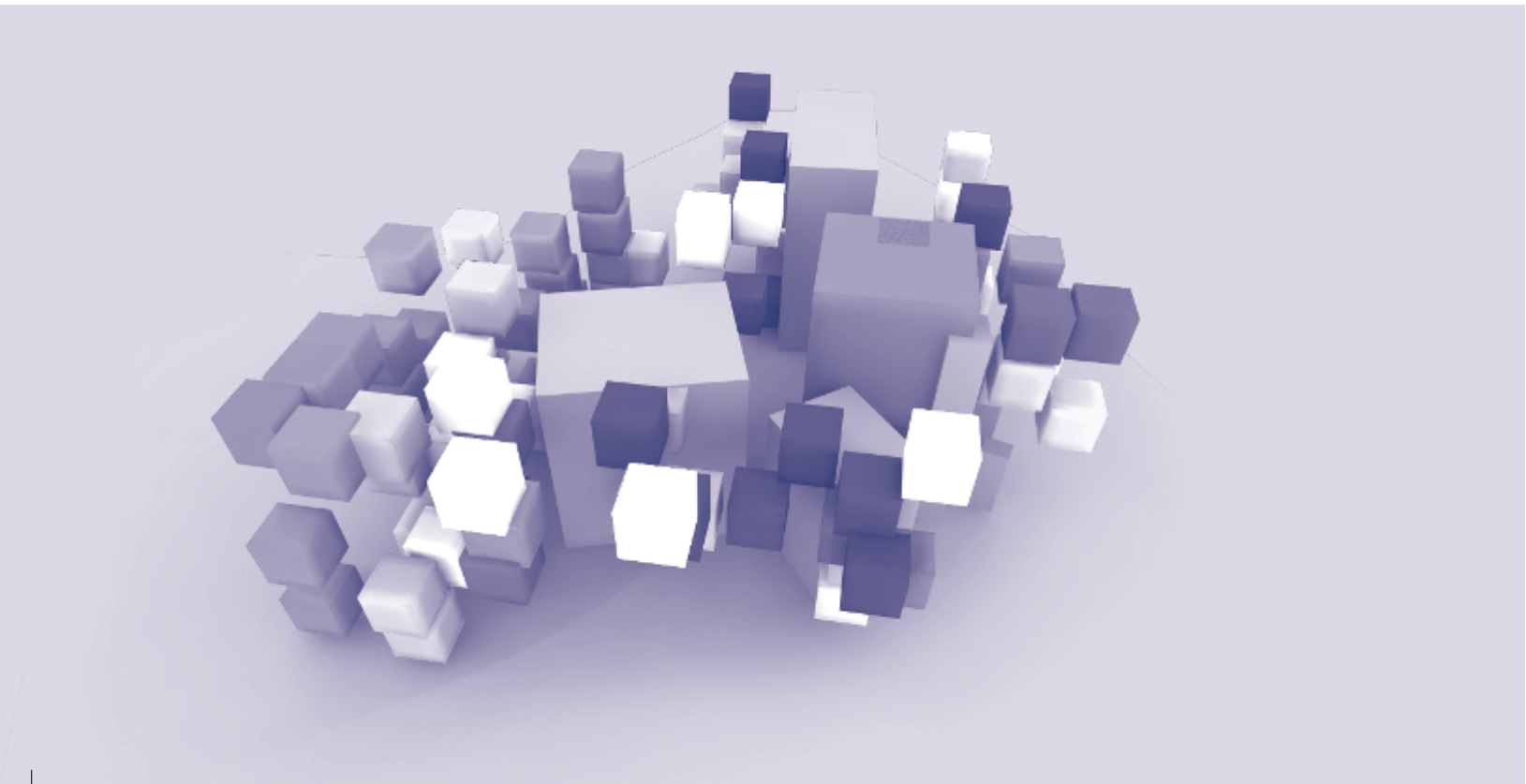
First Clouds Arrange



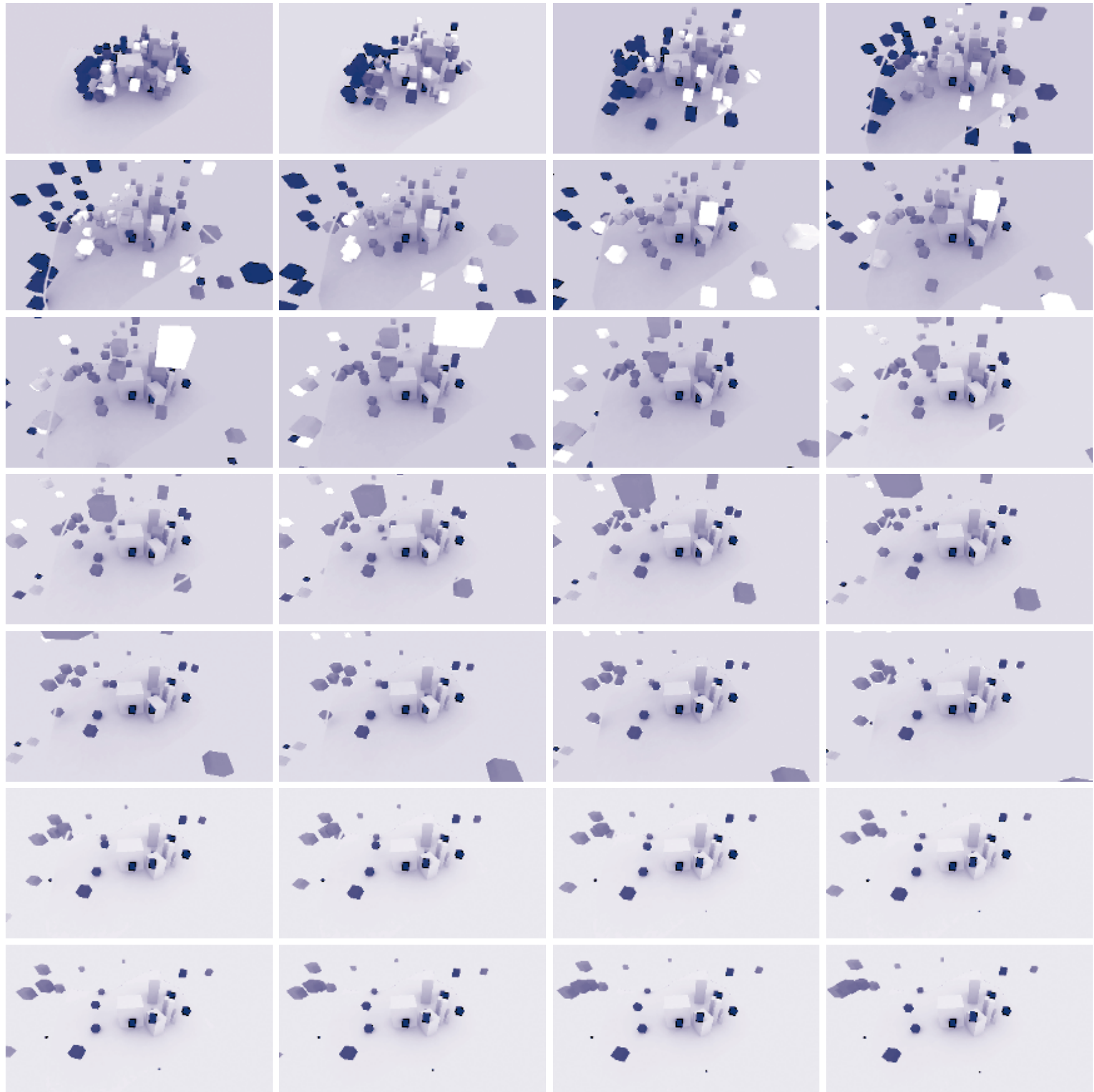


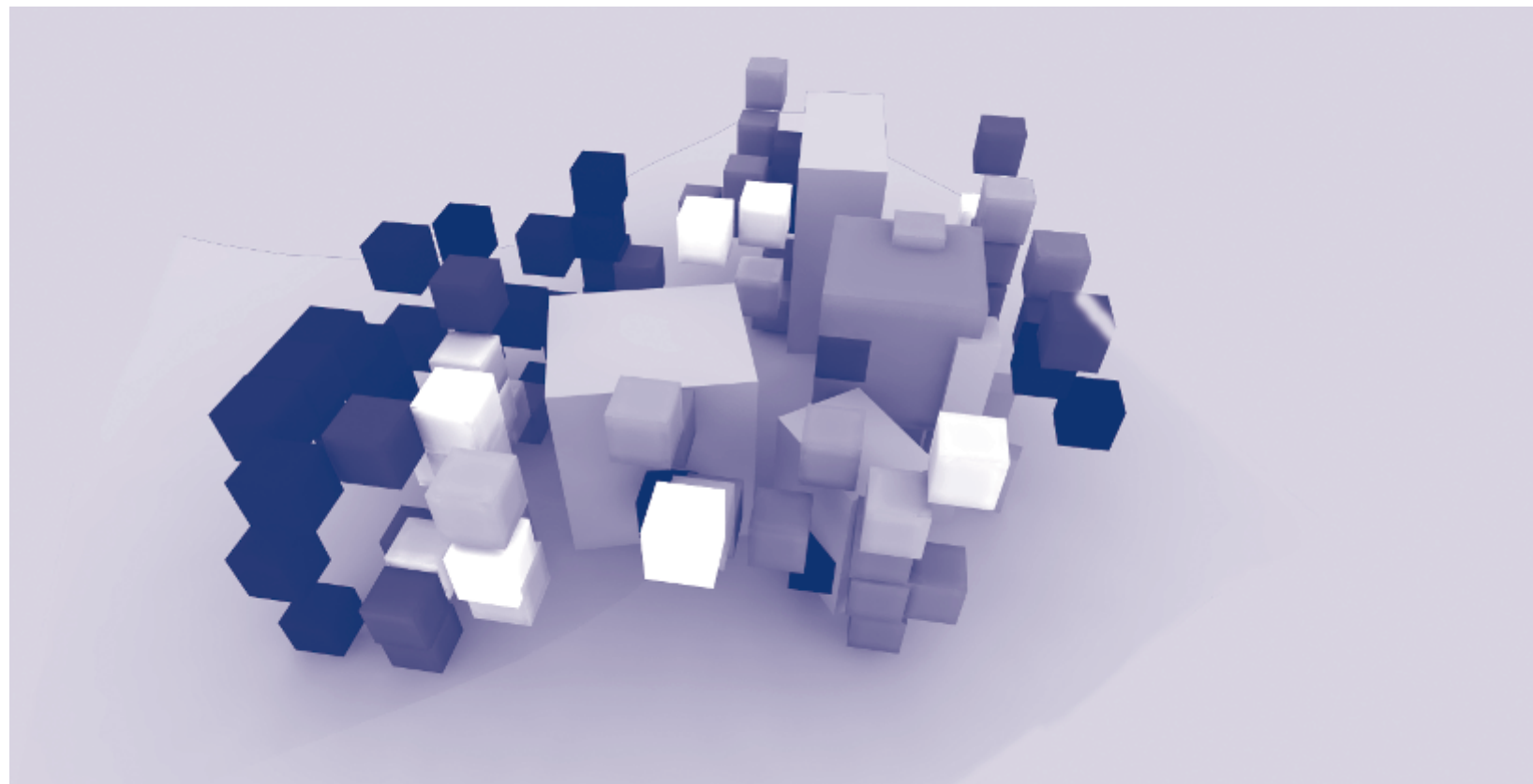
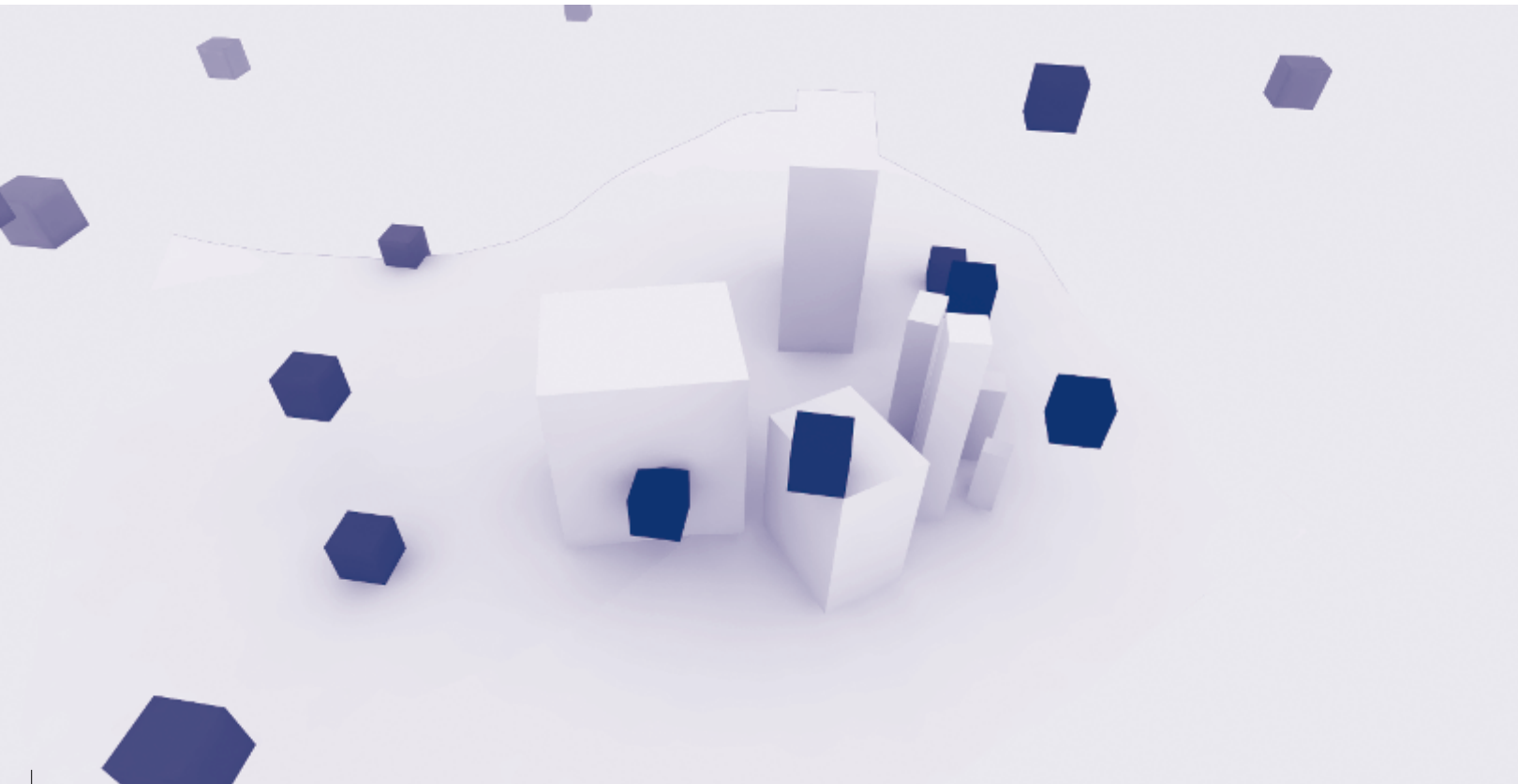
... and Rearrange





... and Shrink





The Main Technical Concepts

INDIVIDUALS

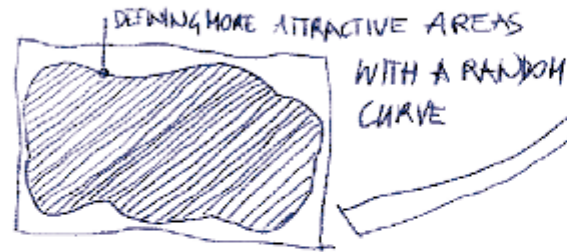
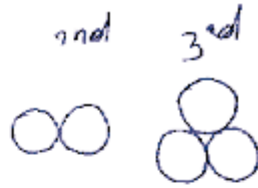
PRIMARY



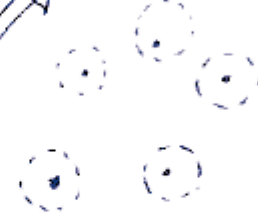
AREA

EXCLUSION

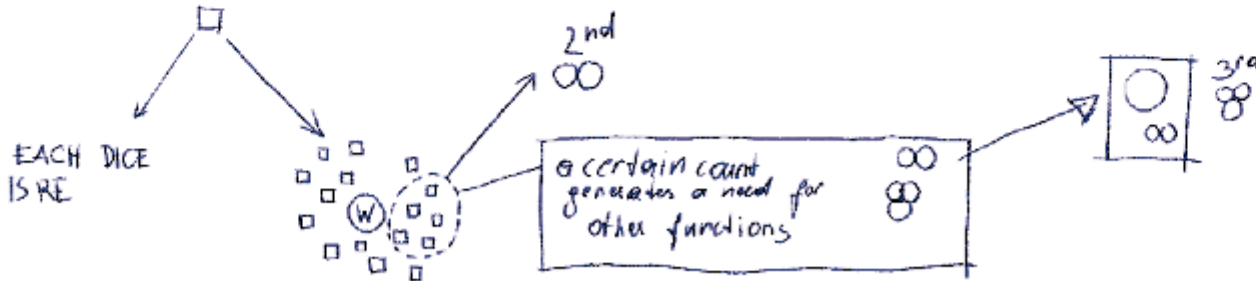
NO
BOARDERS



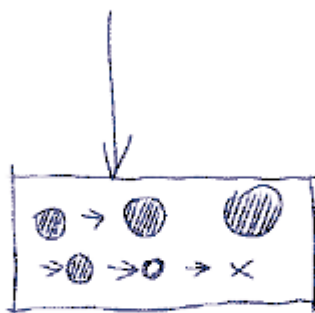
RANDOMLY selecting
SOME POINTS



AND GENERATE EVEN
MORE ATTRACTIVE AREAS

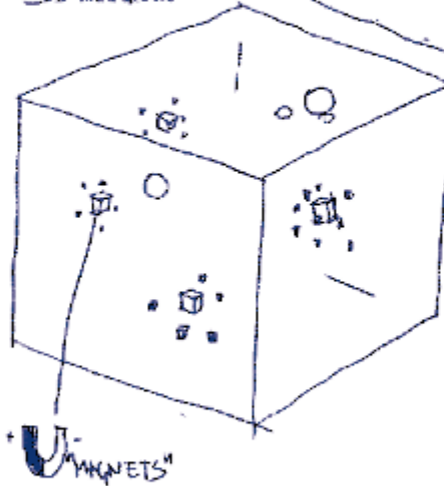


"Attractors" act like a force

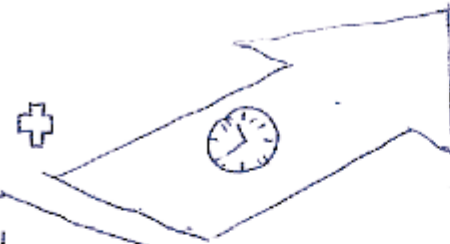


OTHER ATTRACTORS
LIKE 2nd TURN
INTO PRIMARY

3D dimensions



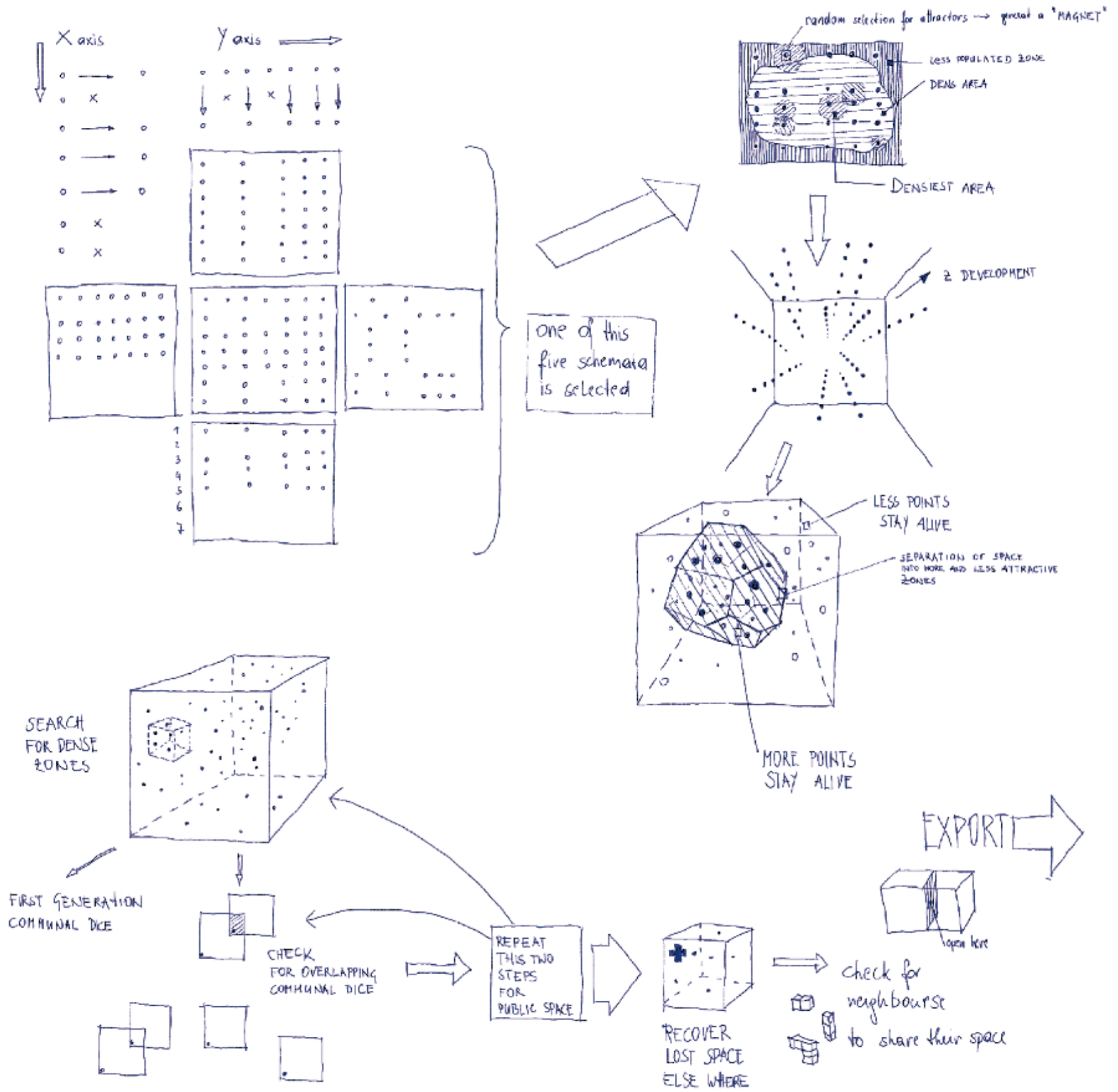
"U-MAGNETS"



AFTER THIS
PRESELECTION PROCESS FOR THE DIFFERENT
DICES, THE SCRIPT CHECKS THE SYSTEM FOR VALIDITY.



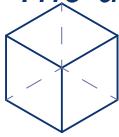
From the First Layer to an Urban Cloud Population



Urban Cloud Script

Concept / Work-Flow

*The extent of 505.6 centimetres, the side length of the space defining cube:
The unit ONE³ for every Utopian.*



This unit ONE³ (also Standard-Size³) predefines the entire Urban Cloud, Urban Dice and Urban Link Scripts.

- Manually with several sliders in both X and Y direction.
- With Galapagos towards a predefined density.

Galapagos is an extension for Grasshopper to optimise structures. This is an algorithm based on evolutionary theory. This algorithm starts to randomly set values for the first generations. For the continuing generations it uses the best solutions from the previous solutions and mixes them with new random solutions. It runs until the user selects one of the solutions.

Definition of the Urban Cloud Extent

Two Options:

1st Numeric - defines the extents of the three axis with the count of units in each direction.
2nd 3D Mesh Model of an existing structure - the script now defines the extends towards the input geometry

Options to choose a pattern for the X and Y axis.

City blocks and several different patterns are at hand.

First possible Communal Dice are chosen - [POV's].

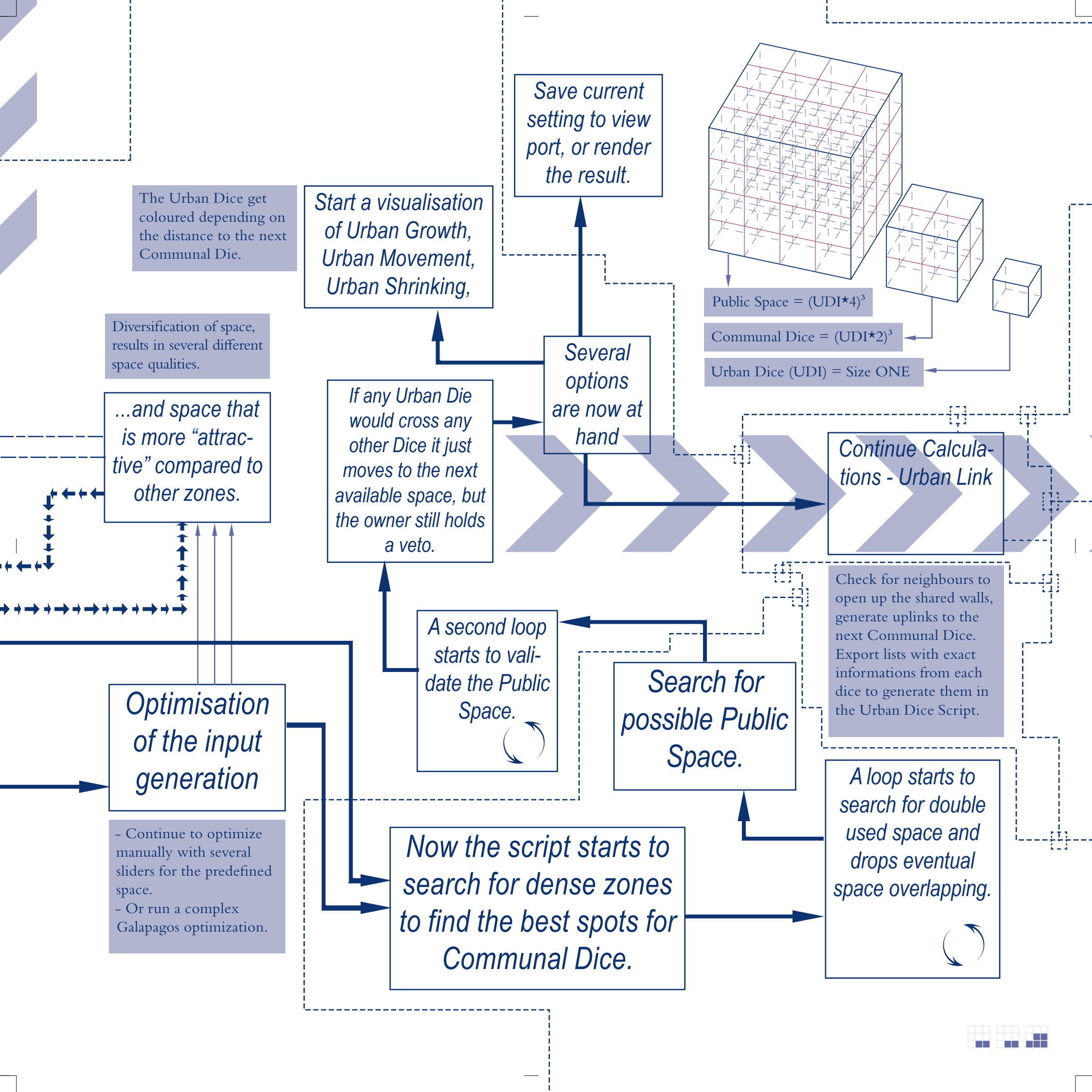
Optimization of the 2D pattern.

Meanwhile the script Generates random values based on some incidental attractive zones, defines areas around the first Points of Interest

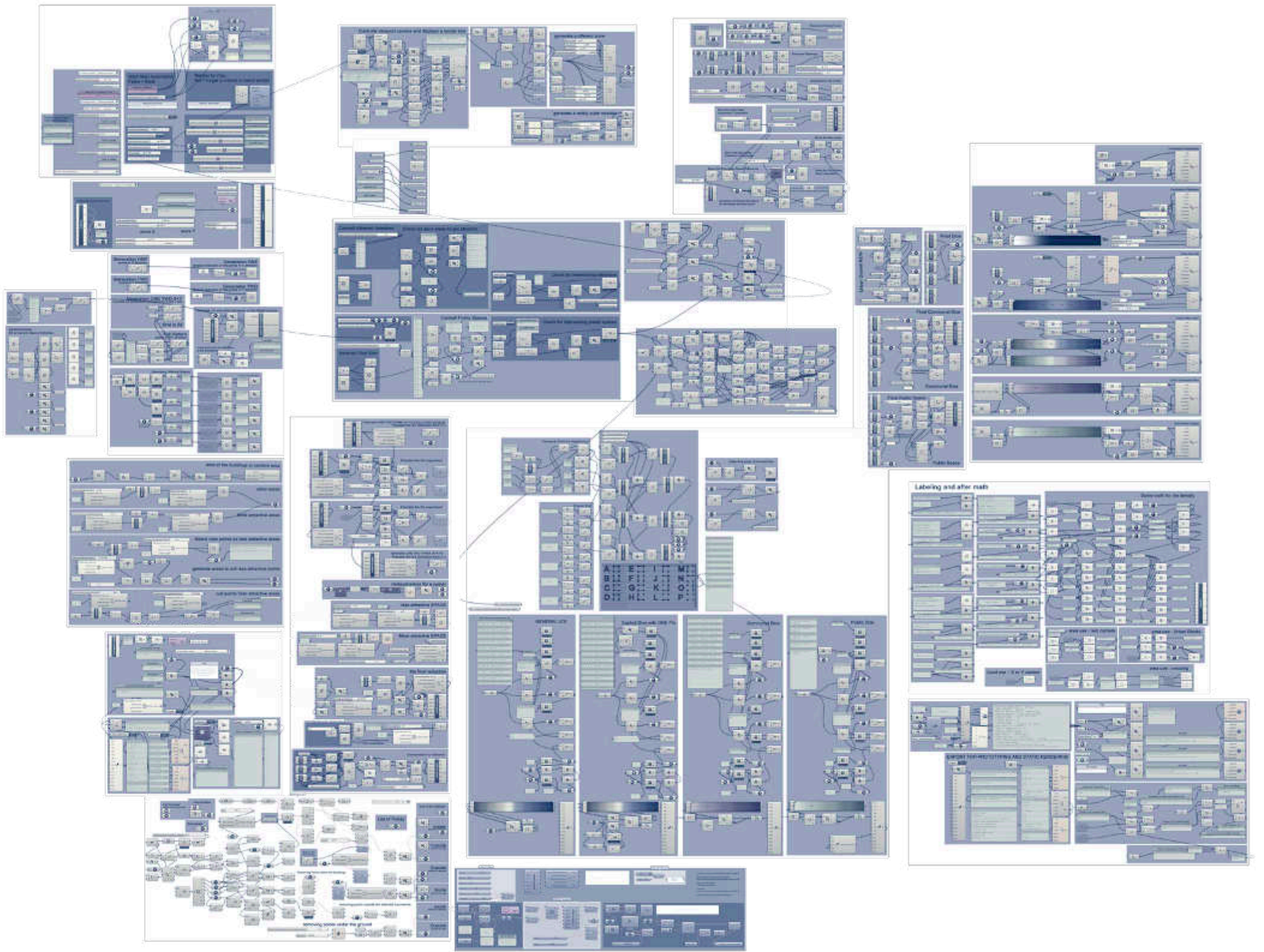
Population of the 2D generation into the Third (Z) Dimension

- Some initial selections are to be made, if it should stand on the ground, or much better if it should fly.





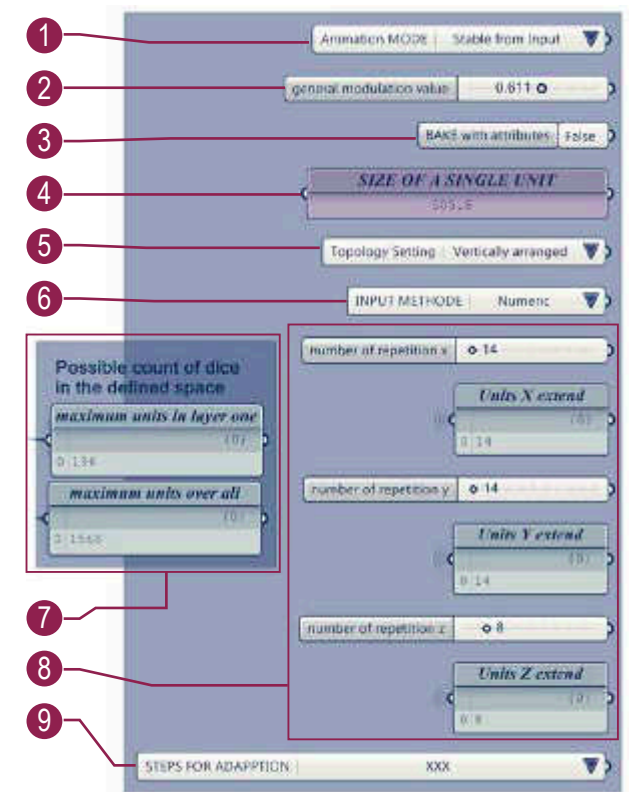
Code Overview



Defining the Extent of the Urban Cloud

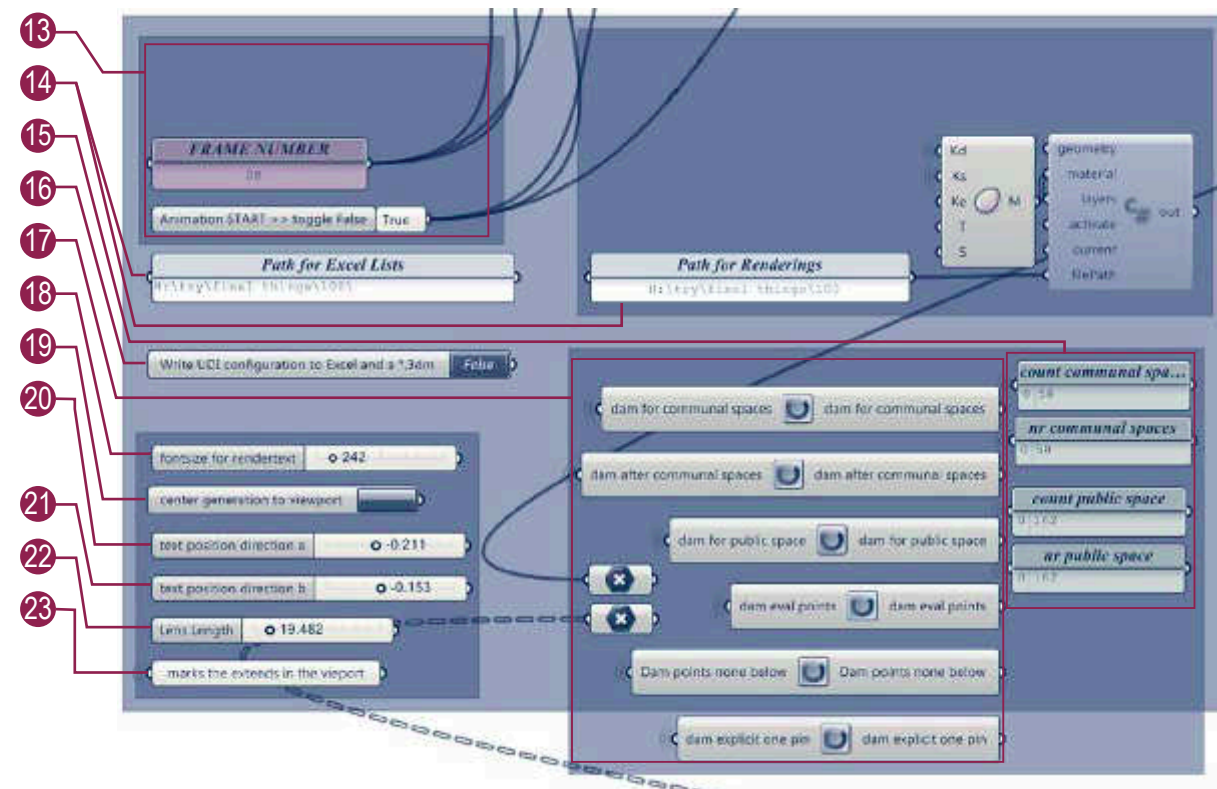
A defined space that literally can move every where. It is autonomous, a space ship, individuals build an urban structure, the Urban Cloud.

	Description	Options	Value	Note
1	Selection of the Animation Mode	Urbanity Condenses/Shrinks	0	
		Urban Movement	1	
		Urban Growth	2	
		Urban Growth new	4	
		Stable from Input	3	No animation selected
2	General Modulation	Numeric Slider	0,1to1	Manipulates all random values
3	Bake with Attributes	Boolean Switch	False	Bakes the calculated Urban Cloud into the Rhino view port
			True	
4	Initial Size ONE	Number	505,6cm	Could be changed, but Ma.Ad.Man. Utopia is based on this value.
5	Topology Settings	Cloud Arrangement	0	
		Vertically Arranged	1	
		Full Grid	2	
		Cellular Automata	3	
6	Input Method	Numeric	1	
		From 3D input	2	
7	General Generation Information	-	Number	Possible units X and Y plane Overall possible units
8	Definition of the Extend, and Information if 3d Input is selected	Integer Numeric Slider X	0 - ∞	Values are overridden if 3d Input is selected. The final limit of the extent is set by calculating power of available central processing unit(CPU).
		Integer Numeric Slider Y	0 - ∞	
		Integer Numeric Slider Z	0 - ∞	
9		Step One	0	configure grid layout
		Step Two	1	configure unattractive things
		Step three	2	config. vertical arrangement
		Step Four	3	arrange boxes



Further Handling

Simulations, generations, chaotic things that arrange, ...

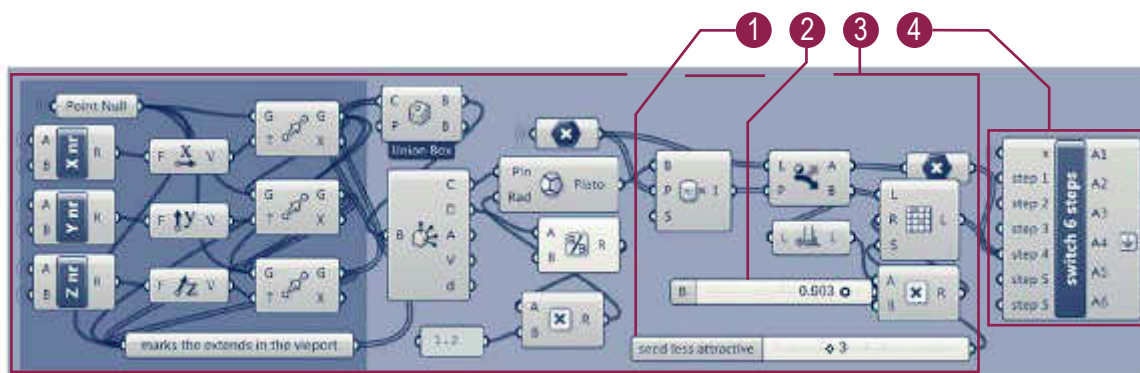
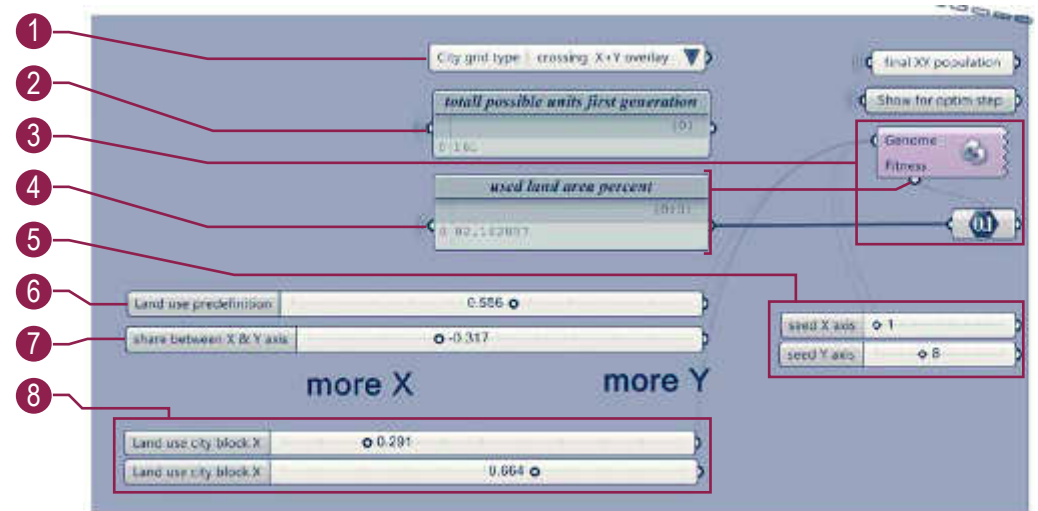


	Description	Options	Value	Note
13	Animation Control	Set Frame Number	Integer	
16		Start Animation	True	Animation OFF
			False	Animation is started and rendered in V-ray
14	File Path	Text		For exports.
15	Population Metrics	-	-	Information about the Urban Cloud and population/MaAdManians.
16	Write Urban Cloud to Files	On/Off	True/False	Writes a list with the basic information about each die, and the geometry as a mesh in a file.
17	Multiple Data Dam	Run from top down.	Run/Rerun	Necessary to keep the solutions flawless. (Else loops would cause problems).
19	Center Urban Cloud	Boolean Toggle	-	
18	Render Text Font Size	Number Slider	Number	Displays text with the current metrics of the Urban Cloud.
20	Render Text Position V	Number Slider	Number	
20	Render Text Position H	Number Slider	Number	
22	Focal Length for Lens			
23	Corners of the current generation			For easy orientation in the Rhino view port.



Control of Details

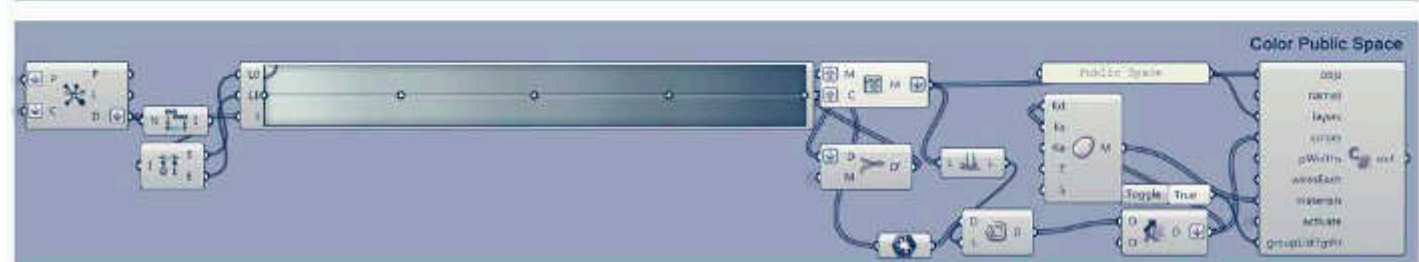
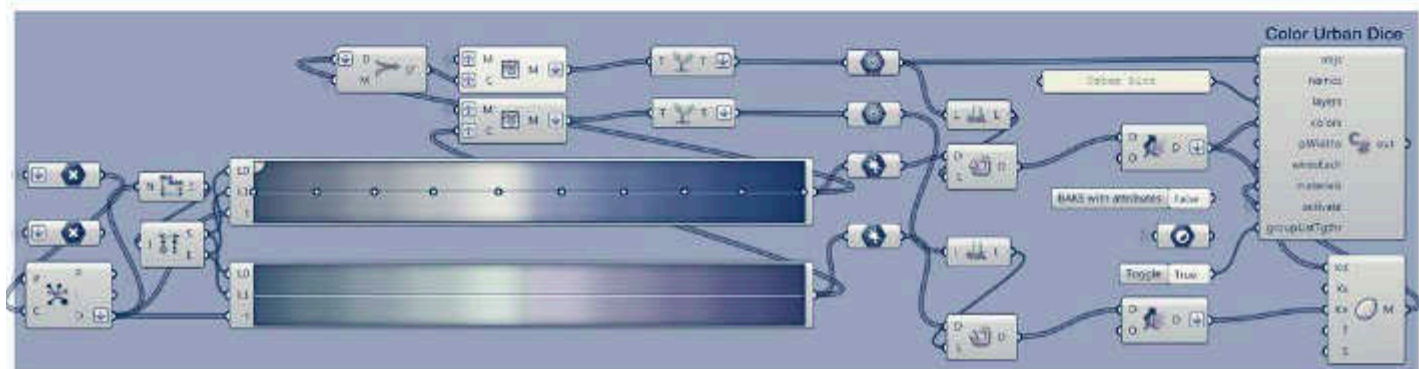
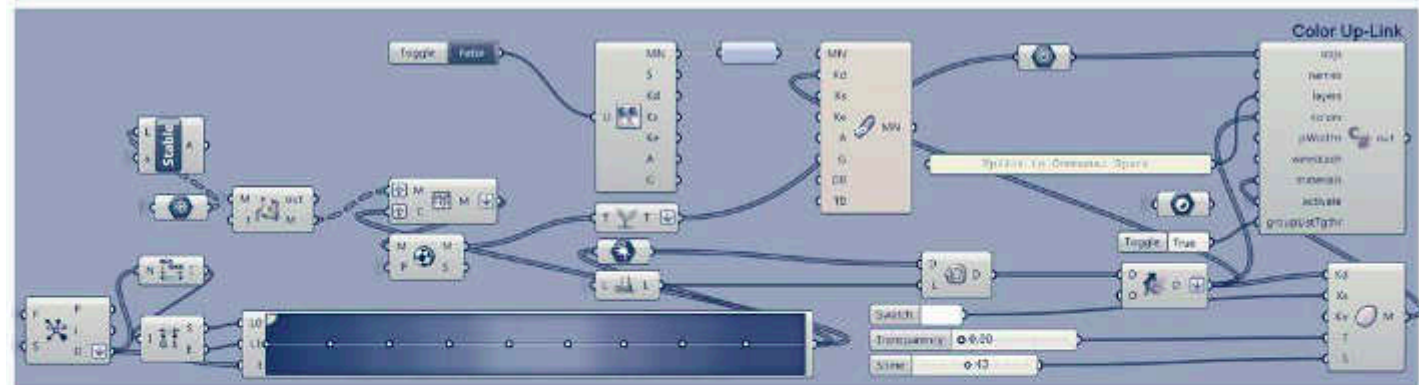
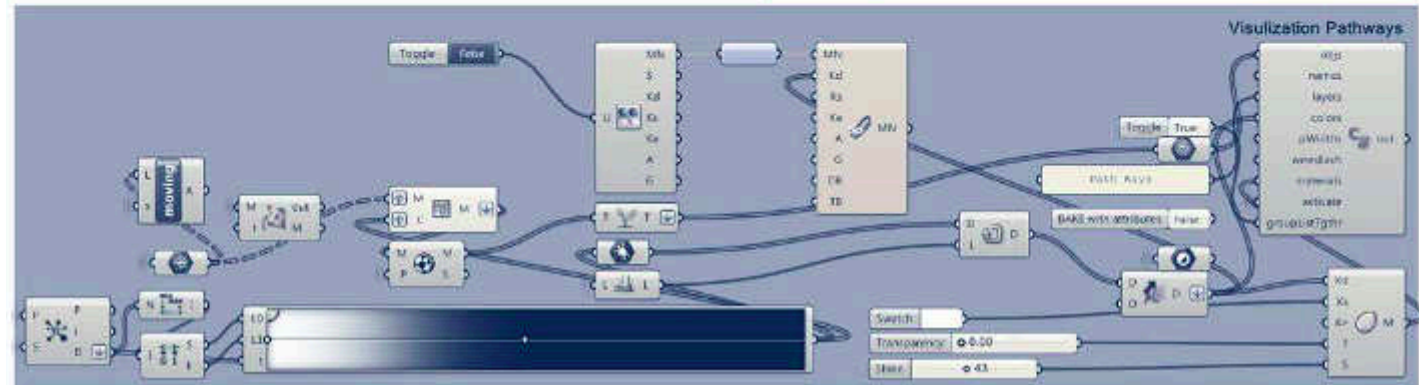
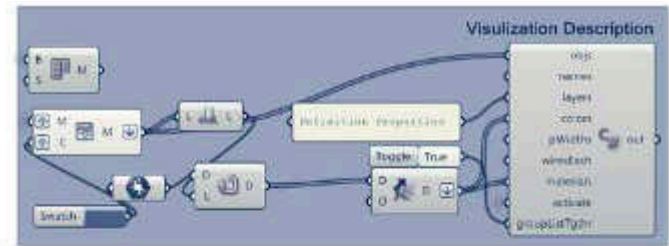
	Description	Options	Value
1	X-Y Plane Grid-Type	Remove Corners	0
		Urban Blocks	1
		Crossing X+Y Overlay	2
		Full Pattern	3
		Only X Pattern	4
		Only Y Pattern	5
2		Possible Units X-Y Plane	Information
3	Galapagos - Optimisation	Add-On with several options, Fitness is the most important, to be set in Galapagos.	-
4	Actually Used Land	Information/Fitness for Galapagos	-
5	Manipulation of the Random Seed.	Number Slider	Integer
6	Approximate Land-use in %	Number Slider	0 to 1
7	Share between X and Y density	Number Slider	-1 to 1
8	Detail Land use share between X and Y		



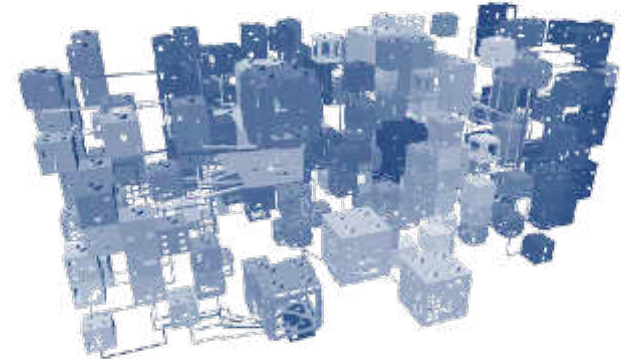
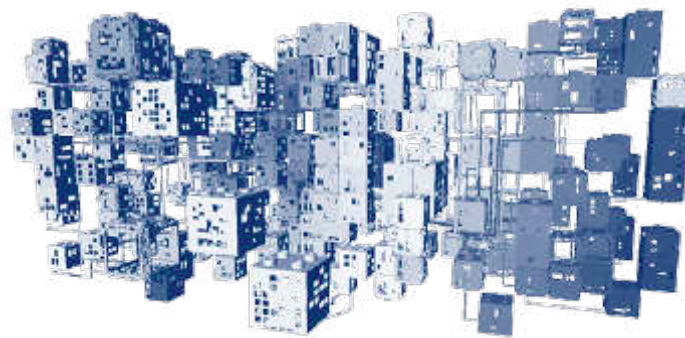
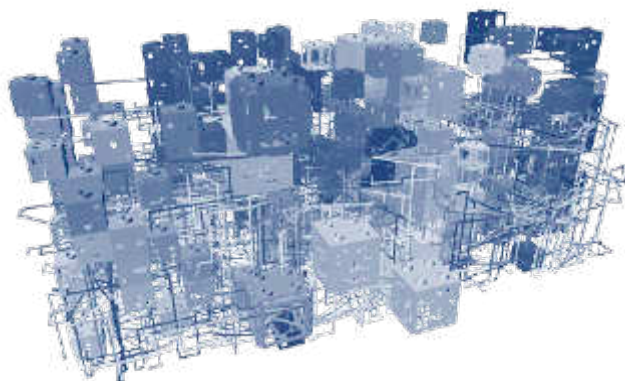
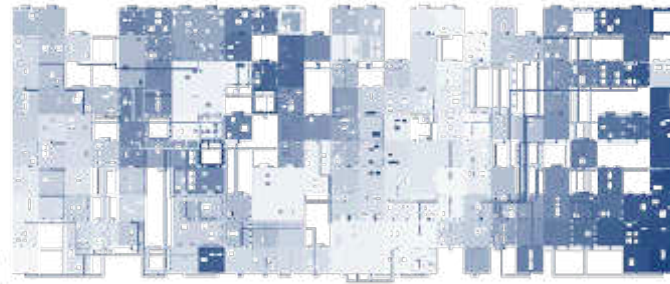
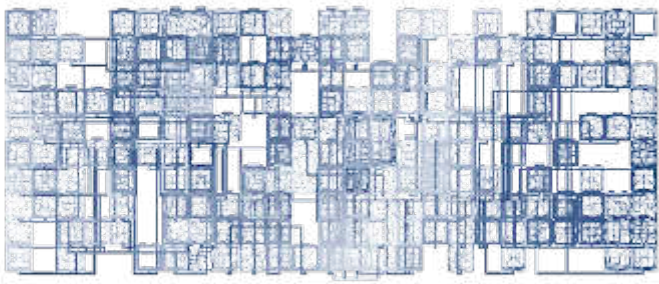
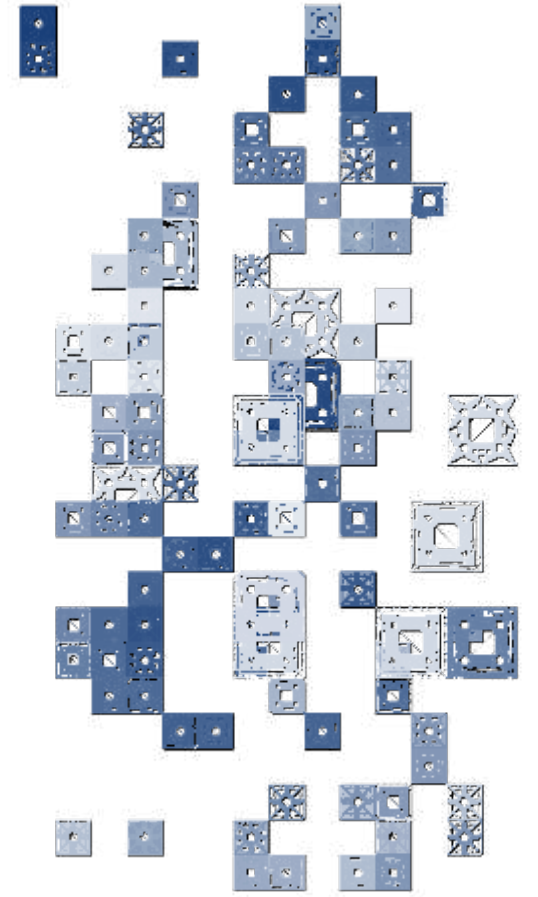
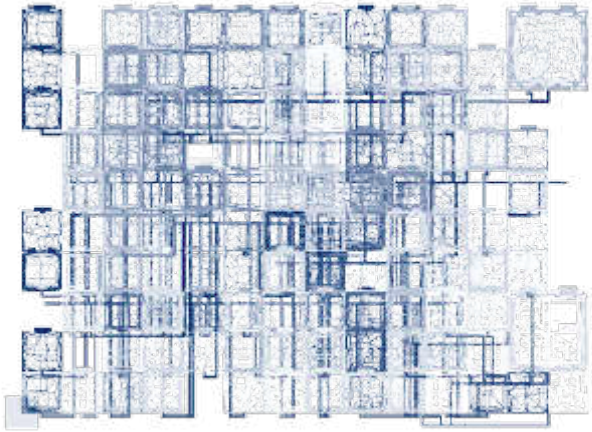
	Description	Options	Value
1	Manipulation of the Randomness	Number Slider	Number
2	Defines in Percent how many Units stay alive in this pre selected area.	Number Slider	0-1
3	Definition of Space that will keep a high amount of Units alive.	-	-
4	Element that prevents from solutions behind this stage of the ongoing Urban Cloud definition.		



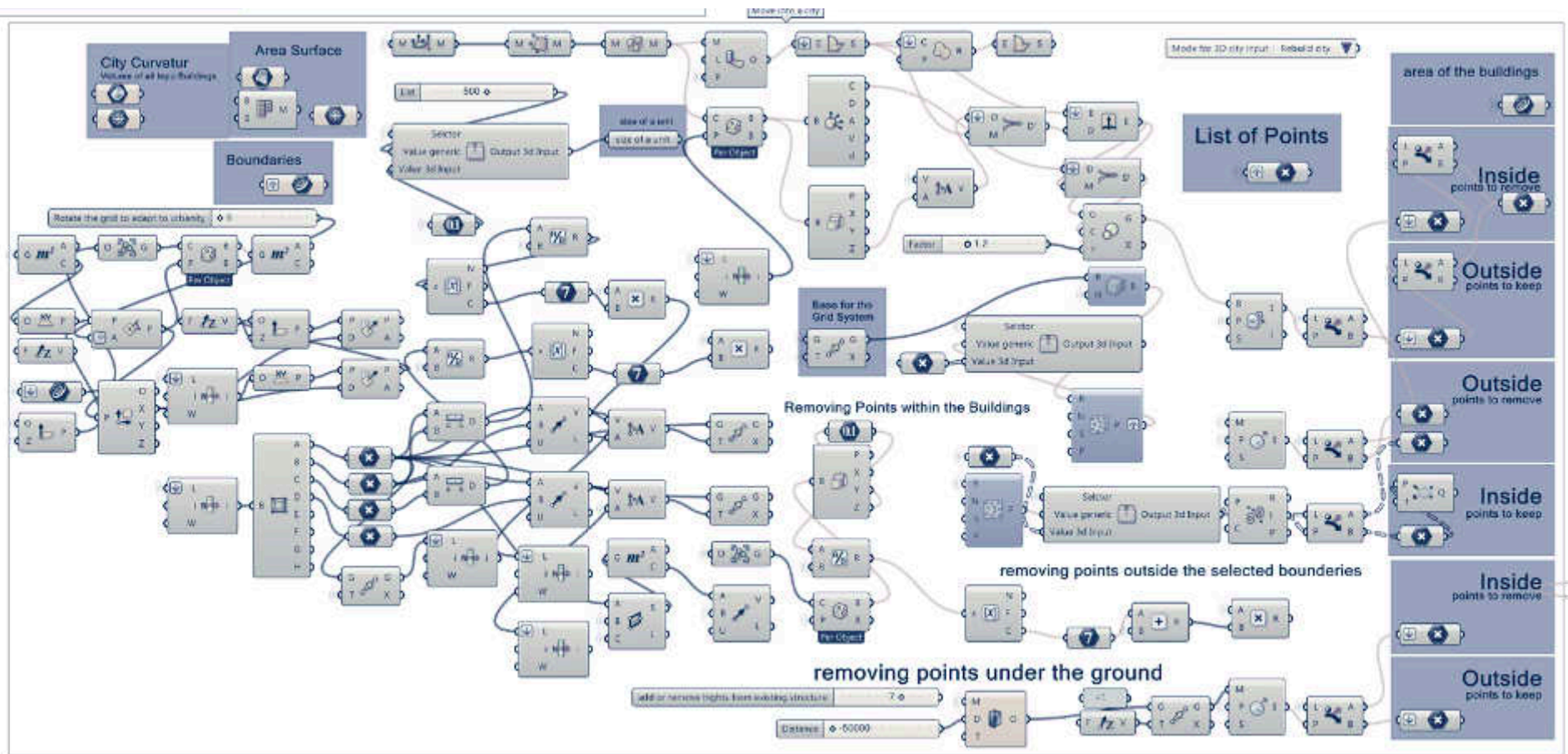
Bring some Colour to the Urban Cloud



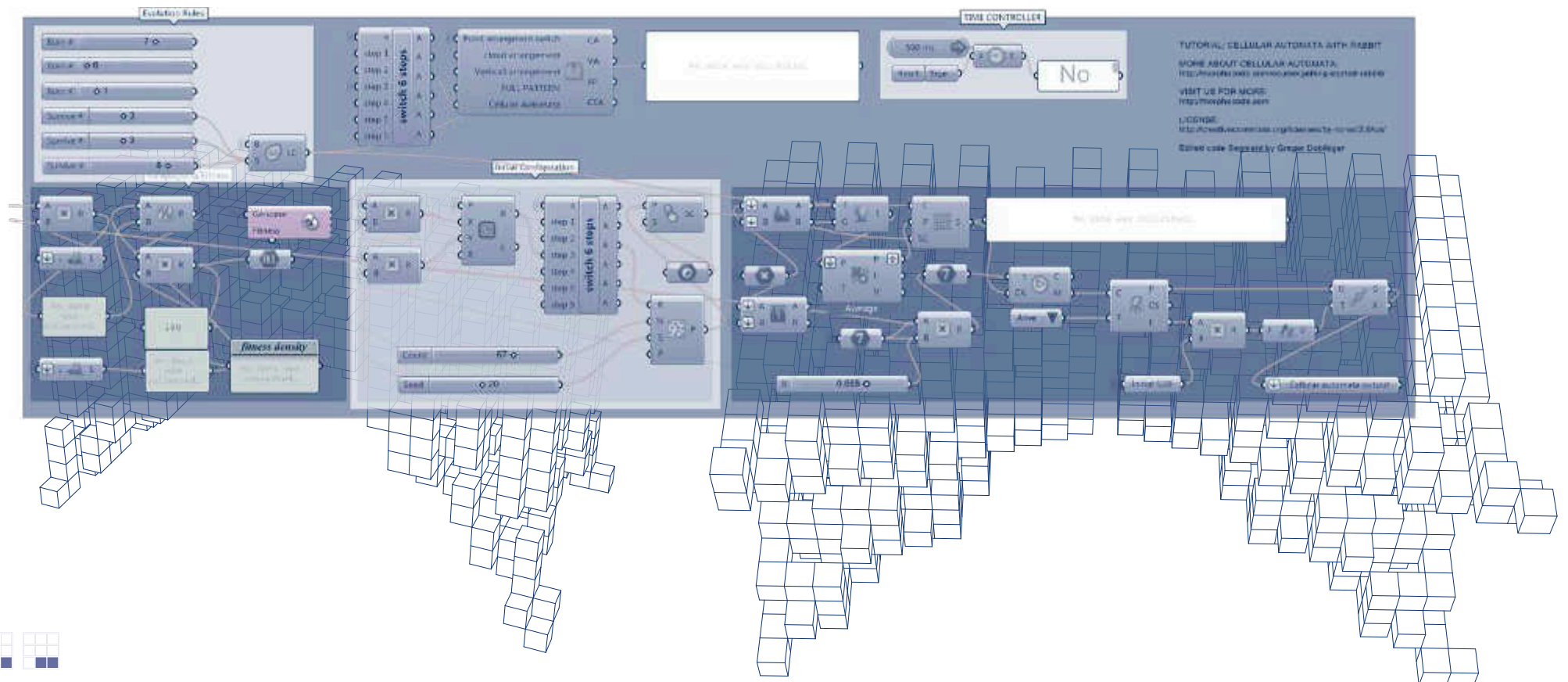
Cloud Structure in the Rhino View Port

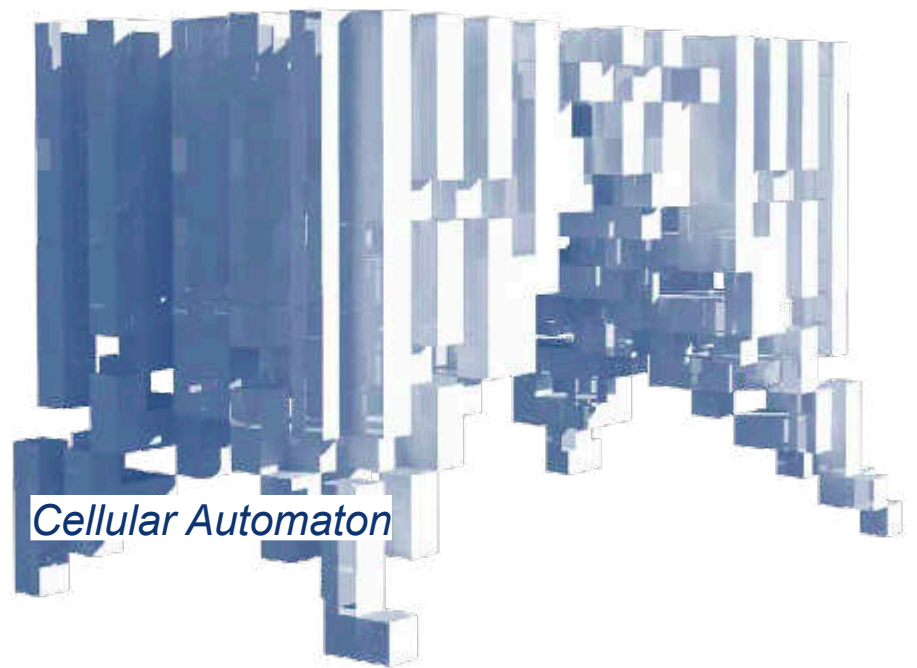
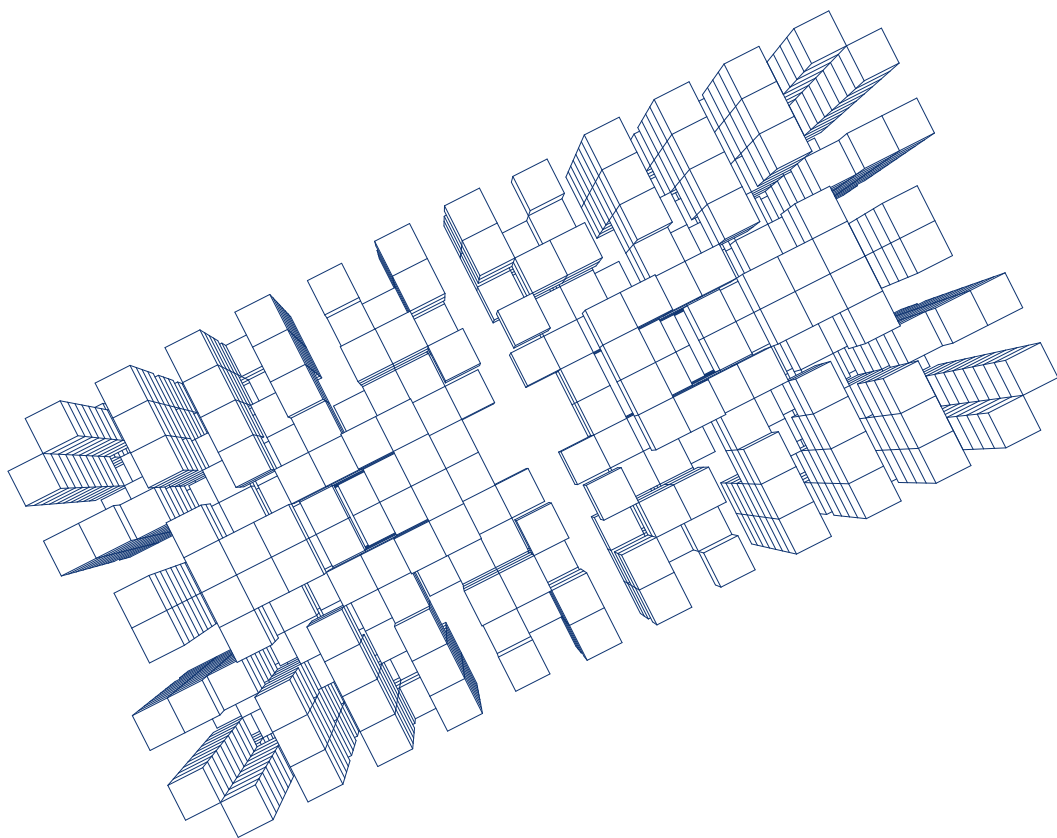
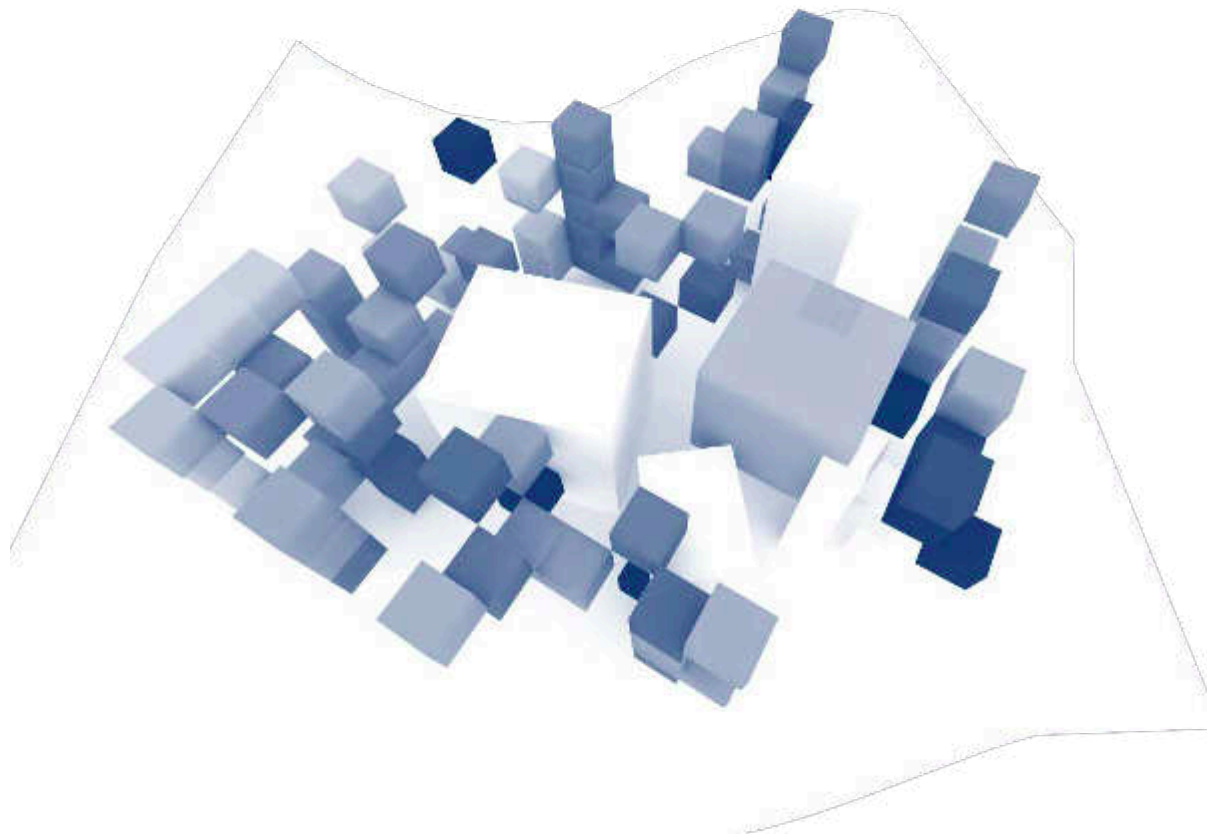


The Urban Cloud Moves Into Existing Cities



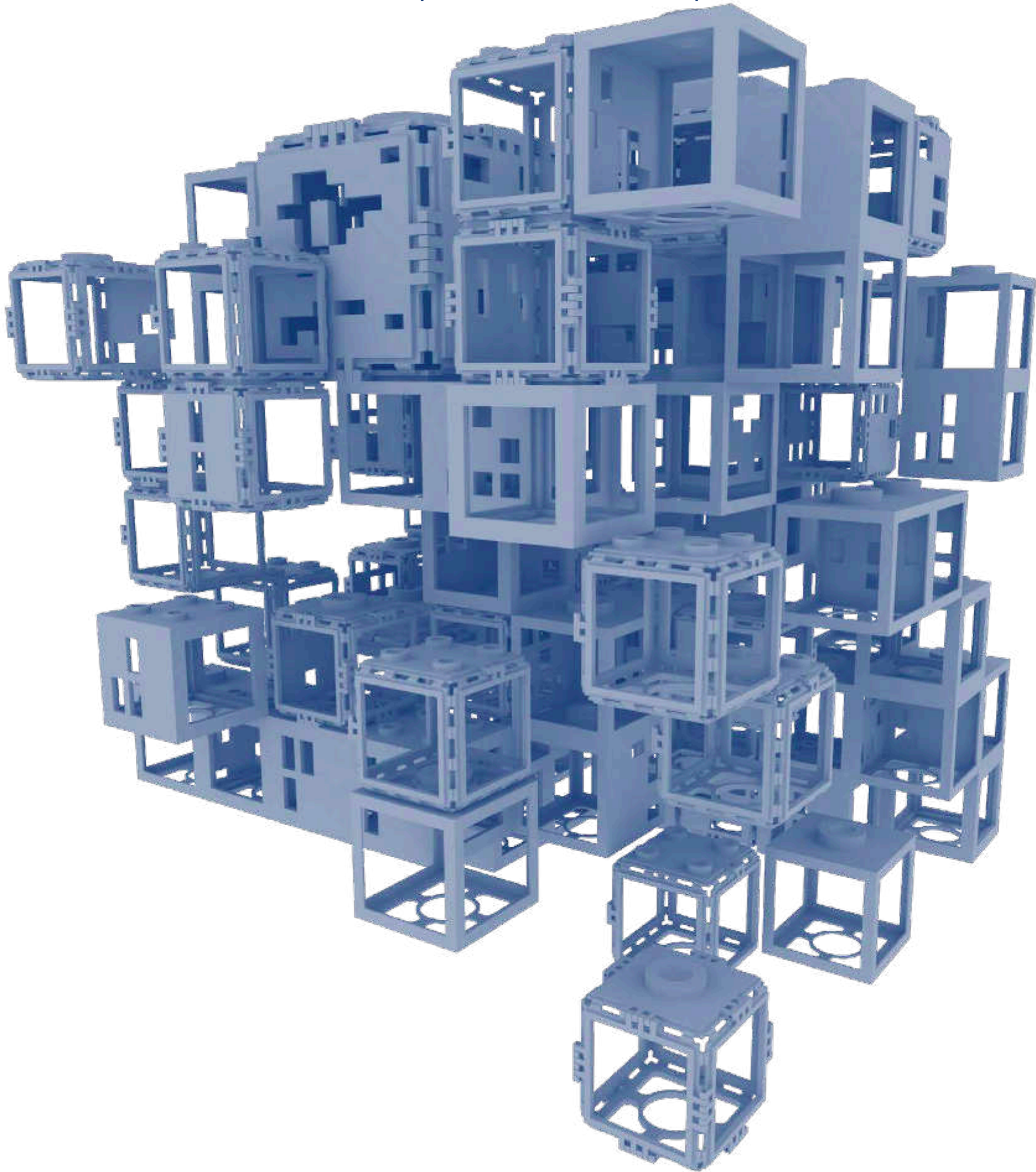
Cellular Automaton, implementation of given algorithms

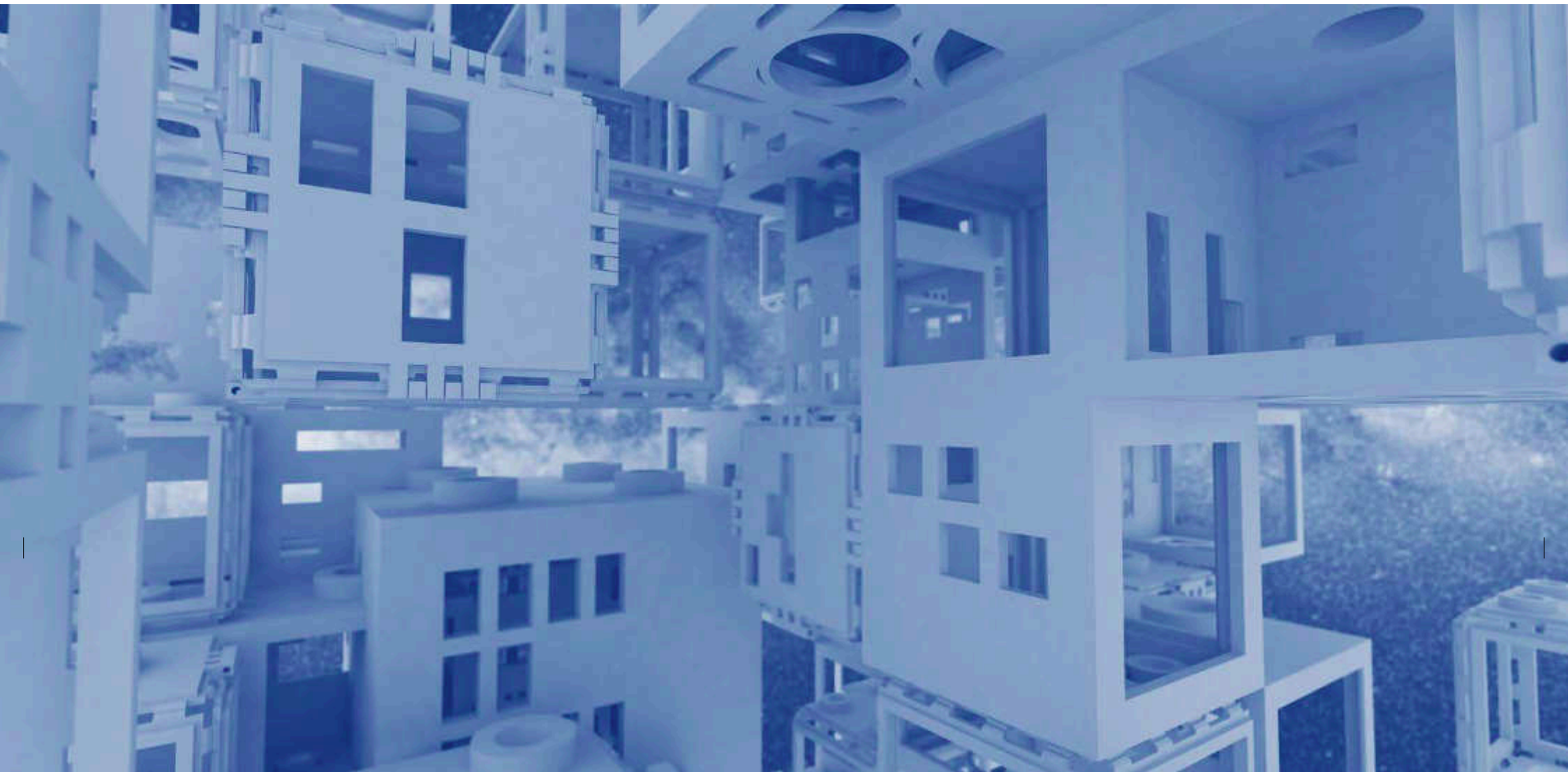




Dice Start to Communicate

"Excuse me!" Utopians started to share space.



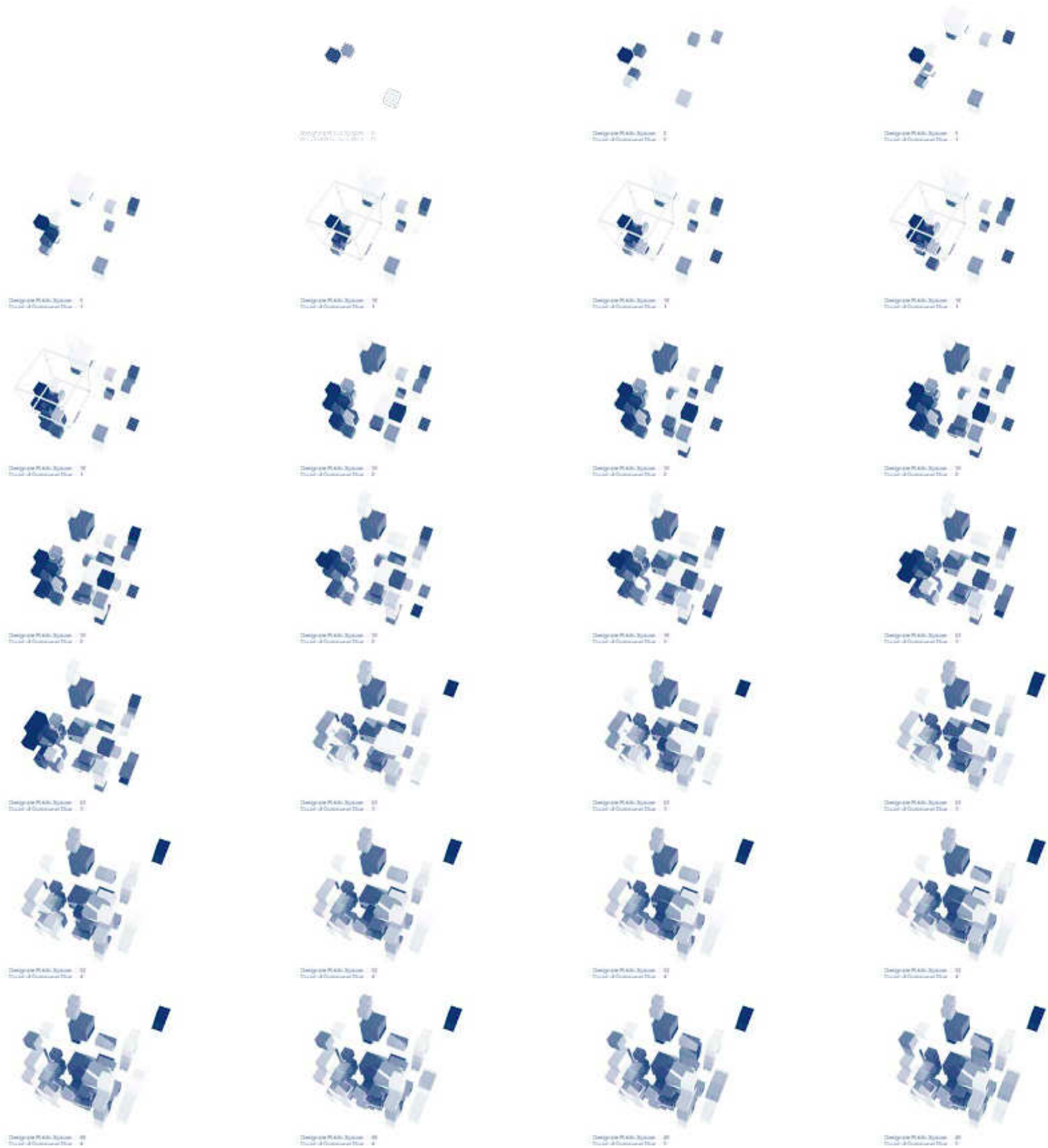


299 New Possibilities have been found in Space

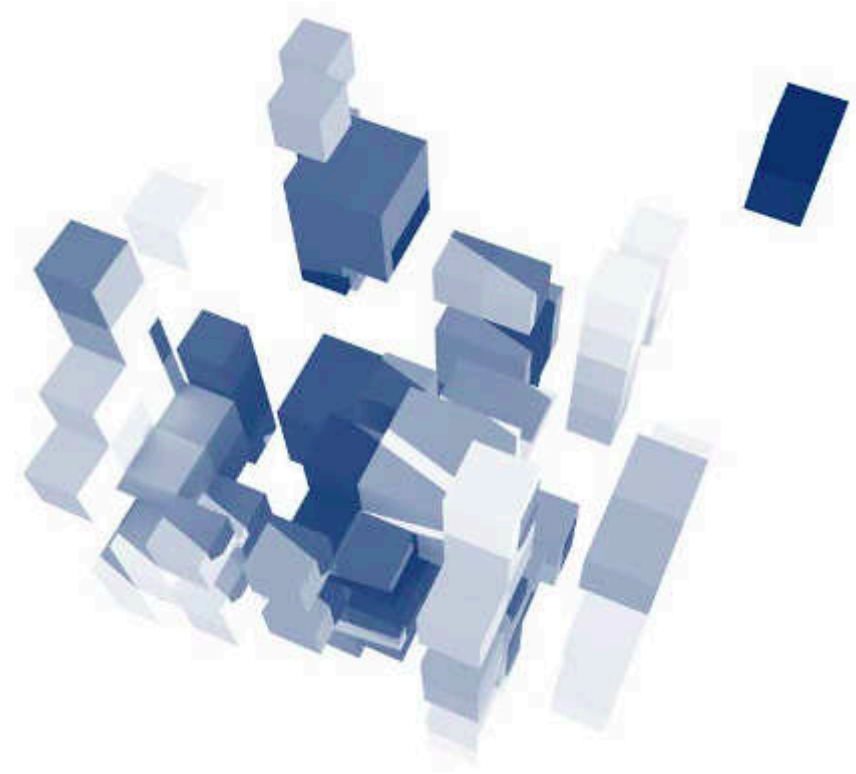


Urban Cloud Script - Documentation of Different Clouds

2015_10_14_22_8_10_UDI

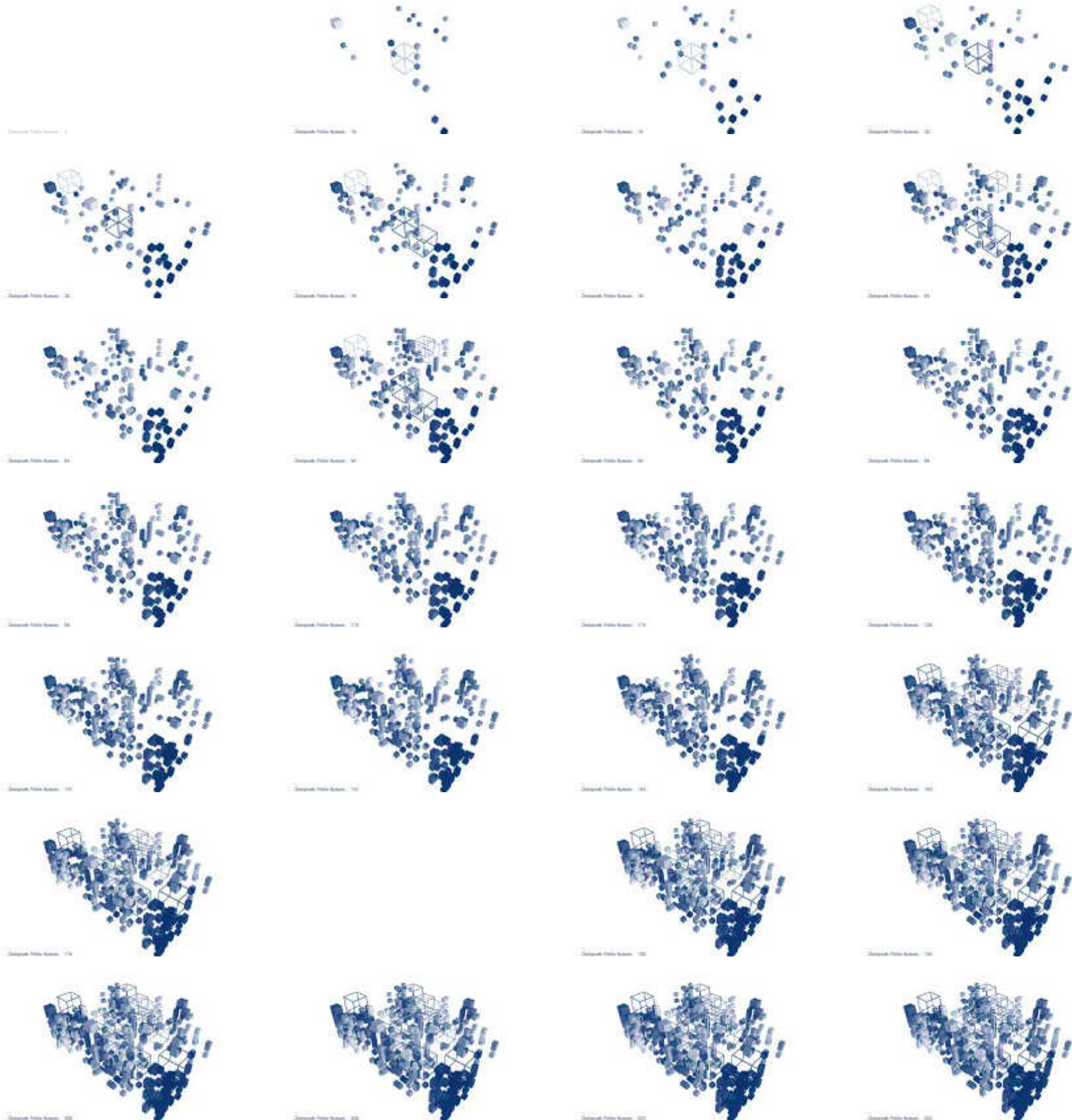


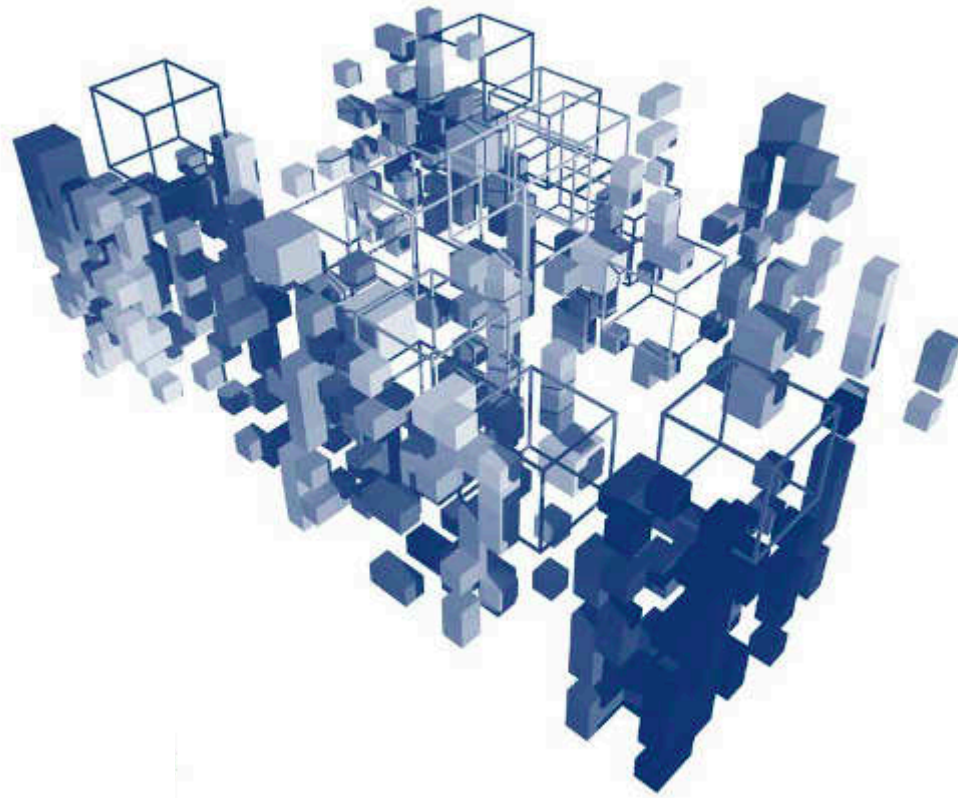
SIZE OF A SINGLE UNIT : 505.6cm
 INPUT METHOD : Numeric
 Mode for 3D city input : Rebuild city
 Topology Setting : Cloud arrangement
 Animation MODE : Urban Growth new
 X Extent units : 14
 Y Extent units : 14
 Z Extent units : 9
 City Grid type : city blocks
 Land usage > 21.428571%
 Count of Urban Dice : 96
 Count of Communal Dice : 5
 Designated Public Spaces : 0
 USED Volume : 17577.621324
 Floor Area Ratio : 1.387755
 Percentage of the whole volume : 7.709751
 W:\...\2015_10_14_22_8_10_UDI_Definitions.xlsx
 C:\...\2015_10_14_22_8_4_data record 3d.xlsxSheet10



Unit size	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scale	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Count of holes (Best with four)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Four(True)/One(False) Pin	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE
Type of production	2	2	2	1	0	3	0	1	2	1	1	0	2	0	0	2
Height modification	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Facade type	6	6	6	3	1	8	1	2	6	4	2	0	6	0	0	4
Facade empty wall	0	4	0	2	0	9	0	0	0	2	0	3	1	0	0	0
XYZ Coordinates	{ 3 0 3 3 . 6 , 5 0 5 6 . 0 , 3539.2}	{ 3 0 3 3 . 6 , 5056.0,0.0}	{ 5 0 5 6 . 0 , 2 0 2 2 . 4 , 2528.0}	{ 1 0 1 1 . 2 , 1 5 1 6 . 8 , 1011.2}	{ 1 5 1 6 . 8 , 2 0 2 2 . 4 , 1516.8}	{ 1 0 1 1 . 2 , 2 5 2 8 . 0 , 4044.8}	{505.6,6067.2, 3033.6}	{ 5 0 5 6 . 0 , 2 5 2 8 . 0 , 3033.6}	{ 5 0 5 6 . 0 , 6 0 6 7 . 2 , 3539.2}	{ 2 5 2 8 . 0 , 3 5 3 9 . 2 , 2022.4}	{505.6,1516.8, 0.0}	{ 4 0 4 4 . 8 , 2 0 2 2 . 4 , 2022.4}	{ 2 5 2 8 . 0 , 2022.4,0.0}	{ 1 5 1 6 . 8 , 1 5 1 6 . 8 , 2022.4}	{ 5 0 5 6 . 0 , 2 5 2 8 . 0 , 3539.2}	{ 4 0 4 4 . 8 , 5056.0,505.6}
Colour	(75,0,29)	(87,63,0)	(86,93,153)	(241,211,132)	(161,152,153)	(165,131,41)	(63,72,136)	(97,104,162)	(47,56,120)	(167,133,43)	(176,142,53)	(94,101,160)	(242,212,134)	(65,74,138)	(33,41,104)	(114,85,9)



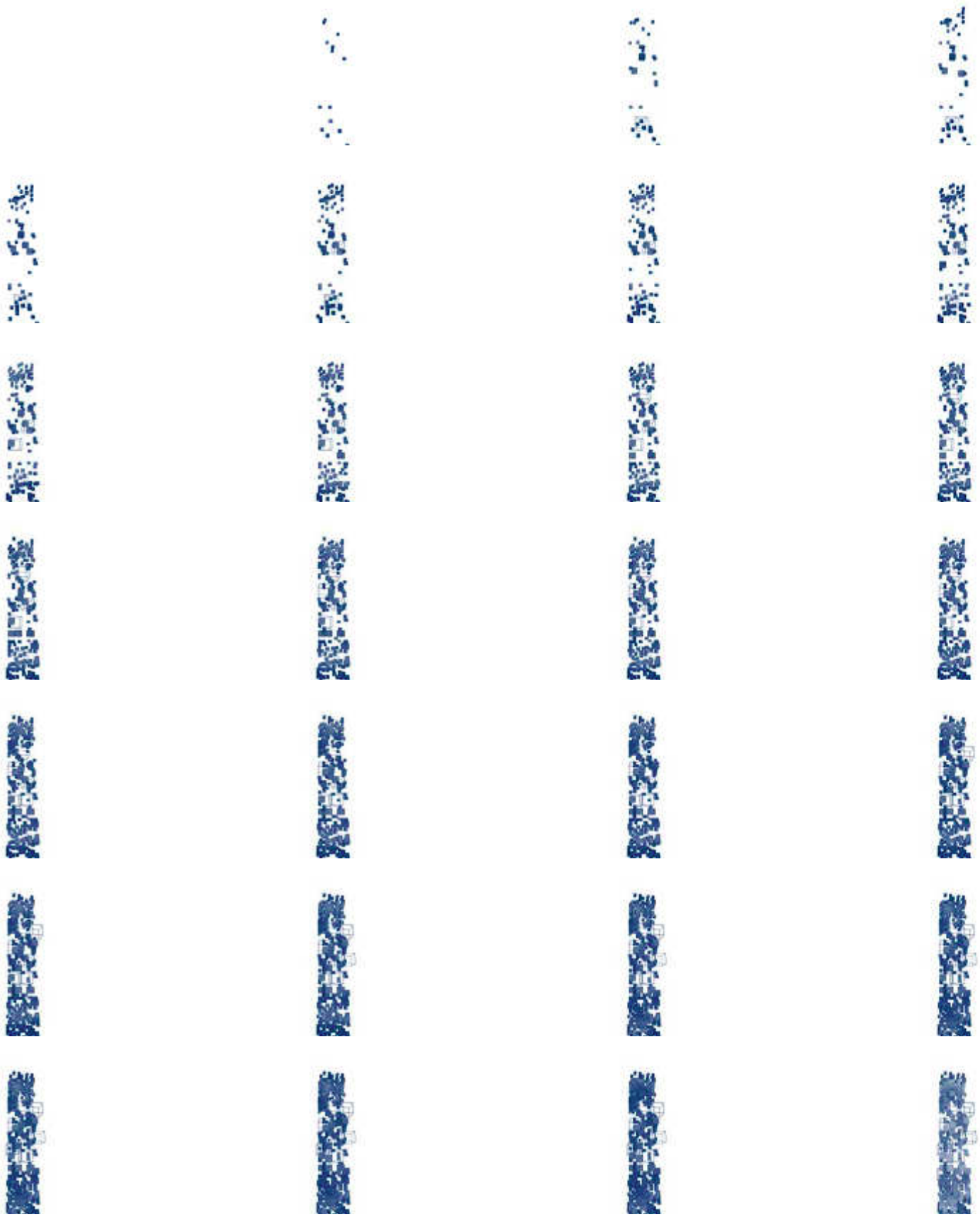




SIZE OF A SINGLE UNIT : 505.6cm
 INPUT METHOD : Numeric
 Mode for 3D city input : Rebuild city
 Topology Setting : Cloud arrangement
 Animation MODE : Urban Growth new
 X Extent units : 37
 Y Extent units : 28
 Z Extent units : 11
 City Grid type : city blocks
 Land usage > 20.849421%
 Count of Urban Dice : 492
 Count of Communal Dice : 16
 Designated Public Spaces : 14
 USED Volume : 195938.77 m³
 Floor Area Ratio : 1.5
 Percentage of the whole volume : 13,3 %
 W:\..\..\2015_10_15_10_54_5_UDI_Definitions.xlsx
 C:\..\..\2015_10_15_10_53_55_data record 3d.xlsxSheet10

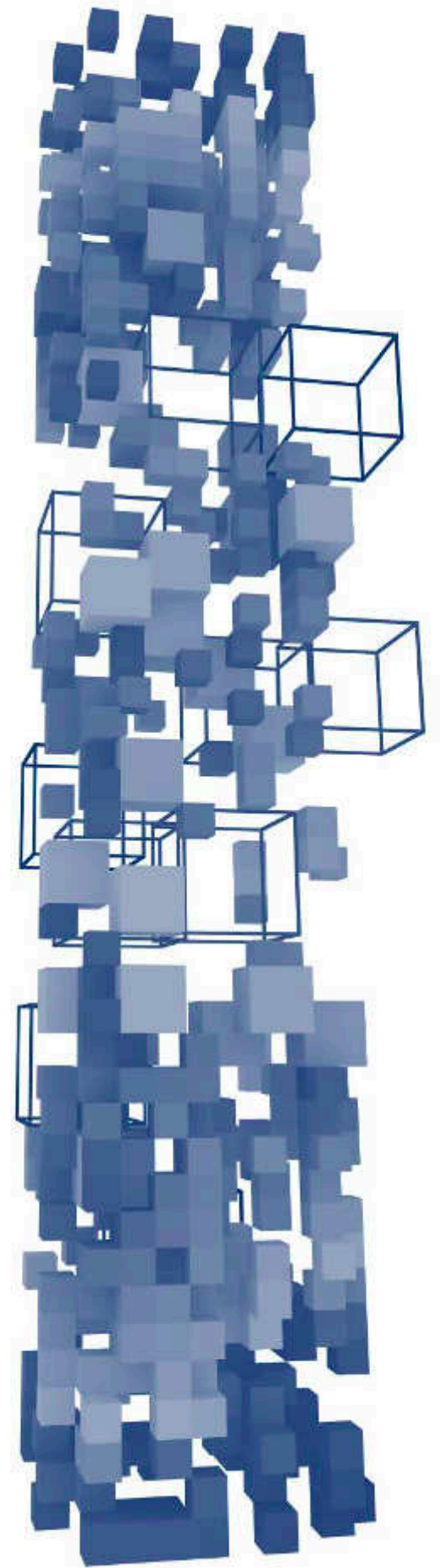
Unit size	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Scale	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Count of holes (Best with four)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Four(True)/One(False) Pin	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE
Type of production	2	2	2	1	0	3	0	1	2	1	1	0	2	0	0	2
Height modification	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Facade type	6	6	6	3	1	8	1	2	6	4	2	0	6	0	0	4
Facade empty wall	0	3	0	2	1	10	4	2	0	1	0	2	0	0	3	0
XYZ Coordinates	{11628.8, 11628.8, 1516.8}	{8595.2, 6067.2, 1011.2}	{1011.2, 6067.2, 1011.2}	{11123.2, 10112.0, 1011.2}	{16179.2, 1516.8, 505.6}	{3033.6, 1516.8, 3033.6}	{16684.8, 5056.0, 5056.0}	{505.6, 5056.0, 4550.4}	{13145.6, 12134.4, 4550.4}	{1516.8, 11628.8, 3033.6}	{7078.4, 5056.0, 1516.8}	{1011.2, 10112.0, 3539.2}	{16179.2, 10112.0, 0.0}	{16179.2, 10112.0, 3033.6}	{17696.0, 2528.0, 3539.2}	{10112.0, 10112.0, 4550.4}
Colour	(115,14,53)	(212,179,93)	(93,101,159)	(204,171,83)	(233,202,122)	(240,211,134)	(178,144,54)	(49,58,123)	(222,190,107)	(62,71,135)	(175,141,51)	(242,212,134)	(240,211,134)	(101,108,166)	(238,207,128)	(208,175,88)



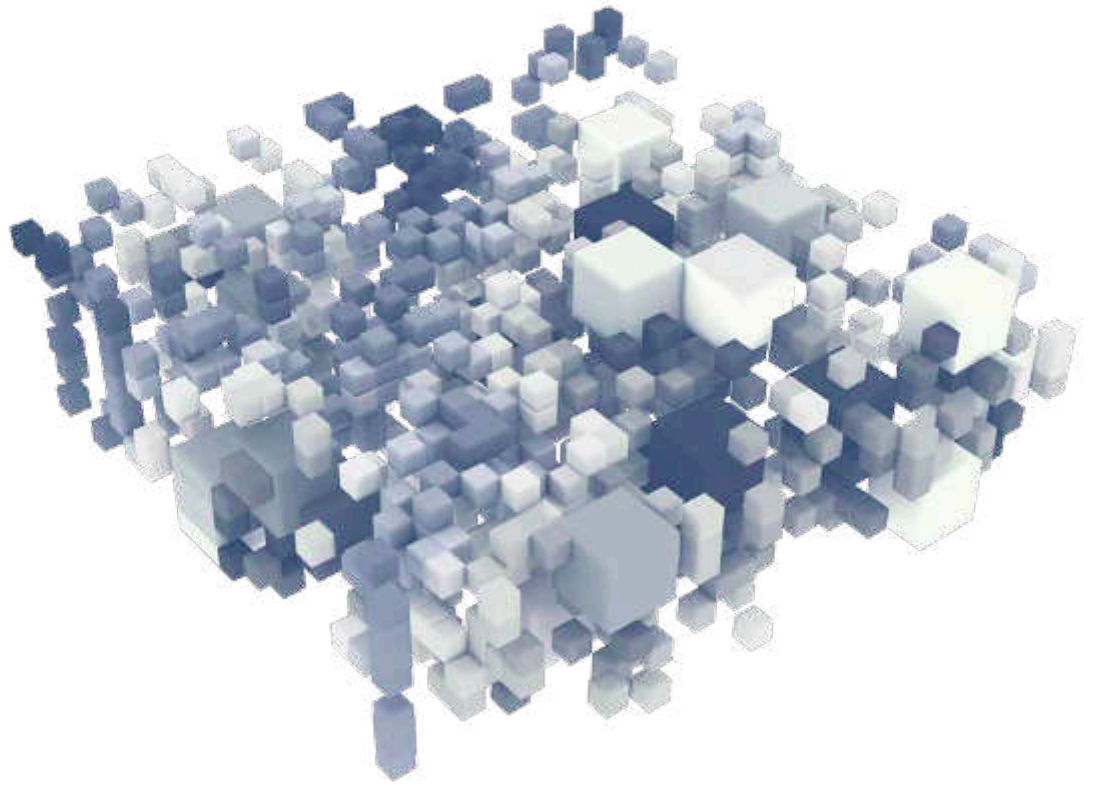
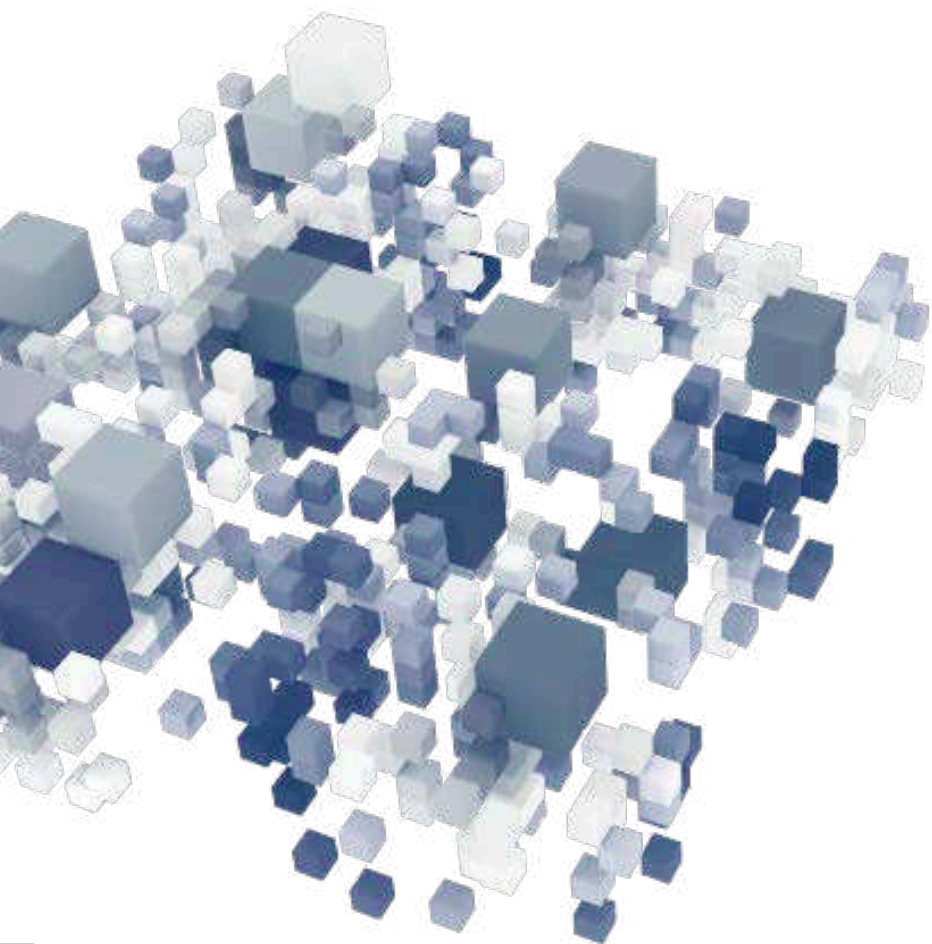
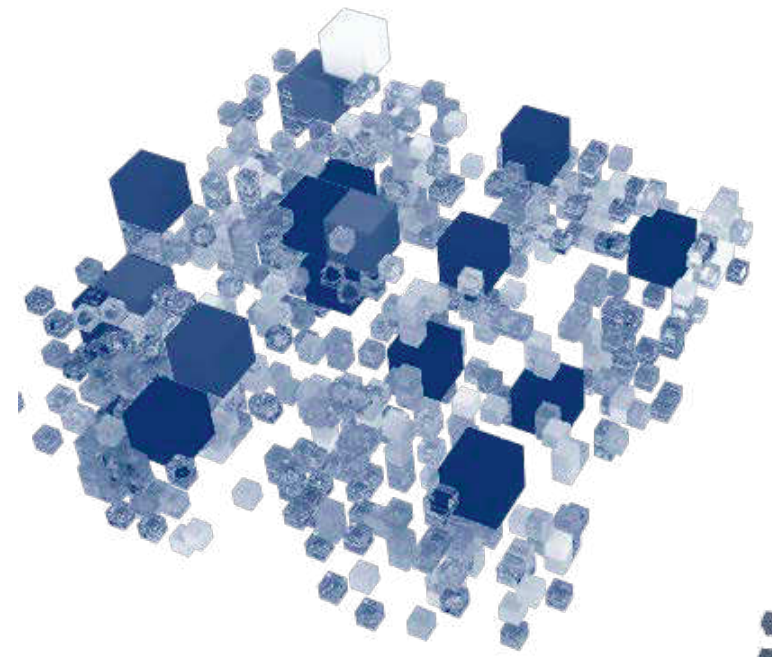
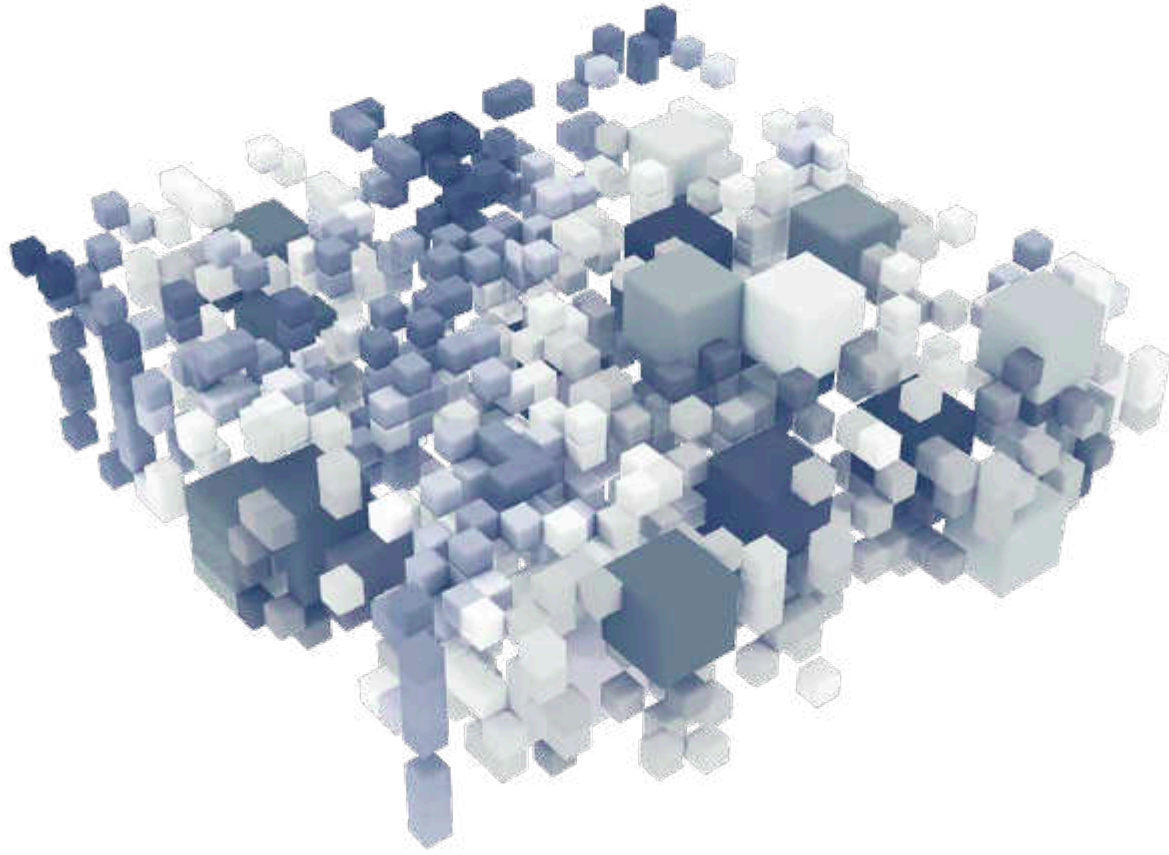


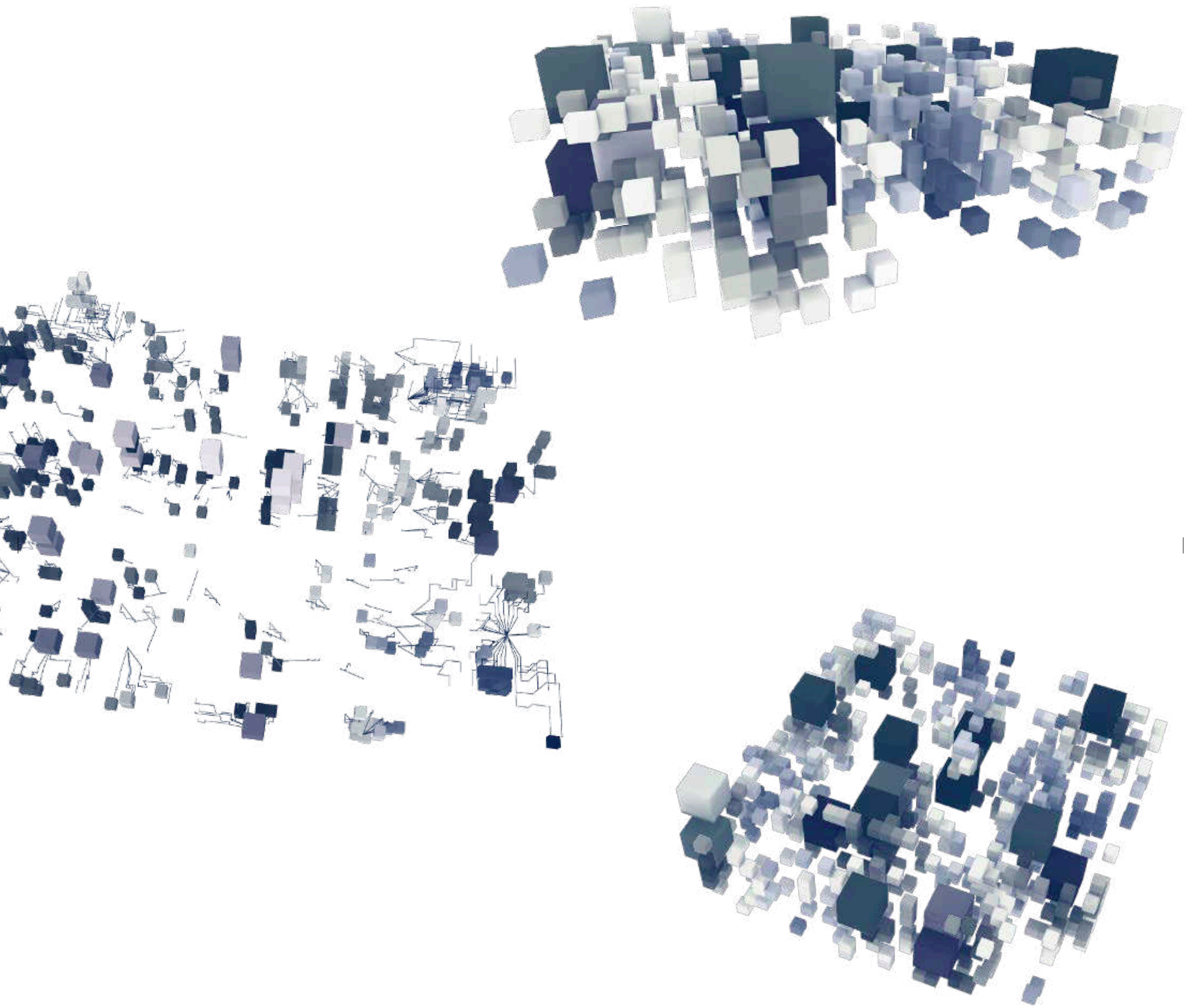
SIZE OF A SINGLE UNIT : 505.6cm
 INPUT METHOD : Numeric
 Mode for 3D city input : Rebuild city
 Topology Setting : Cloud arrangement
 Animation MODE : Stable from Input
 X Extent units : 11
 Y Extent units : 10
 Z Extent units : 50
 City Grid type : city blocks
 Land usage > 25.454545%
 Count of Urban Dice : 258
 Count of Communal Dice : 4
 Designated Public Spaces : 7
 USED Volume : 37481.692529
 Floor Area Ratio : 5.272727
 Percentage of the whole volume : 5.272727
 H:\..\..\2015_10_15_1_38_3_UDI_Definitions.xlsx
 C:\..\..\2015_10_15_1_33_37_data record 3d.xlsxSheet10

Unit size	2	1	1	1	1	1	1	1	1	1
Scale	1	1	1	1	1	1	1	1	1	1
Count of holes (Best with four)	4	4	4	4	4	4	4	4	4	4
Four(True)/One(False) Pin	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
Type of production	2	2	2	1	0	3	1	0	0	1
Height modification	1	1	1	1	1	1	1	1	1	1
Facade type	6	6	6	3	1	8	3	1	1	2
Facade empty wall	0	0	0	0	0	0	0	0	0	0
XYZ Coordinates	{ 5 0 5 6 . 0 , 4 0 4 4 . 8 , 9100.8}	{ 5 0 5 6 . 0 , 4 0 4 4 . 8 , 5561.6}	{ 4 0 4 4 . 8 , 1 0 1 1 . 2 , 10112.0}	{ 4 0 4 4 . 8 , 1 0 1 1 . 2 , 10112.0}	{ 5 0 5 6 . 0 , 4 0 4 4 . 8 , 8595.2}	{505.6, 1011.2, 11628.8}	{ 5 0 5 6 . 0 , 4 0 4 4 . 8 , 8595.2}	{505.6, 1011.2, 11628.8}	{ 4 0 4 4 . 8 , 4 5 5 0 . 4 , 5056.0}	{ 4 0 4 4 . 8 , 3 0 3 3 . 6 , 21740.8}
Colour	(:198,101,139)	(:130,97,14)	(:87,63,0)	(:158,124,36)	(:173,139,49)	(:131,98,15)	(:7,13,60)	(:7,13,60)	(:41,50,115)	(:129,96,14)

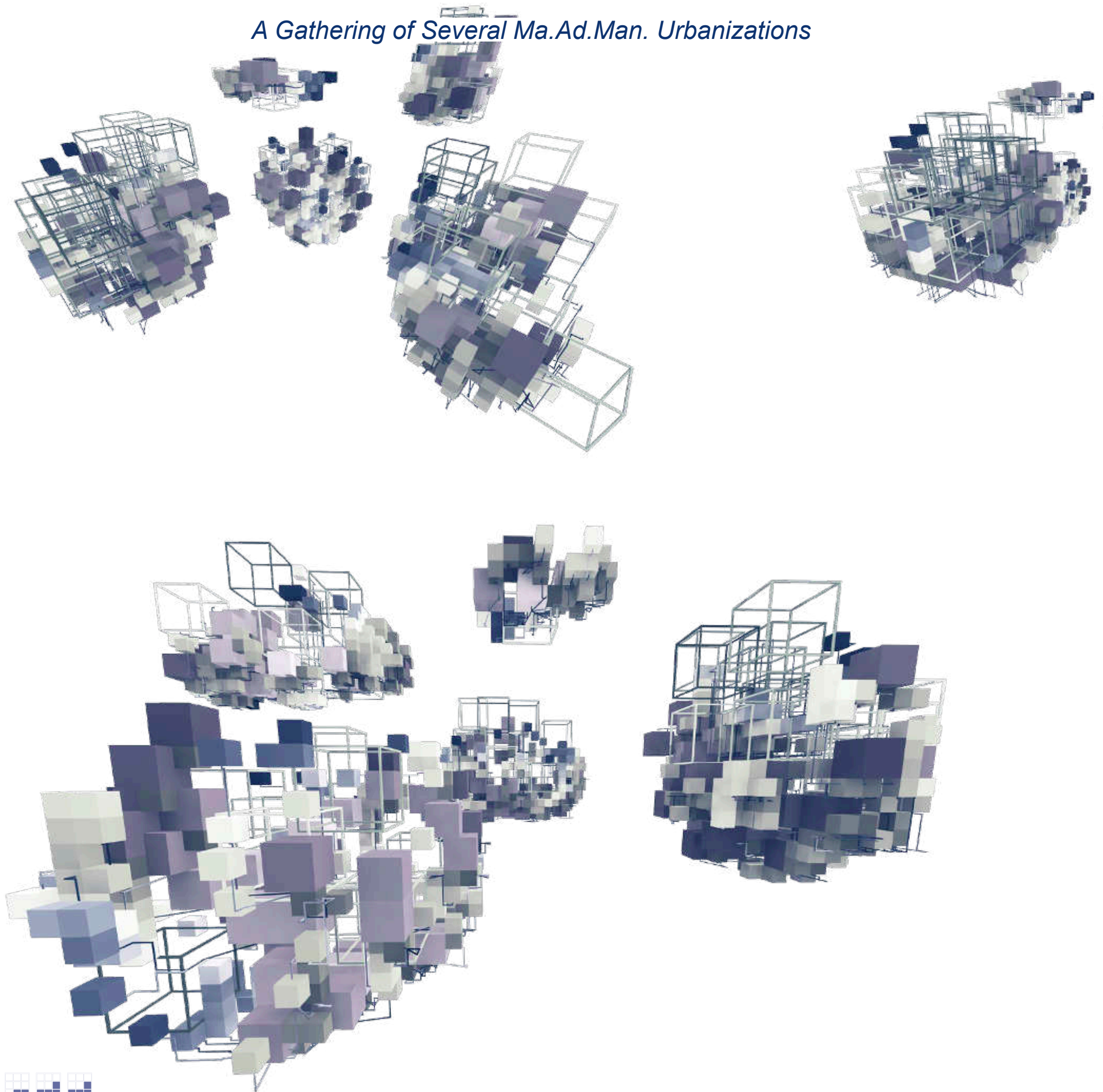


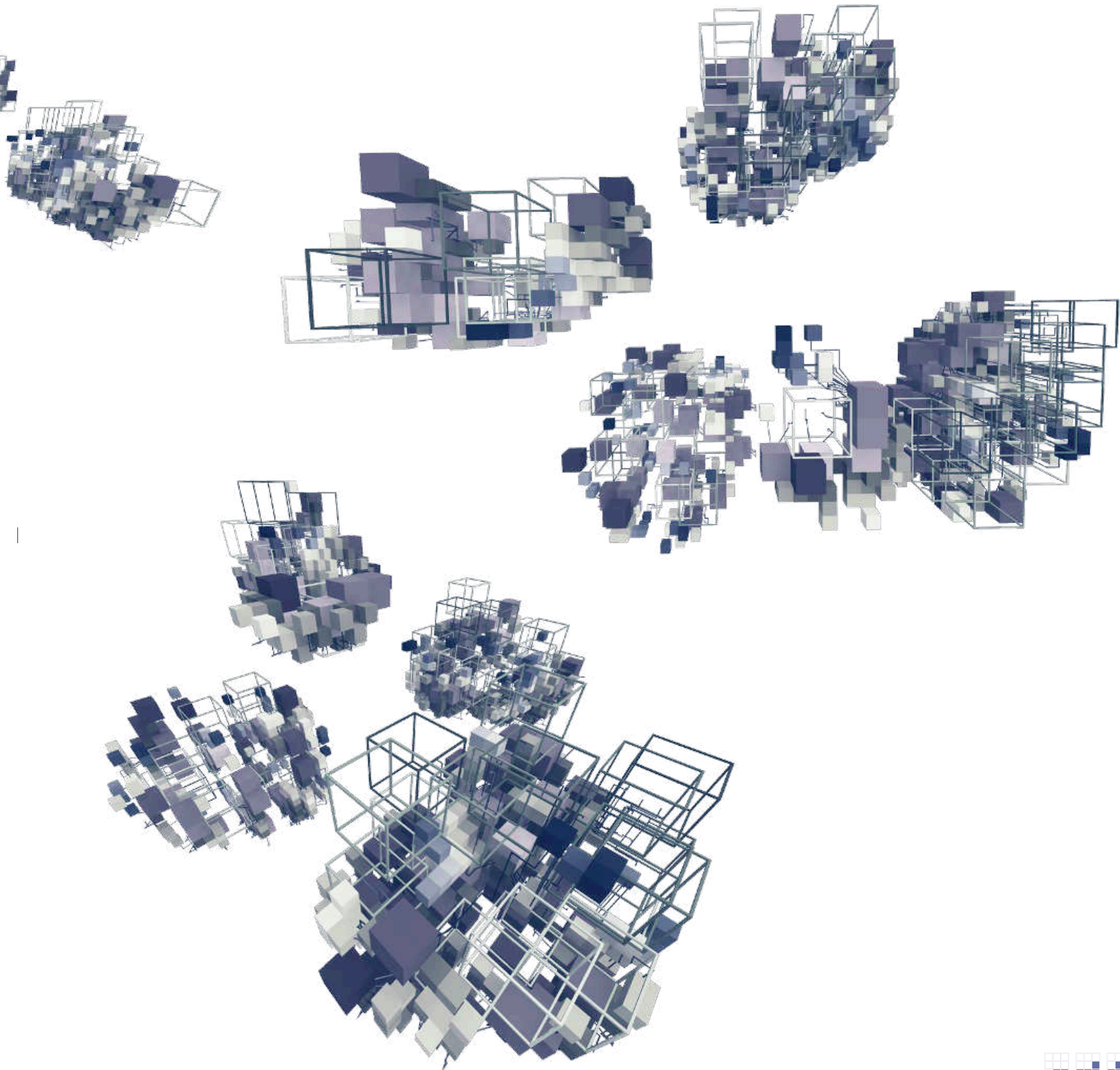
The Evolution of Different Urban Clouds





A Gathering of Several Ma.Ad.Man. Urbanizations

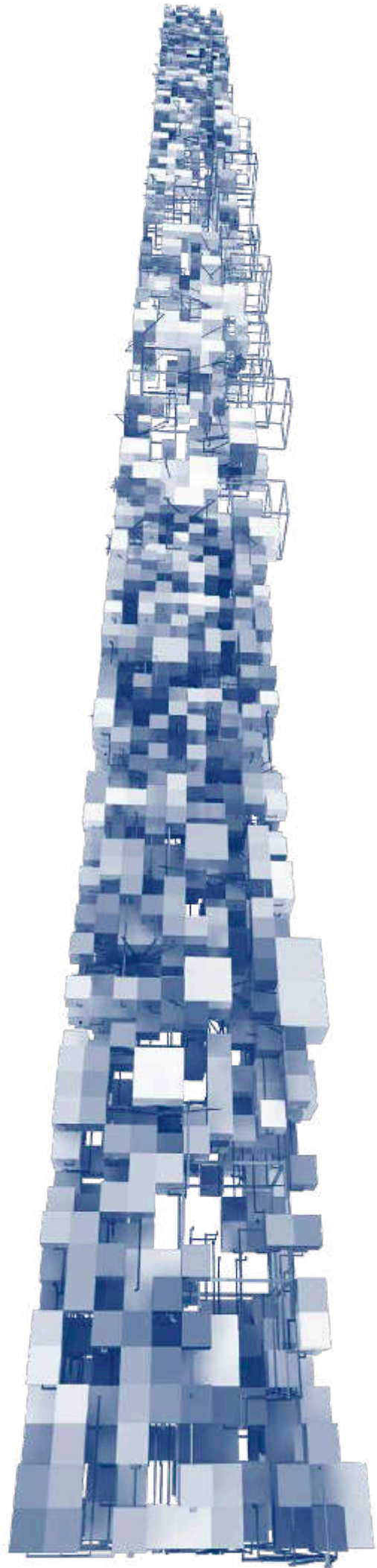




Vertical City-Cloud

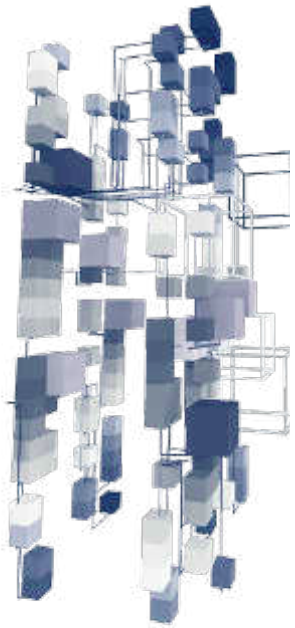
Vertical or horizontal does not matter in space, this generation measures about 200 units and has a total length of 1000 metres.



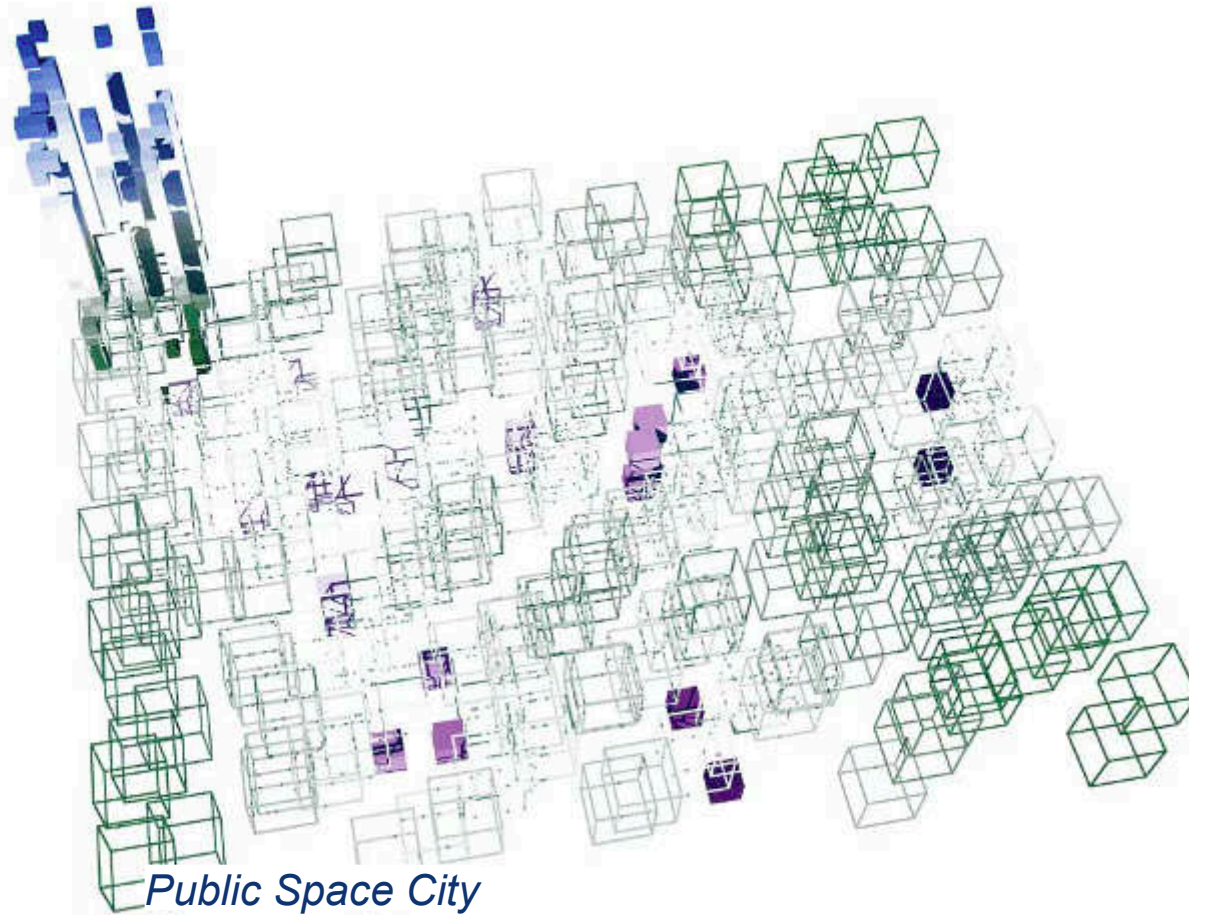


Utopian's Excitement in Experimenting

From the public space only city to a well organized and optimized cloud, towards heavily dense structures already turning into dystopia.



Vertical Growth

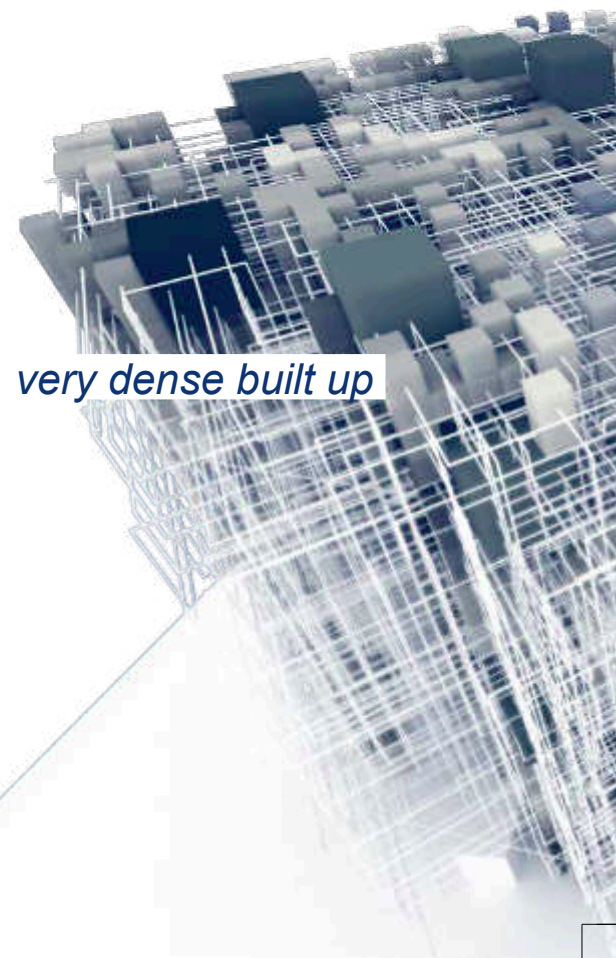


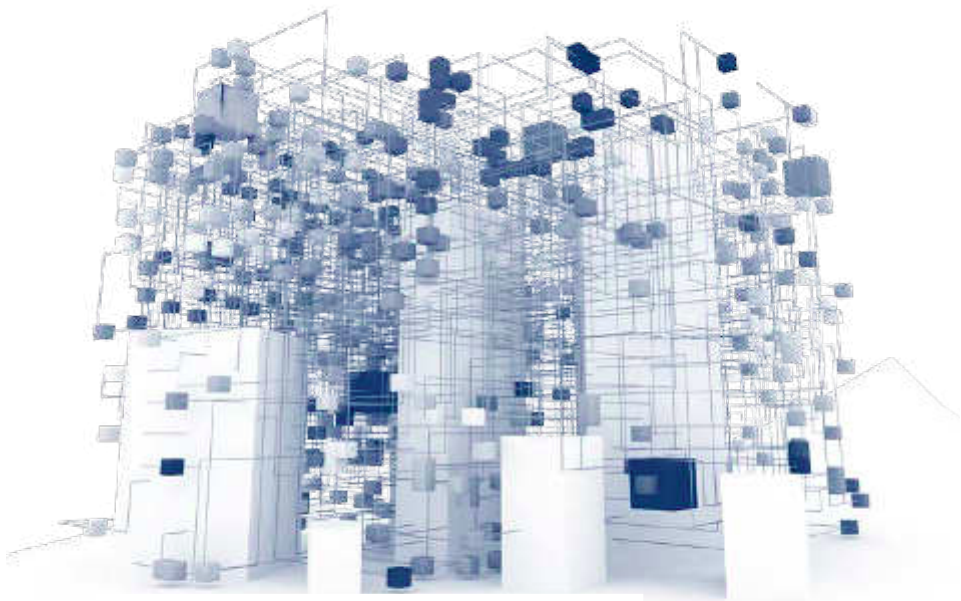
Public Space City



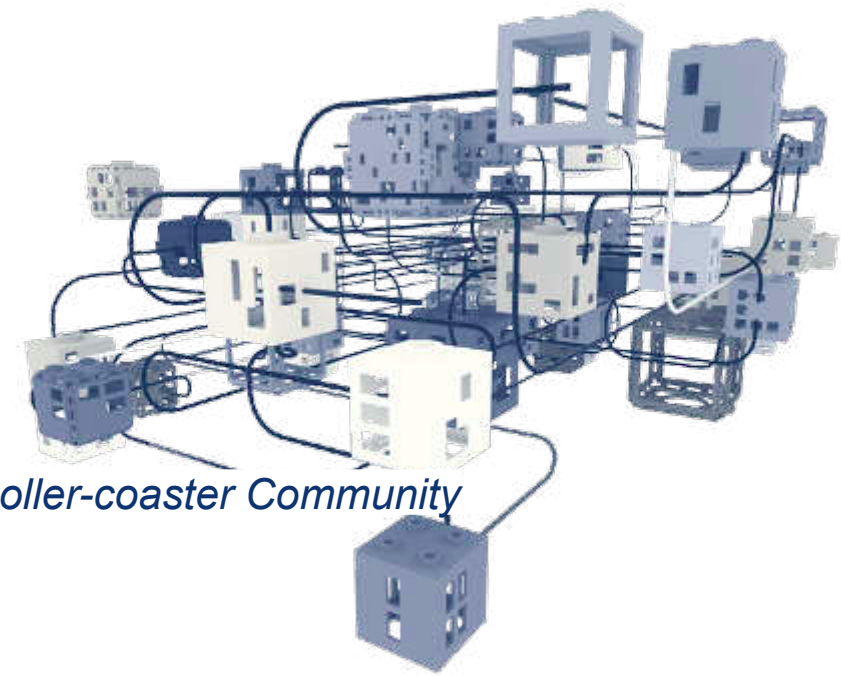
*Some
were
bored*

Dense network, very dense built up structure.

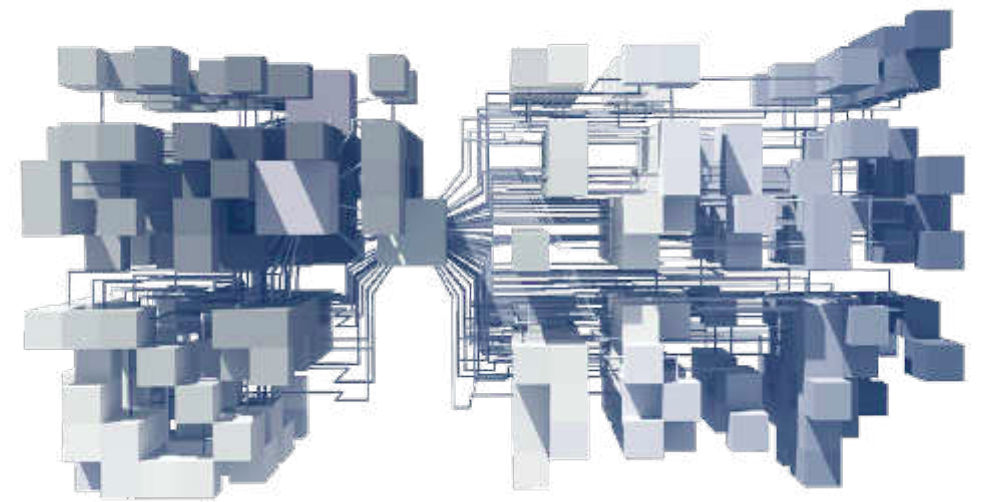




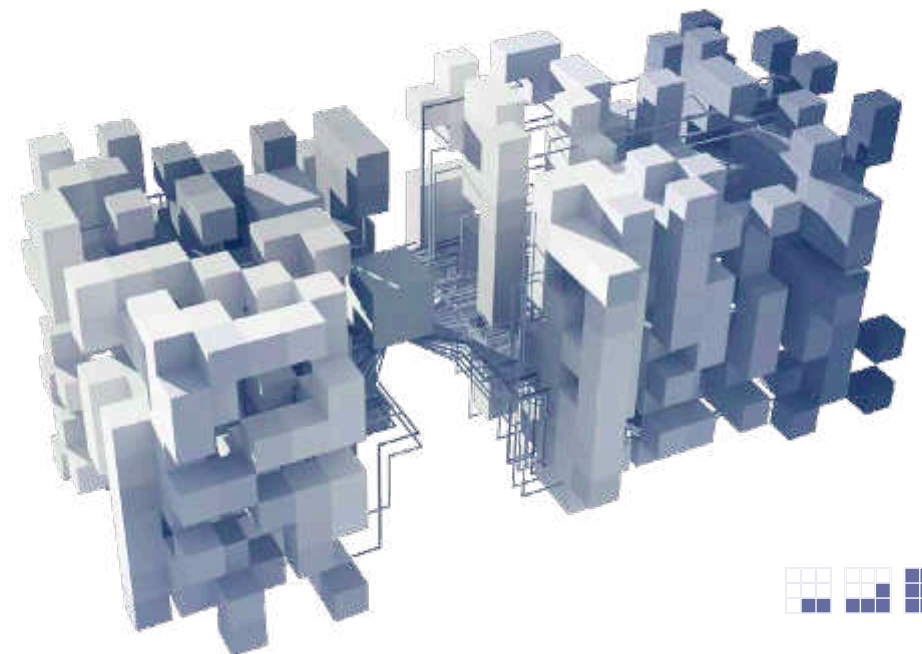
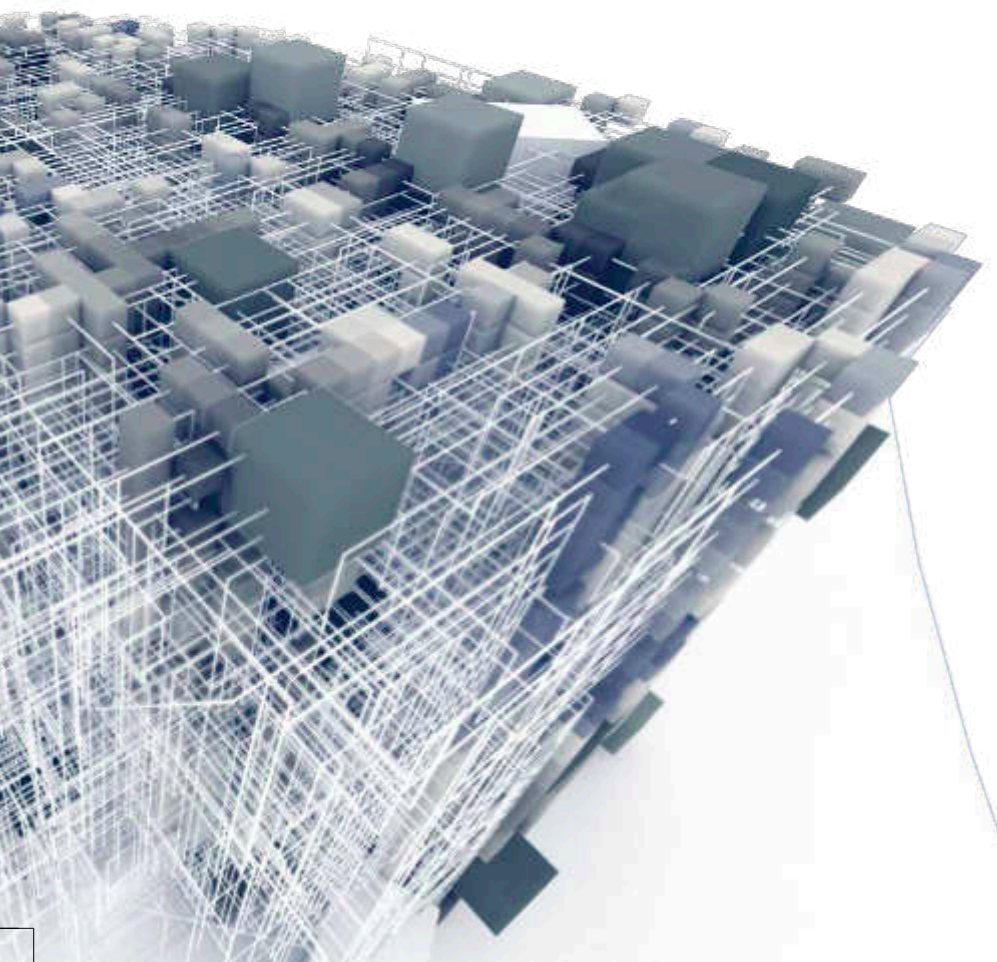
Utopian's span an optimized network into an existing city



Roller-coaster Community

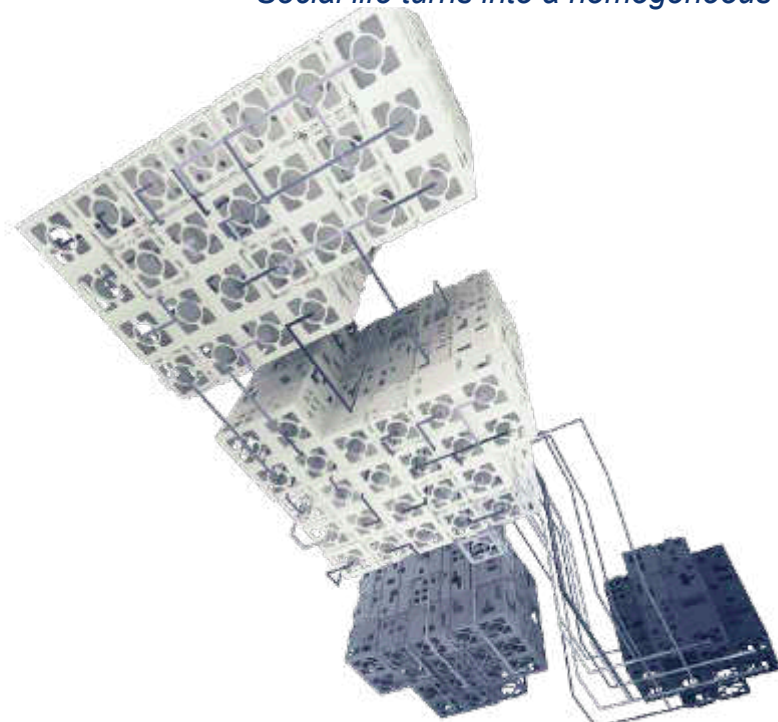


Core City

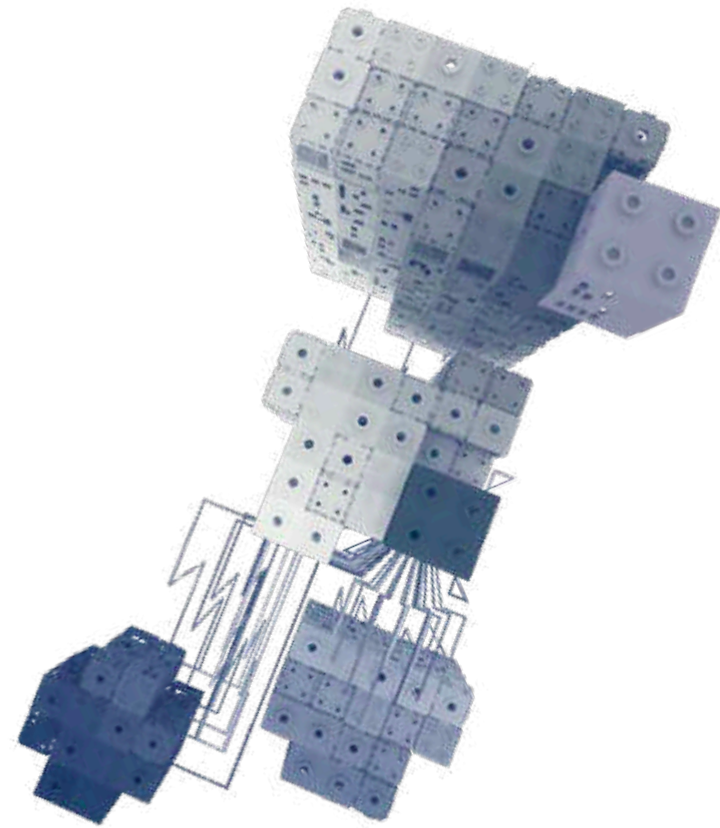


Also, Mega Blocks Might Occur

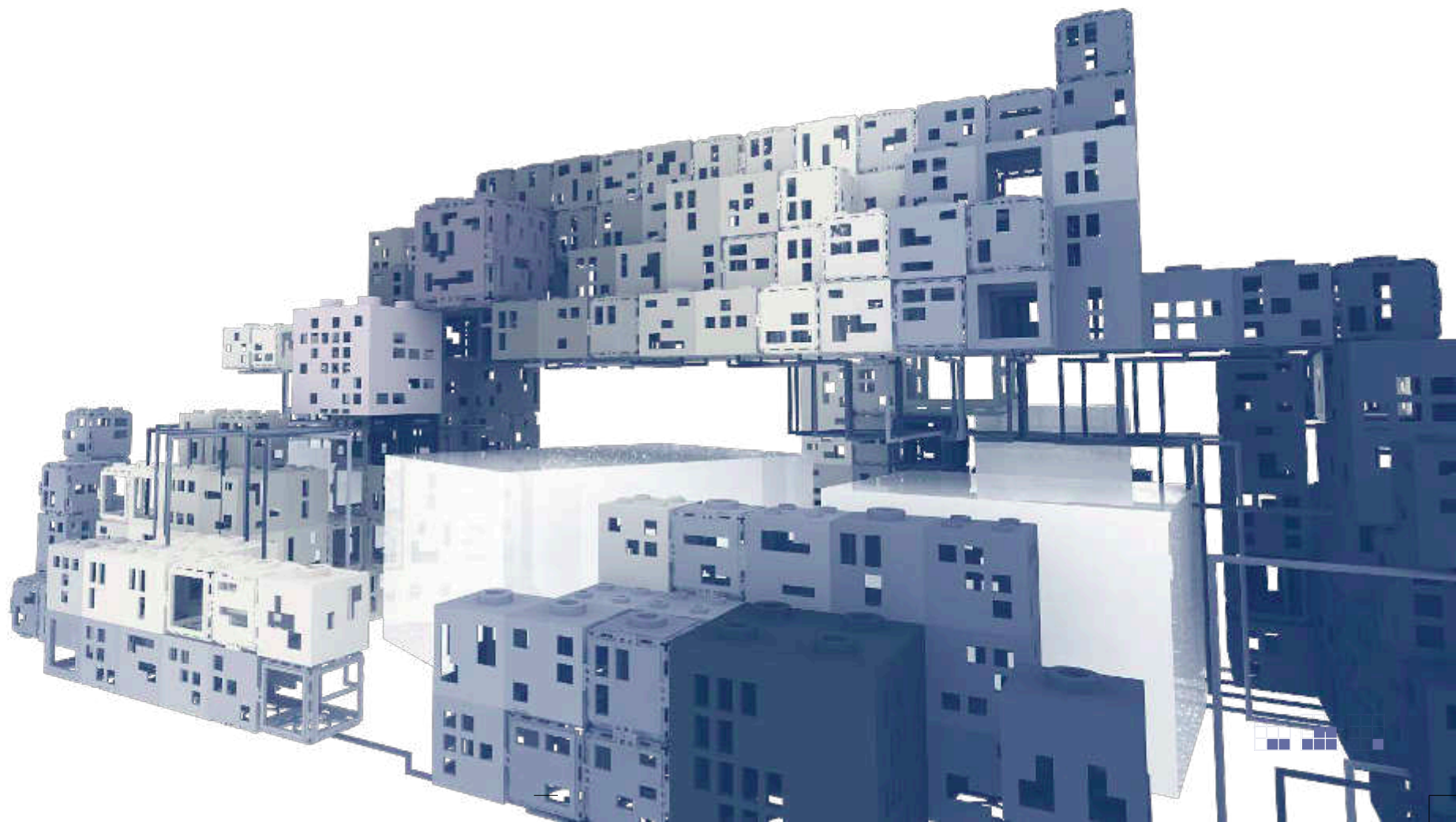
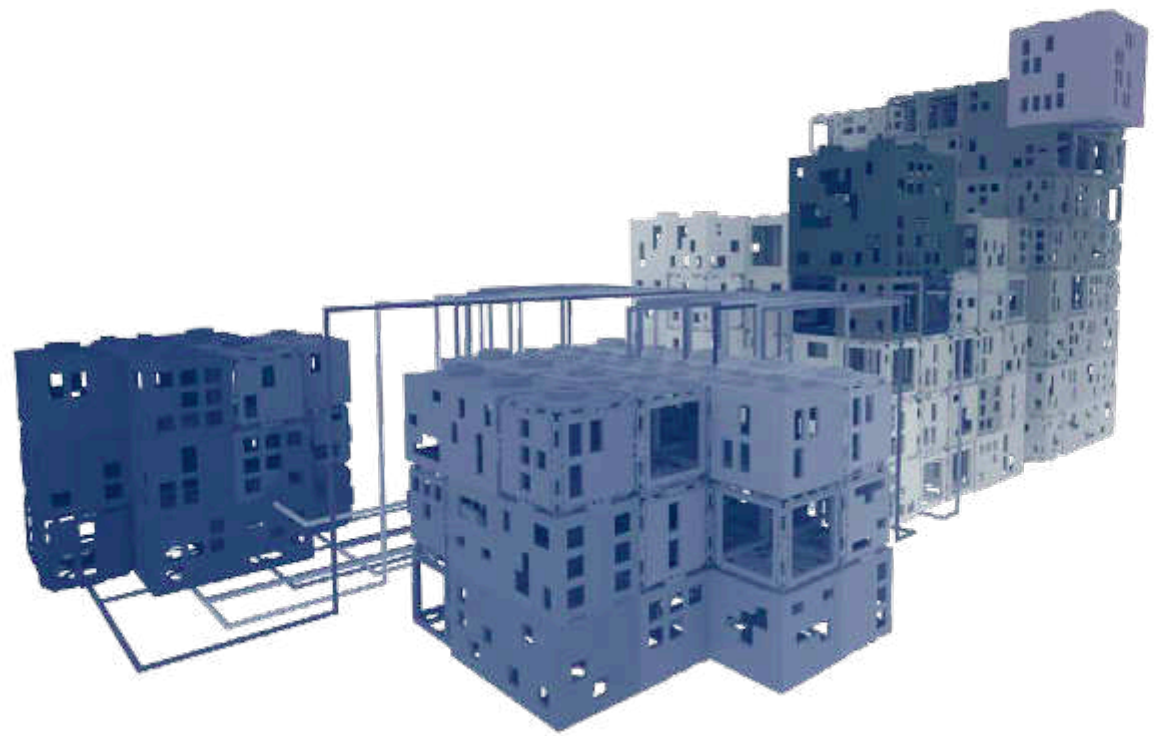
Social life turns into a homogeneous structure.



About 1270 Dice



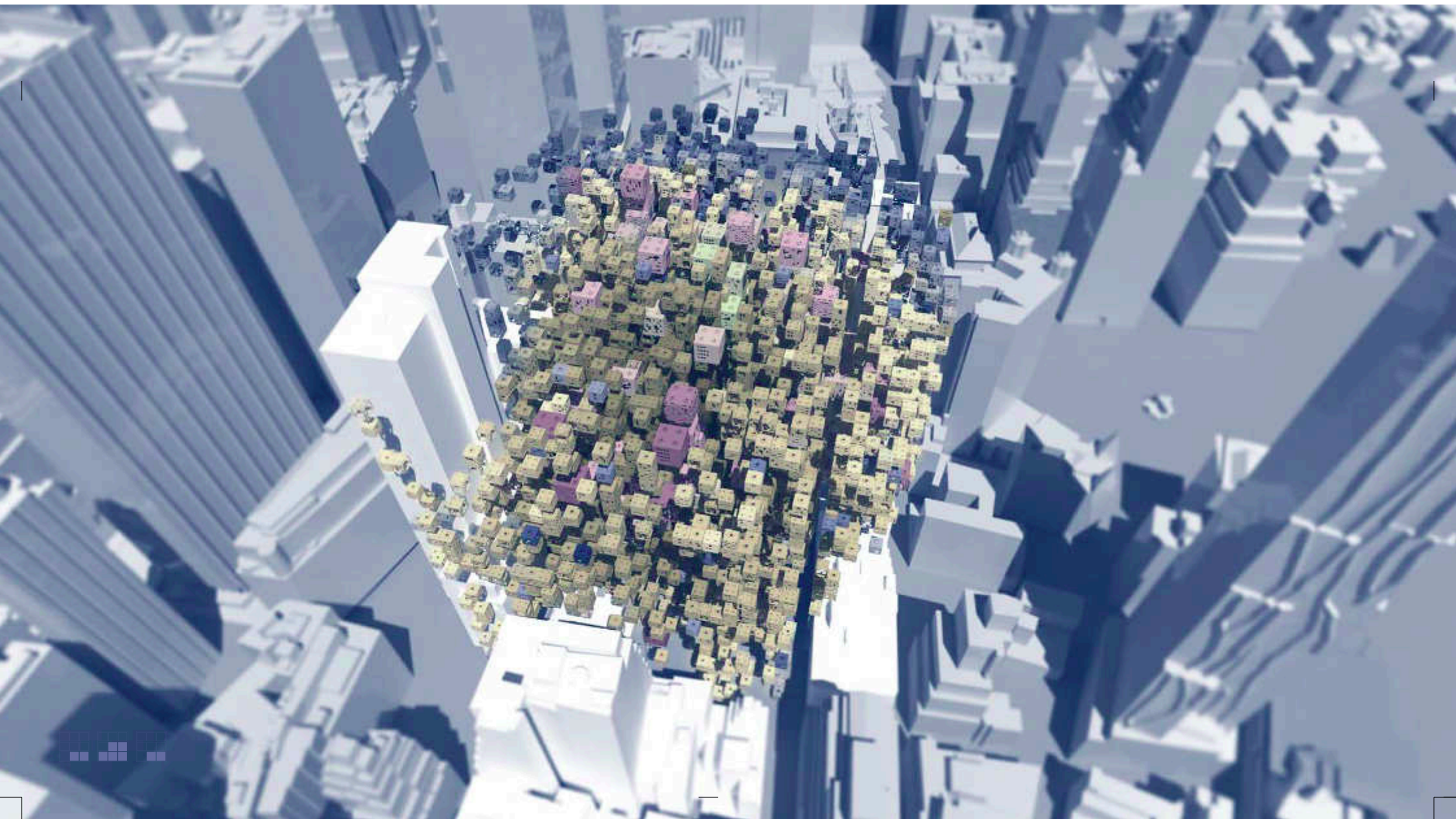
About 1000 Dice



Movement of Ma.Ad.Man into Existing Cities

In this case New York City, in the back the World One Trade Center

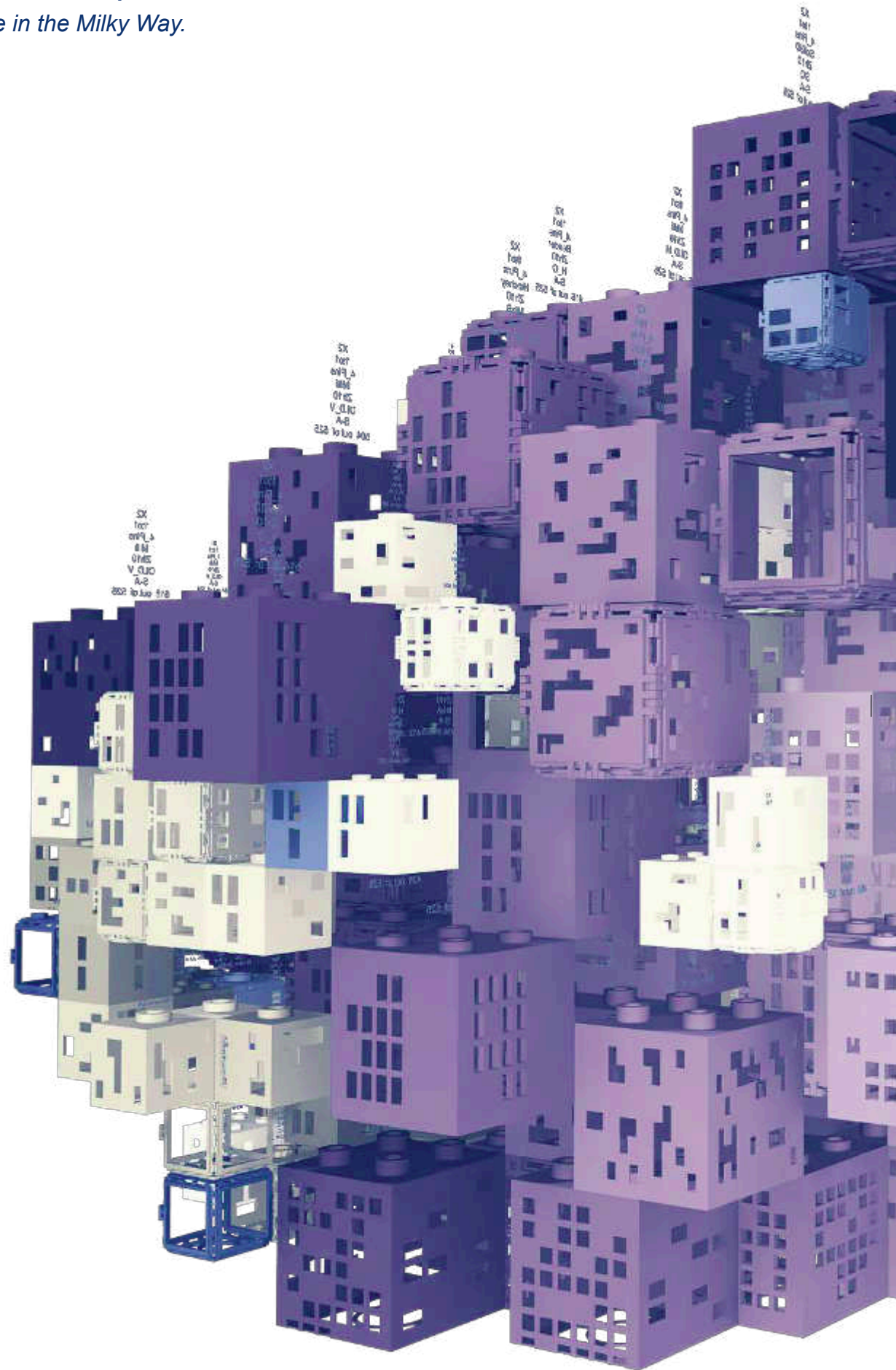
About 5 to 10 thousand dwellers (Utopians) seek there chances in New York. A proper densification of low risen areas in downtown Manhattan.





Ma.Ad.Manians Make New Space Accessible

Not to far from Earth somewhere in the Milky Way.



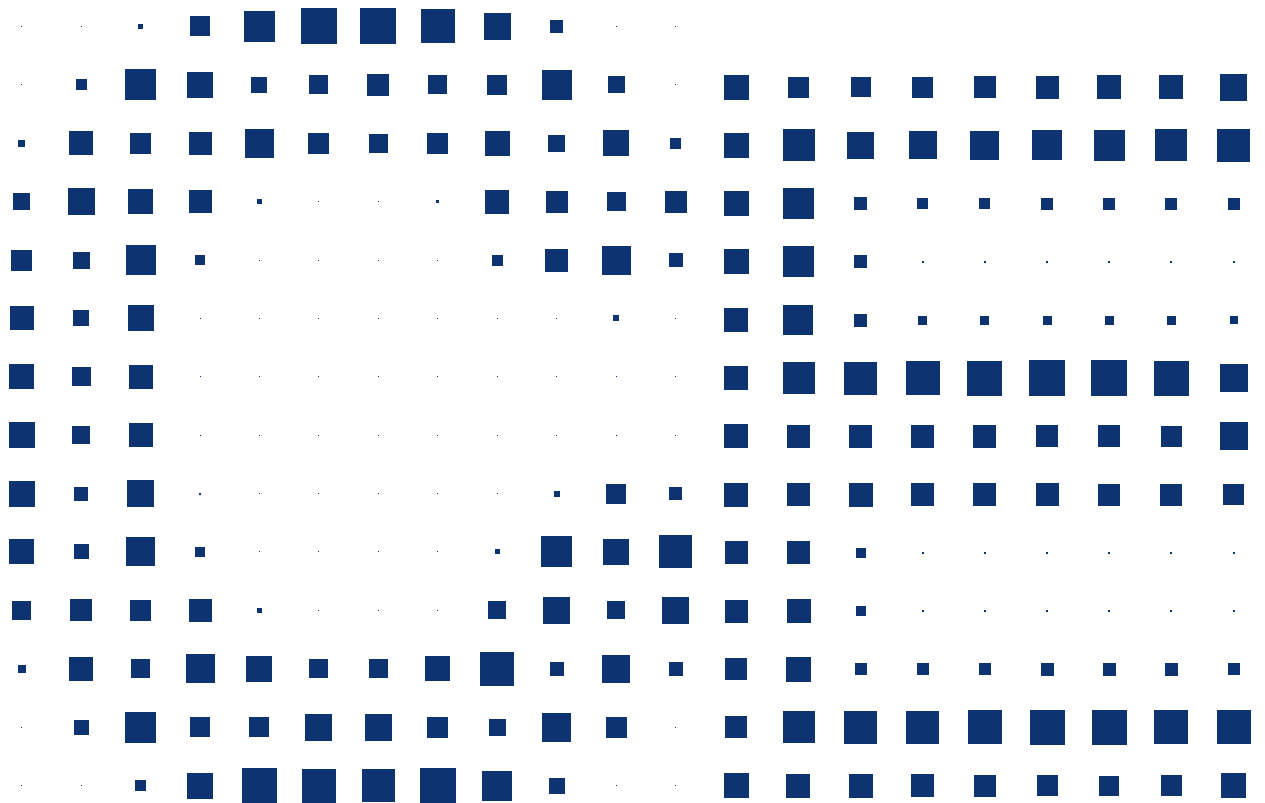
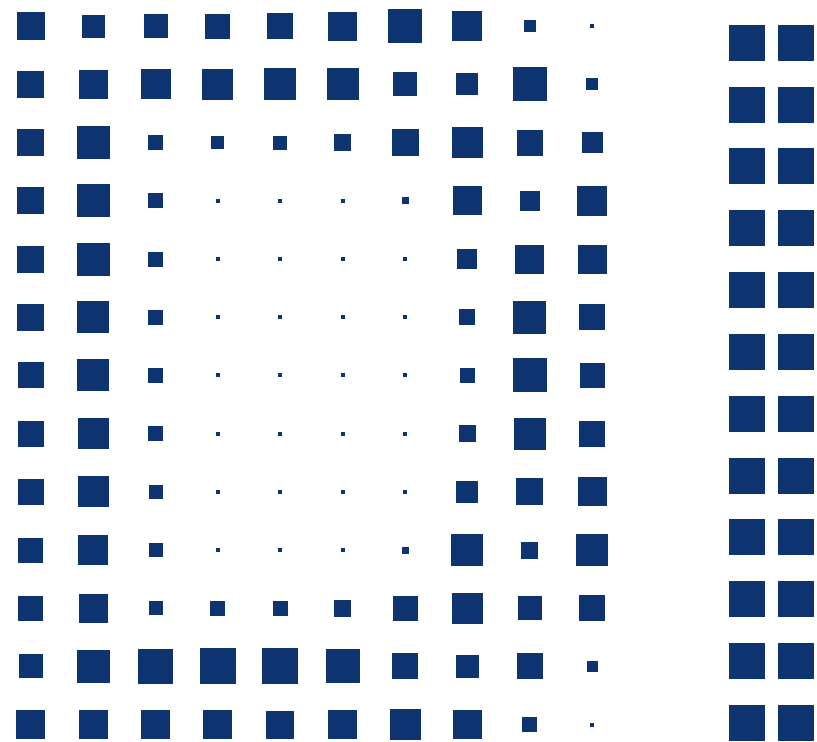
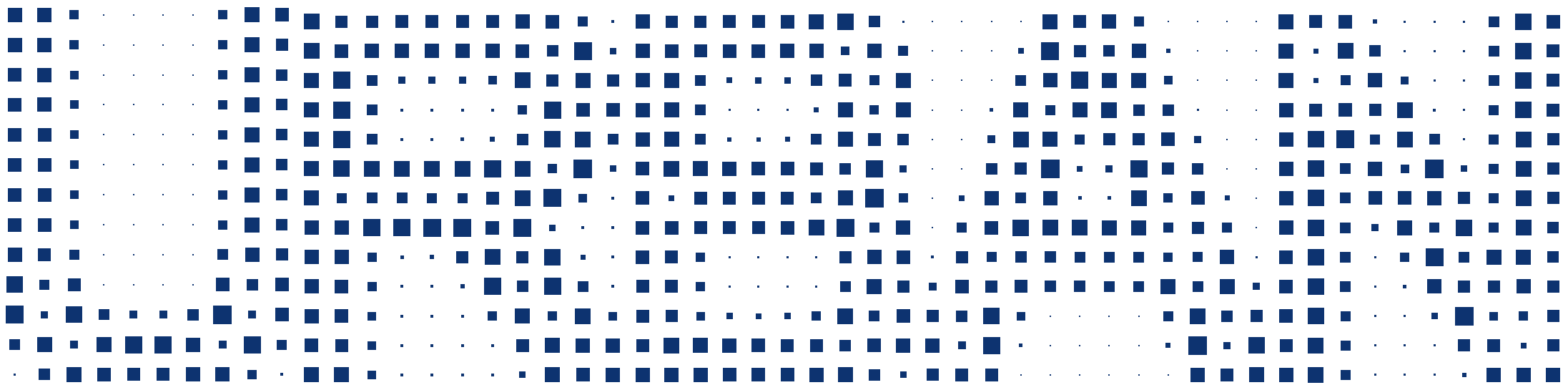
300 Rendering by author; Source
background image, <http://www.eso.org/public/images/eso0932a/>, 2015
10 26





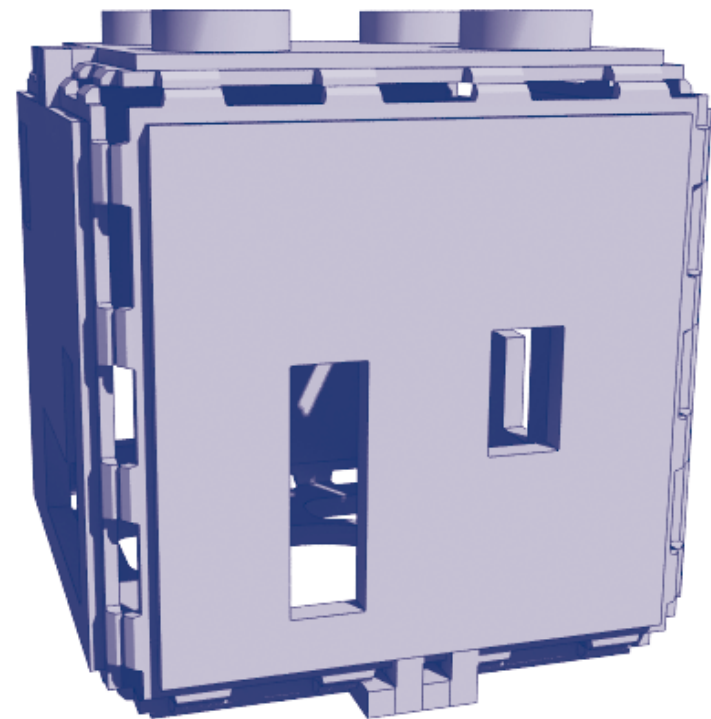
u3

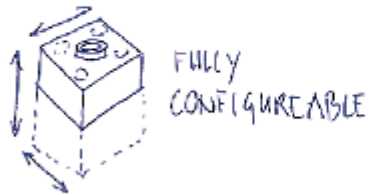
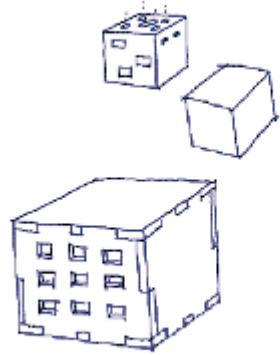
As Simple as a Cube is



Fold-Able, Stick-Able, Print-Able, Share-Able, etc. ...

The idea for the Urban Dice came after I printed a fold-able cube as a little New Years Present. Later it was followed by the idea that a fold-able Lego like cube would be a interesting way to build models of entire cities.

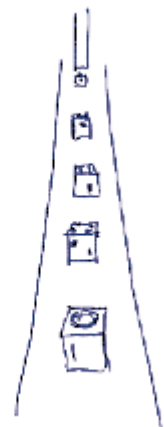




technical solutions

RAPID PROTOTYPING
individualised

↓
individuality
for each



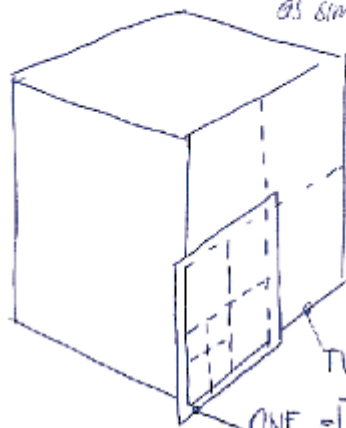
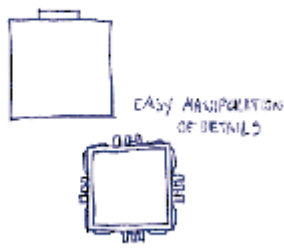
A EXPLORATION OF POSSIBILITIES
RAPID MANUFACTURING
diversity from the conveyor belt



DIFFERENT PRODUCTION TYPES

URBAN DICE

as simple as a cube

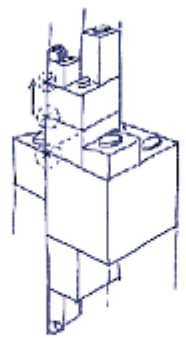
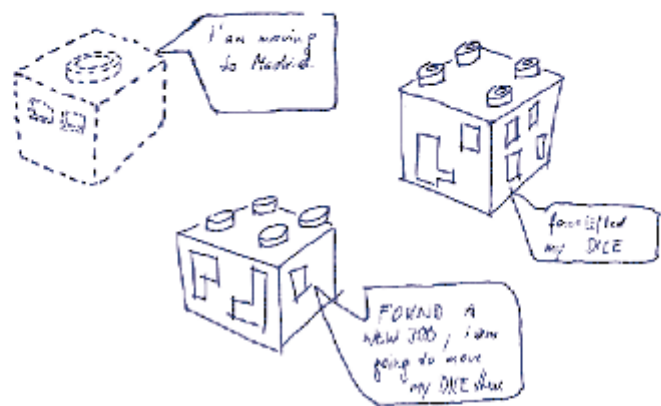


THE STANDARD URBAN DICE, THE SAME AMOUNT OF SPACE FOR EVERY INHABITANT.

$$\text{TWO} = [505,06 \times 2]^3$$

$$\text{ONE} = [505,06 \text{ centimetres}]^3$$

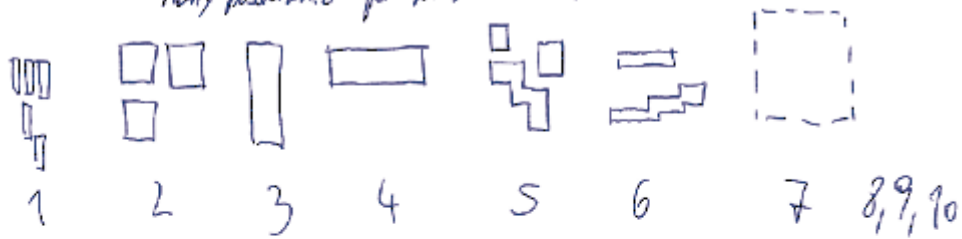
$$\text{HALF} = \left[\frac{505,06}{2} \right]^3$$



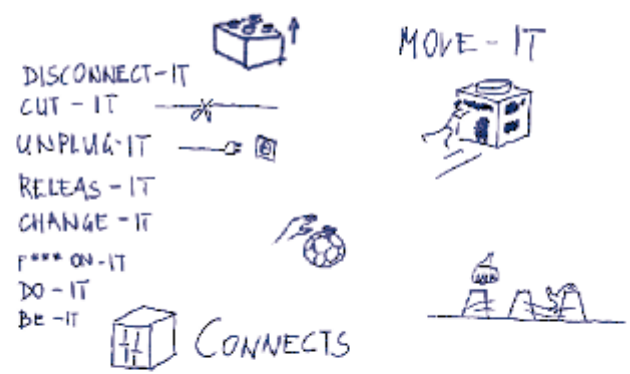
▲ up- and downwards compatible

IT IS ABOUT ENCOURAGING PEOPLE FOR PARTICIPATION FOR A DIVERSE URBAN SURFACE.

Many possibilities for WALL OPENINGS



SIMULATION OF DIVERSITY



IT - IS UDI - IS URBAN DICE
- IS IT -



Diversity and Inspiration

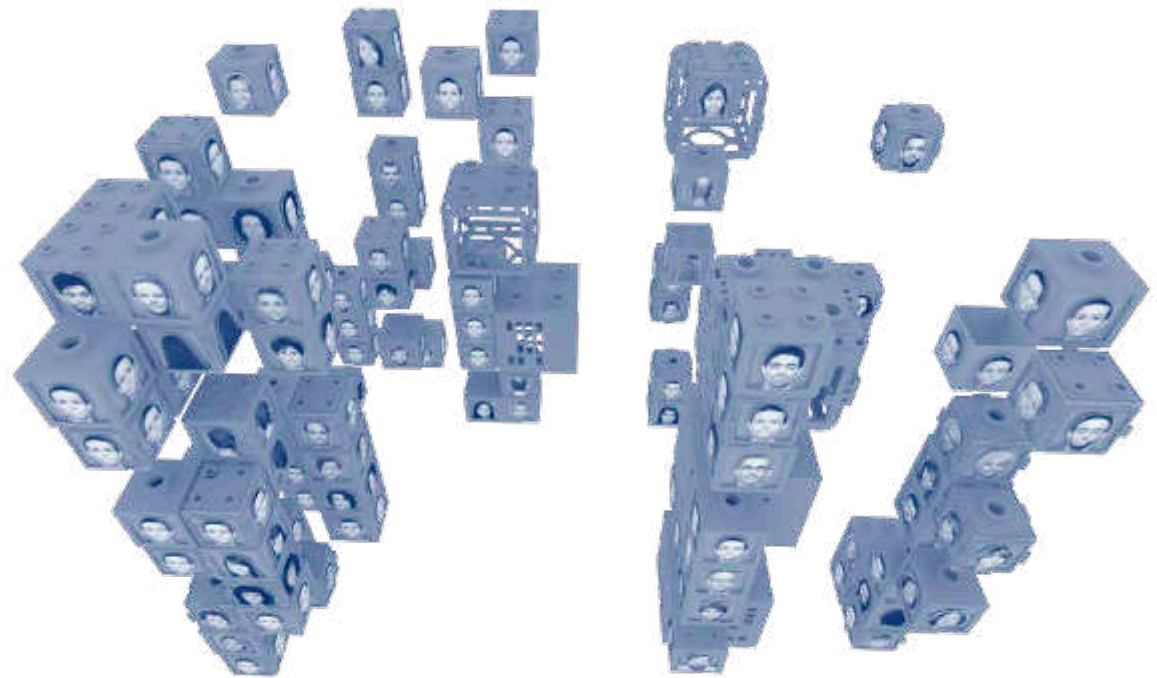
The mass production of diversity.

A city is usually recognisable by its built up structures, the urban design and architecture, all the individually designed buildings, with often different surfaces.

Every human has a unique face and distinct features, this brings up the idea to have a city with as many unique surfaces on the built up structure. Urban Dice generates these unique surfaces for each unit in Ma.Ad.Man. Utopia. Resulting in a urbanity with as many different surfaces as people who live in this urbanity.

To finally realize this paradigm of entire uniqueness for each persons space, I developed a series of tools and script elements, which will be introduced and explained on the following pages.

Behind this idea of uniqueness stands the idea to encourage an average person to participate in the shaping of “Urban Surfaces”, Urban Dice shows this possibility, and every one can actually print these very personal dice in 3d, making the first step in participating in urban development.



301 *The Urban Cloud gets as many surfaces and people reside in the Cloud, “Unique Faces For Each Dice”*

In Ma.Ad.Man. Utopia the Urban Dice is of the highest value, the right to your space, the personal space of an individual, it is given to every one at the moment of birth. A unshaped and rough unit that will be used from the parents during the period of growing up. With the age of 15 the die is entirely the space of the grown-up Ma.Ad.Manian. The dice can be put anywhere, totally to the choice of the owner. This space and Urban Dice is totally bound to the life of its owner. So to say, every persons urban die is finally every ones “coffin”, it might not be necessary to get buried in your die, but to keep the balance it will be disassembled when no longer in use.



Urban Dice Script

Schemata

TWO WAY INPUT

Input with an excel spread sheet
or
Manual input with sliders and values

*.XLS files/lists for automated INPUT can be defined manually with a specified spreadsheet, or can be generated with the URBAN CLOUD.

The manual input is made directly in the script. It allows the user to see the changes live in the Rhino 3D view port.

General CONTROLS

Manipulation for 3D printing, milling or laser cutting

Saleable script basis that allows choice between 256 scale variations

Size One = 1 to 1 = 505,6 cm
Half size = 1 to 1 = 252,8 cm
All features remain in scale.

Within this script it is possible to select between five different types for rapid manufacturing

They are named after their features. Bender, Hinchey, Milli, Soli3D, etc.

Wall openings for the urban dice can be chosen from 12 different setups, each setup is randomly arranged

Openings can be horizontal, square, vertical and hav other forms. Defined by numerous random values

Output CONTROLS

Choose between manual or automated output, define file types and destination folders

Multiple OUTPUT Options

To visualize entire Urban Cloud generations and give its surfaces variations and individuality, or to animate the folding of a single Urban Dice.

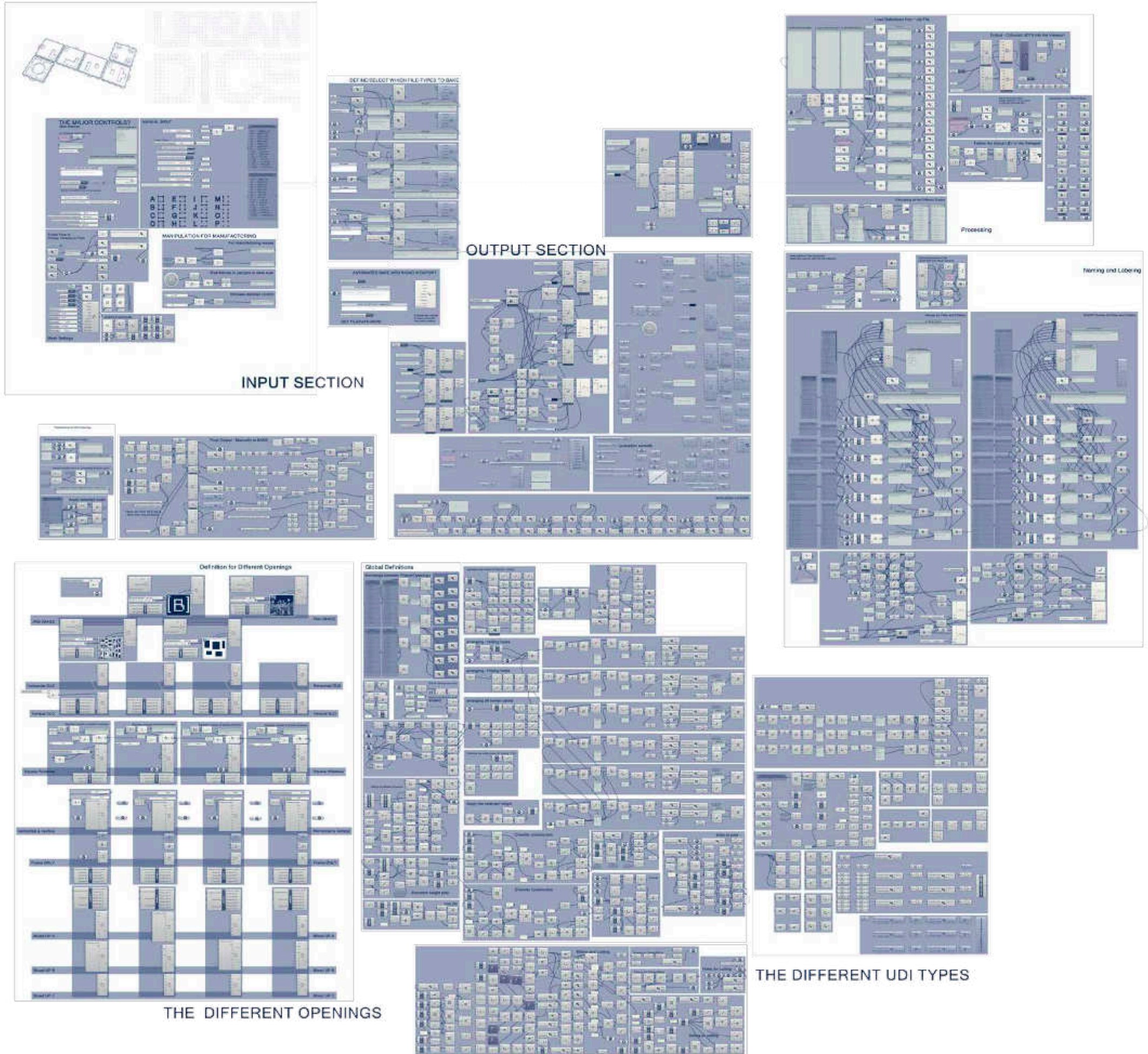
Output for visualization purposes

Output for production purposes

Export to a variation of different file types for rapid prototyping and rapid manufacturing.



Overview



Main Control - Settings

	Description	Options	Value	Short Code	Note
1	Information about the actual configuration	-	-	-	-
2	Initial Size	Numeric, actually any initial Size possible	505,6 cm	-	
3	Choose Input Type	Live Manual Input	True	-	
		*.xls Automated Input	False	-	
4	Path for File Export	any File Path	Text	-	
5	Grasshopper Timer	Allows to set an impulse	Milliseconds	-	Related to 4, Auto Bake
6	Auto Bake	ON/OFF	True False	-	Enables all automated exports, export elements need to be activated, separately (Timer needs to be enabled)
7	Manual File Bake	ON/OFF	True False		Use to activate the export for the currently made settings manually
8	Follow the actually built Urban Die automatically in the View-port	Follow UDI with cam true Don't follow UDI with cam	True False	-	
9	Boolean union built Urban Dice to one Solid	Disable all solid boolean operations	False	-	
		Enable solid boolean operations	True		
10	Pin Height Manipulation	Numeric Slider		-	Has no actual size, set in relation to the actual Urban Die
11	Material Thickness for "Milli" Production Type	Numeric Slider	Millimetre	-	Allows the user to set the thickness of a chosen material
12	Reduction of outer Pin Diameters	Numeric Slider	Percent	-	Adaptation to fit pins and pinholes
13	Increase Hole Size	Numeric Slider	Percent	-	Adaptation to fit pins and pinholes



THE MAJOR CONTROLS? Main Settings

UDI STANDARD DIMENSION IN MM

2016mm

2,500-k

Live Manual Input

Are Windows possible for selected Scale Proportions

OUTPUT PATH FOR FILE EXPORT

\\1020001\000100\00100_00100_1
\\1020001\000100\00100_00100_100
printing\2015_09_15\

True > AUTO BAKE OFF: True

Manual file EXPORT: False

Bakes current definition into a file as selected

FOLLOW UDI WITH CAM

Change to boolean for 3D PRINT: Enable Solid Booleans Operations

Pin Height Manipulation: 2.3

Material Thickness for milling or cutting mm: 280.438

percent shrinkage of outer diameters: 1

adjust hole size: 0.080

Current Configuration

Standard=8322

I-to-I=1

cm-to-mm

full-scale

height: ONE

disc

Settings

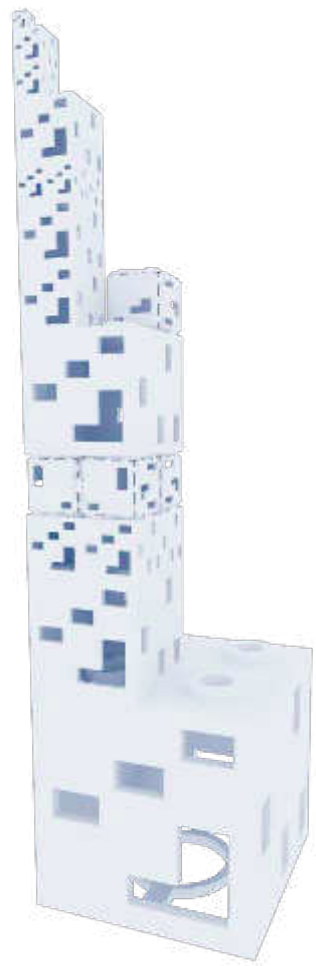
Current Generation...

0.152227, 2

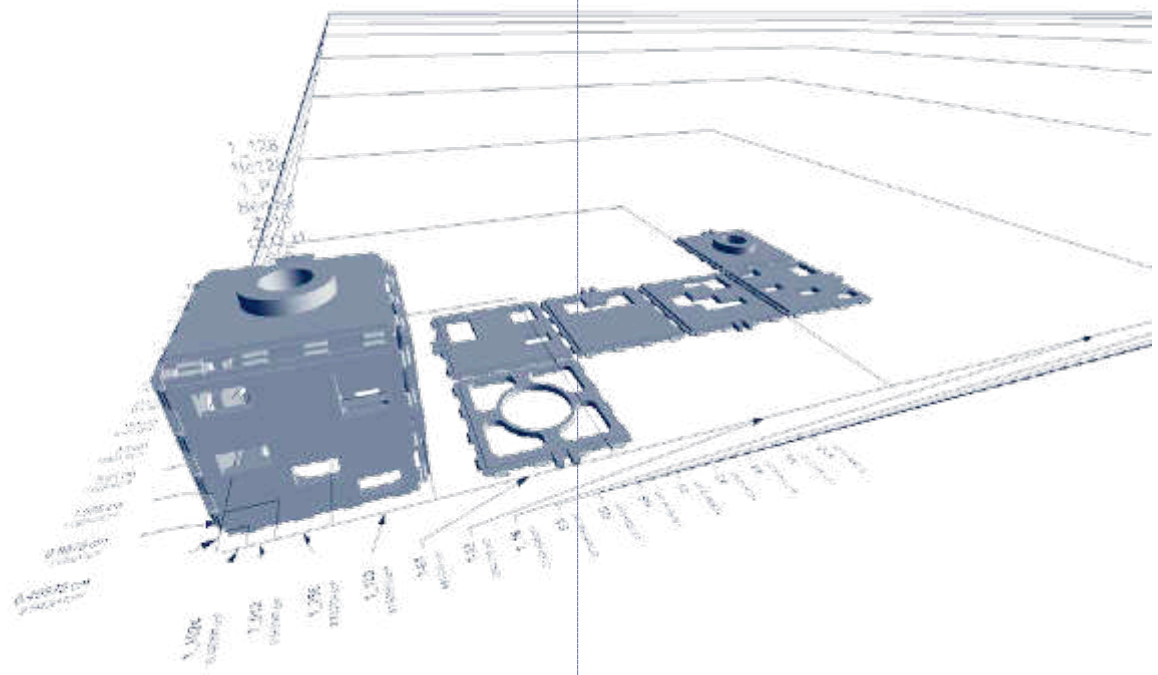
total frame count

Input

0.152227, 2



- 8089.6 cm
0.243789cm²
- 4044.8 cm
0.975166cm²
- 2022.4 cm
3.90625cm²
- 1011.2 cm
15.6025cm²
- 505.6 cm
62.41cm²
- 252.8 cm
249.64cm²
- 126.4 cm
998.56cm²
- 63.2 cm
3994.24cm²
- 31.6 cm
15978.96cm²
- 15.8 cm
63907.84cm²
- 7.9 cm
255631.36cm²
- 3.95 cm
1.0225e+6cm²
- 1.975 cm
4.0901e+6cm²
- 0.9875 cm
1.639e+7cm²
- 0.49375 cm
6.5442e+7cm²



302 The generated Urban Dice in the Rhino View Port

- 1_1024
- 0.120371 cm²
- 1_512
- 0.982987 cm²
- 1_256
- 7.703794 cm²
- 1_128
- 61.62975 cm²
- 1-64
- 483.039 cm²
- 1-32
- 3944.312 cm²
- 1_16
- 31854.498 cm²
- ES
- 262435.988 cm²
- QS
- 2,0185e+6 cm²
- HS
- 1.6165e+7 cm²
- S1
- 1.2926e+8 cm²
- X2
- 1.034e+9 cm²
- X4
- 8.2718e+9 cm²
- X8
- 6.6175e+10 cm²
- X16
- 5.294e+11 cm²



Manual Configuration of Urban Dice Script

	Description	Options	Value	Short Code	Note
14	Unit Size	Sixteen-Times ³ -Larger	16	X16	This is one of the core elements of the Urban Dice Script, it is the base for all different sizes.
		Eight-Times ³ -Larger	8	X8	
		Four-Times ³ -Larger	4	X4	
		Double ³ -Size	2	X2	
		Standard ³ -Size	1	S1	
		Half ³ -Size	1/2	HS	
		Quarter ³ -Size	1/4	QS	
		Eighth ³ -Size	1/8	ES	
		Sixteenth ³ -Size	1/16	1_16	
		1-div-by-32 ³	1/32	1-32	
		1-div-by-64 ³	1/64	1-64	
		1-div-by-128 ³	1/128	1_128	
		1-div-by-256 ³	1/256	1_256	
1-div-by-512 ³	1/512	1_512			
1-div-by-1024 ³	1/1024	1_1024			
15	Scale	16to1	16	16to1	The scale in which the actual configured dice should be generated, in relation to the size, same scale and same size is the Standard ³ -Size in the selected scale.
		8to1	8	8to1	
		4to1	4	4to1	
		2to1	2	2to1	
		1to1	1	1to1	
		1to2	1/2	1to2	
		1to4	1/4	1to4	
		1to8	1/8	1to8	
		1to16	1/16	1to16	
		1to32	1/32	1to32	
		1to64	1/64	1to64	
		1to128	1/128	1to128	
		1to256	1/256	1to256	
1to512	1/512	1to512			
1to1024	1/1024	1to1024			

MANUAL INPUT

14 UNIT SIZE: Standard-Size

15 Unit Size

16 SCALE: 1:1

17 usually 4 holes

18 Count of Holes for Bonding: 4

19 Count of Holes

20 BAKE Current UDI to Viewport

21 BAKE the Scale Schemata to Viewport

22 (FALSE) ONE or (TRUE) FOUR PINS: False

23 TYPE OF PRODUCTION: Foldable

24 HIGHLIGHT MODIFICATION: Height ONE

25 Scale Wall Thickness: ON

FACADE TYPE: Mixed UP-C

FACADE Exchange Walls to Empty Frame: Setting-A

Unit Size: A, B, R

Scale: A, B, R

Count of Holes: A, B, R

Pin: A, B, R

Prod typ: A, B, R

Z modification: A, B, R

F-Type: A, B, R

Wall rep: A, B, R

Possible size in millimeter

- X16 = 80896.0 mm
- X8 = 40448.0 mm
- X4 = 20224.0 mm
- X2 = 10112.0 mm
- S1 = 5056.0 mm
- H5 = 2528.0 mm
- Q5 = 1264.0 mm
- E5 = 632.0 mm
- 1_16 = 316.0 mm
- 1_32 = 158.0 mm
- 1_64 = 79.0 mm
- 1_128 = 39.5 mm
- 1_256 = 19.75 mm
- 1_512 = 9.875 mm
- 1_1024 = 4.9375 mm

Possible size in centimeter

- X16 = 8089.6 cm
- X8 = 4044.8 cm
- X4 = 2022.4 cm
- X2 = 1011.2 cm
- S1 = 505.6 cm
- H5 = 252.8 cm
- Q5 = 126.4 cm
- E5 = 63.2 cm
- 1_16 = 31.6 cm
- 1_32 = 15.8 cm
- 1_64 = 7.9 cm
- 1_128 = 3.95 cm
- 1_256 = 1.975 cm
- 1_512 = 0.9875 cm
- 1_1024 = 0.49375 cm

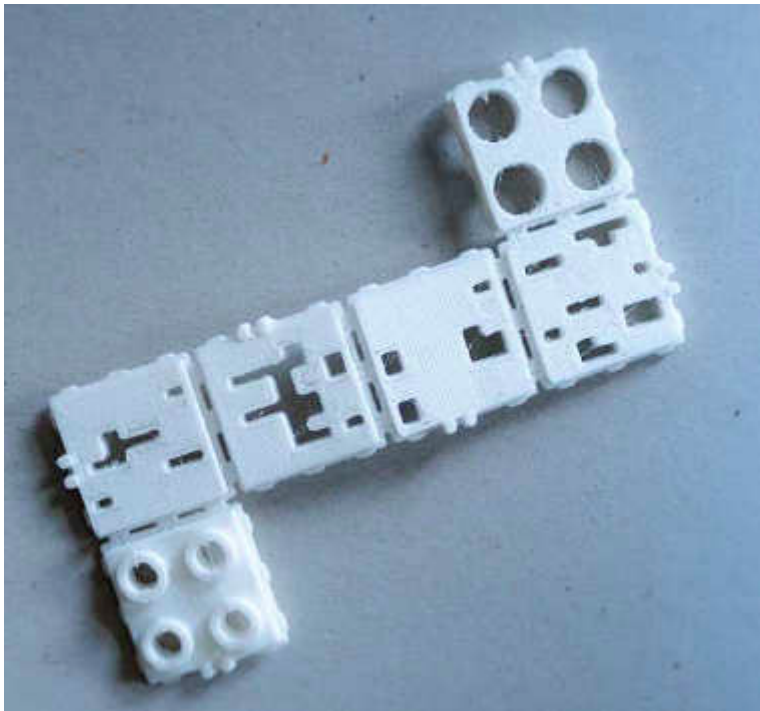
Letters A-P with dice patterns.

	Description	Options	Value	Short Code	Note
16	Count of “Holes” for Bending	Numeric Slider	4	4	Best with four holes.
17	List of the different sizes for the Dice	-	-	-	Information Only
18	Bake current Urban Die into the Rhino View Port	Boolean Toggle	True	-	Only a short impulse
19	Bake the predefined Scale Schemata into Rhino View Port	Boolean Toggle	True	-	-
20	Option to choose between one and four pins for the actual Urban Die	One Pin Four Pins	False True	1_Pin 4_Pins	-
21	Choose Type for Rapid Manufacturing	Fold-able	0	Bender	
		Solid to print 3D	1	Soli3D	
		Milling or cutting	2	Milli	
		With Hinges	3	Hinchey	
22	Height Modification	Height ONE	1	Zh10	
		Half Height	2	Zh05	
		Double Height	0.5	Zh20	
23	Scale Wall Thickness	Scale Wall Thickness ON	True	-	This option enables the scale of the wall thickness fitting to the selected scale ON, or to the selected size OFF.
		Scale wall Thickness OFF	False	-	
24	Facade Type	Horizontal openings	0	H_O	This is the second core element of the Urban Dice Script, it gives the variations to the facade. Currently ten different types.
		Vertical openings	3	V_O	
		Frame only	1	F_on	
		Square openings	2	SQ	
		Old version horizontal	4	OLD_H	
		Old version vertical	5	OLD_V	
		MixA	6	MixA	
		MixB	7	MixB	
		MixC	8	MixC	
		IMAGE	9	IMAGE	
25	Facade Exchange	Setting A, Setting B, ...	A, B, C, ...	S_A to S_B	How this schemata works can be seen in the main input image. For generations from the Urban Cloud Script, if two Urban Dice meet wall to wall, they automatically open up to each other

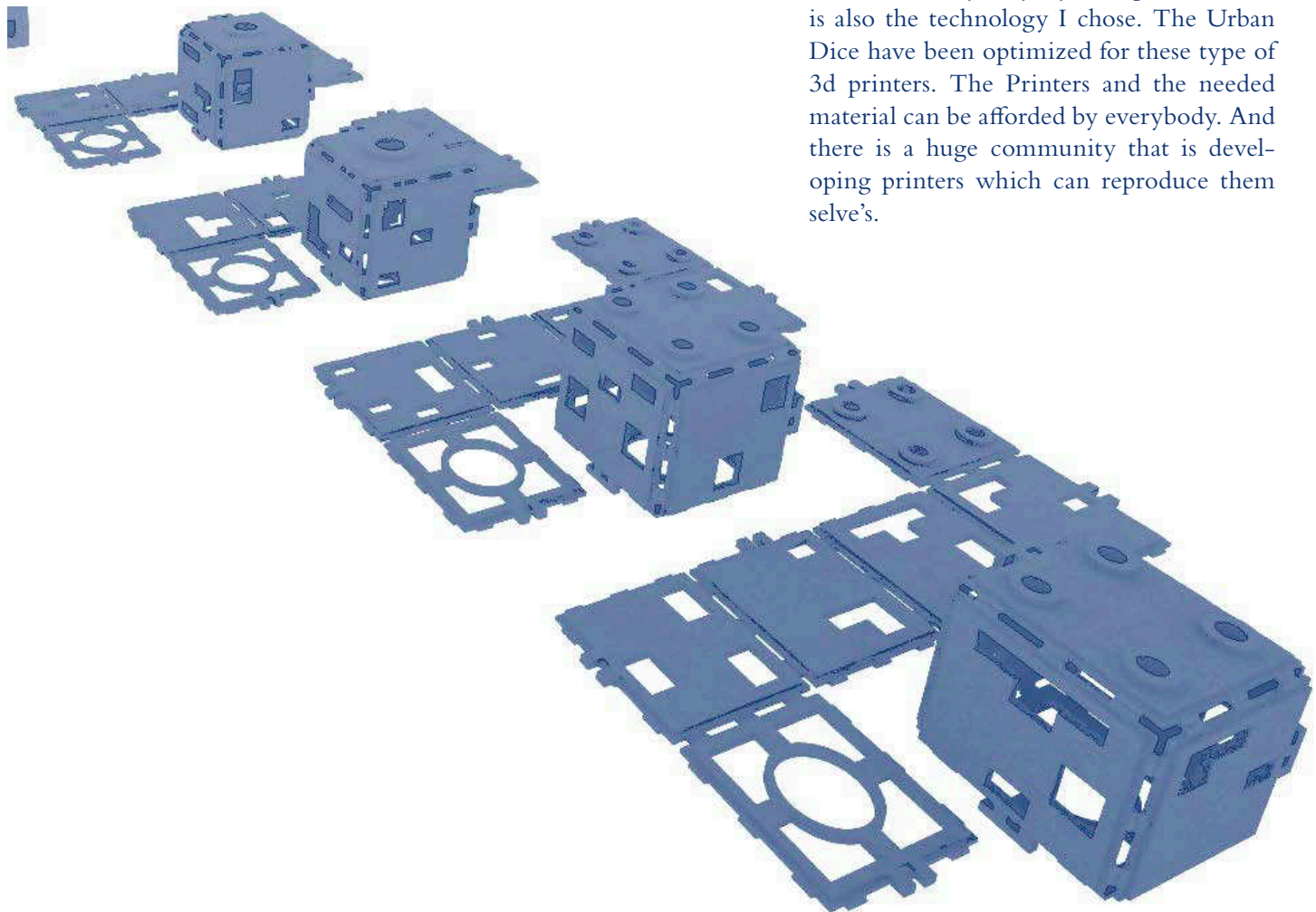


Rapid Manufacturing

Prototyping techniques turn into mass production.



303 *The first prototypes looked quite different.*



Mass-production is based on the principle of uniformity, every part identical to the other. This makes sense for many things, as mass production is the only way most of our electronics can be purchased for a payable price, and so it is for many things, the food industry make even animals a mass product.

The ideas behind rapid manufacturing are some how the opposite of mass-production. It is no longer necessary to make identical parts. No need to make a minimum count of a plastic product to reach the amortisation count. Every part can be different, and it does not change the costs and the efficiency in the production line. Mass-production can now be individualized and very personal, awakening awareness and engagement.

Technologies advance steadily, first family homes are printed and it is not long till the first taller buildings will be printed.

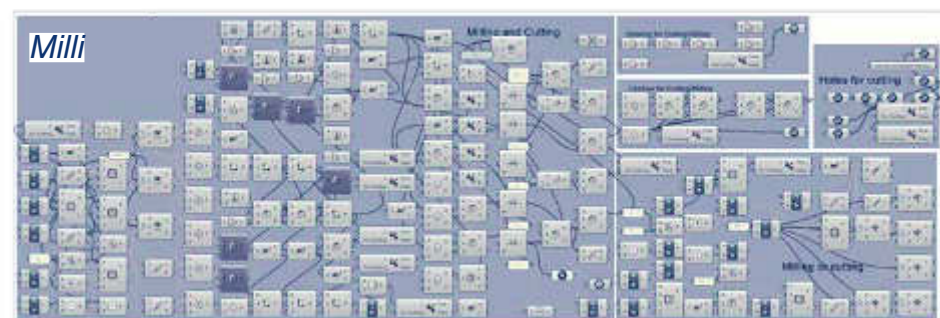
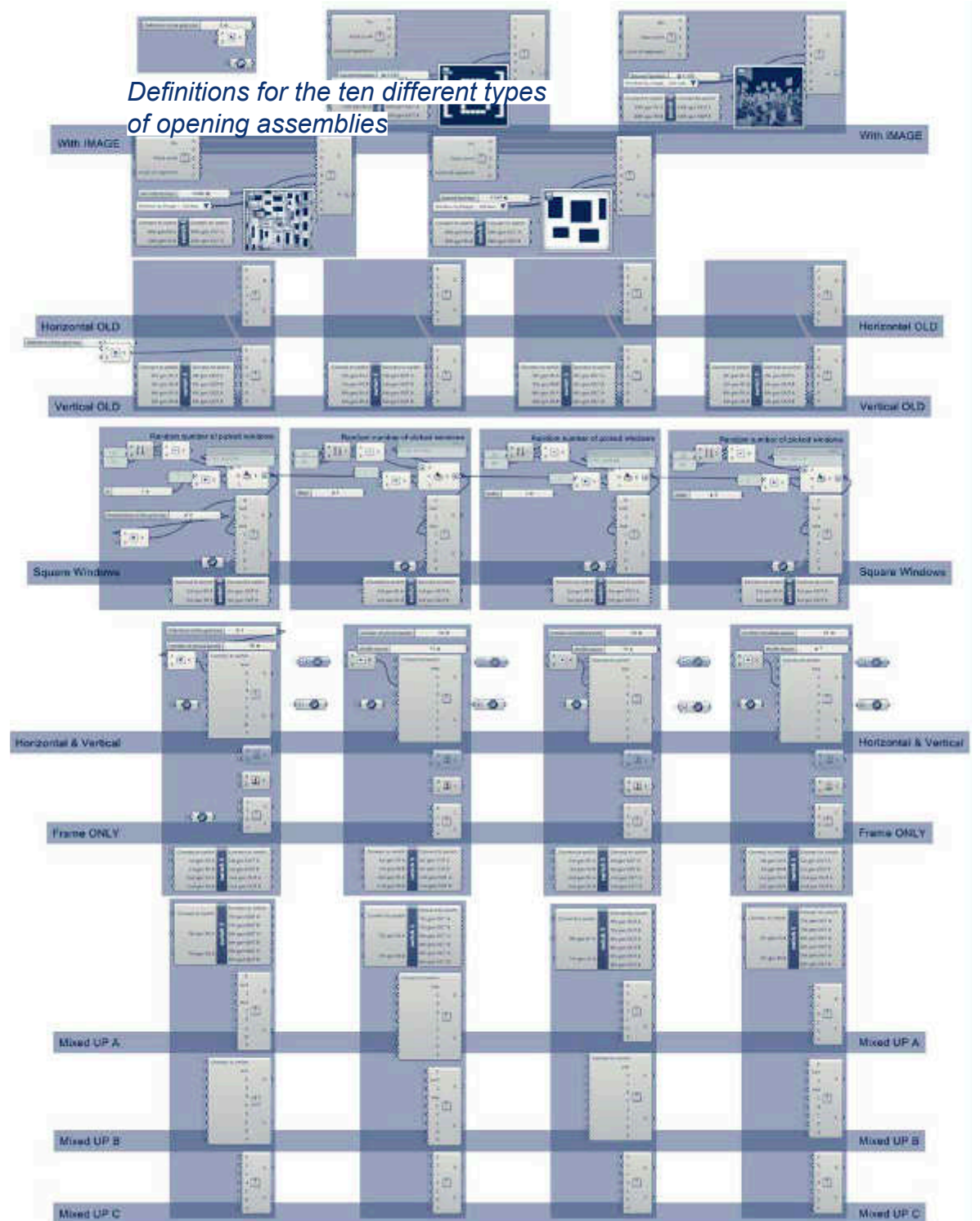
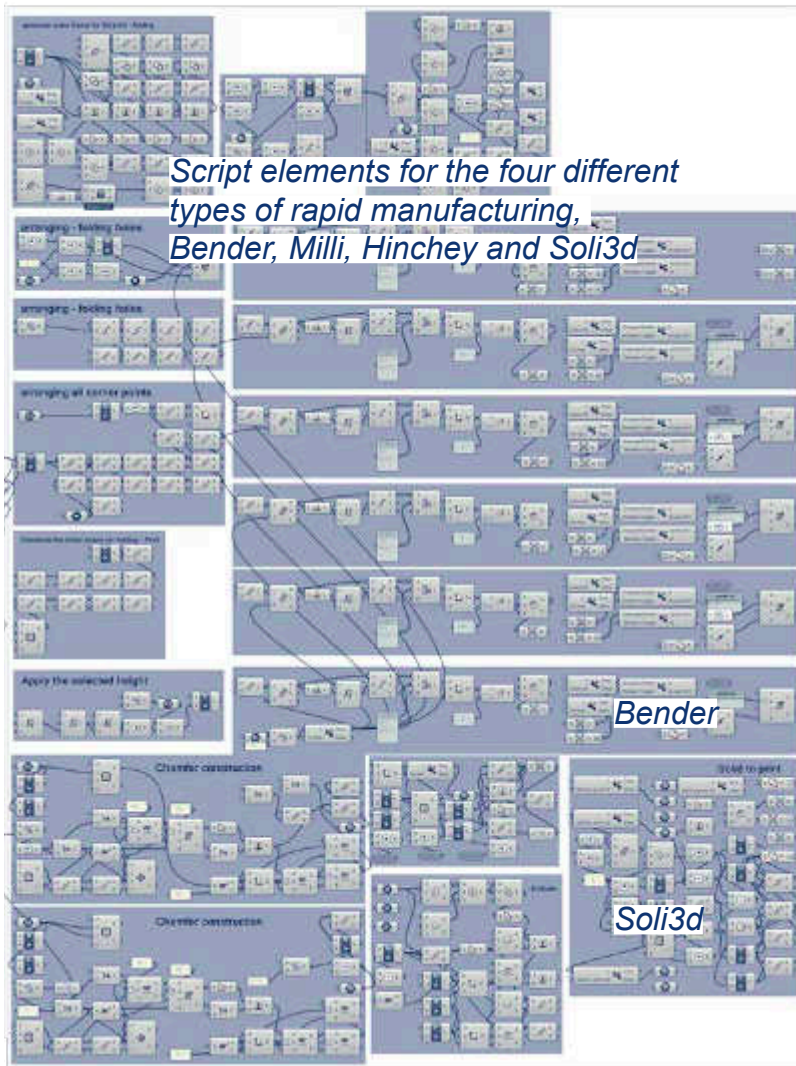
Most rapid manufacturing techniques have their origins in rapid prototyping technologies. Meanwhile almost any kind of material can be printed in 3d. Different metal materials, ceramic, clay, concrete and all kinds of plastic are used to print any given 3d model in perfect scale.

Plastic is the most common material in 3d printing. The hot extruder technology is by far the most popular plastic application besides laser sintering or UV light hardening resin technologies.

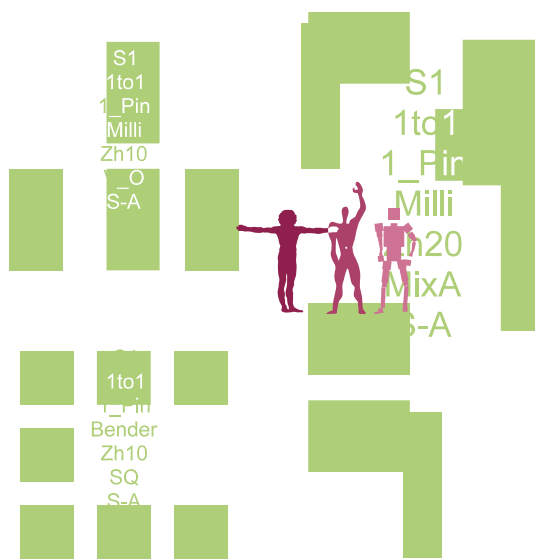
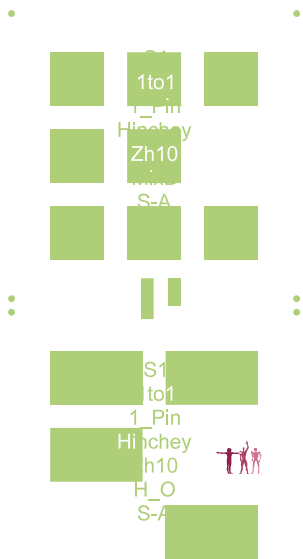
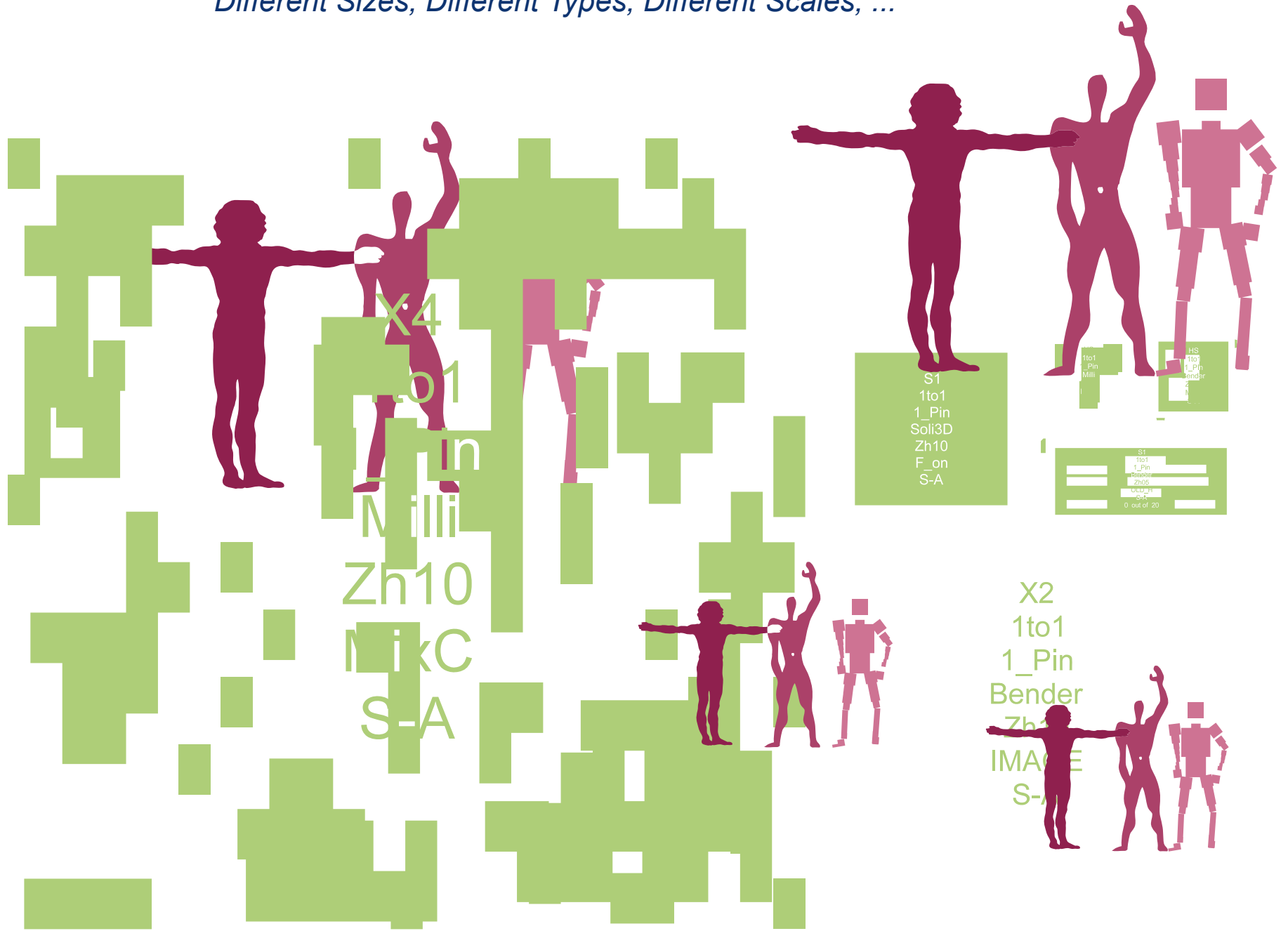
A plastic filament is poured through a hot nozzle and by the moving of this nozzle the model is layer by layer 3d printed. This is also the technology I chose. The Urban Dice have been optimized for these type of 3d printers. The Printers and the needed material can be afforded by everybody. And there is a huge community that is developing printers which can reproduce themselves.



Script Elements that give Uniqueness to Every Urban Dice

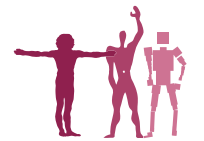


Different Sizes, Different Types, Different Scales, ...



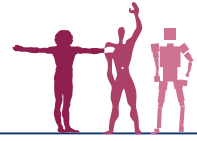
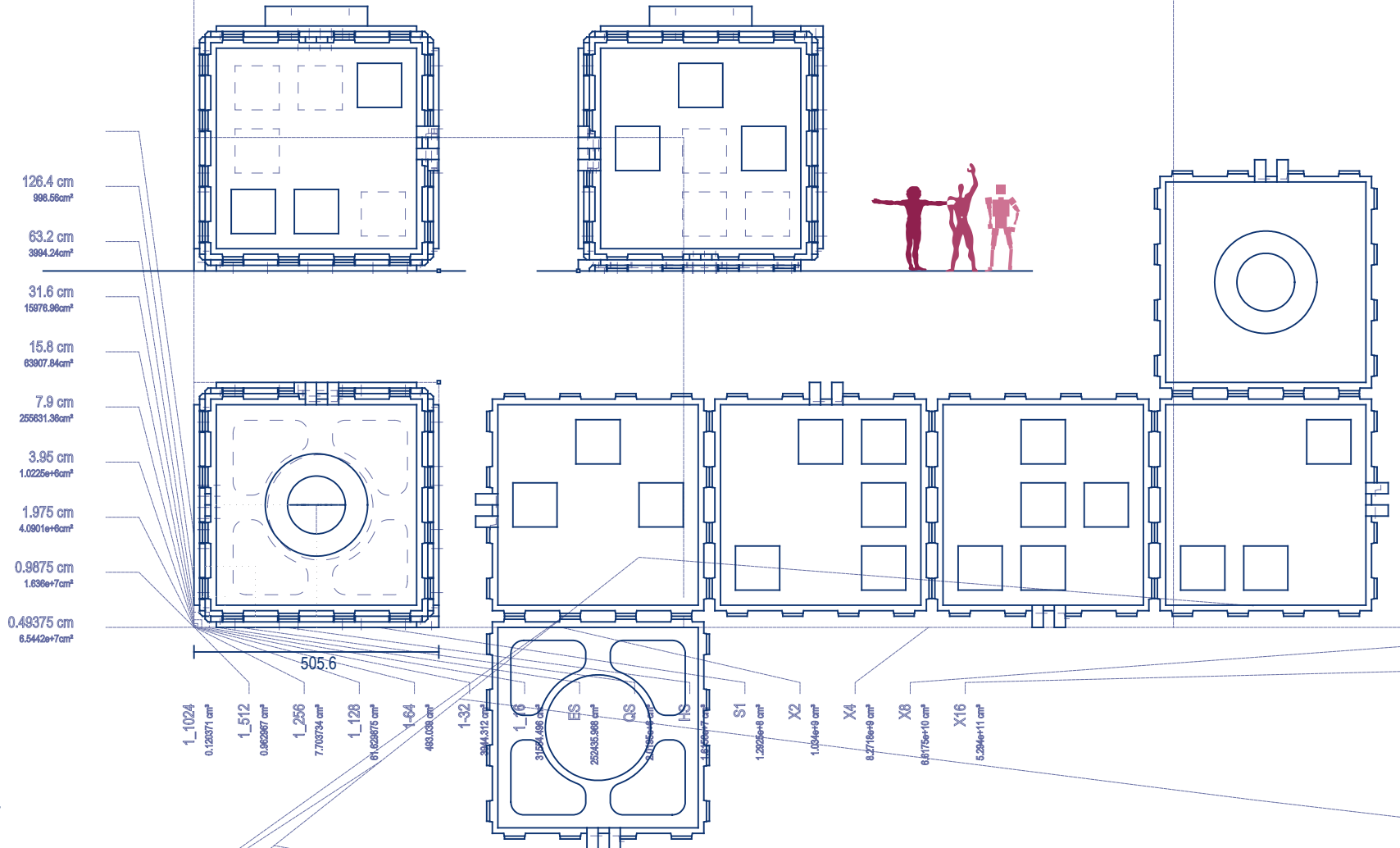
S1
1to1
1_Pin
Soli3D
Zh20
OLD_V
S-A

X2
1to1
1_Pin
Hinchey
Zh10
MixC
S-A

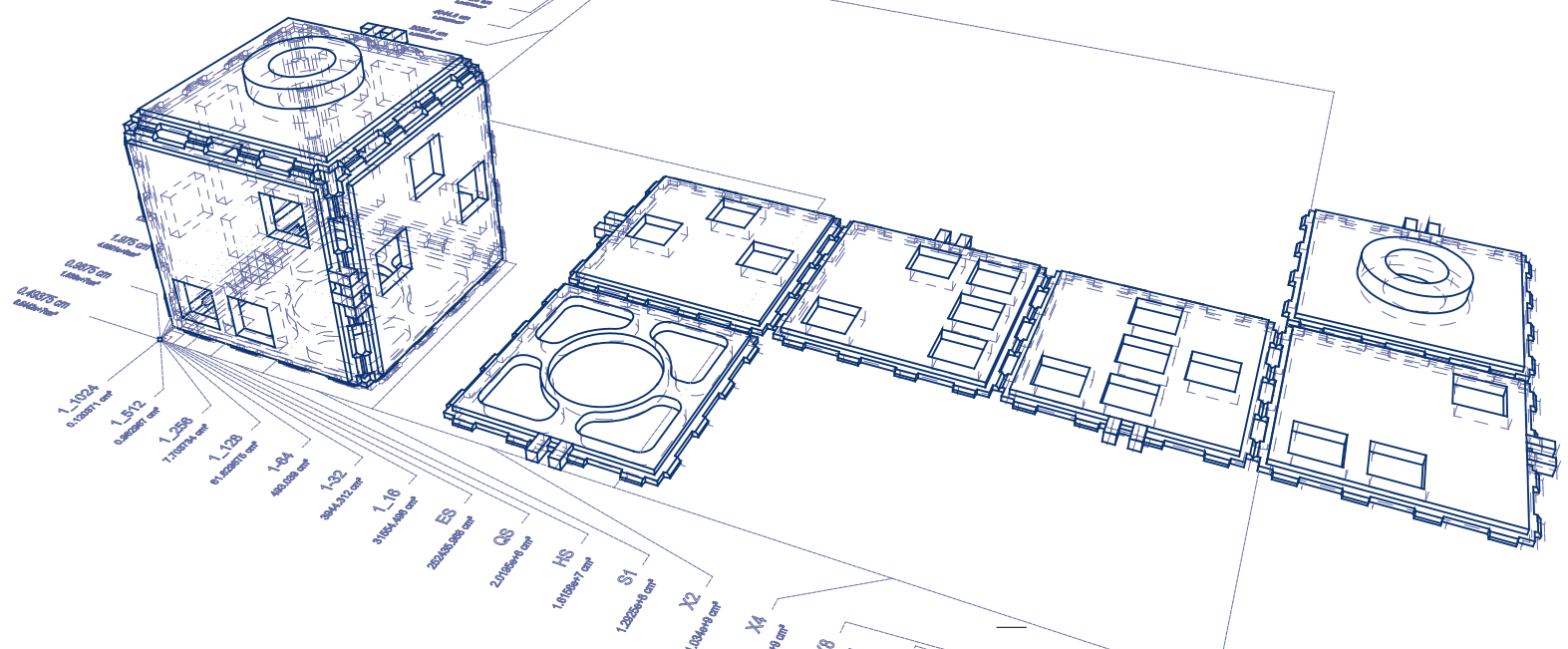


S1, 1 to 1, 1_Pin, Bender, Zh10, SQ, S-A

S1
1to1
1_Pin
Bender
Zh10
SQ
S-A



S1
1to1
1_Pin
Bender
Zh10
SQ
S-A



S1, 1to1, 1_Pin, Milli, Zh20, MixA, S-A

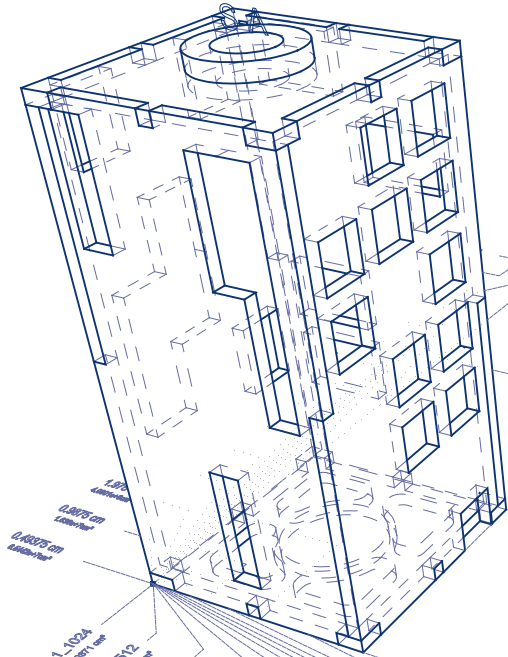
S1
1to1
1_Pin
Milli
Zh20
MixA
S-A

126.4 cm
996.56cm²
63.2 cm
3994.24cm²
31.6 cm
15978.96cm²
15.8 cm
63907.64cm²
7.9 cm
256831.36cm²
3.95 cm
1.0225e+6cm²
1.975 cm
4.0901e+6cm²
0.9875 cm
1.638e+7cm²
0.49375 cm
6.5442e+7cm²

S1
1to1
1_Pin
Milli
Zh20
MixA

505.6
1_1024 0.120371 cm²
1_512 0.862967 cm²
1_256 7.703734 cm²
1_128 61.626875 cm²
1_64 488.038 cm²
1_32 3944.312 cm²
1_16 31654.488 cm²
ES 252435.068 cm²
QS 2.0195e4 cm²
HS 4.6165e7 cm²
S1 1.2925e4 cm²
X2 1.094e4 cm²
X4 4.2718e4 cm²
X8 6.6175e+10 cm²
X16 6.296e11 cm²

Material Thickness 4mm



1_1024 0.120371 cm²
1_512 0.862967 cm²
1_256 7.703734 cm²
1_128 61.626875 cm²
1_64 488.038 cm²
1_32 3944.312 cm²
1_16 31654.488 cm²
ES 252435.068 cm²
QS 2.0195e4 cm²
HS 4.6165e7 cm²
S1 1.2925e4 cm²
X2 1.094e4 cm²
X4 4.2718e4 cm²
X8 6.6175e+10 cm²
X16 6.296e11 cm²

S1, 1 to 1, 1_Pin, Soli3D, Zh20, OLD_V, S-A

S1
1to1
1_Pin
Soli3D
Zh20
OLD_V
S-A

126.4 cm
988.66cm²

63.2 cm
3984.24cm²

31.6 cm
15976.96cm²

15.8 cm
63907.84cm²

7.9 cm
255631.36cm²

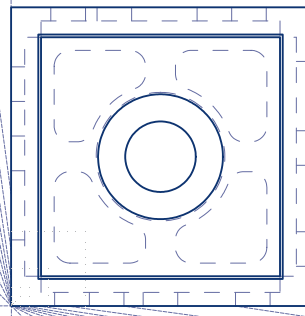
3.95 cm
1.0225e+6cm²

1.975 cm
4.0801e+6cm²

0.9875 cm
1.638e+7cm²

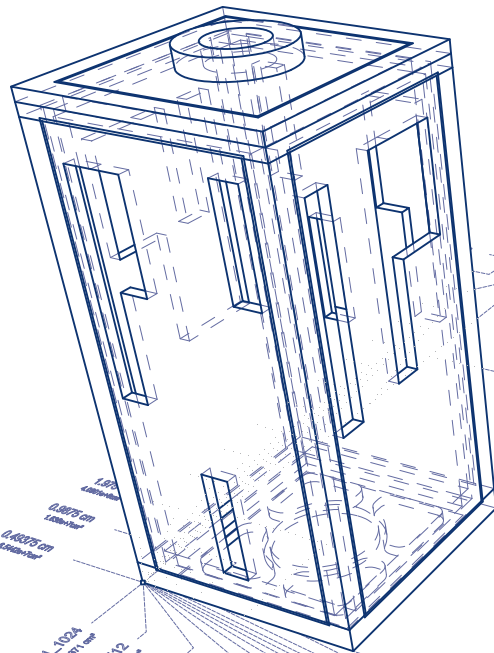
0.49375 cm
6.5442e+7cm²

1_Pin
Soli3D
Zh20
OLD_V
S-A



505.6

- 1_1024 0.120371 cm²
- 1_512 0.602867 cm²
- 1_256 7.703734 cm²
- 1_128 61.028975 cm²
- 1_64 483.038 cm²
- 1_32 3844.312 cm²
- 1_16 31554.468 cm²
- ES 252435.988 cm²
- QS 2.0185e+6 cm²
- HS 1.6105e+7 cm²
- S1 1.2205e+8 cm²
- X2 1.034e+8 cm²
- X4 4.2718e+8 cm²
- X8 5.6175e+10 cm²
- X16 5.294e+11 cm²



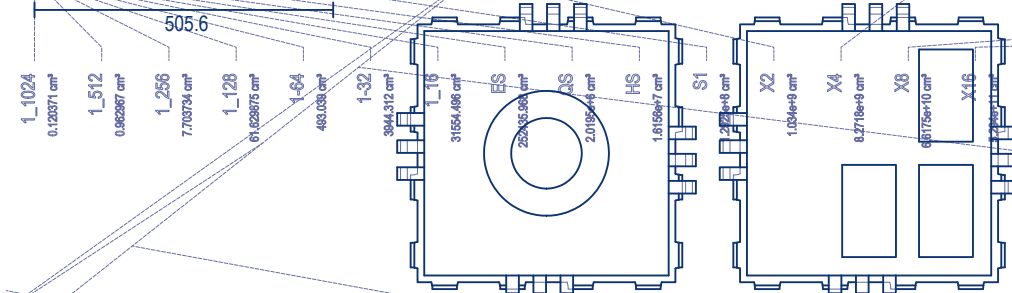
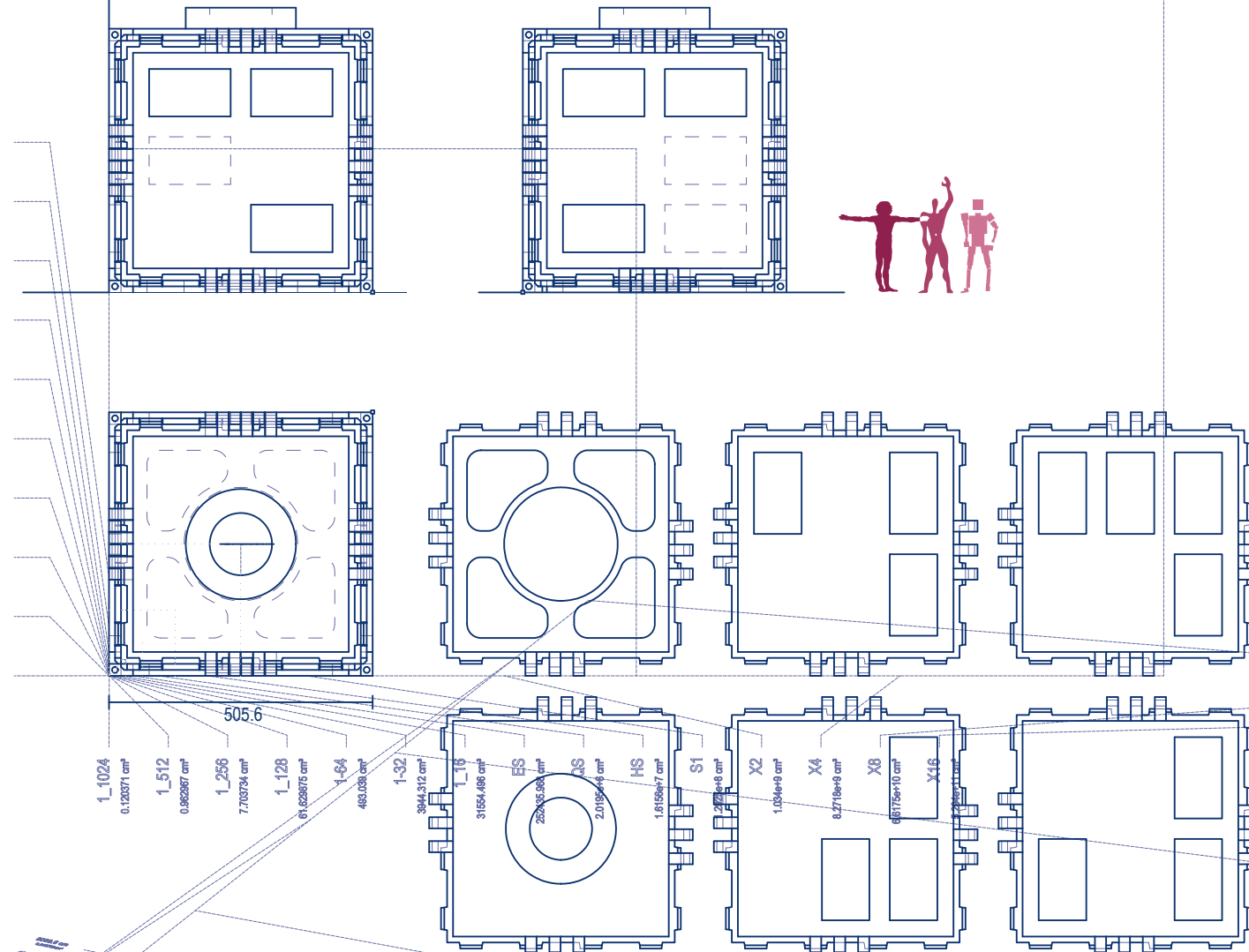
- 1_1024 0.120371 cm²
- 1_512 0.602867 cm²
- 1_256 7.703734 cm²
- 1_128 61.028975 cm²
- 1_64 483.038 cm²
- 1_32 3844.312 cm²
- 1_16 31554.468 cm²
- ES 252435.988 cm²
- QS 2.0185e+6 cm²
- HS 1.6105e+7 cm²
- S1 1.2205e+8 cm²
- X2 1.034e+8 cm²
- X4 4.2718e+8 cm²
- X8 5.6175e+10 cm²
- X16 5.294e+11 cm²



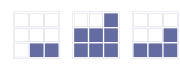
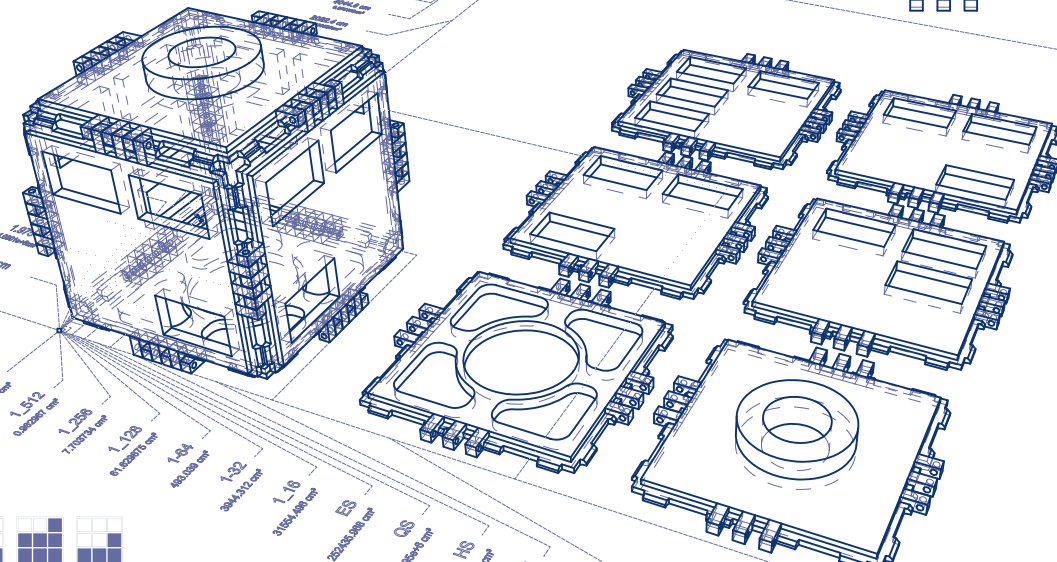
S1, 1to1, 1_Pin, Hinchey, Zh10, H_O, S-A

S1
1to1
1_Pin
Hinchey
Zh10
H_O
S-A

126.4 cm
998.56cm²
63.2 cm
3994.24cm²
31.6 cm
15976.96cm²
15.8 cm
63907.84cm²
7.9 cm
255631.36cm²
3.95 cm
1.0225e+6cm²
1.975 cm
4.0901e+6cm²
0.9875 cm
1.636e+7cm²
0.49375 cm
6.5442e+7cm²

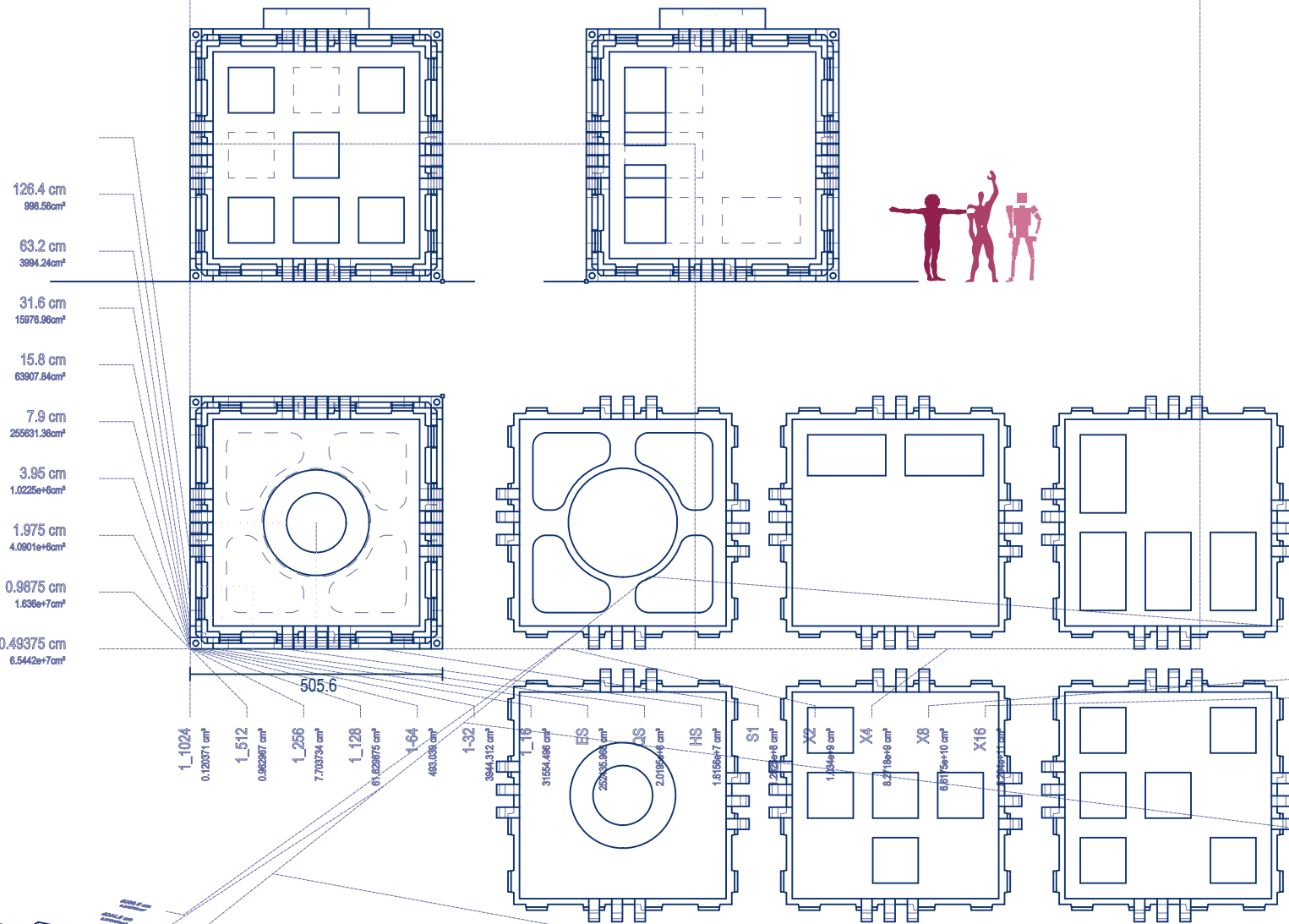


S1
1to1
1_Pin
Hinchey
Zh10
H_O
S-A

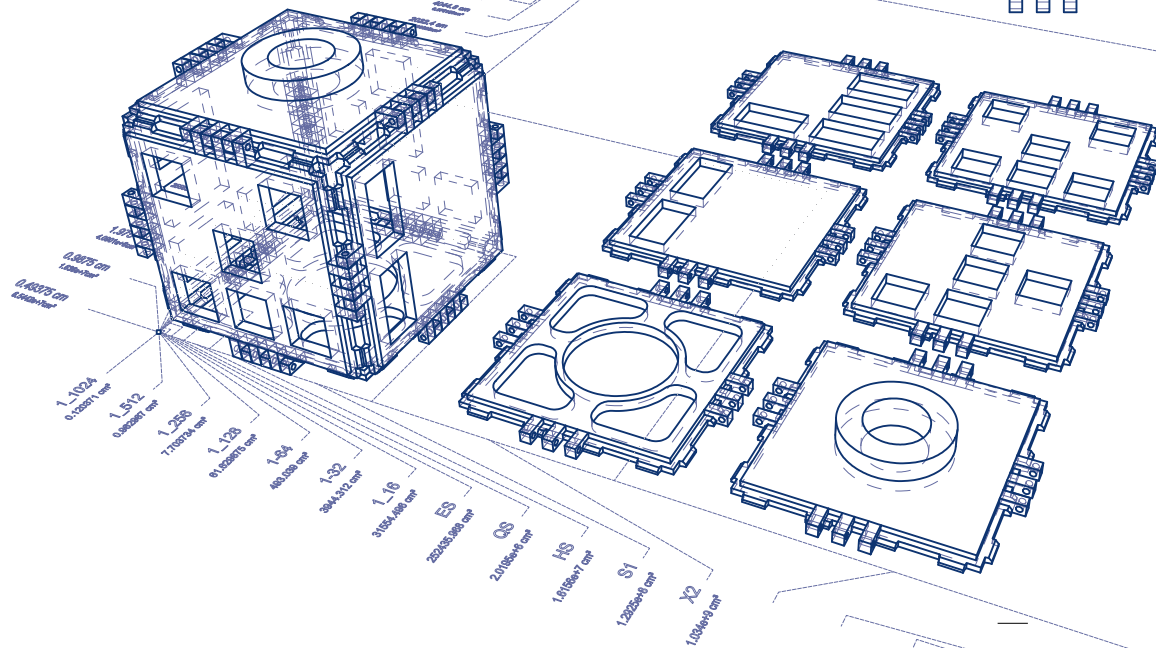


S1, 1 to 1, 1_Pin, Hinchey, Zh10, MixB, S-A

S1
1to1
1_Pin
Hinchey
Zh10
MixB
S-A



S1
1to1
1_Pin
Hinchey
Zh10
MixB
S-A



S1, 1to1, 1_Pin, Soli3D, Zh10, F_on, S-A

S1
1to1
1_Pin
Soli3D
Zh10
F_on
S-A

126.4 cm
998.56cm²

63.2 cm
3994.24cm²

31.6 cm
15976.96cm²

15.8 cm
63907.84cm²

7.9 cm
256831.36cm²

3.95 cm
1.0225e+6cm²

1.975 cm
4.0901e+6cm²

0.9875 cm
1.638e+7cm²

0.49375 cm
6.5442e+7cm²

505.6

1_1024

0.120371 cm²

1_512

0.962987 cm²

1_256

7.703734 cm²

1_128

61.629875 cm²

1_64

488.038 cm²

1_32

3944.312 cm²

1_16

31594.498 cm²

ES

252495.993 cm²

QS

2.0195e+6 cm²

HS

1.6159e+7 cm²

S1

1.2925e+8 cm²

X2

1.094e+8 cm²

X4

6.2719e+8 cm²

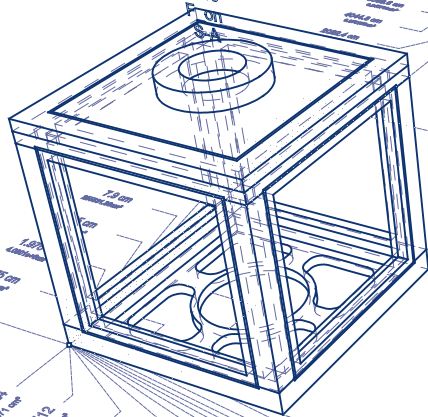
X8

6.6175e+10 cm²

X16

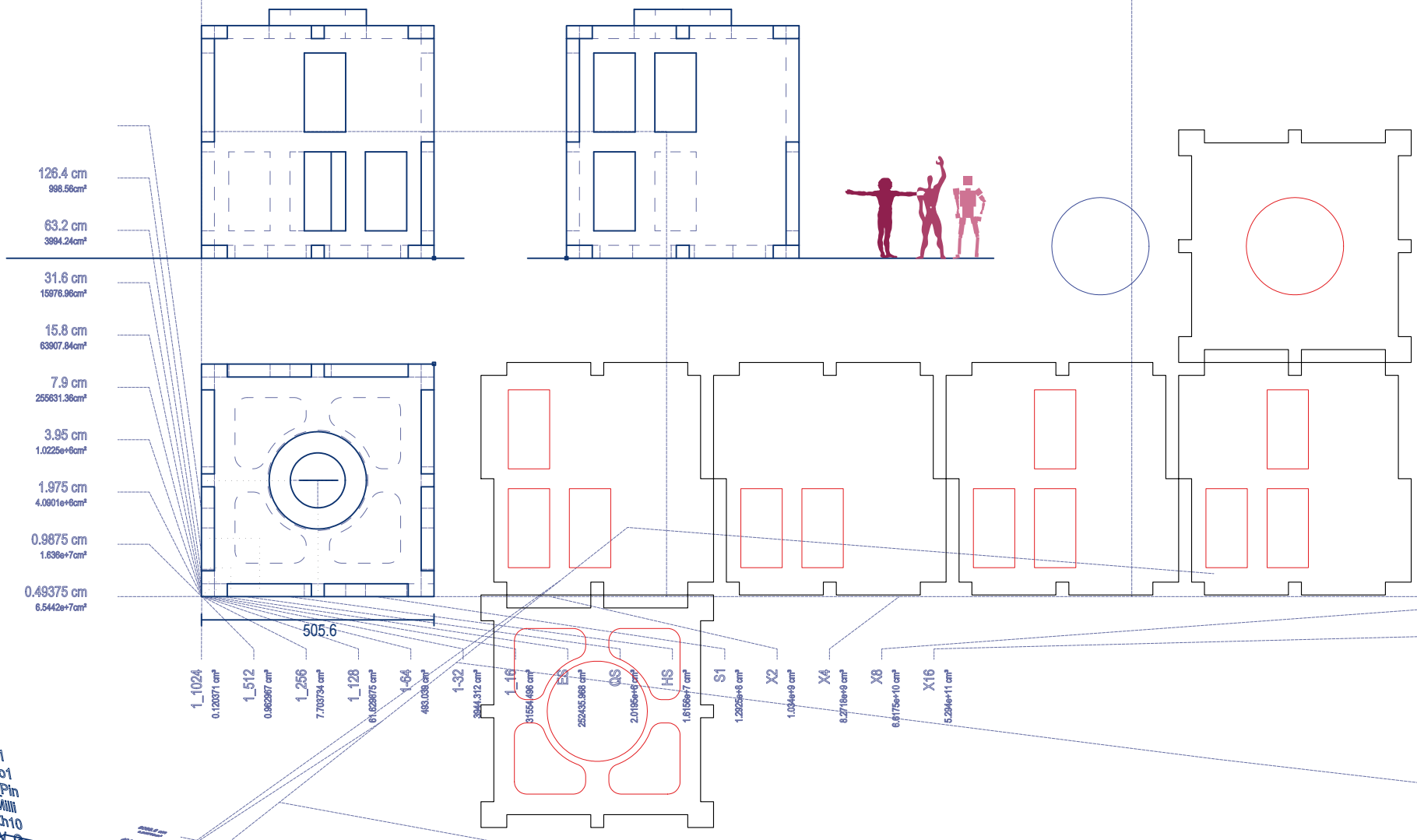
5.294e+11 cm²

S1
1to1
1_Pin
Soli3D
Zh10
F_on

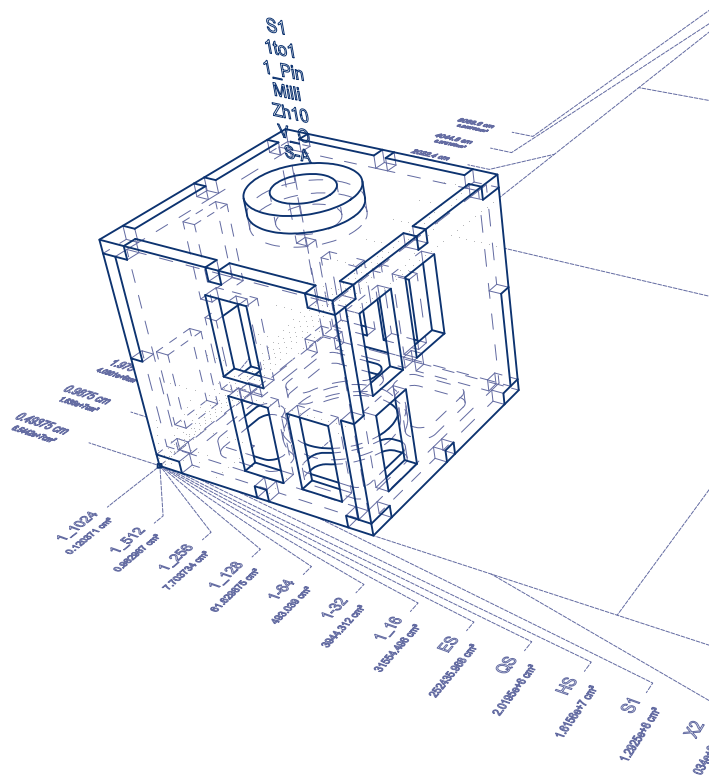


S1, 1 to 1, 1_Pin, Milli, Zh10, V_O, S-A

S1
1to1
1_Pin
Milli
Zh10
V_O
S-A

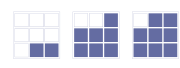
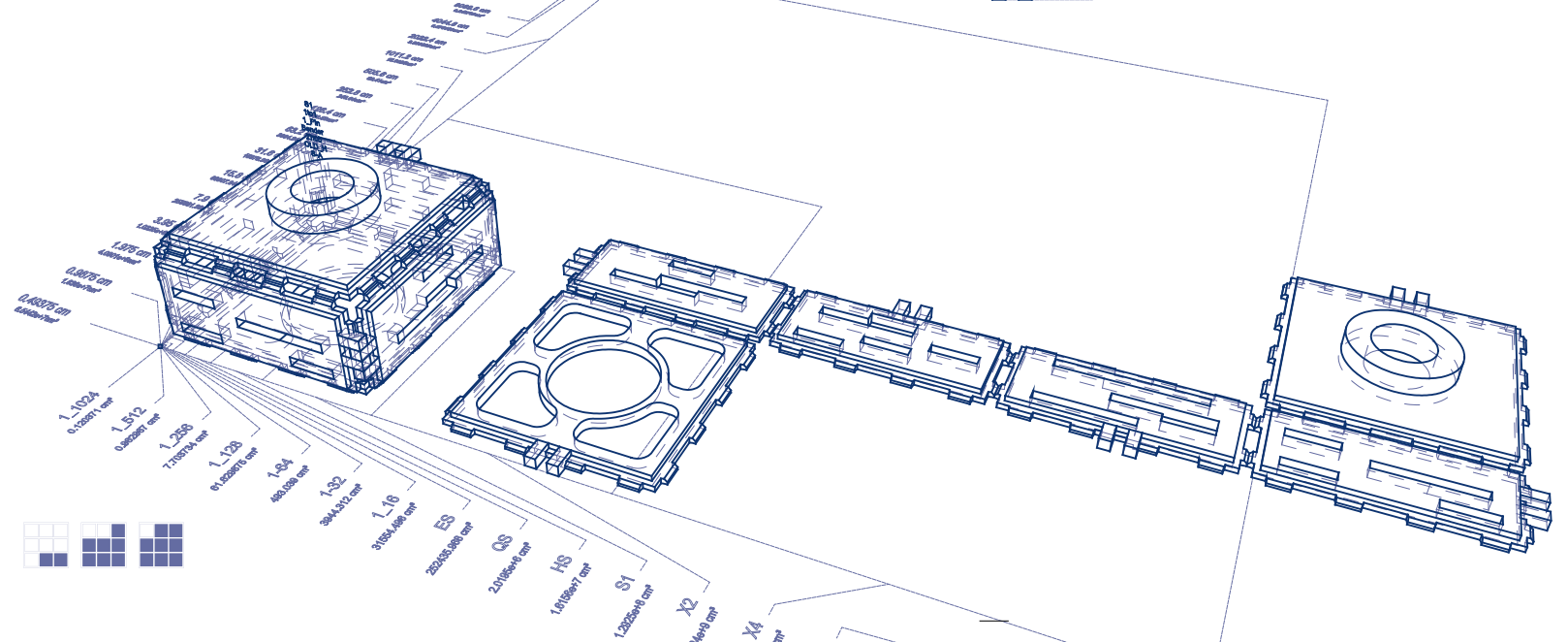
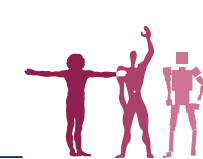
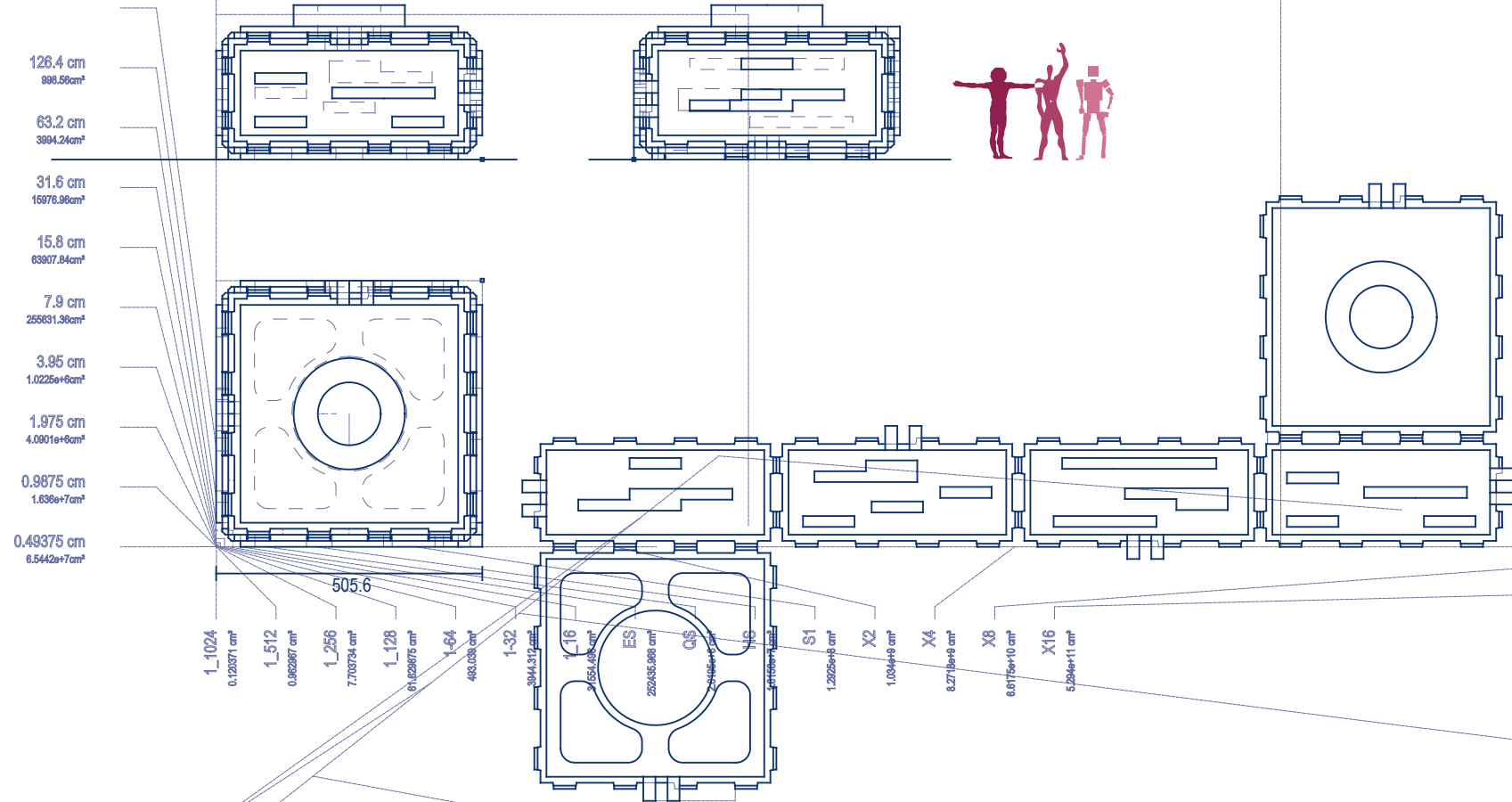


Material Thicknesses 4 mm



S1, 1to1, 1_Pin, Bender Zh05, OLD_H, S-A

81
1to1
1_Pin
Bender
Zh05
OLD_H
S-A
0 out of 20



252.8 cm

249.64cm²

126.4 cm

998.56cm²

63.2 cm

3994.24cm²

31.6 cm

15976.96cm²

15.8 cm

63907.84cm²

7.9 cm

255631.36cm²

3.95 cm

1.0225e+6cm²

1.975 cm

4.0901e+6cm²

0.9875 cm

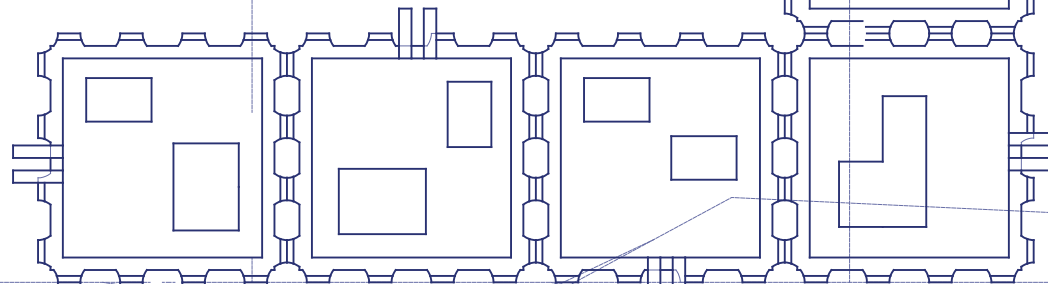
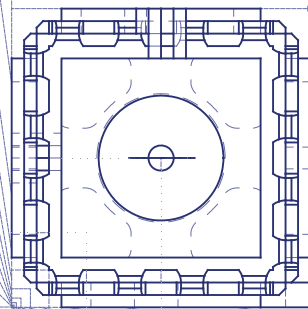
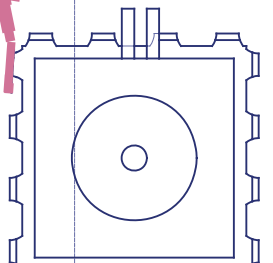
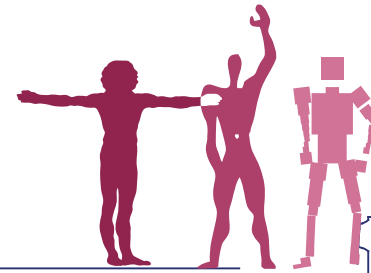
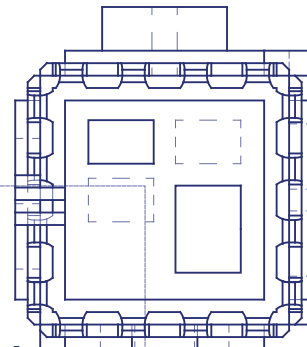
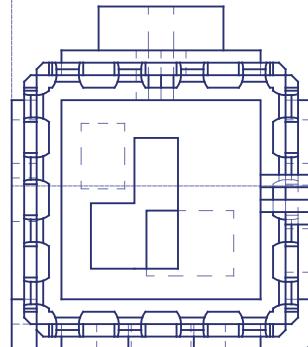
1.636e+7cm²

0.49375 cm

6.5442e+7cm²

HS, 1 to 1, 1_Pin, Bender, Zh10, MixC, S-A

HS
1to1
1_Pin
Bender
Zh10
MixC
S-A



252.8 cm

HS
1to1
1_Pin
Bender
Zh10
MixC
S-A

1_1024

0.120371 cm²

1_512

0.962967 cm²

1_256

7.703734 cm²

1_128

61.629875 cm²

1_64

493.039 cm²

1_32

3944.312 cm²

1_16

31554.496 cm²

ES

252435.968 cm²

QS

2.0195e+6 cm²

HS

1.6156e+7 cm²

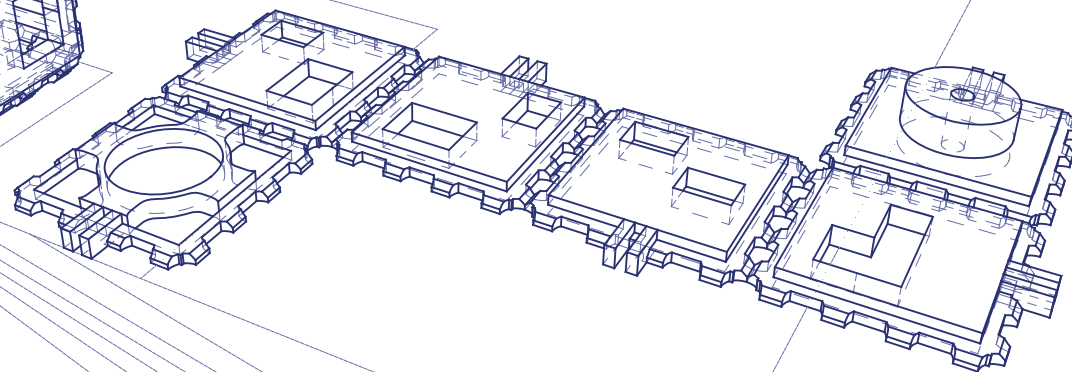
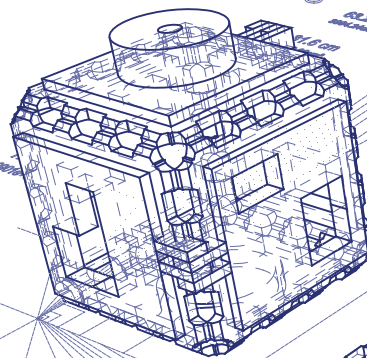
S1

1.2925e+8 cm²

X2

1.034e+9 cm²

X4



1_1024
0.120371 cm²

1_512
0.962967 cm²

1_256
7.703734 cm²

1_128
61.629875 cm²

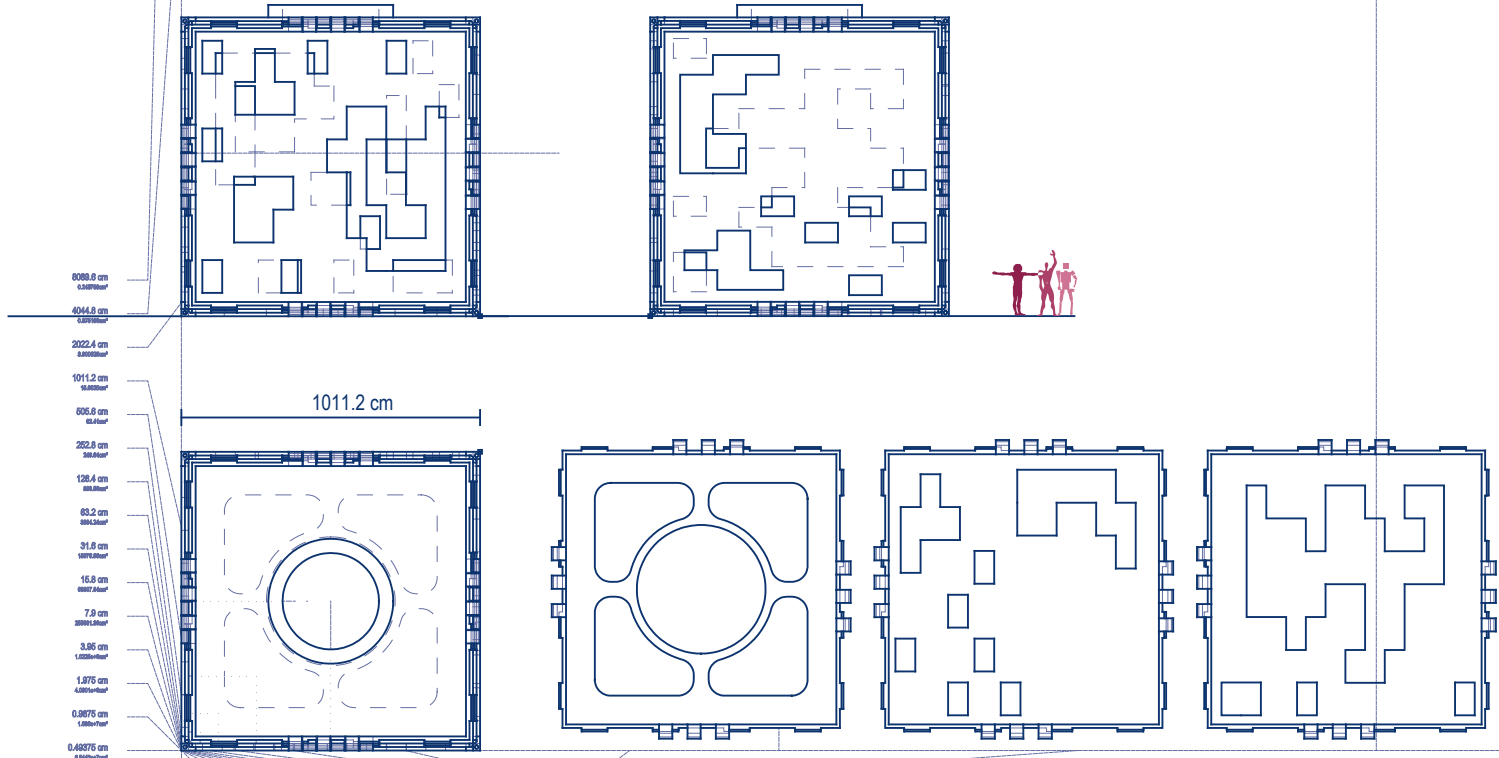
1_64
493.039 cm²

1_32
3944.312 cm²

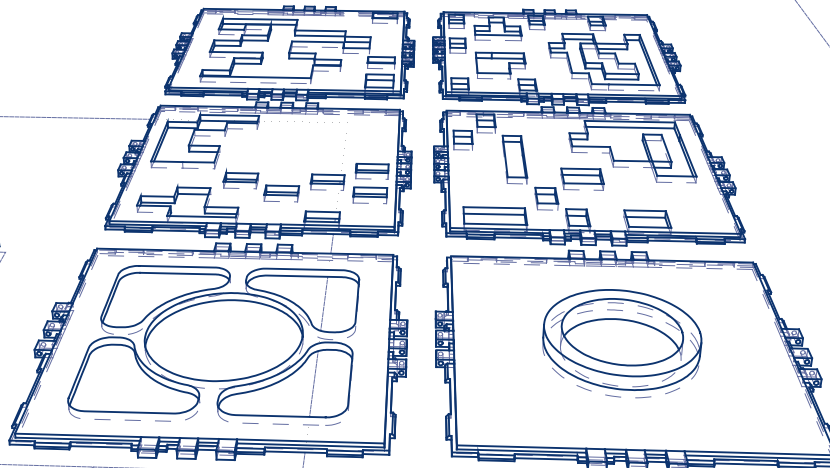
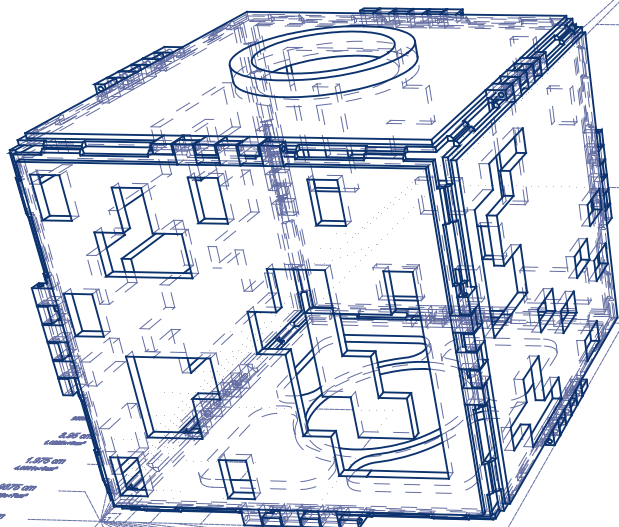
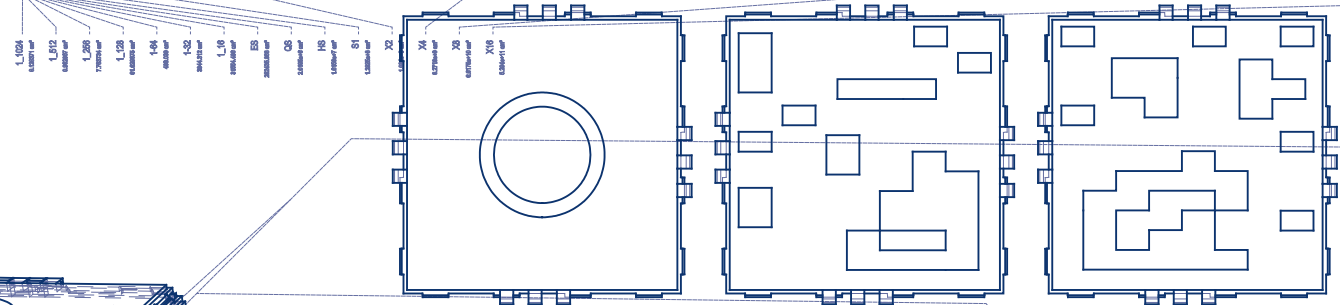


X2, 1to1, 1_Pin, Hinchey, Zh10, MixC, S-A

X2
1to1
1_Pin
Hinchey
Zh10
MixC
S-A



X2
1to1
1_Pin
Hinchey
Zh10
MixC
S-A

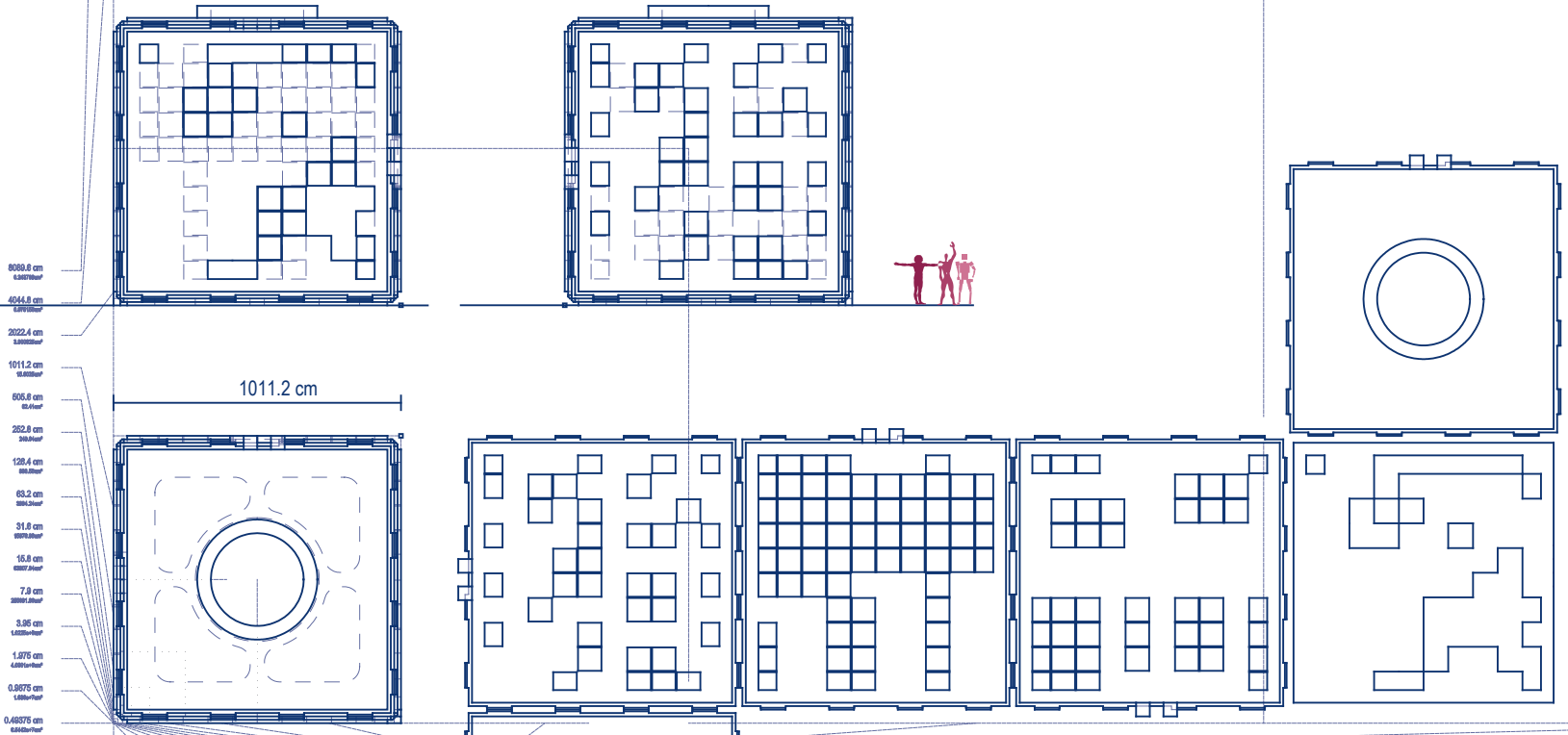


1,1024
1,572
1,289
1,179
1,464
1,36
1,16
E5
O5
H5
S1
X2
X4
X8
X15
X18



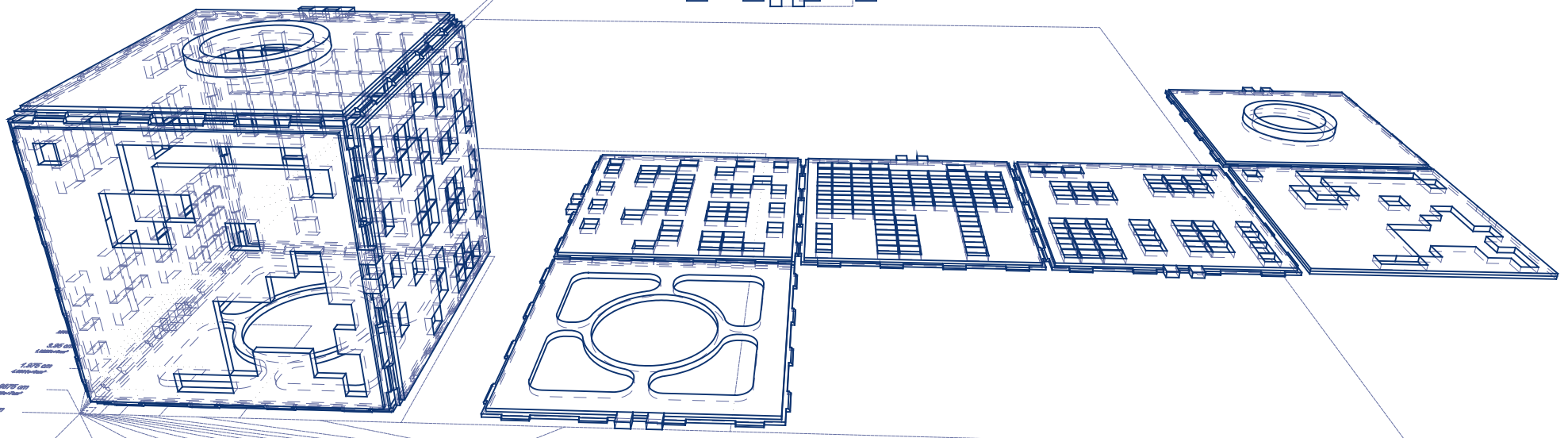
X2, 1 to 1, 1_Pin, Bender, Zh10, IMAGE, S-A

X2
1to1
1_Pin
Bender
Zh10
IMAGE
S-A



X2
1to1
1_Pin
Bender
Zh10
IMAGE
S-A

- L_1024
- L_512
- L_256
- L_128
- L_64
- L_32
- L_16
- E8
- E4
- E2
- S1
- X2
- X4
- X8
- X16



- L_1024
- L_512
- L_256
- L_128
- L_64
- L_32
- L_16
- E8
- E4
- E2
- S1
- X2
- X4
- X8
- X16



252.8 cm
249.64cm²

126.4 cm
998.56cm²

63.2 cm
3994.24cm²

31.6 cm
15976.96cm²

15.8 cm
63907.84cm²

7.9 cm
255631.36cm²

3.95 cm
1.0225e+6cm²

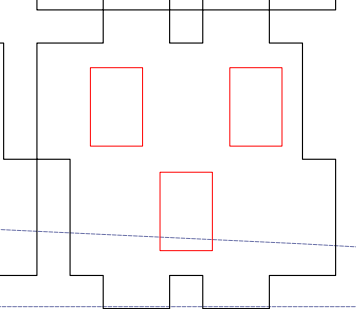
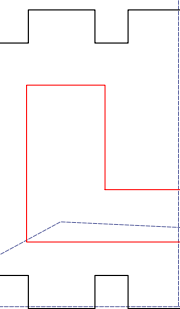
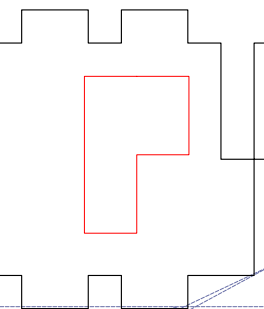
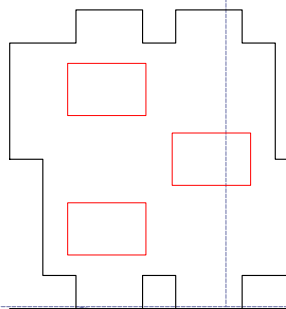
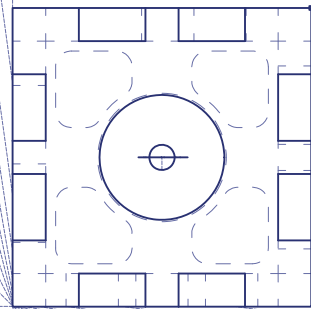
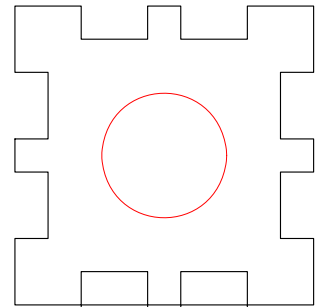
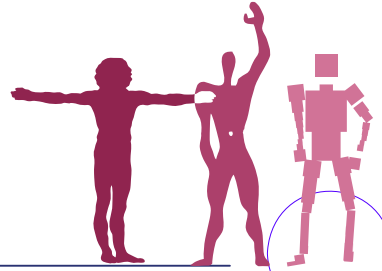
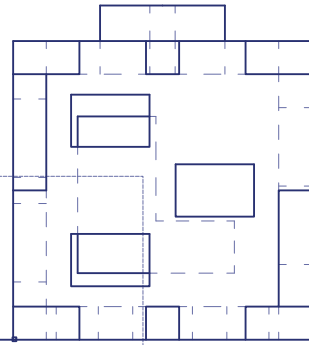
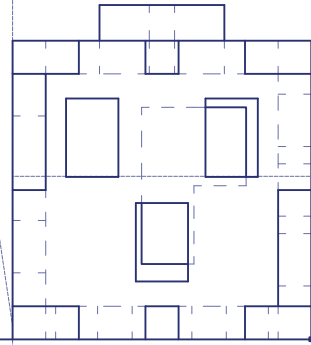
1.975 cm
4.0901e+6cm²

0.9875 cm
1.636e+7cm²

0.49375 cm
6.5442e+7cm²

HS, 1to1, 1_Pin, Milli, Zh10, MixC, S-A

HS
1to1
1_Pin
Milli
Zh10
MixC
S-A



HS
1to1
1_Pin
Milli
Zh10
MixC
S-A

1_1024

0.120371 cm²

1_512

0.982987 cm²

1_256

7.70373 cm²

1_128

61.629875 cm²

1_64

493.039 cm²

1_32

3944.312 cm²

1_16

31554.496 cm²

ES

252435.968 cm²

QS

2.0195e+6 cm²

HS

1.6156e+7 cm²

S1

1.2925e+8 cm²

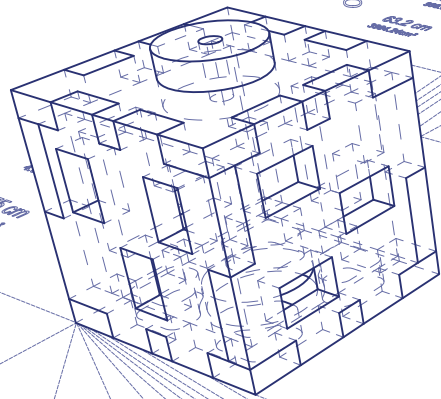
X2

1.034e+9 cm²

X4

Material Thickness 4 mm

Material Thickness 4 mm



0.49375 cm
6.5442e+7 cm²

1_1024
0.120371 cm²

1_512
0.982987 cm²

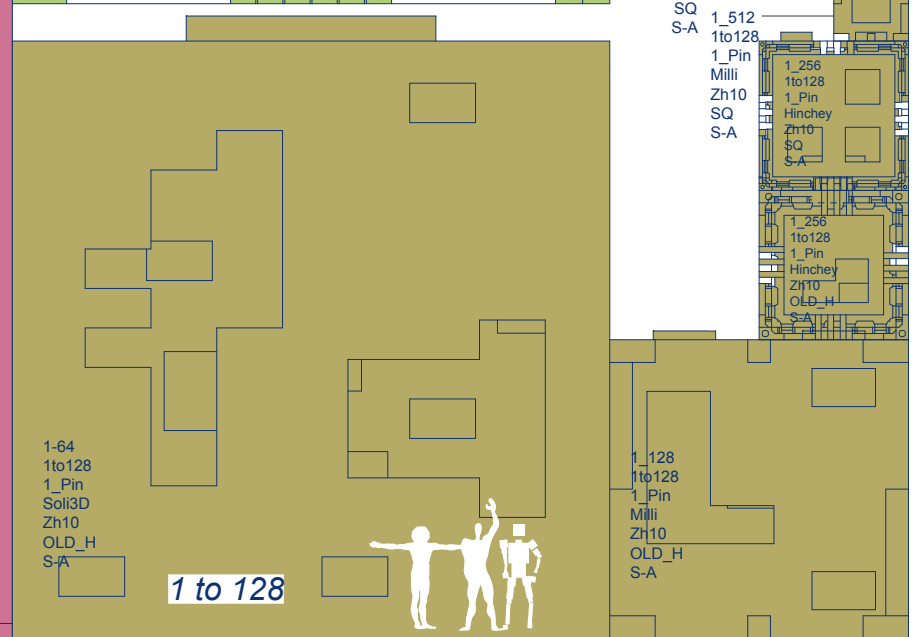
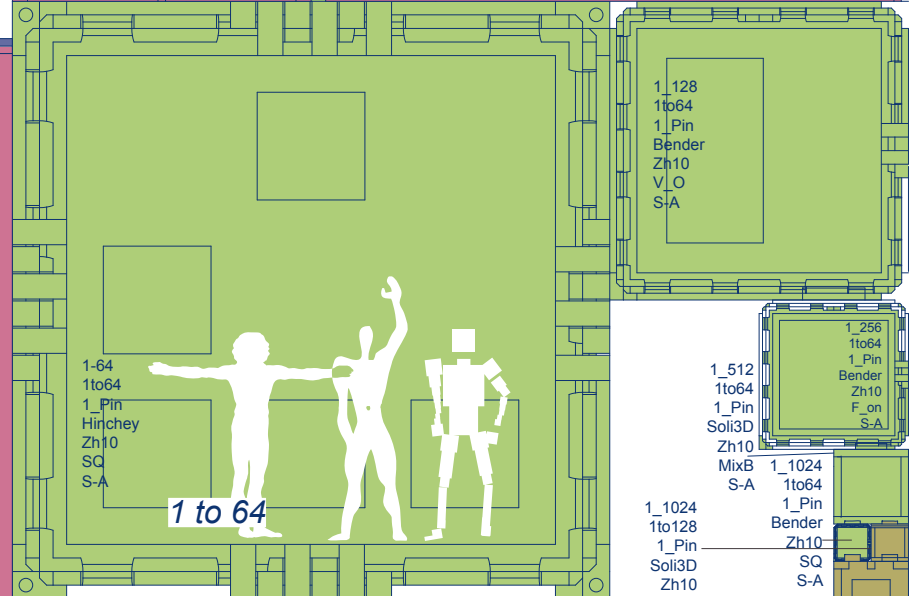
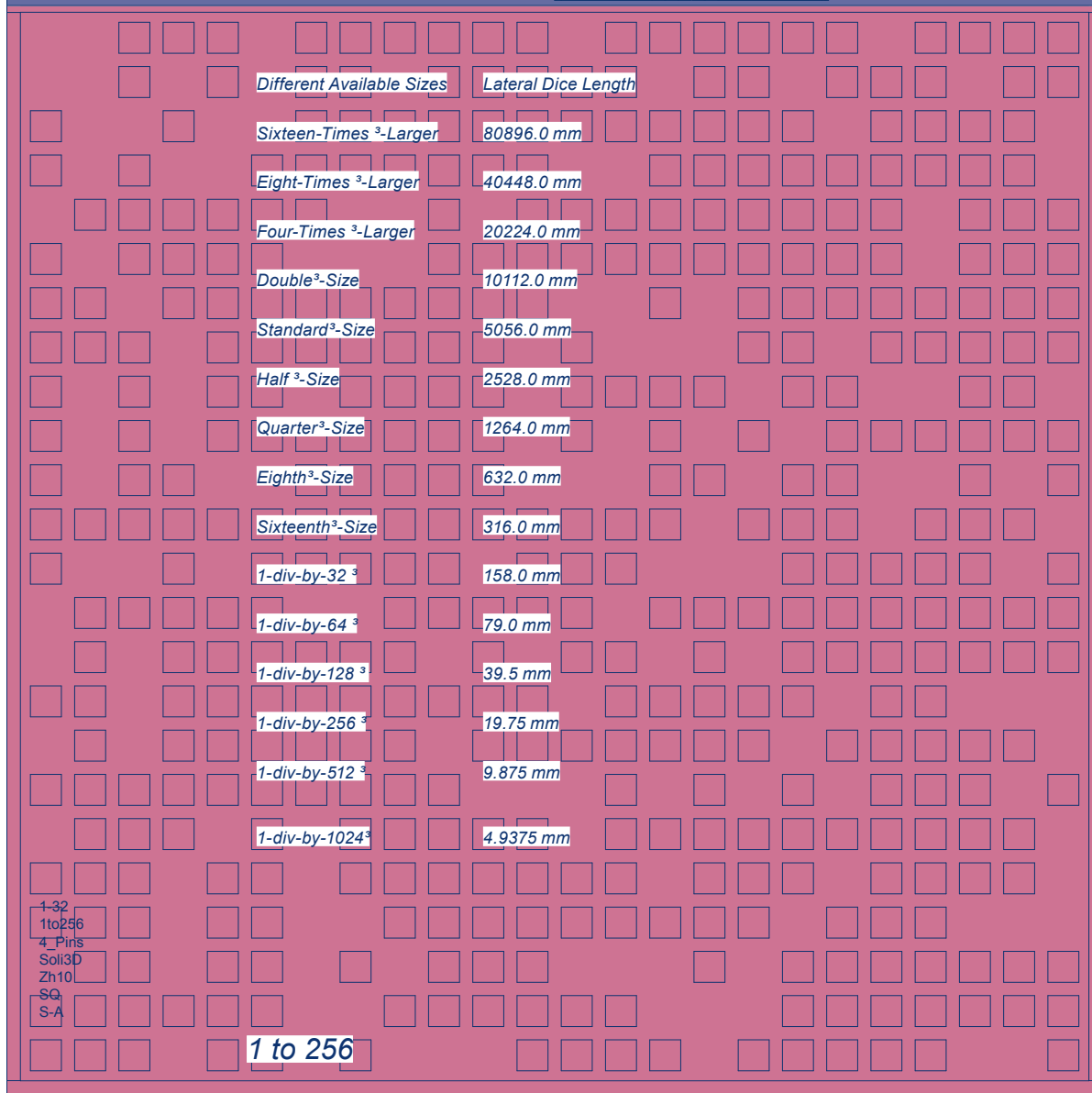
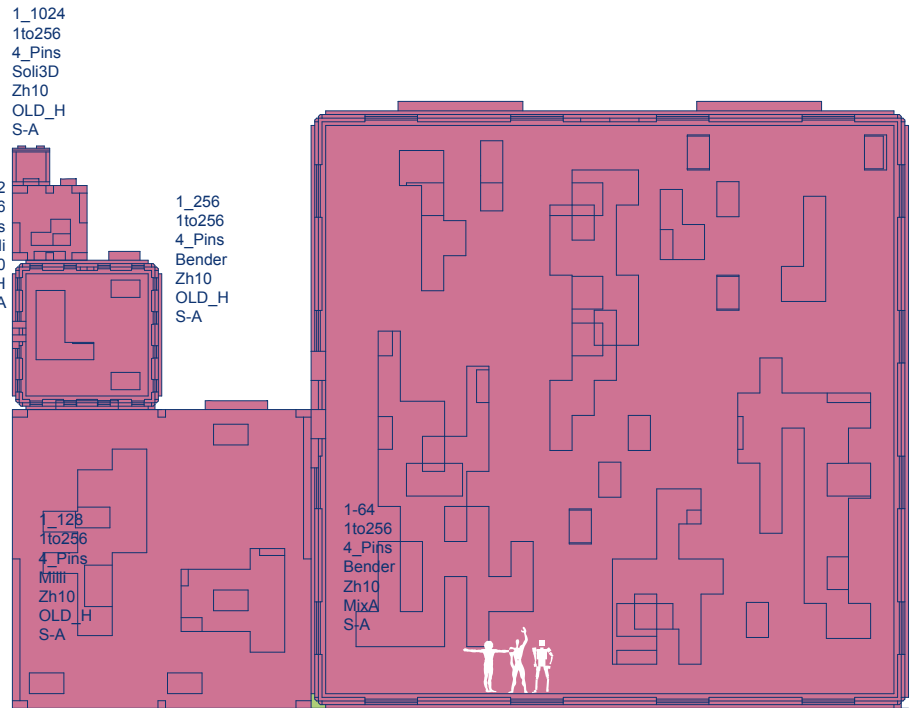
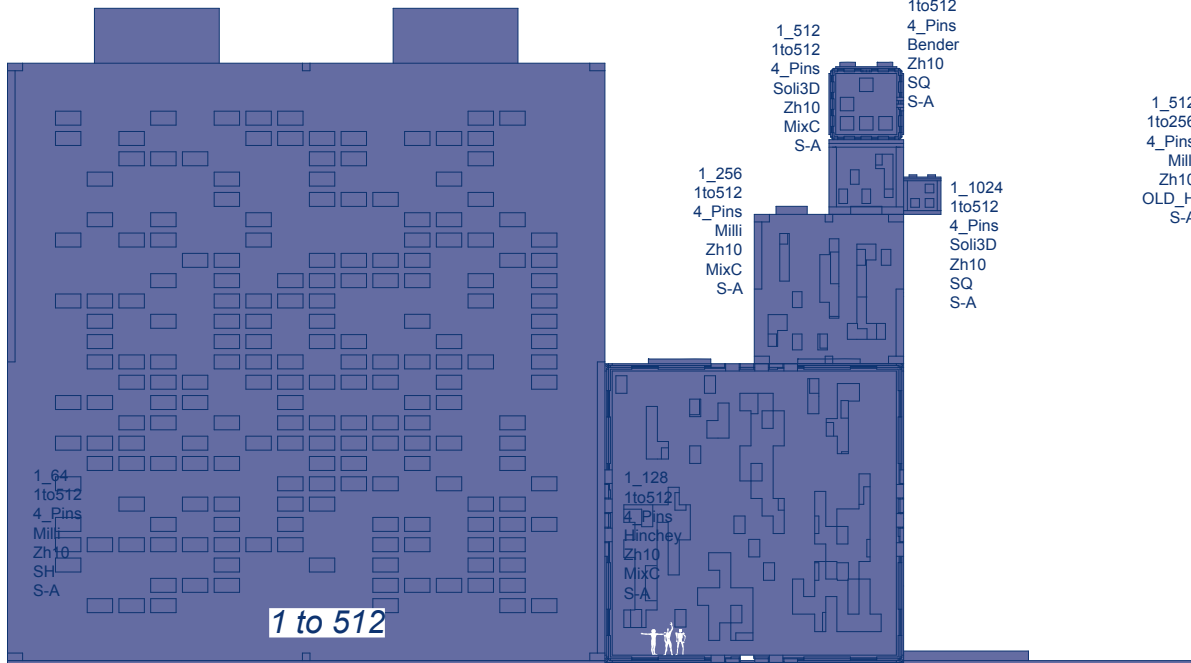
1_256
7.70373 cm²

1_128
61.629875 cm²

1_64
493.039 cm²

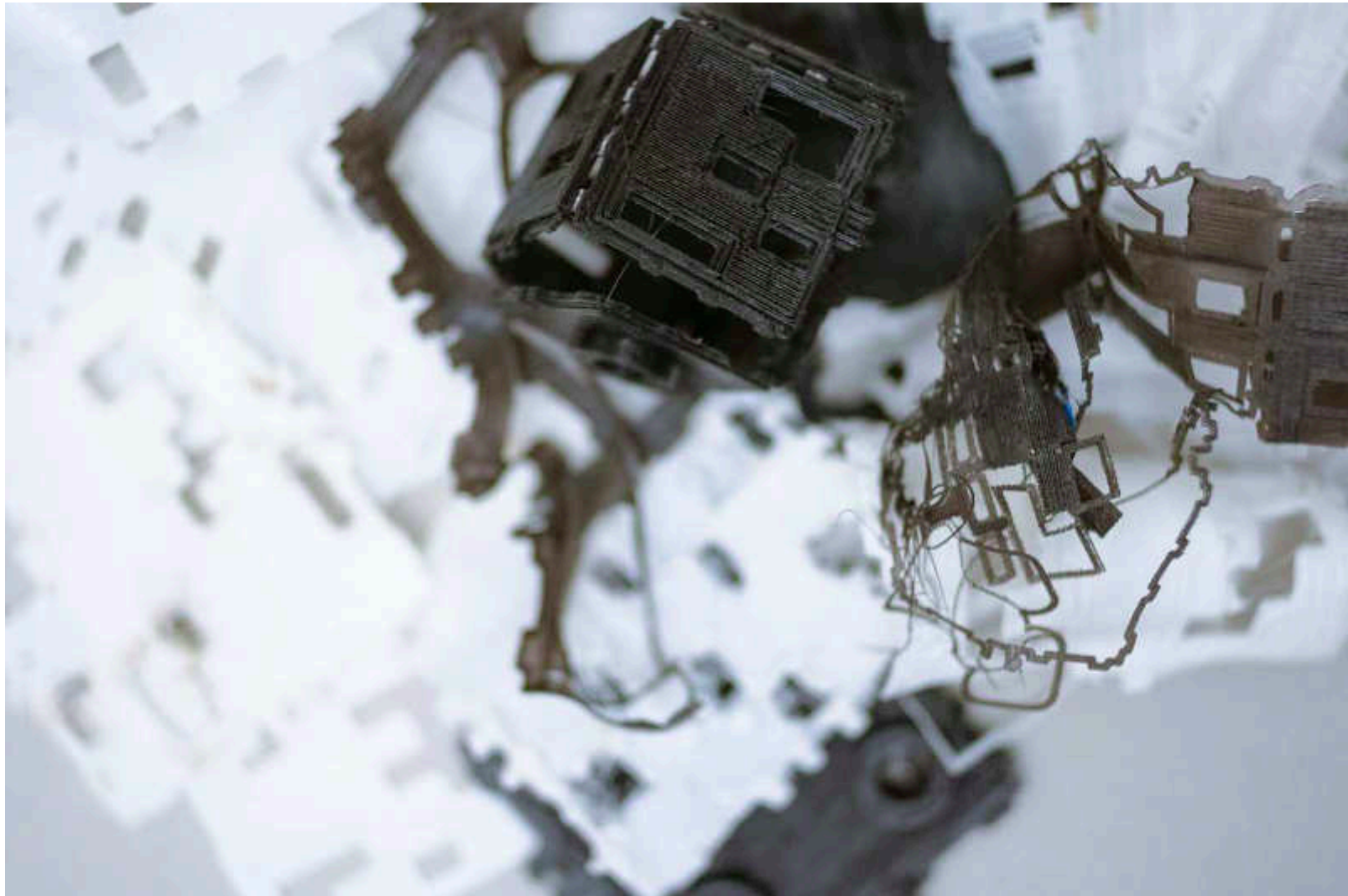
1_32

Different Scales

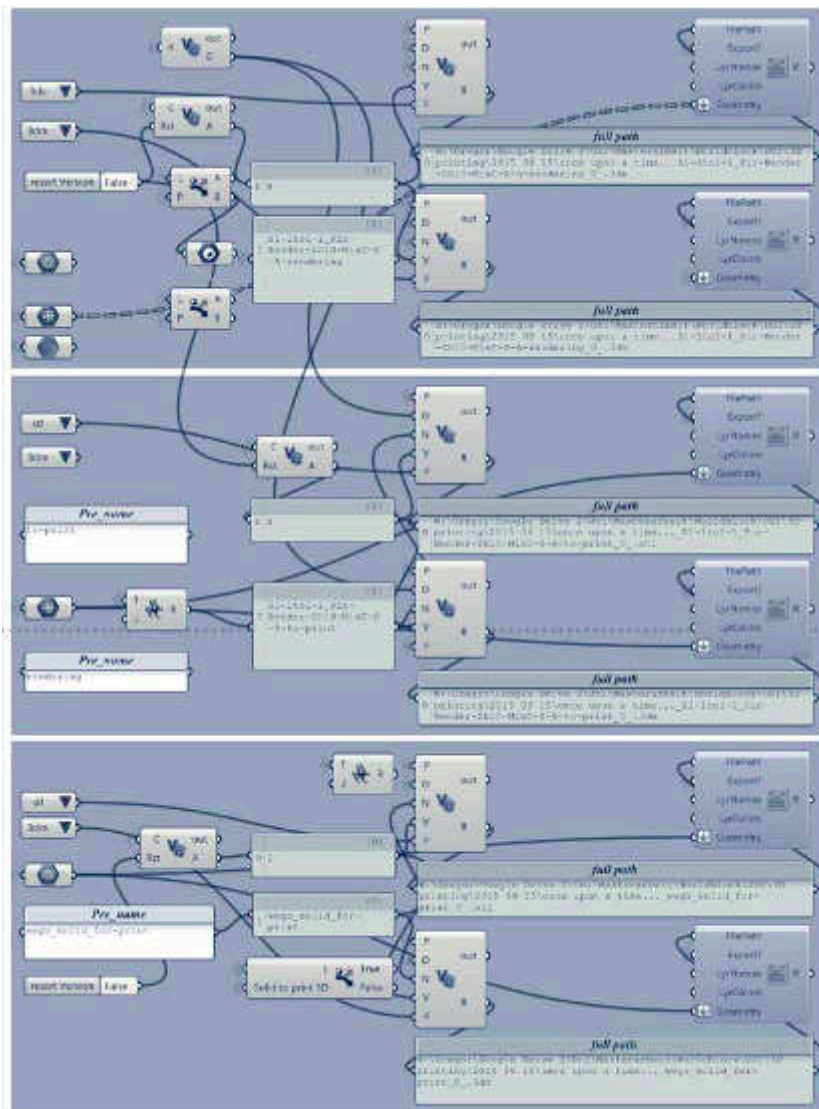
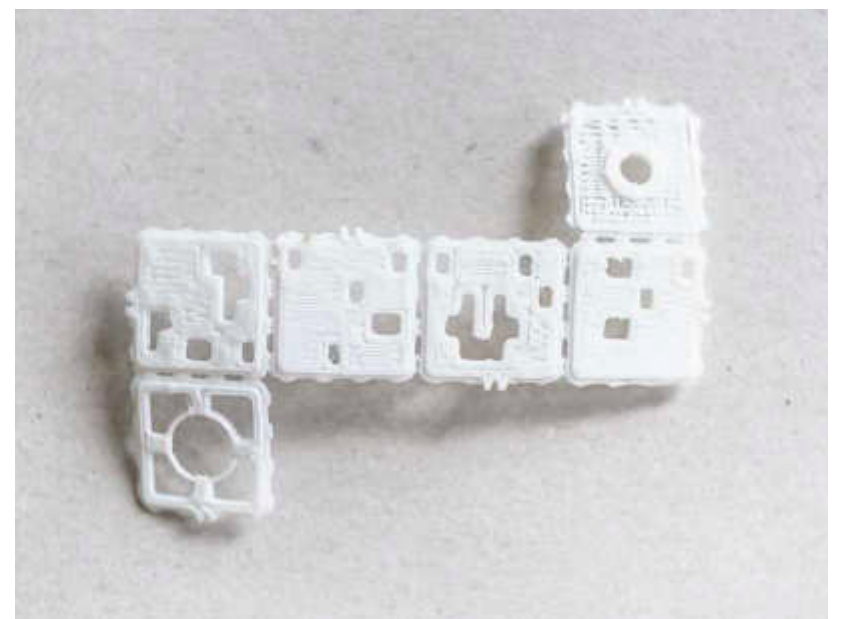


The Manufacturing Can Begin

Things do not necessarily work at once.

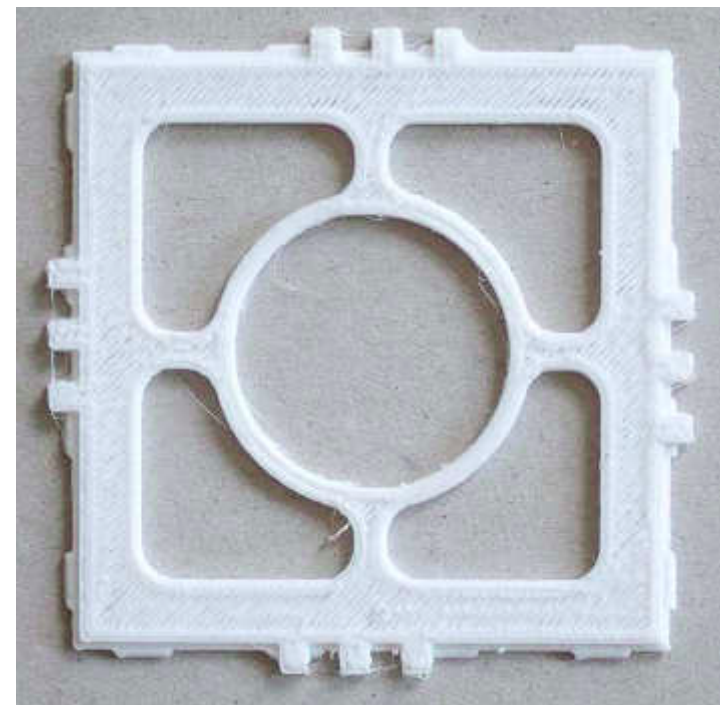
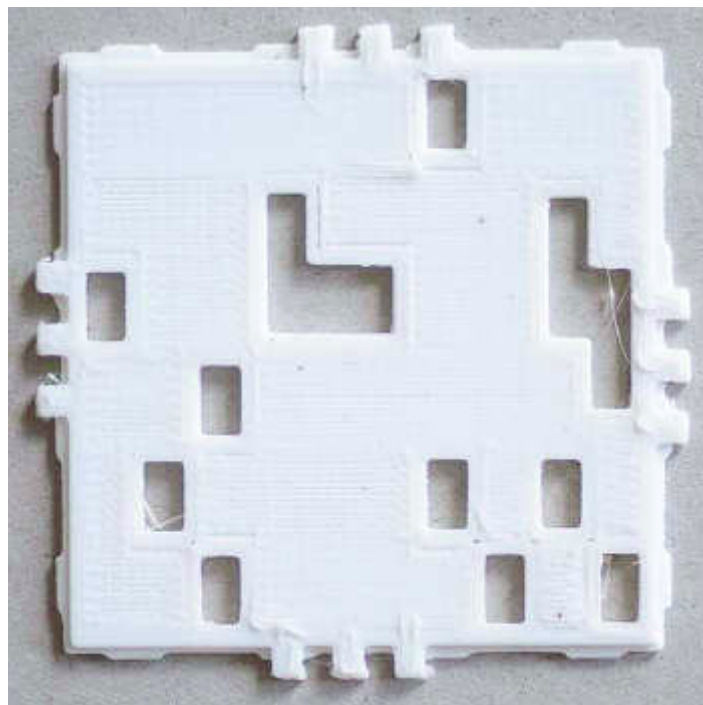
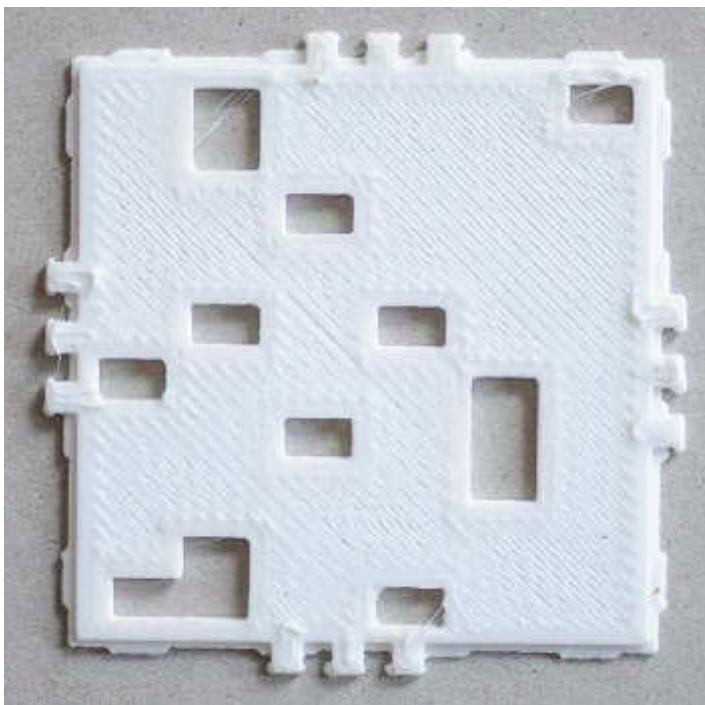
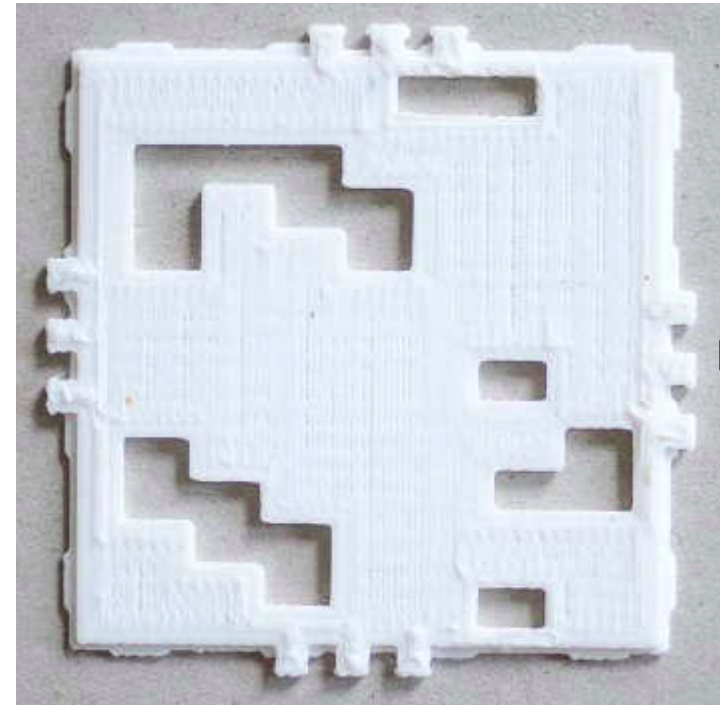
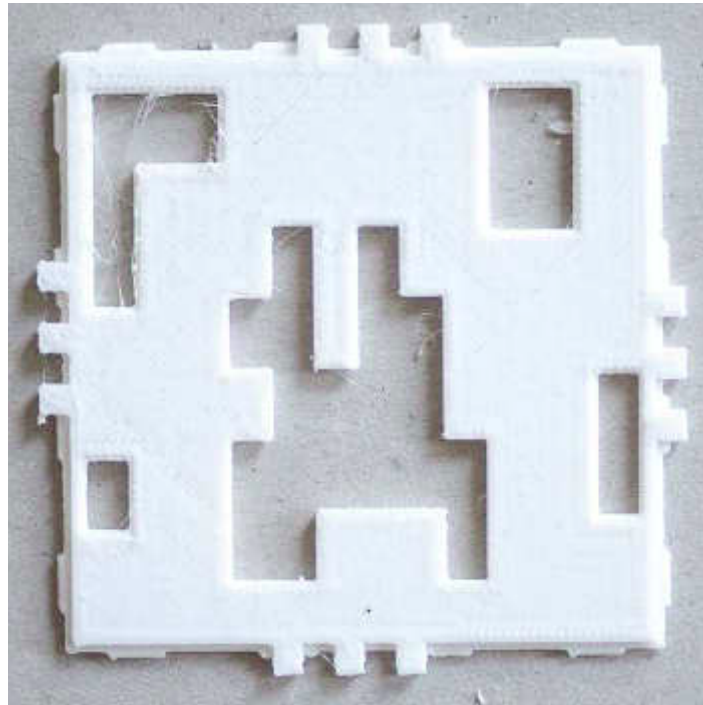
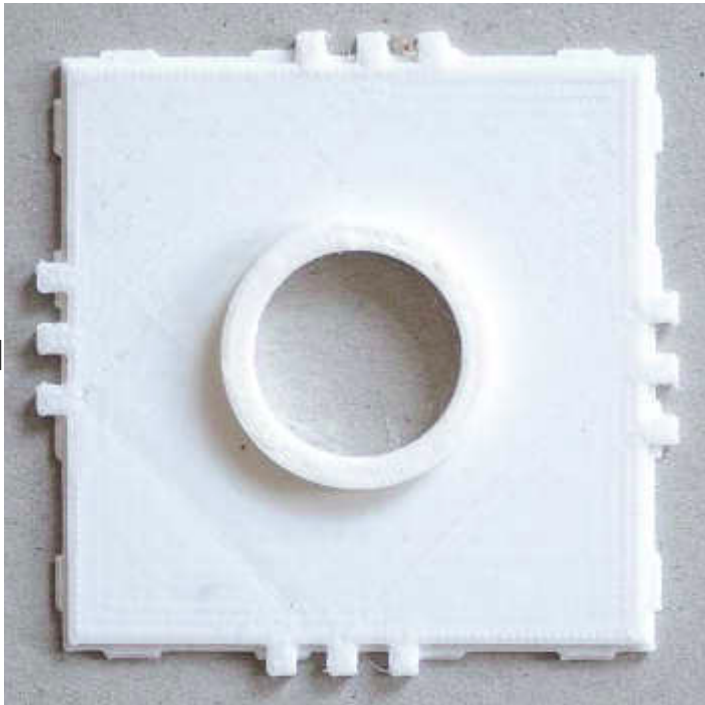


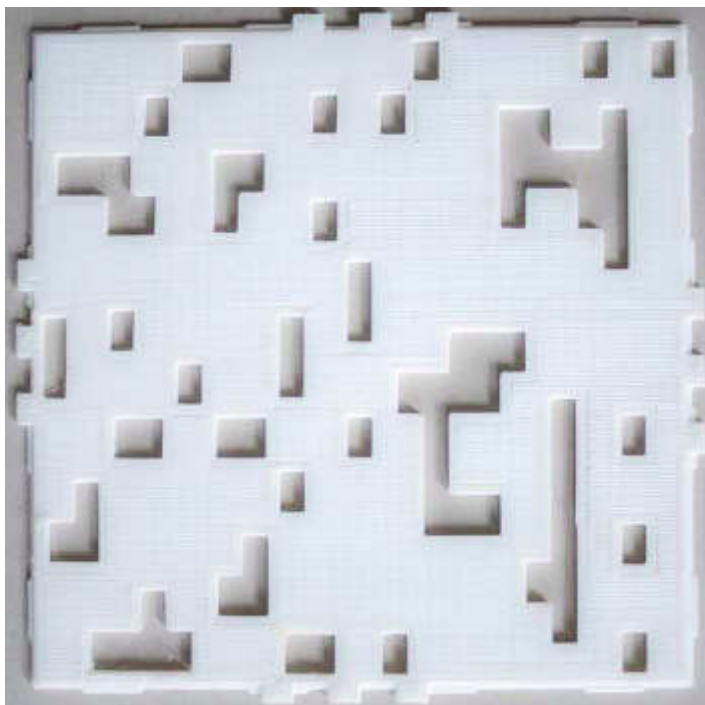
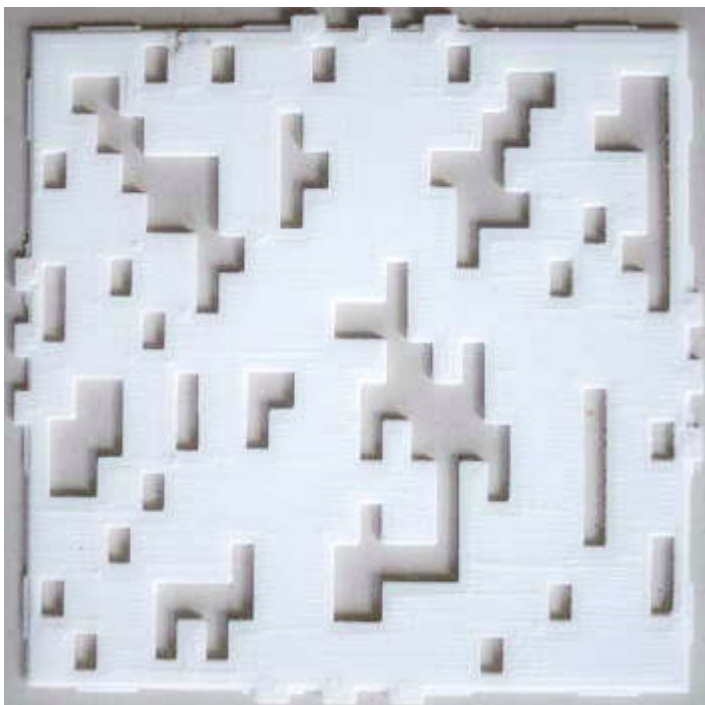
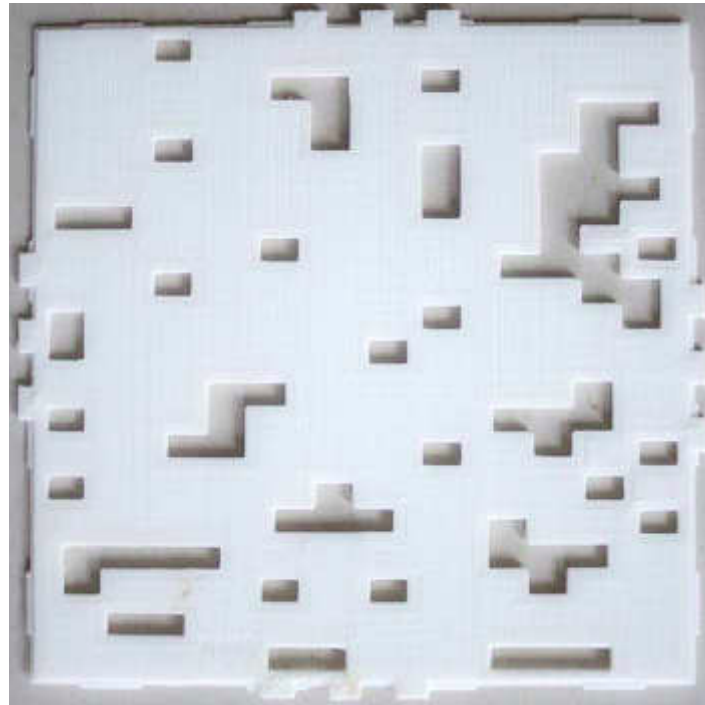
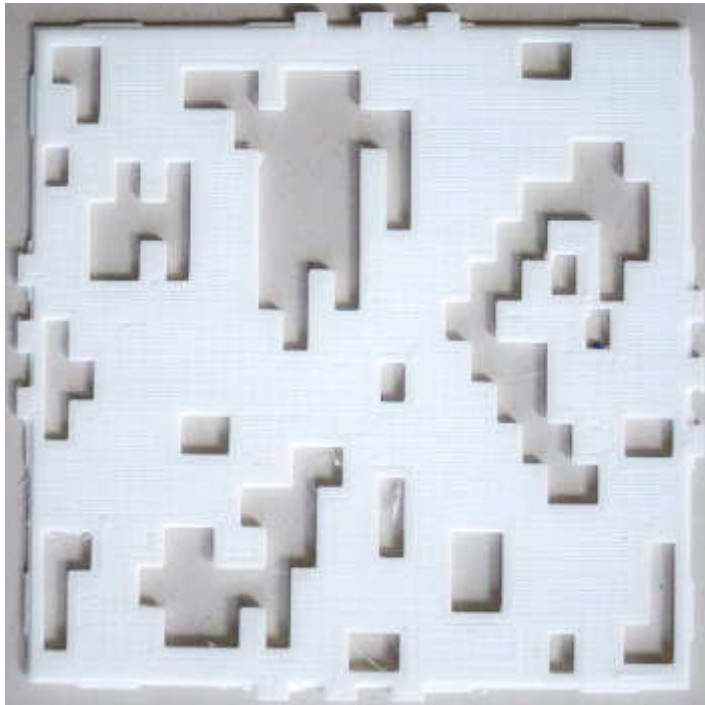
First Generation in the Final Design



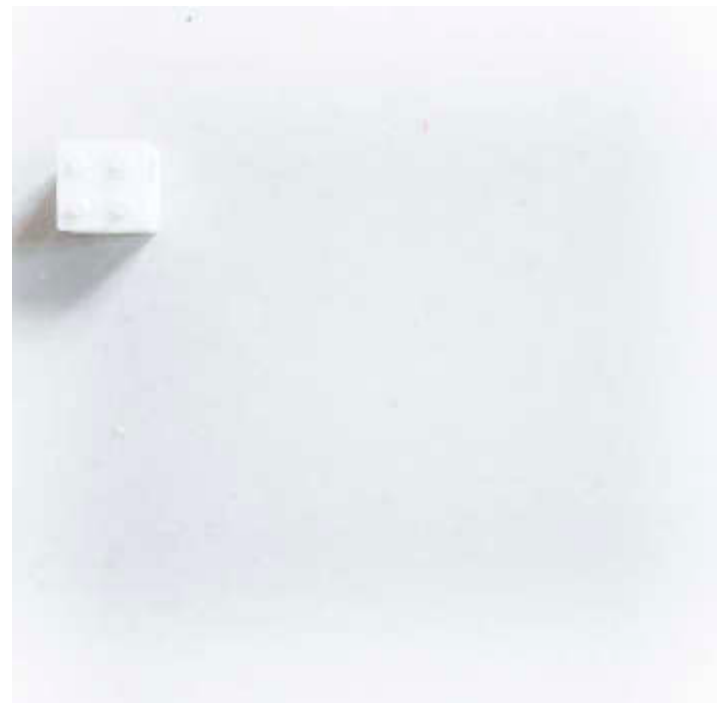
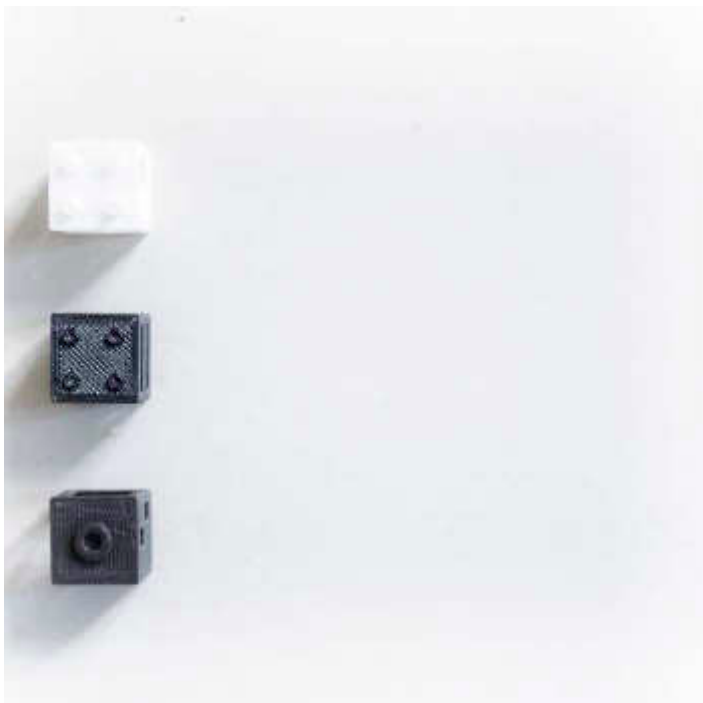
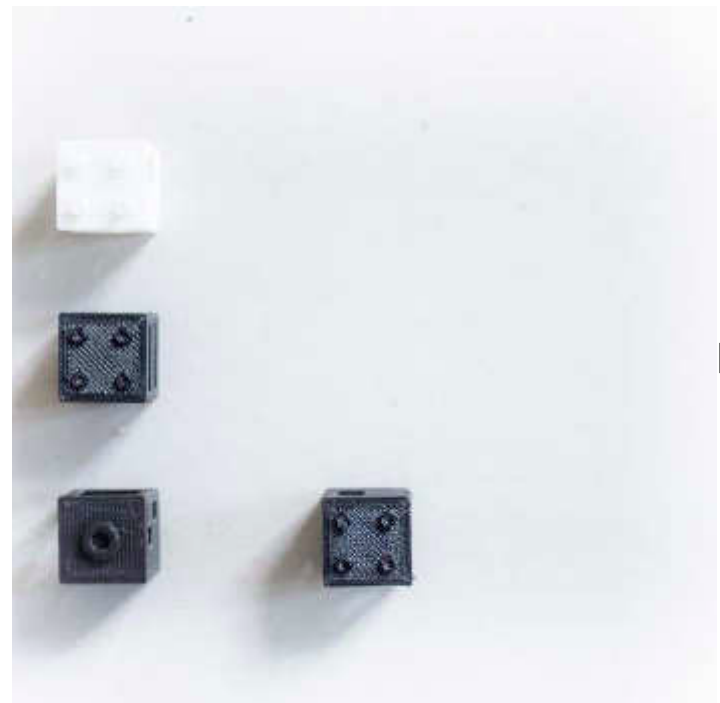
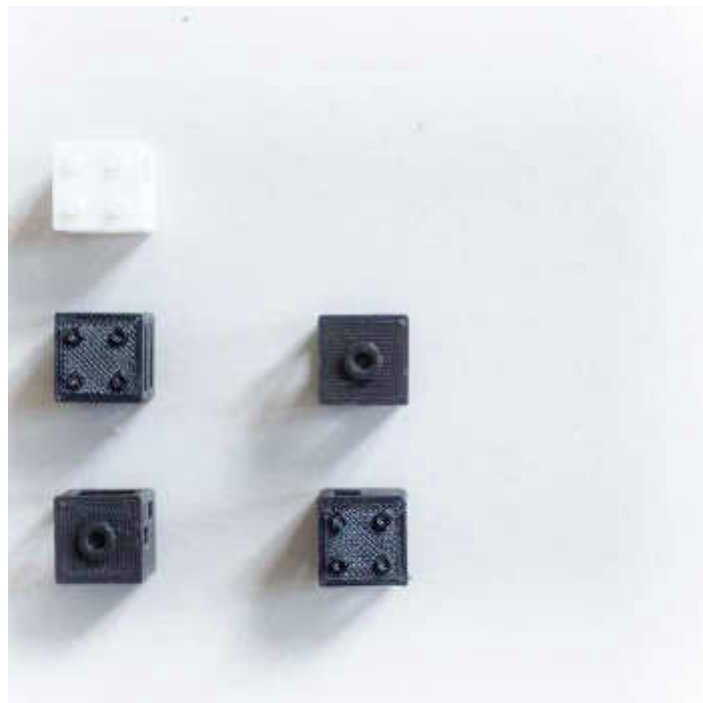
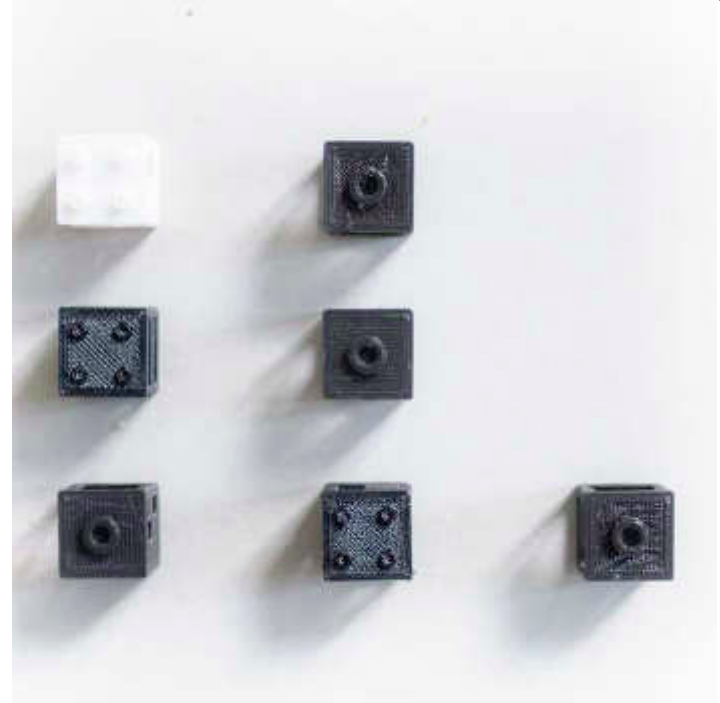
304 This script part takes the newly defined Urban Dice as a printable file into a selected folder

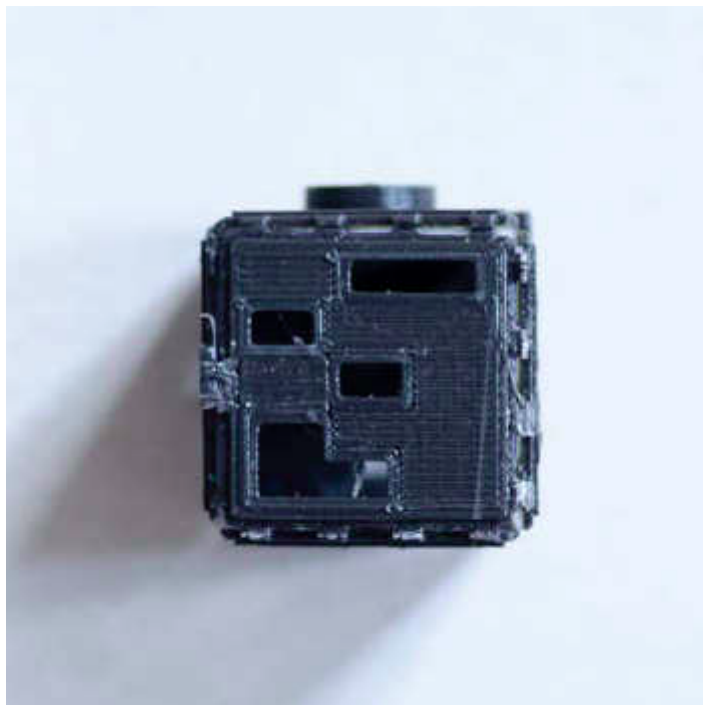
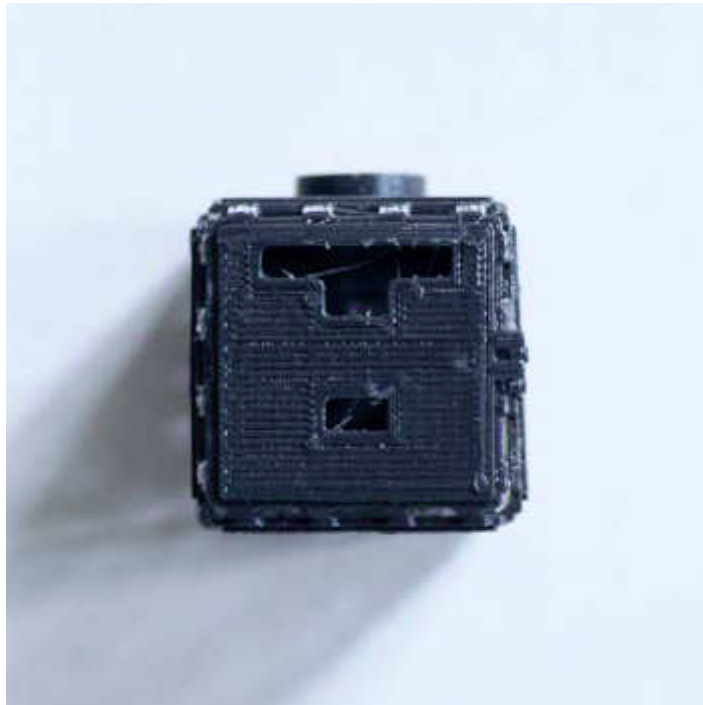
Communal Dice - Scale 1 to 128, Size 1_64



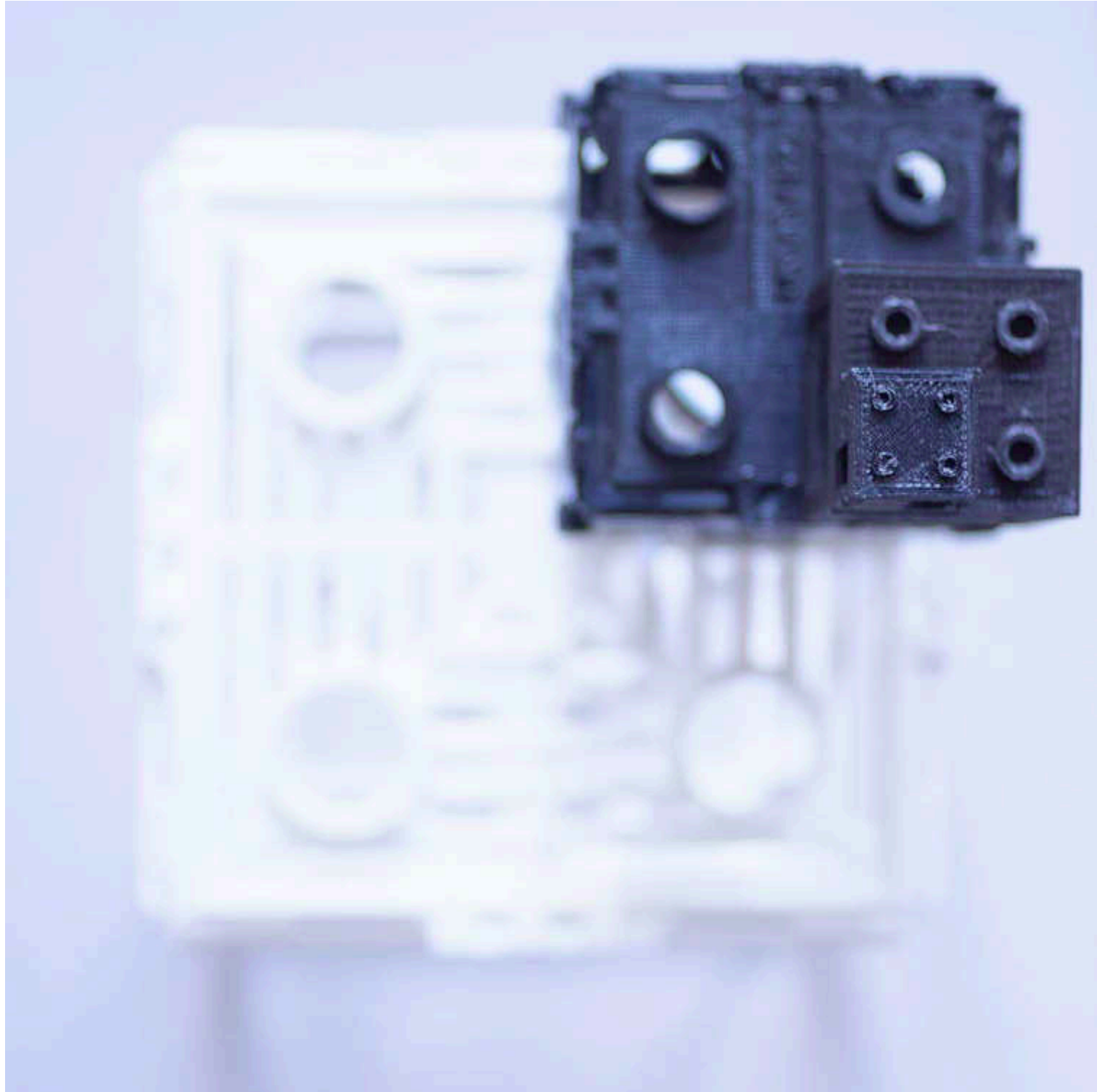


Micro dices - Scale 1 to 128, Size 1_256

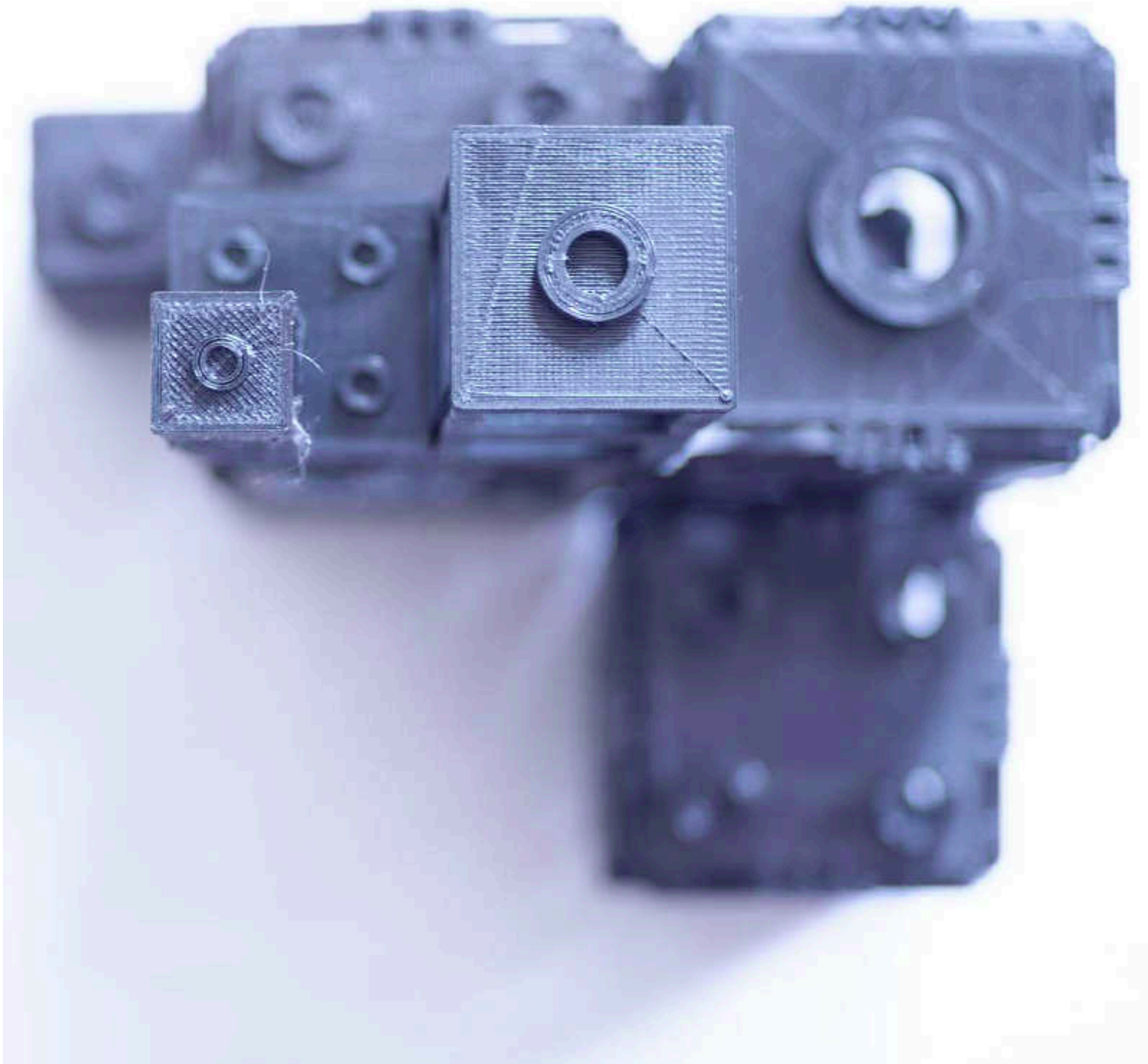




Line-Up on a Public Space, 1 to 128, Sizes 1_32, 1_64, 1_128, 1_256



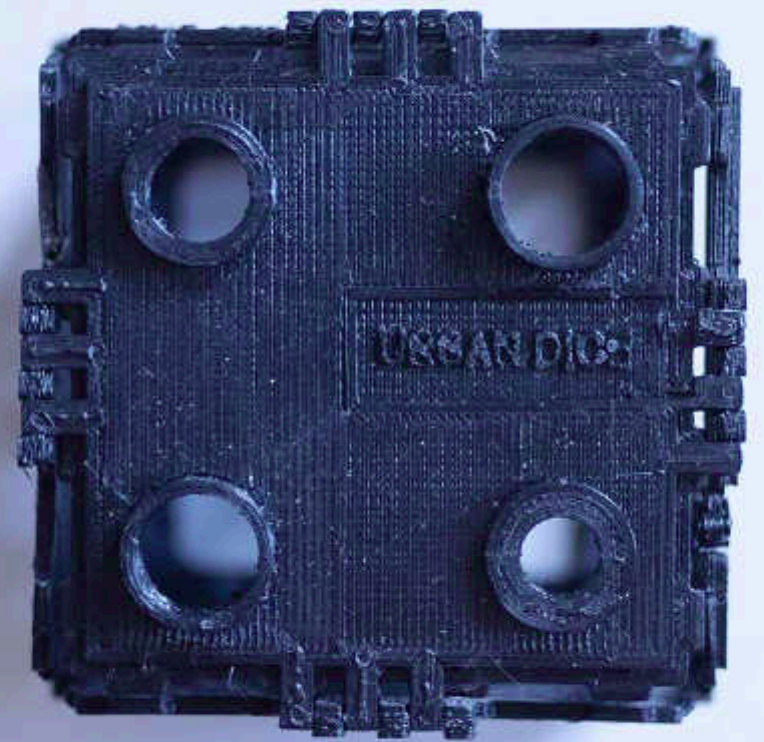
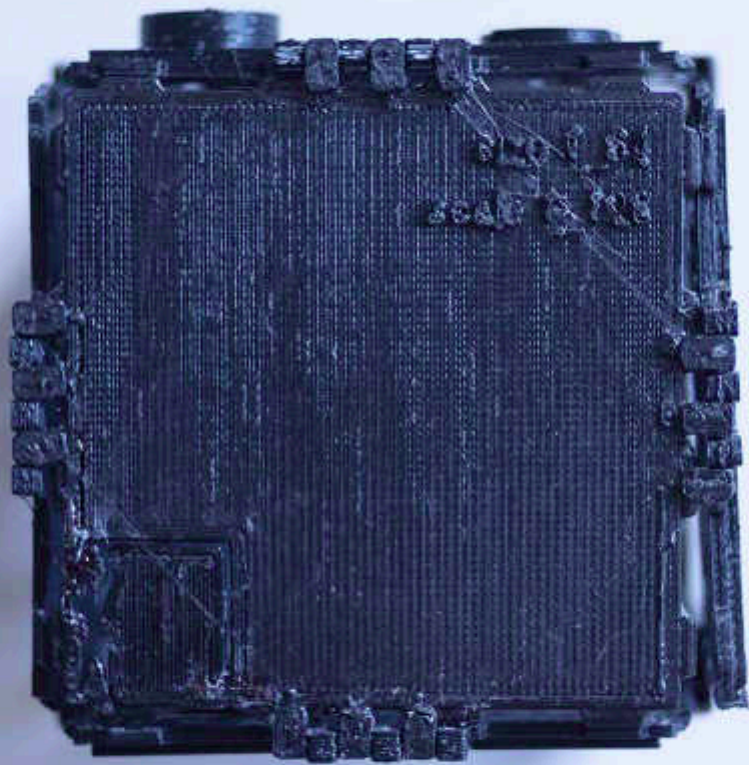
Urban Dice - a Comparative Study



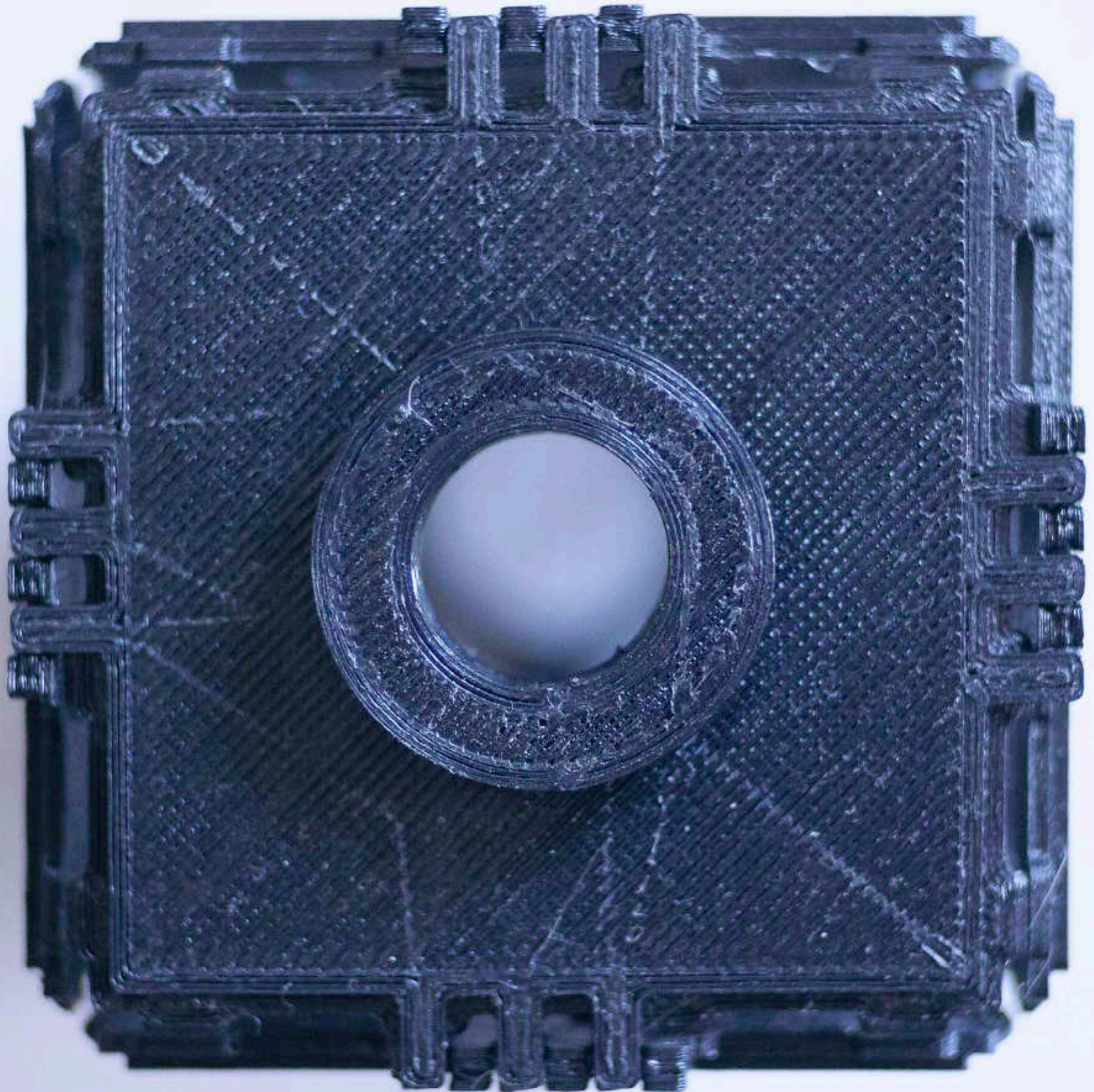
Urban Dice, with hinges, 1 to 64, frame only



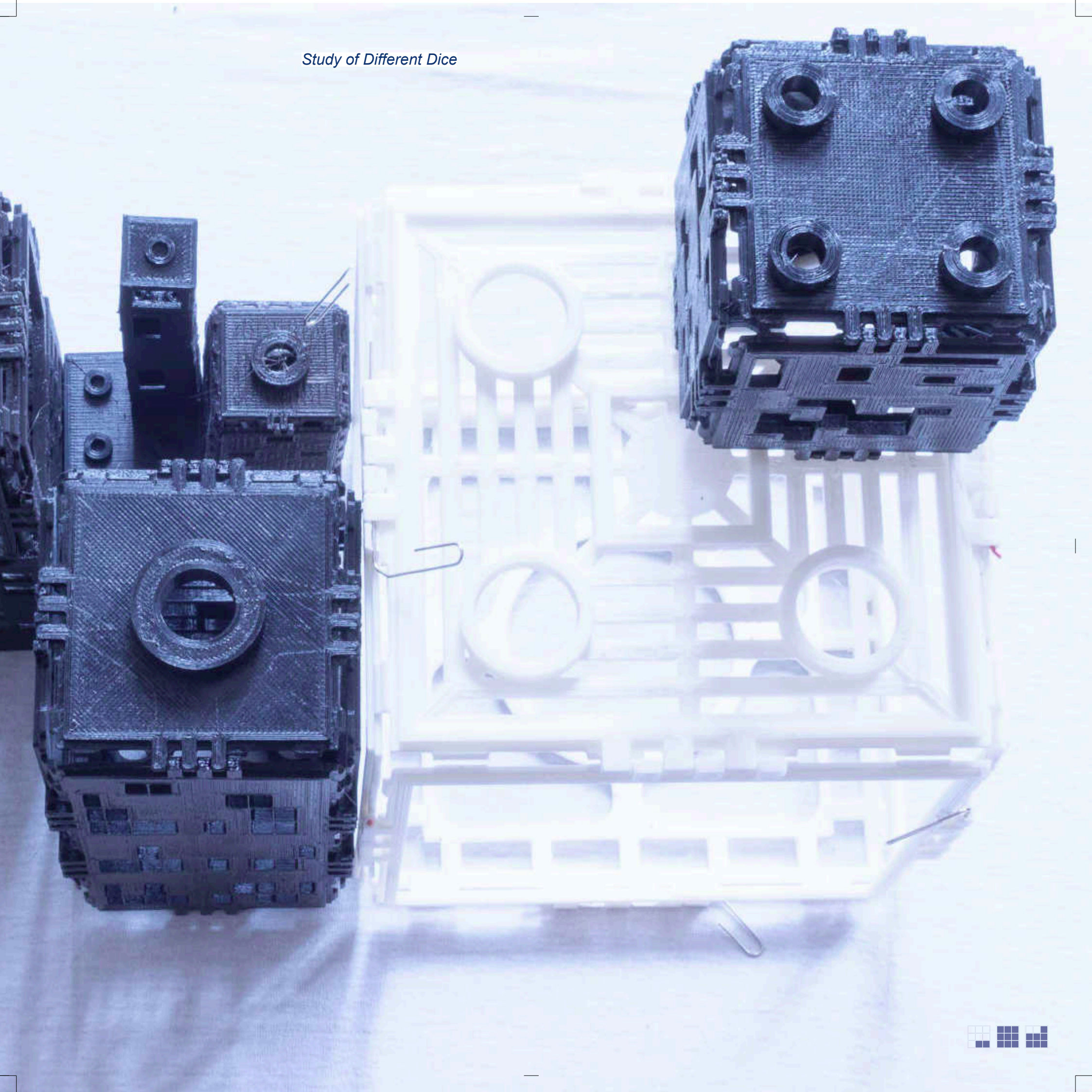
Urban Dice - With Scale Imprinted



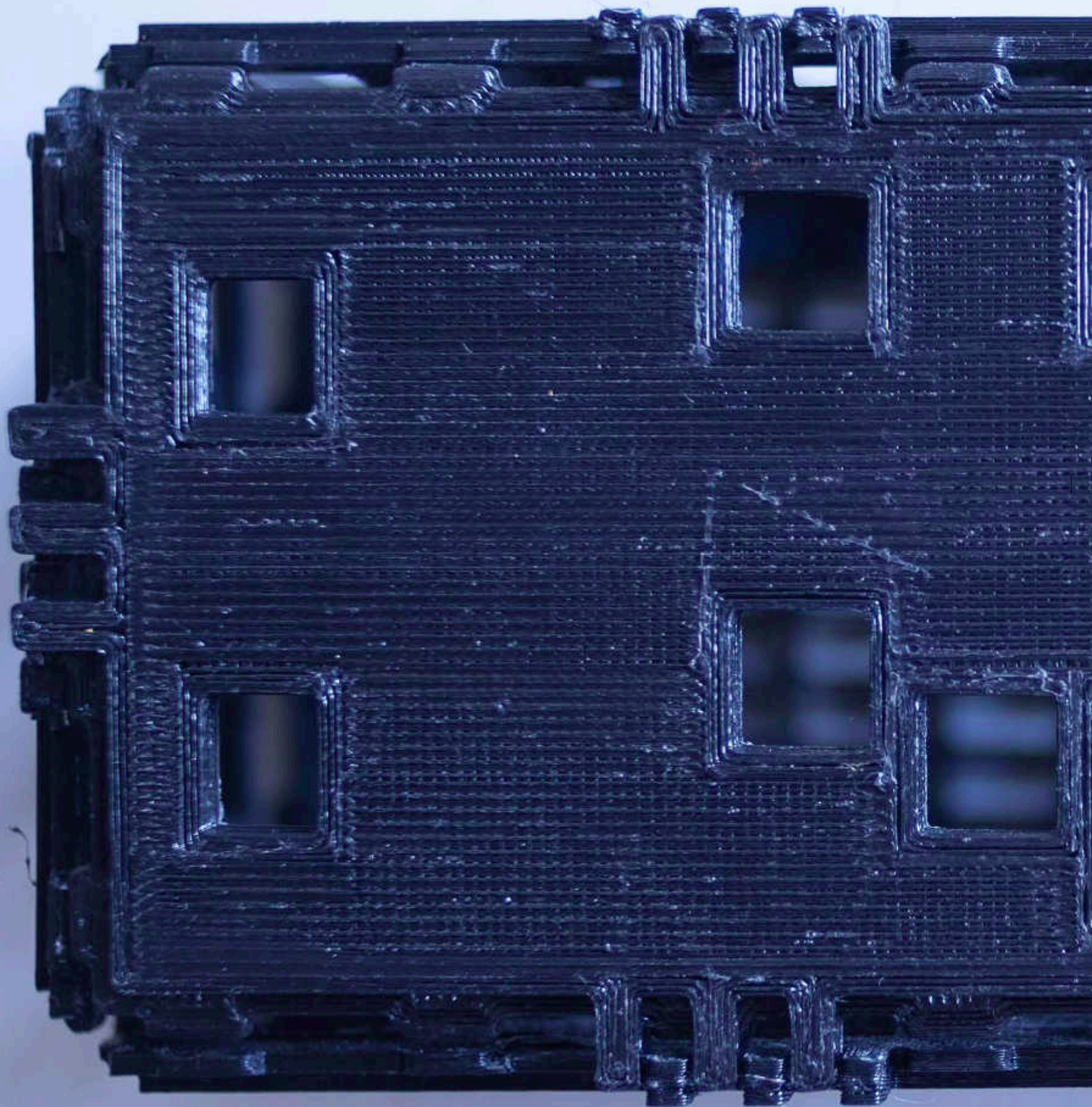
Close-Up, Communal Dice, 1 to 128, Size 1_64, double height

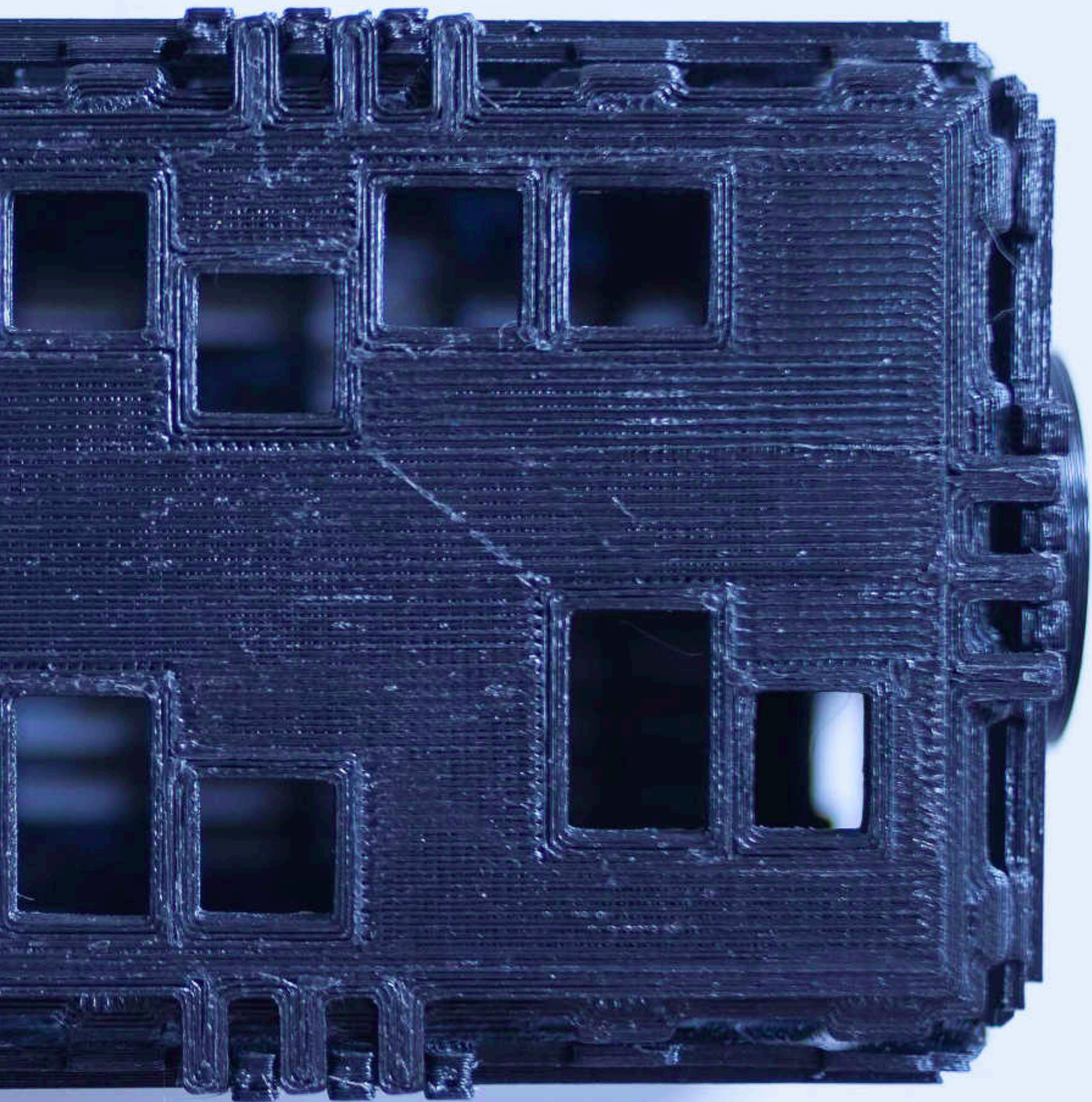


Study of Different Dice

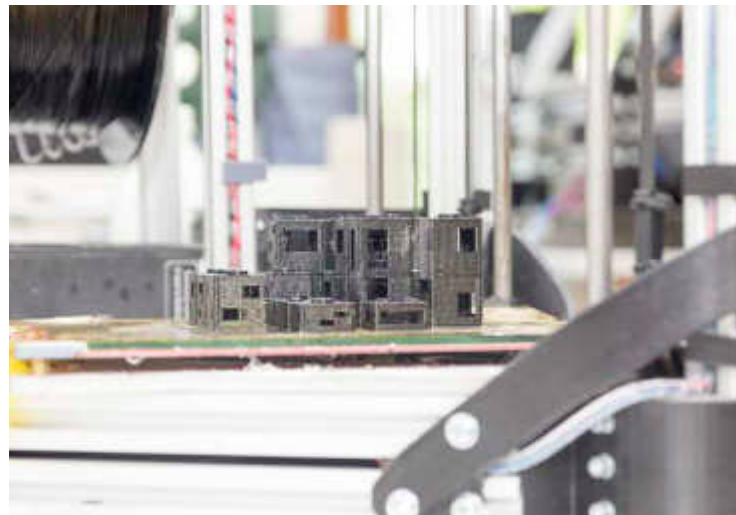
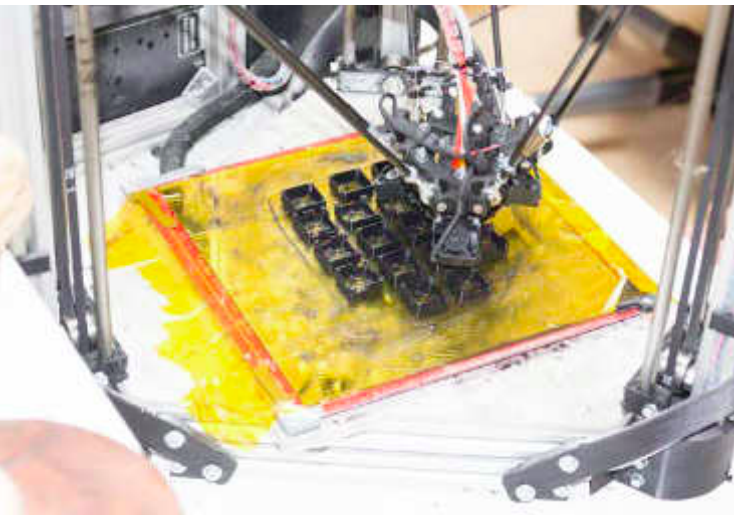
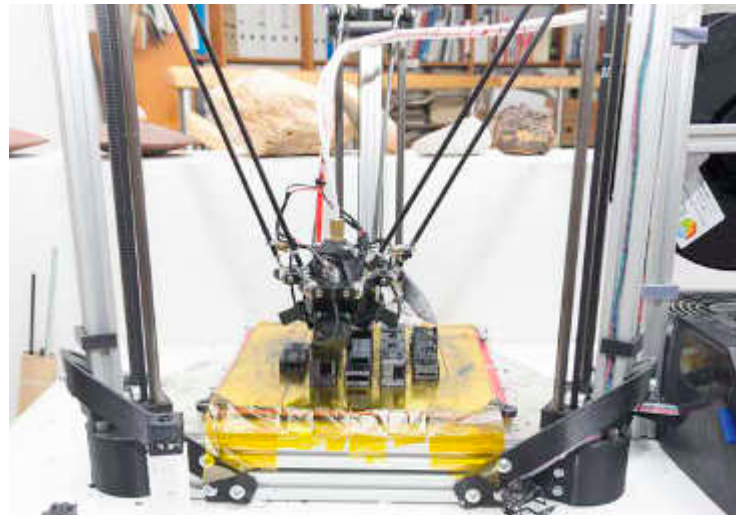
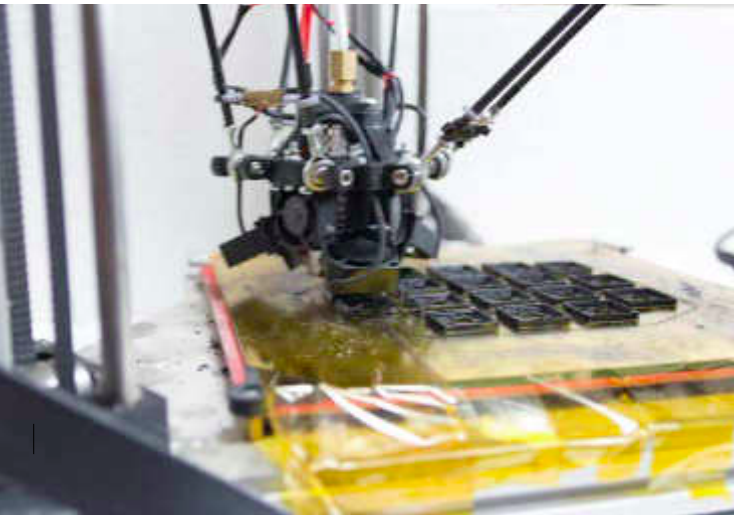


Close-Up, Communal Dice, 1 to 128, Size 1_64, double height

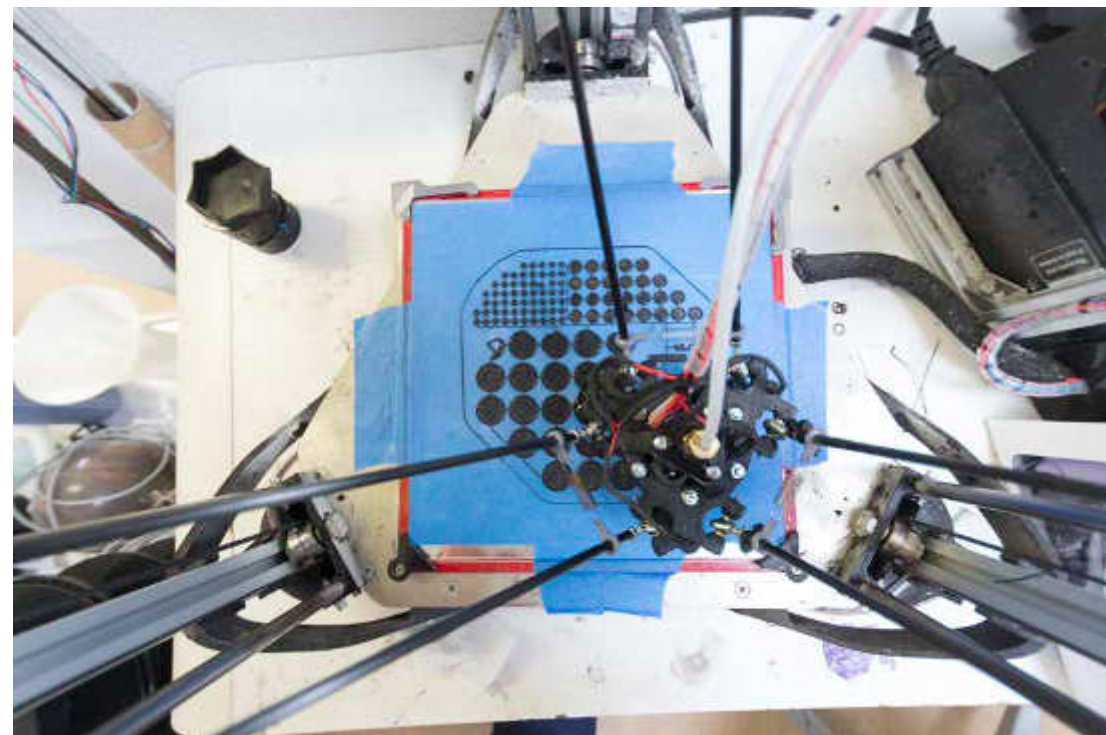
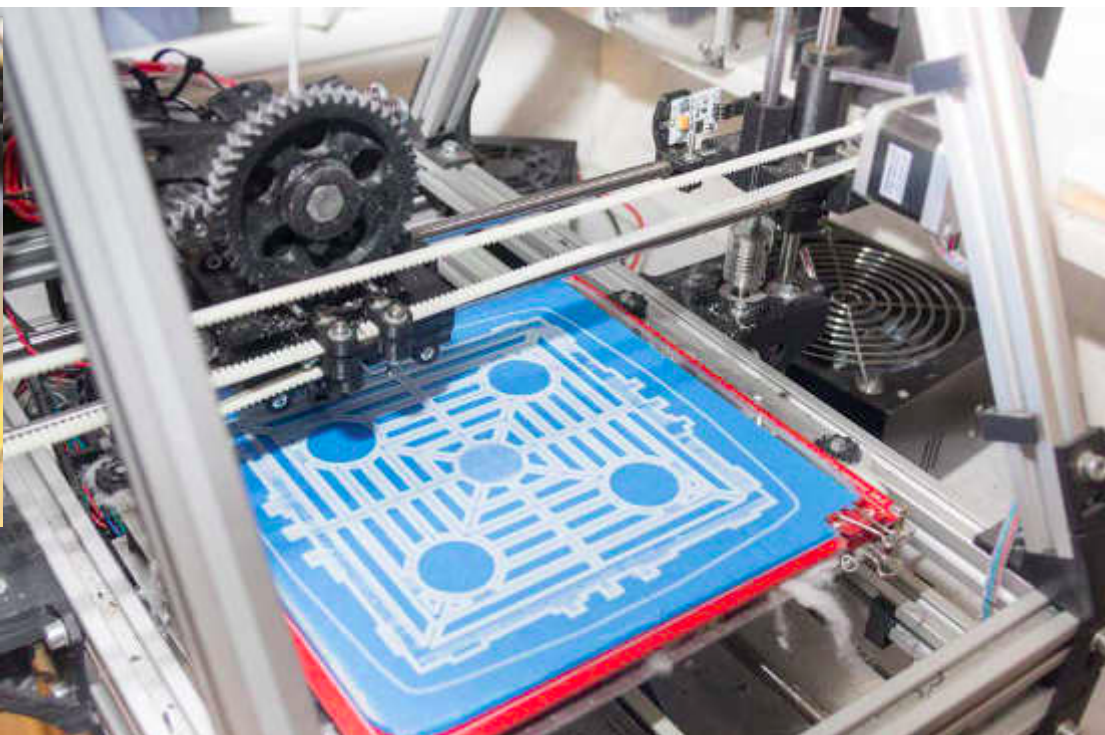
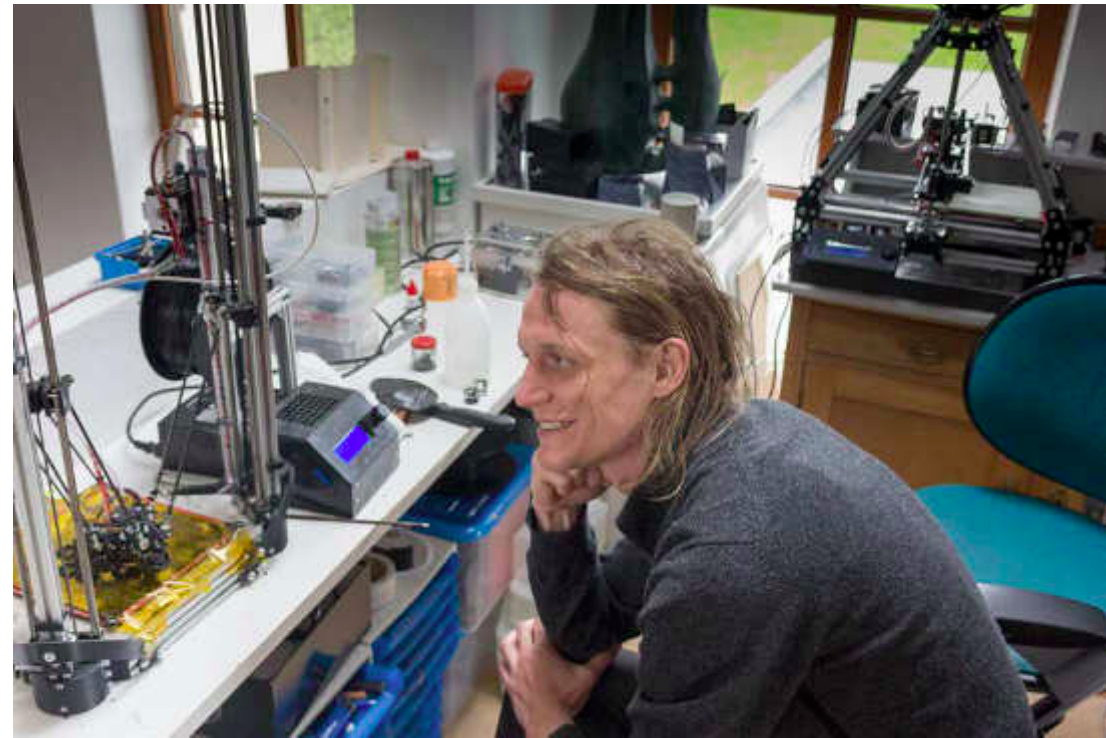
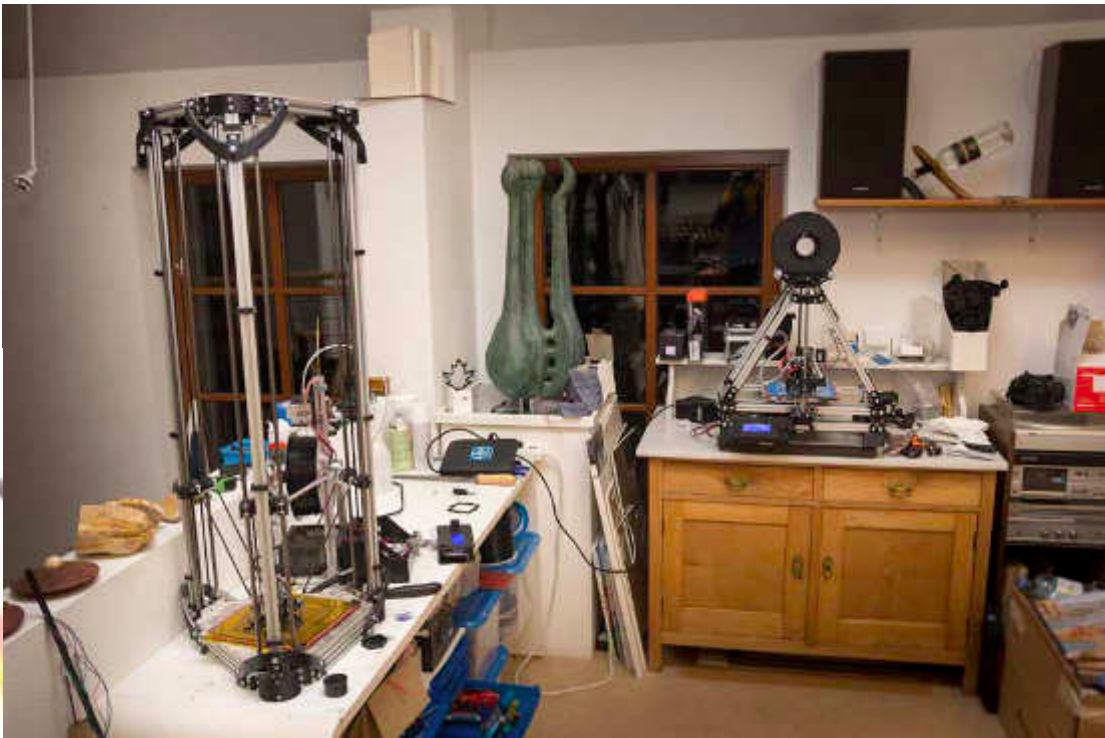




The printing in progress of a small city, Scale 1 to 128, Size 1_256.

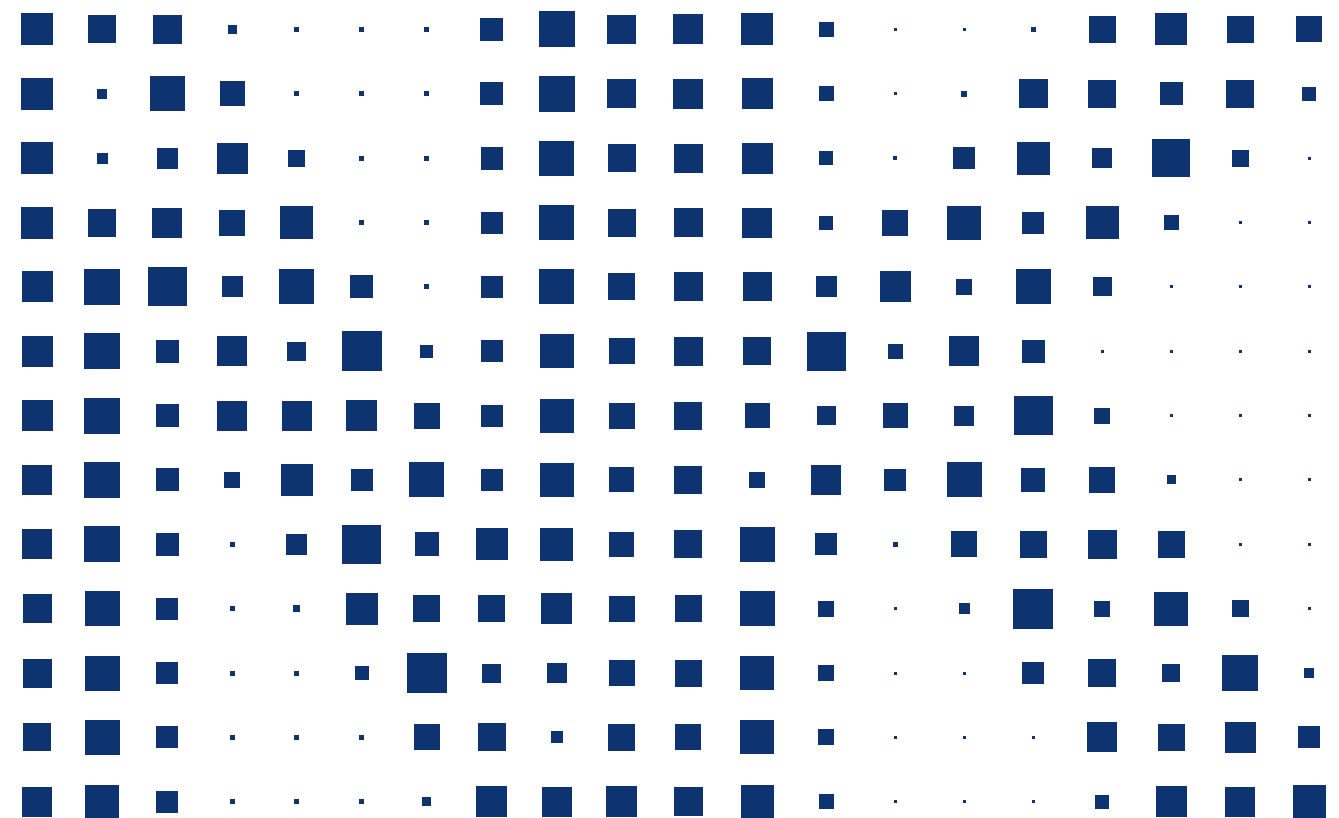
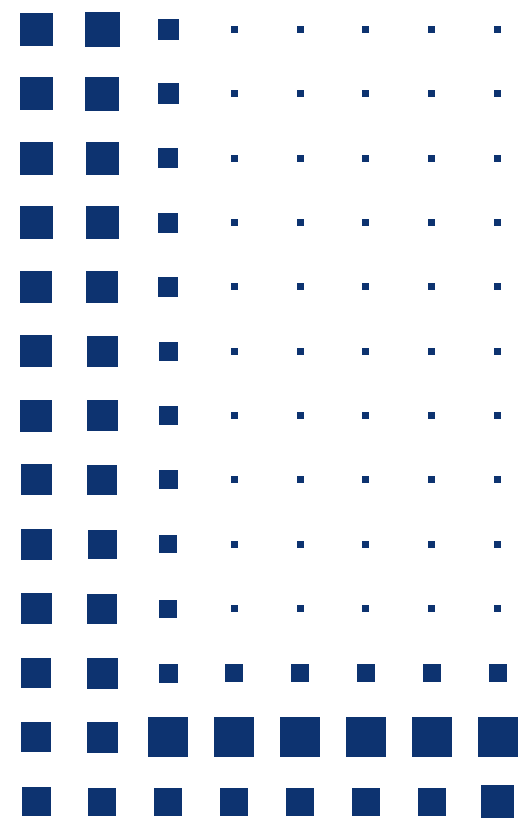
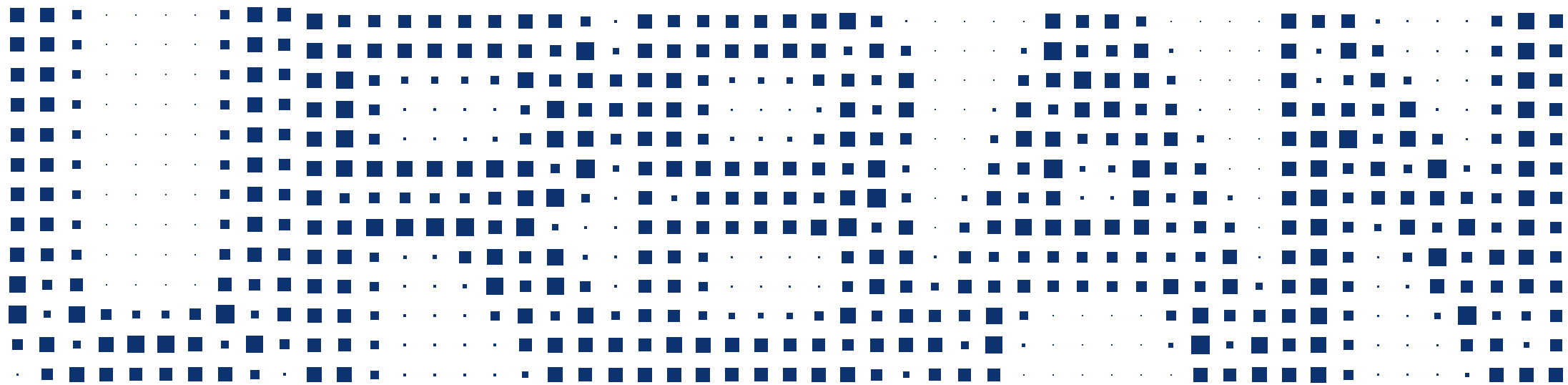


The "Factory" of Urban Dice



u4

Throw the Dice







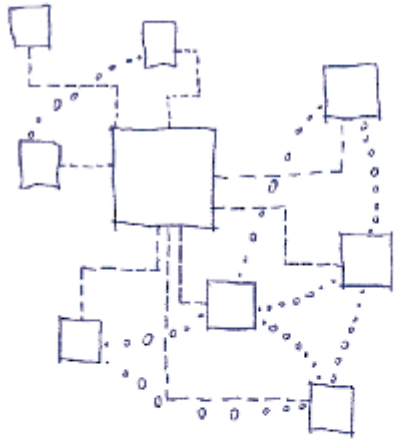
An intersection between thoughts, a link between reality and utopia. Being a grown-up and staying a child. The handling of difficult problems with distance and naivety, being able to play while searching for solutions.

This and much more helps Ma.Ad.Manians to handle their daily life. By participating in their own urban life. Urban life is a day to day challenge and energy needs to be expended whether one participates or not, in this Utopia the people learned to do so.

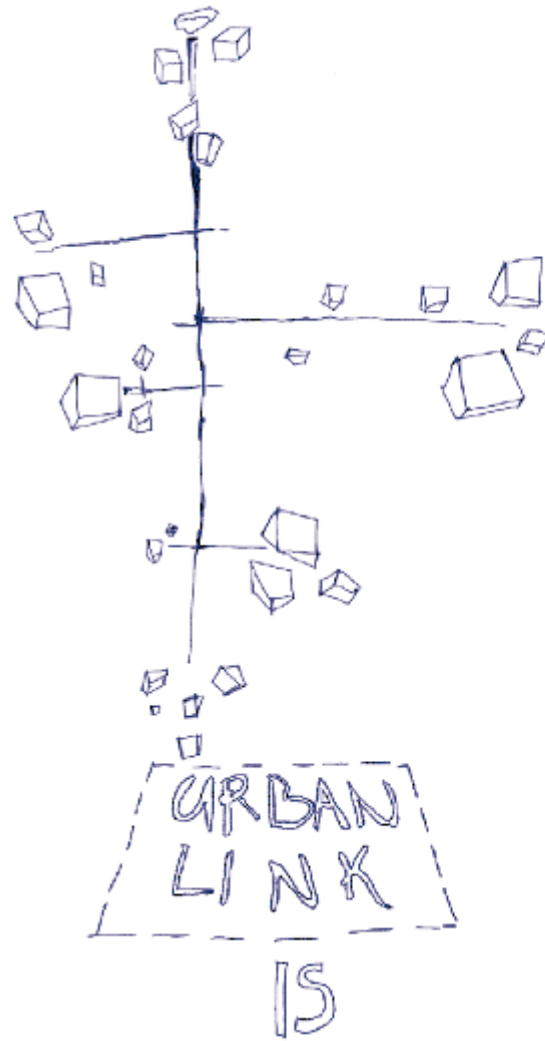
Ma.Ad.Man. Urbanization and all its elements are about gaining awareness of urban life as such and helps understanding mechanisms found in our urbanities. Urban Link is not only the link from virtuality to reality, it is a link between all our different realities and our individuality.



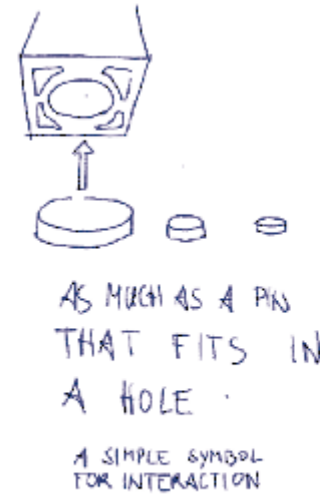
- A VISUALIZATION OF URBAN LINKS -



ABOUT THE MANY THINGS THAT LINK URBAN LIFE TOGETHER



Ma.Ad.Man. URBANIZATION TO THE REAL WORLD



AS MUCH AS A PIN THAT FITS IN A HOLE

A SIMPLE SYMBOL FOR INTERACTION



IS A PROFESSIONAL TOOL FOR URBAN DEVELOPMENT

ABOUT COMMUNICATION

THE INTERFACE FOR THE CONNECTION OF URBAN CLOUD SCRIPT AND URBAN DICE SCRIPT

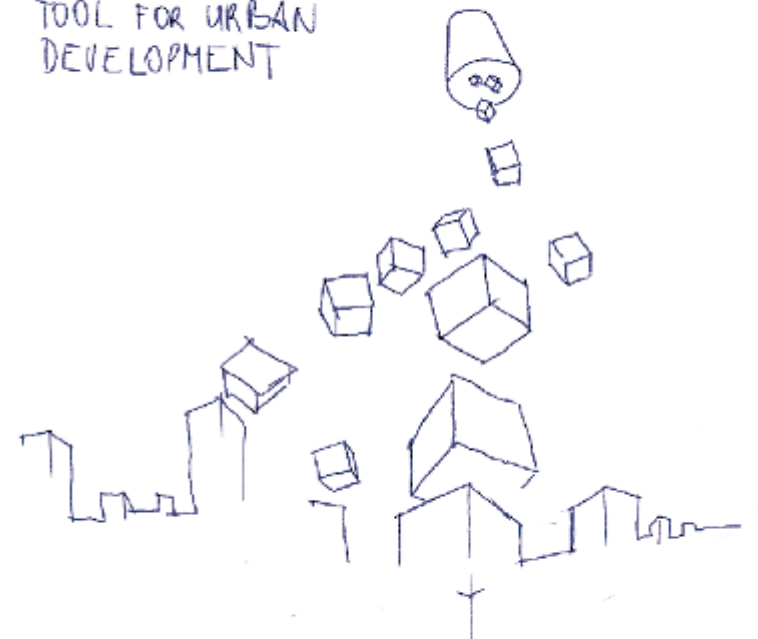
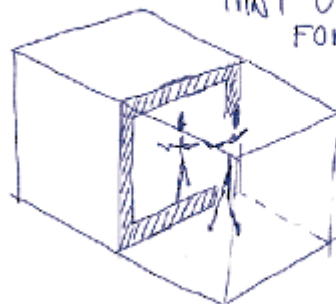
```

0 1 00 10700
1 2 10 04110
0 0 00 11011
01 00 11100
00 01 10011
01 00 11100
00 00 10000
1 1 11100
1 1 10000

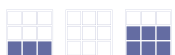
```

ABOUT NEIGHBOURS IN Ma.Ad.Man. URBANIZATION

THAT OPEN UP FOR EACH OTHER



the secret link of all world@block.org elements.



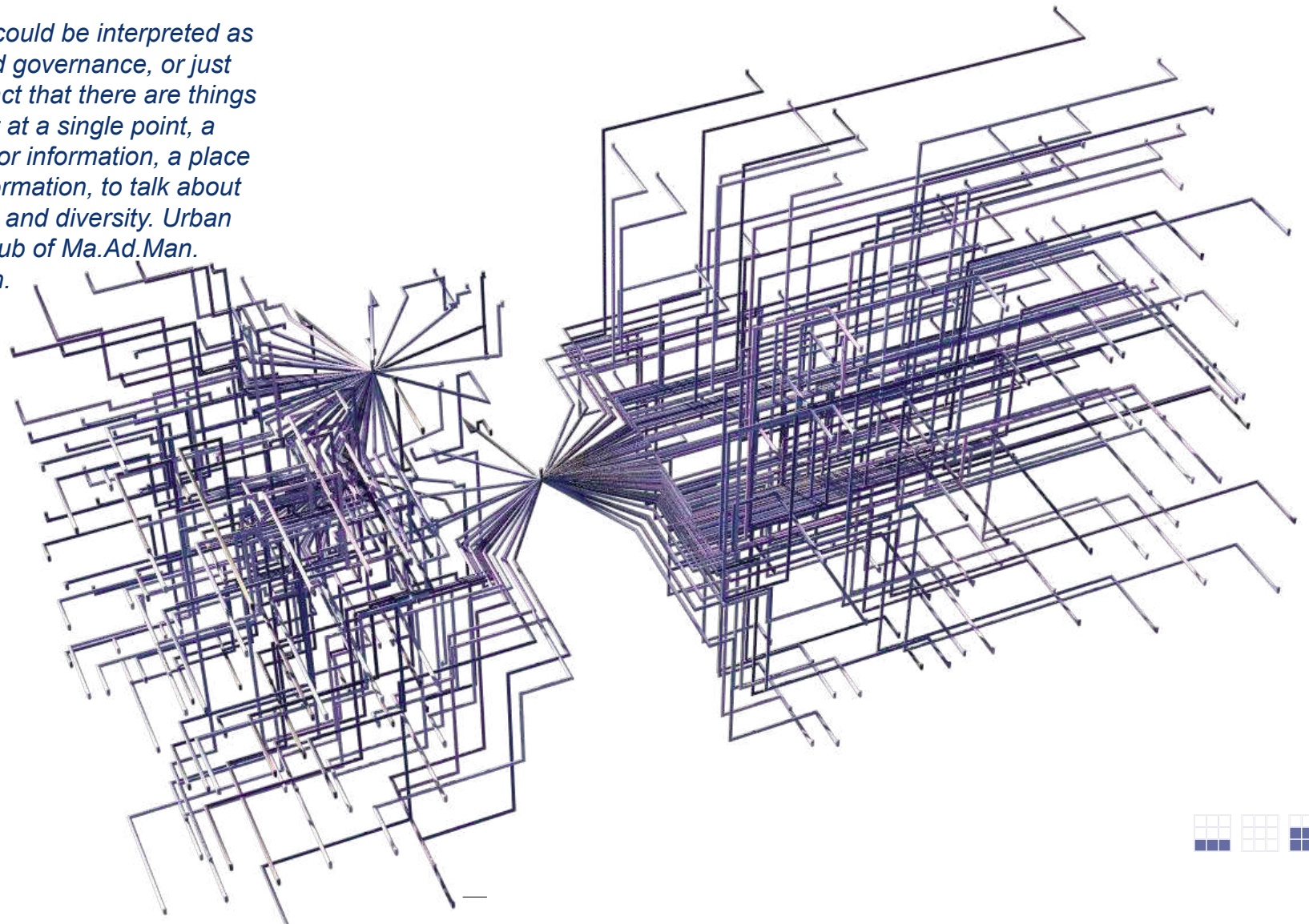
A Hub - Everything is Connected

About the understanding of virtual and real relations that urban life is based on.

Urban link is actually not implemented in Urban Cloud and Urban Dice, it is the implementation of Ma.Ad.Man. Urbanization into our life.

Urban life and life in general are a lot about the connections in-between. Connections and interactions that have numberless meanings and every one would draw them differently. To understand what we talk about we need to abstract things, and we need to make simplifications of complicated matters. Urban Link claims to be this simplification of urban matters and helps us to understand and learn about urban life in simple steps, by playing, talking or expressing one self with Urban Dice.

This image could be interpreted as a centralised governance, or just reveal the fact that there are things that connect at a single point, a hub. A hub for information, a place to share information, to talk about experiences and diversity. Urban Link is the hub of Ma.Ad.Man. Urbanization.



Urban *Link* IS

Principles

Urban
Cloud
+
Script

Urban
Dice
+
Script

electricity

internet

physical uplinks in a urbanities

UTOPIA

Communal Space

Public Space

MA.AD.MAN.

a principle in Ma.Ad.Man. UTOPIA

people

the sharing of ideas

the lust in experimenting

the water from the tap

a network

infrastructure

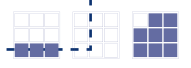
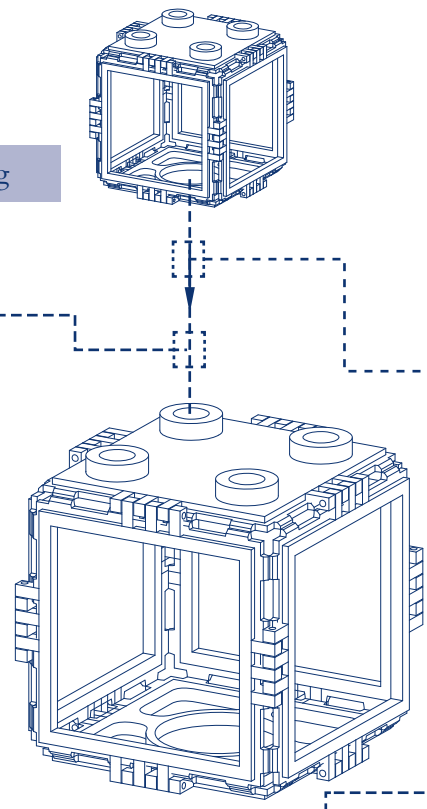
playing

information

bumping into someone
around the corner

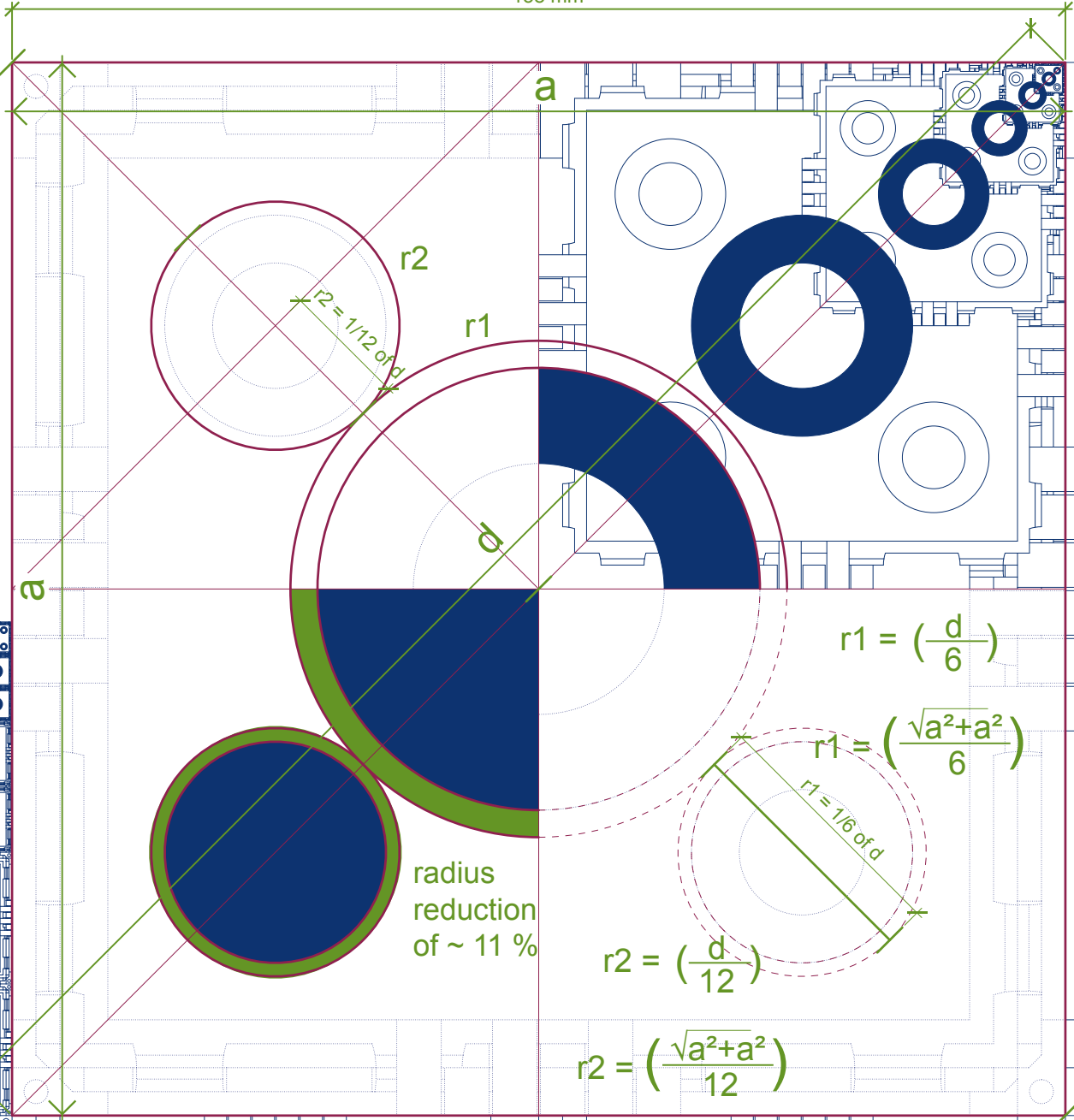
communication

a stage for all world citizens

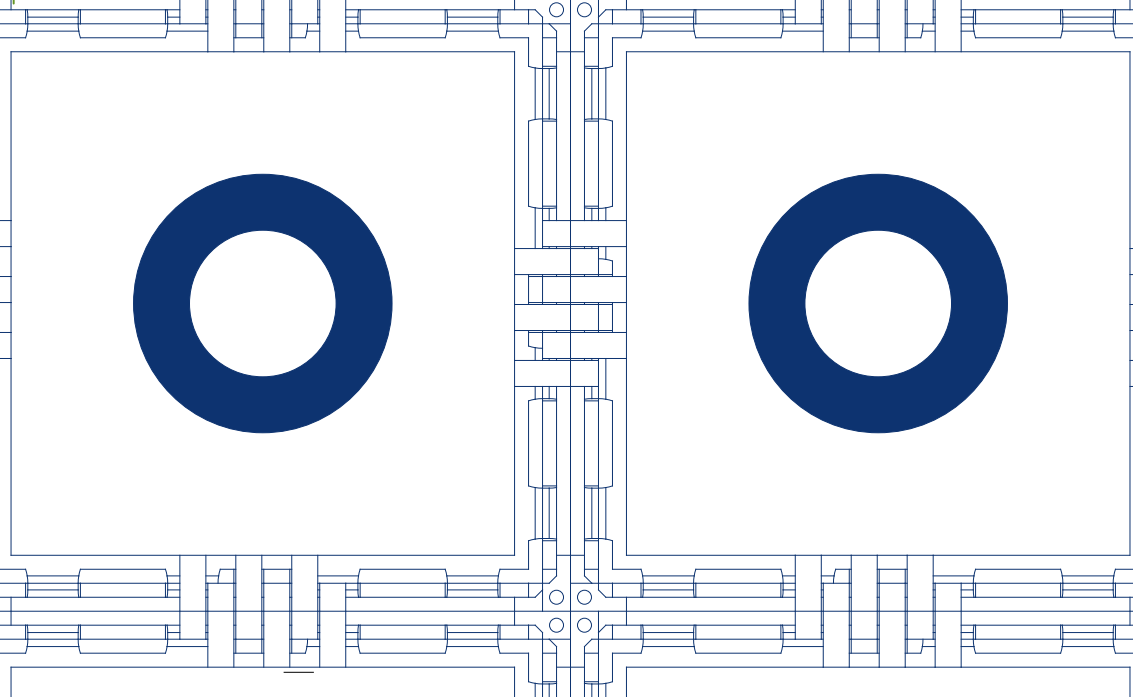
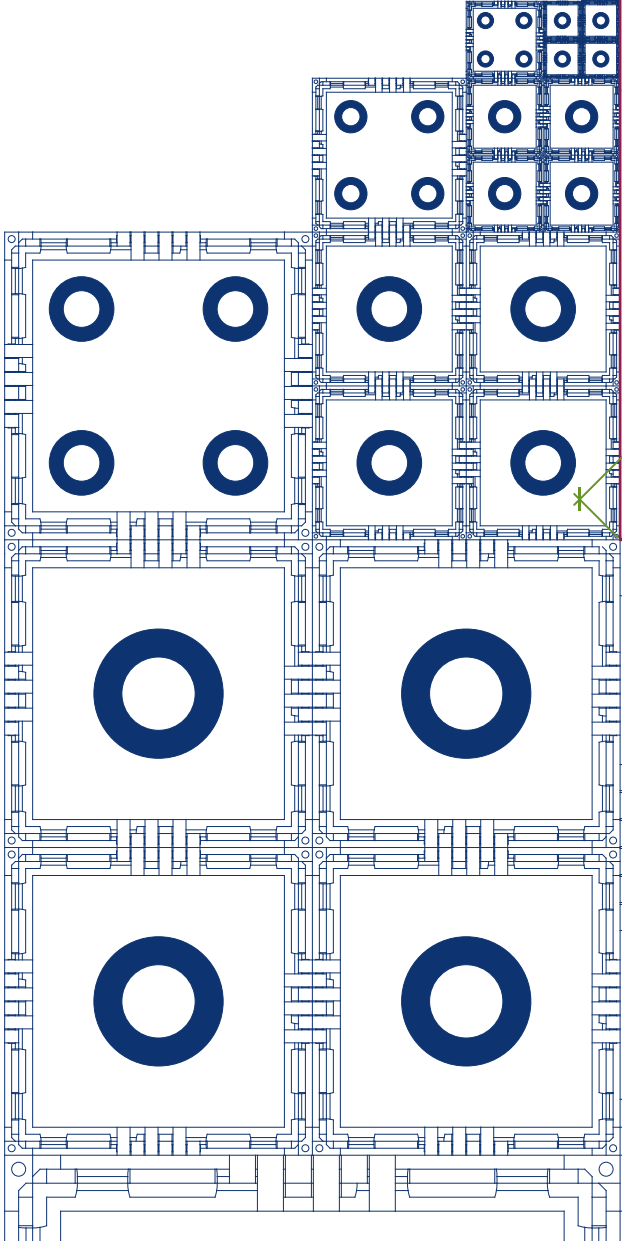
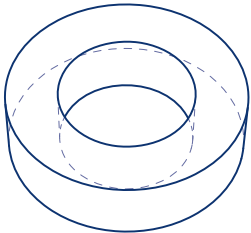


A Simple Pin

158 mm



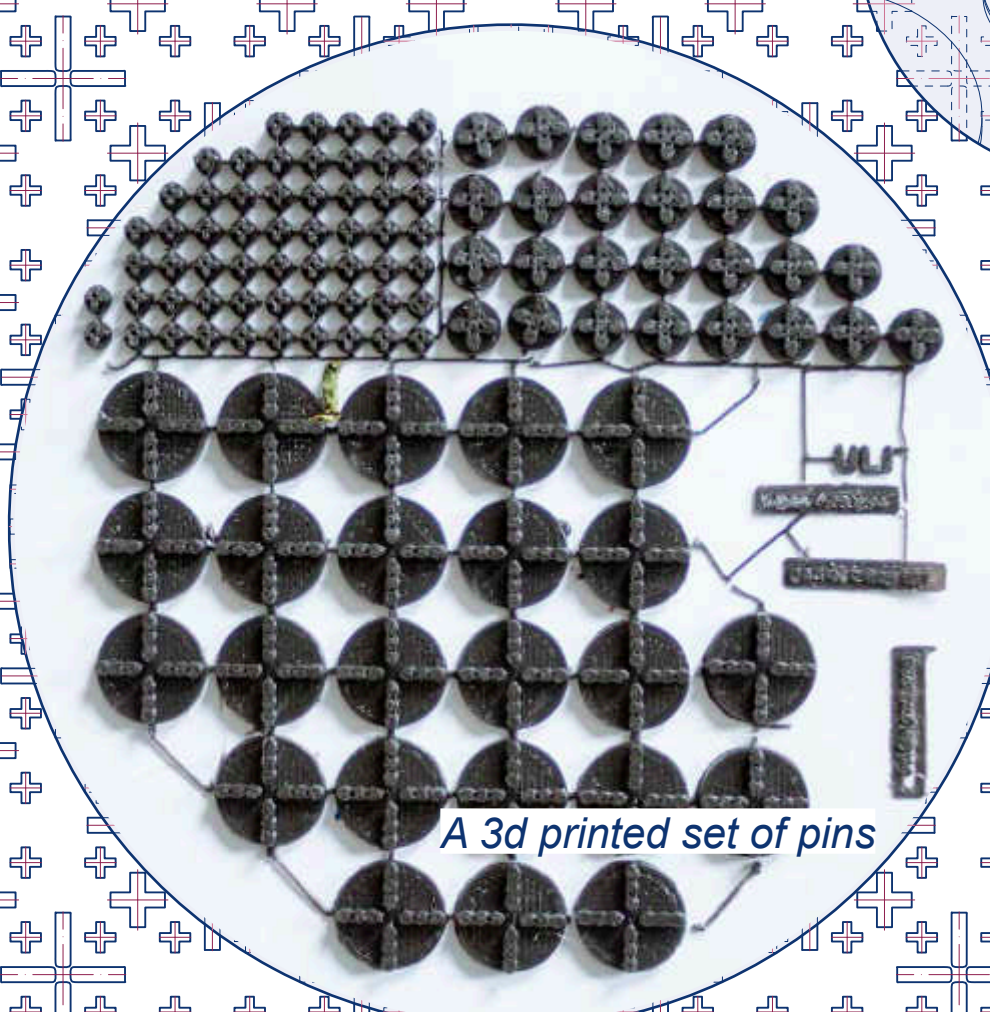
radius reduction of ~ 11 %



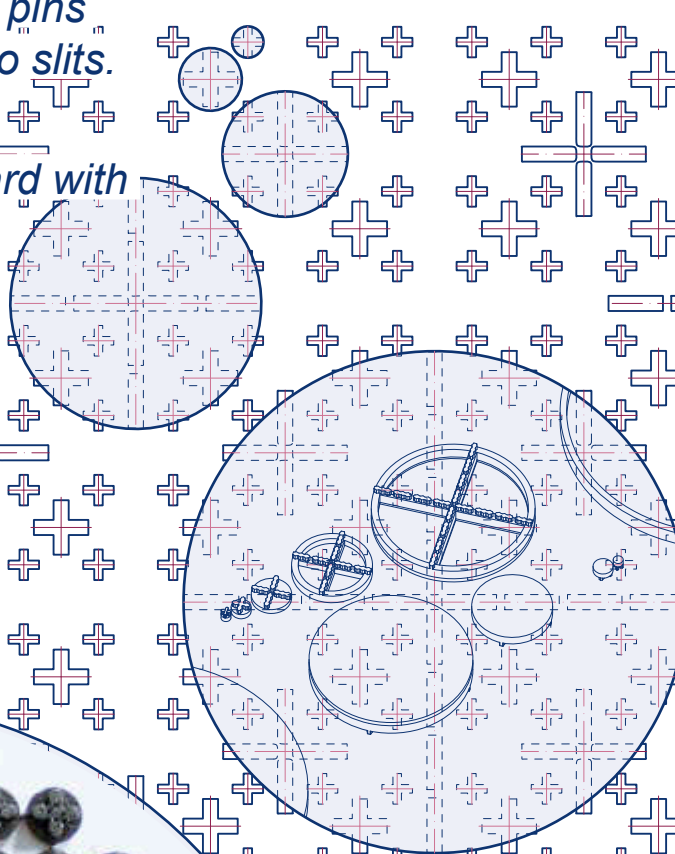
Urban Dice-Pinboard

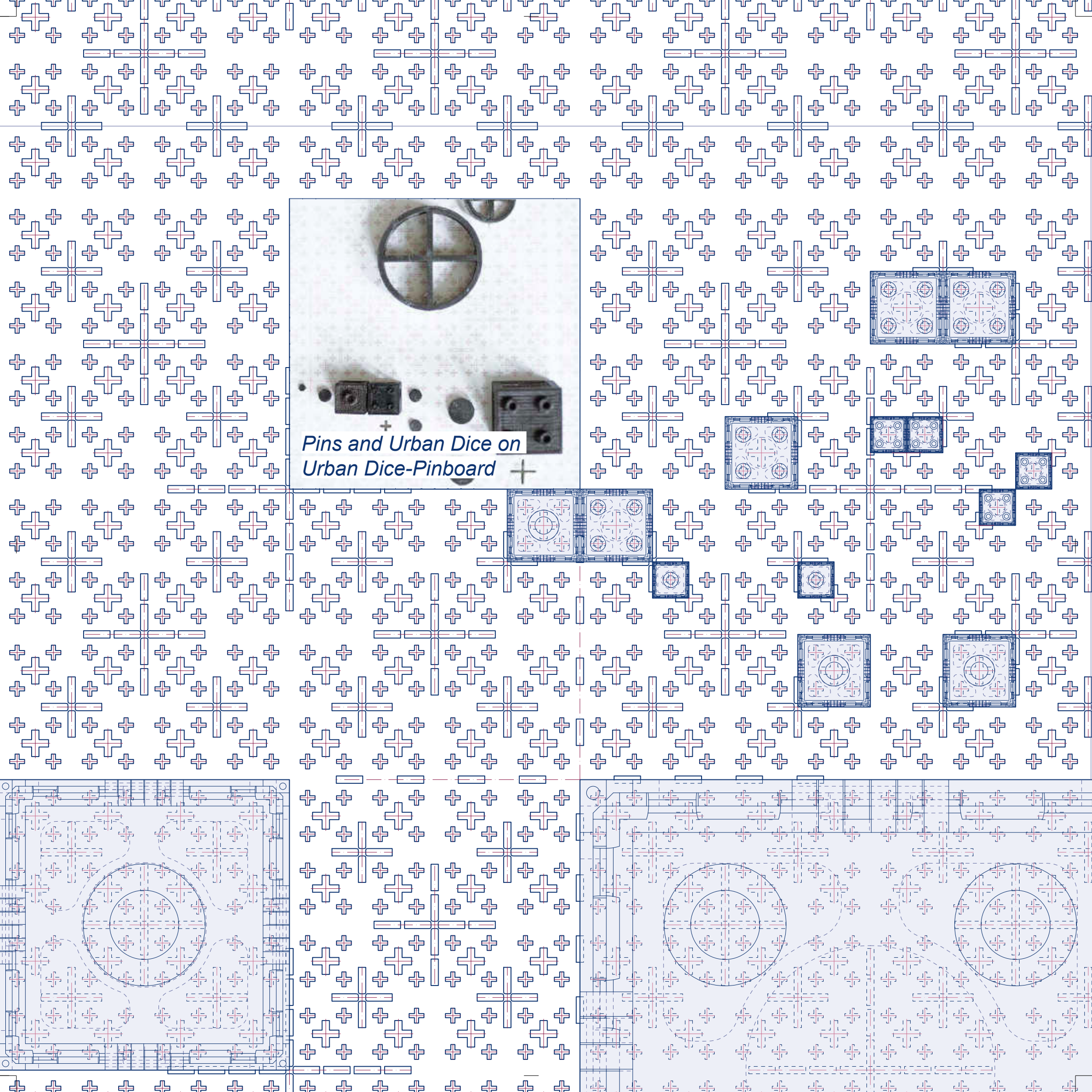
The Urban Dice-Pinboard is a versatile mounting and base plate on which pins can be placed by pushing them into slits.

Can be made from simple cardboard with a laser cutting unit.



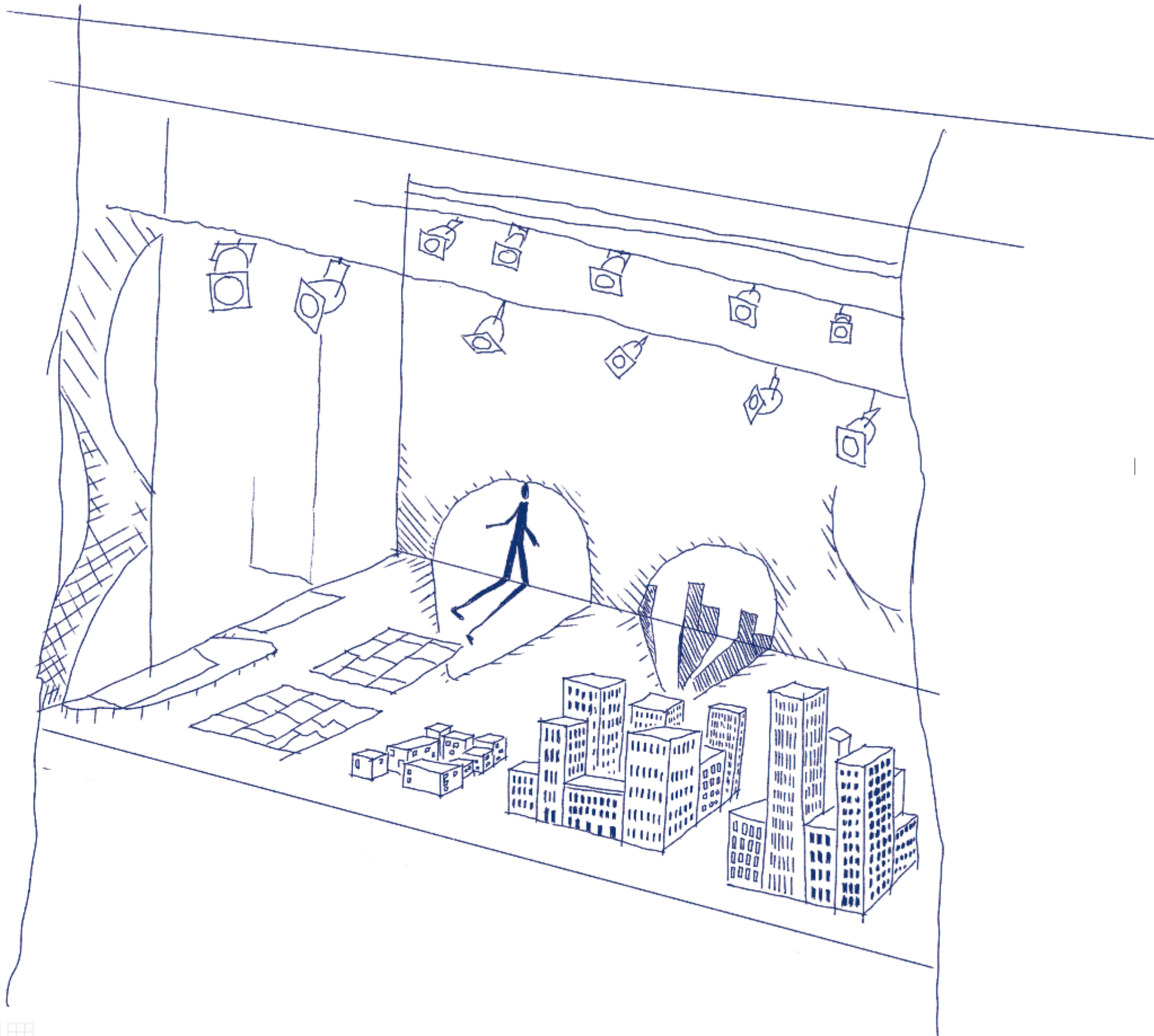
A 3d printed set of pins





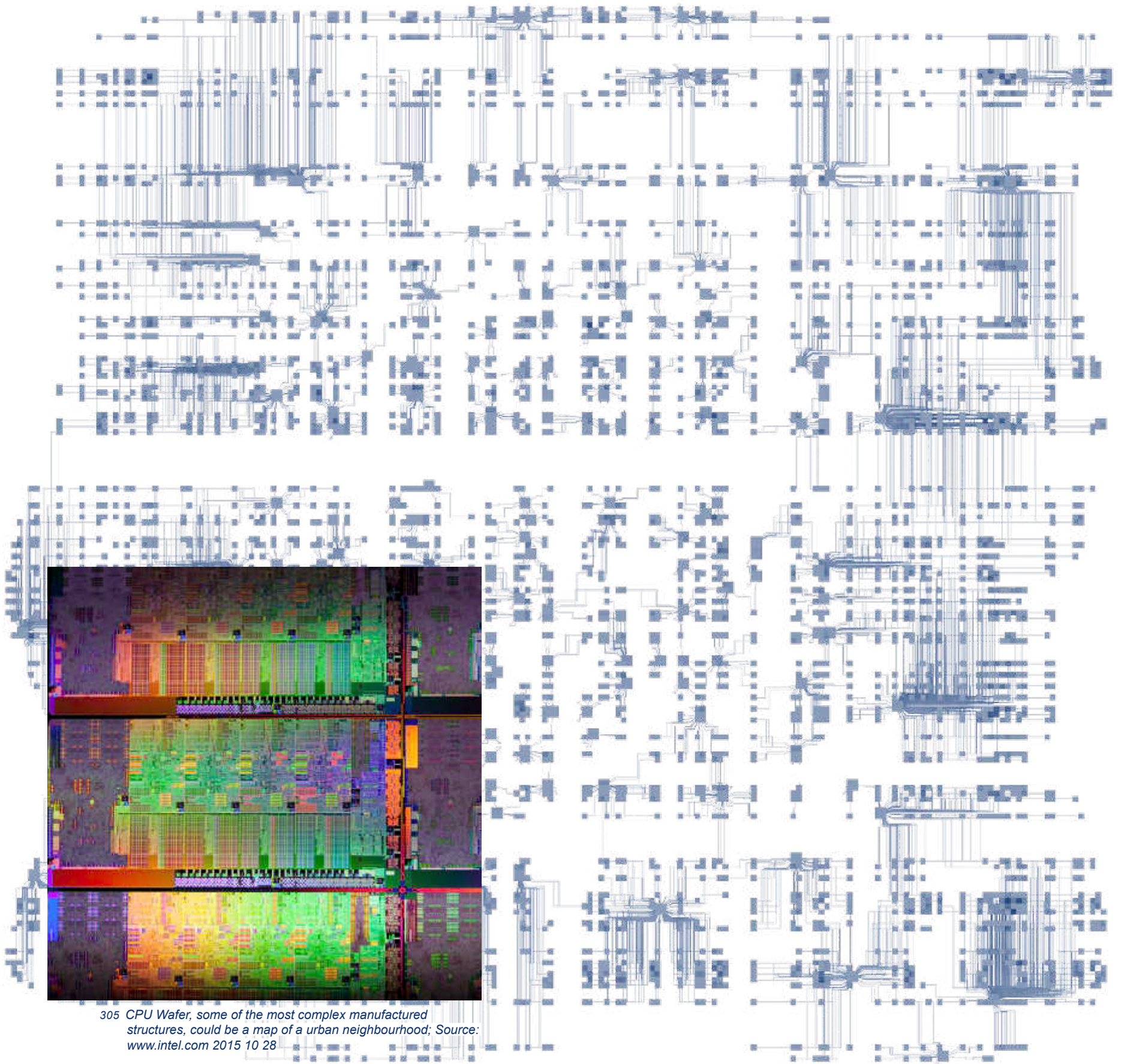
*Pins and Urban Dice on
Urban Dice-Pinboard*

Urbanity: "A Stage for Utopians."



Urbanity - a Central Processing Unit?

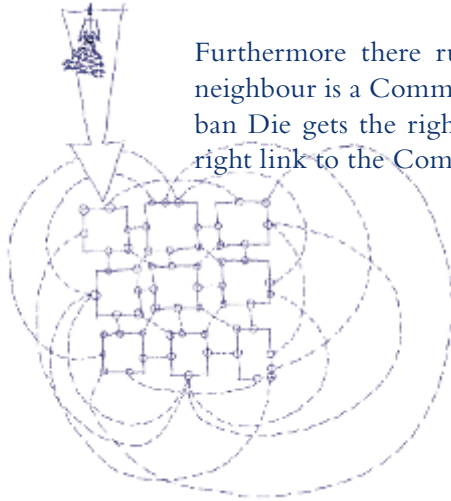
The CPU. Every thing is linked and millions of possibilities arise.



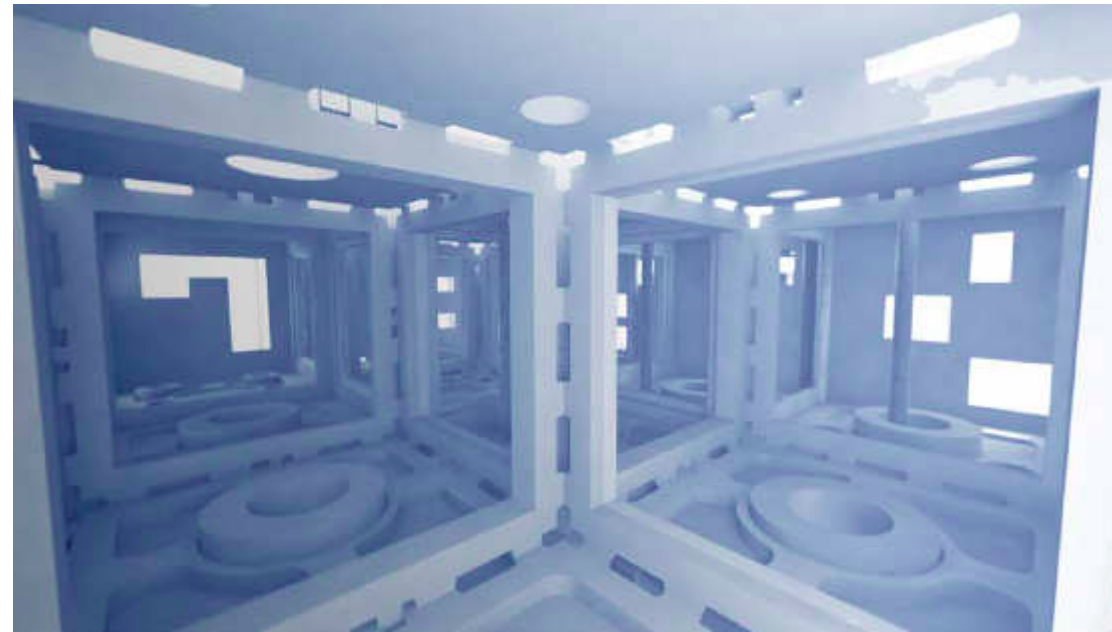
305 CPU Wafer, some of the most complex manufactured structures, could be a map of a urban neighbourhood; Source: www.intel.com 2015 10 28

Watch out for Neighbours

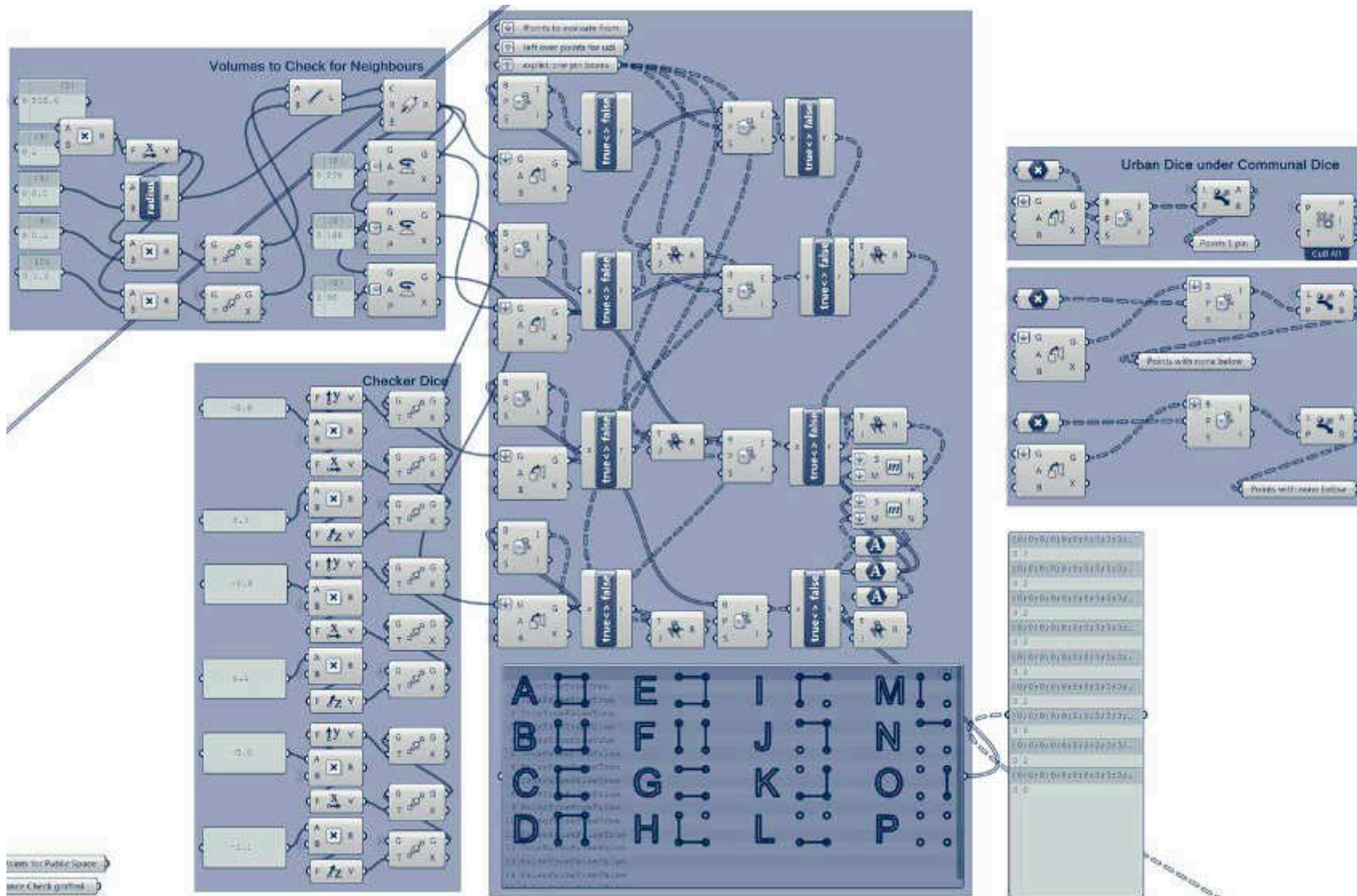
In this part of the Urban Cloud Script, every Urban Die checks if it has neighbours. If Ma.Ad.Manians have a neighbour the walls in-between are opened up, and the space can be shared.



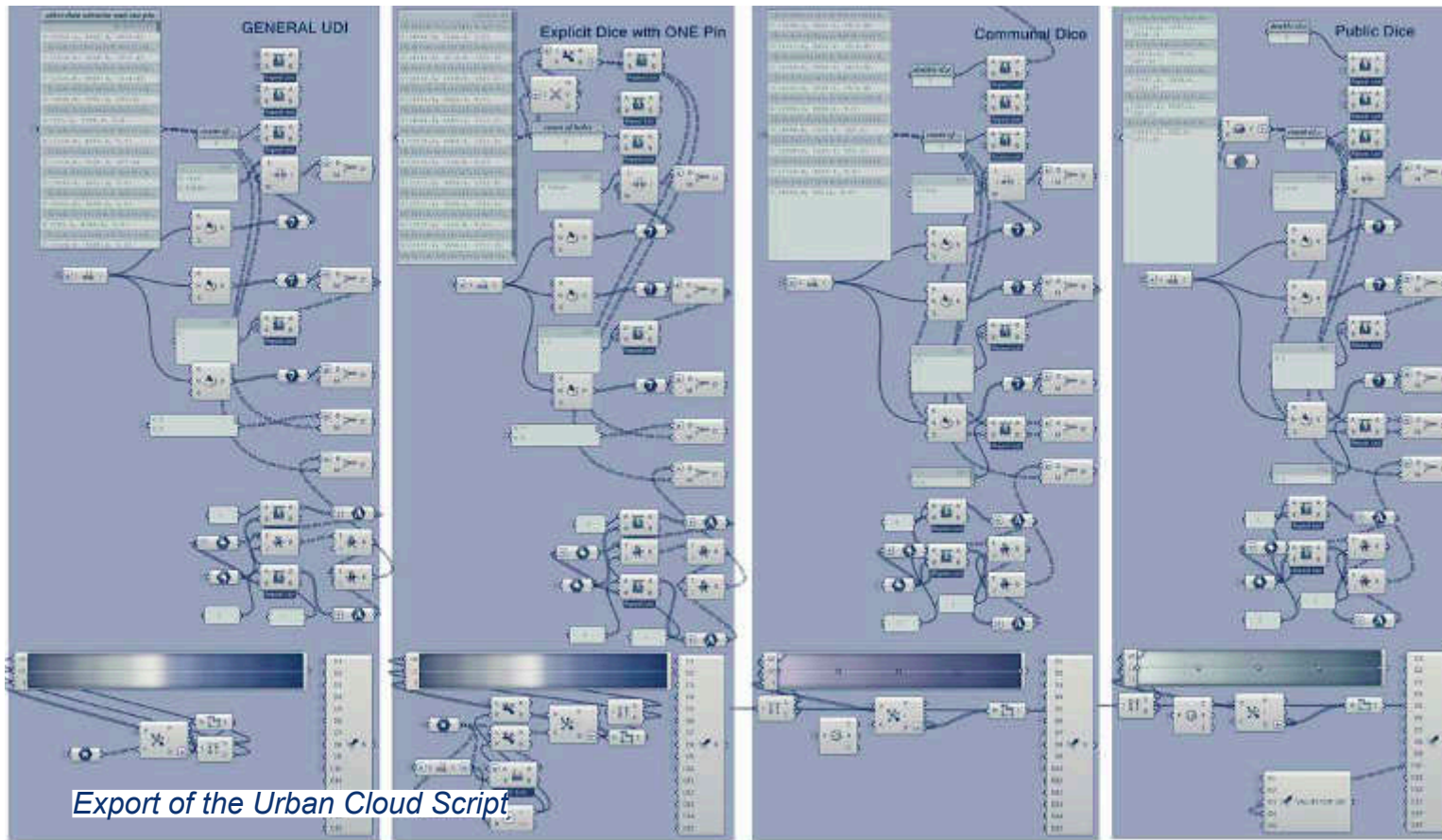
Furthermore there runs a check if the top neighbour is a Communal Die, if so, this Urban Die gets the right sized pin to have the right link to the Communal Die.



306 Automated opening of shared walls



Transfer of the Code from the Urban Cloud Script to the Urban Dice Script



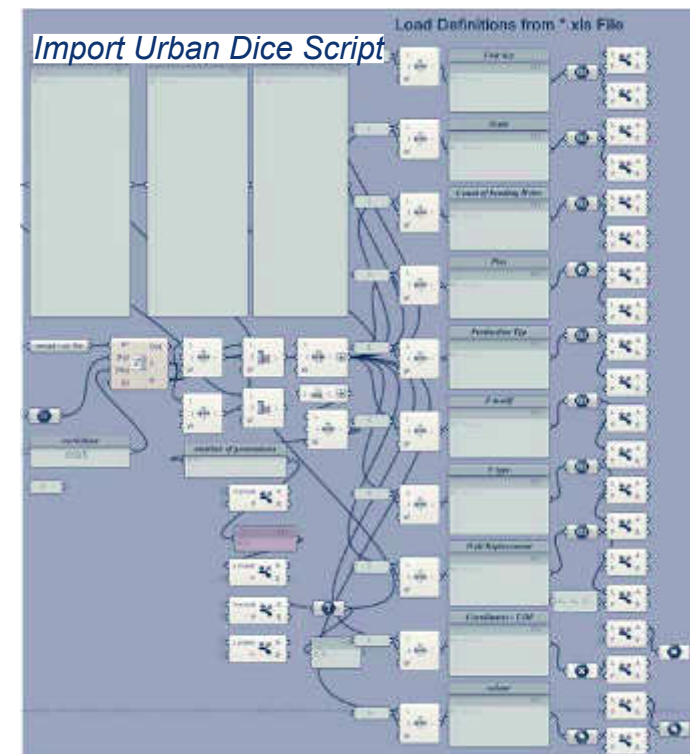
Unit size	2	1
Scale	1	1
Count of holes (Best with four)	4	4
Four(True)/One(False) Pin	TRUE	FALSE
Type of production	2	2
Height modification	1	1
Facade type	6	6
Facade empty wall	0	0
XYZ Coordinates	{ 5 0 5 6 . 0 , 4 0 4 4 . 8 , 9100.8 }	{ 5 0 5 6 . 0 , 4 0 4 4 . 8 , 5561.6 }
Colour	(198,101,139)	(130,97,14)

The Export Section of the Urban Cloud Script writes all needed data like position, colour, size, openings, pin type in a new *.xls spread sheet.

A second option to define Urban Dice is a spread sheet, by selecting the wished definitions from the list elements, this can directly be loaded into the Urban Dice Script.

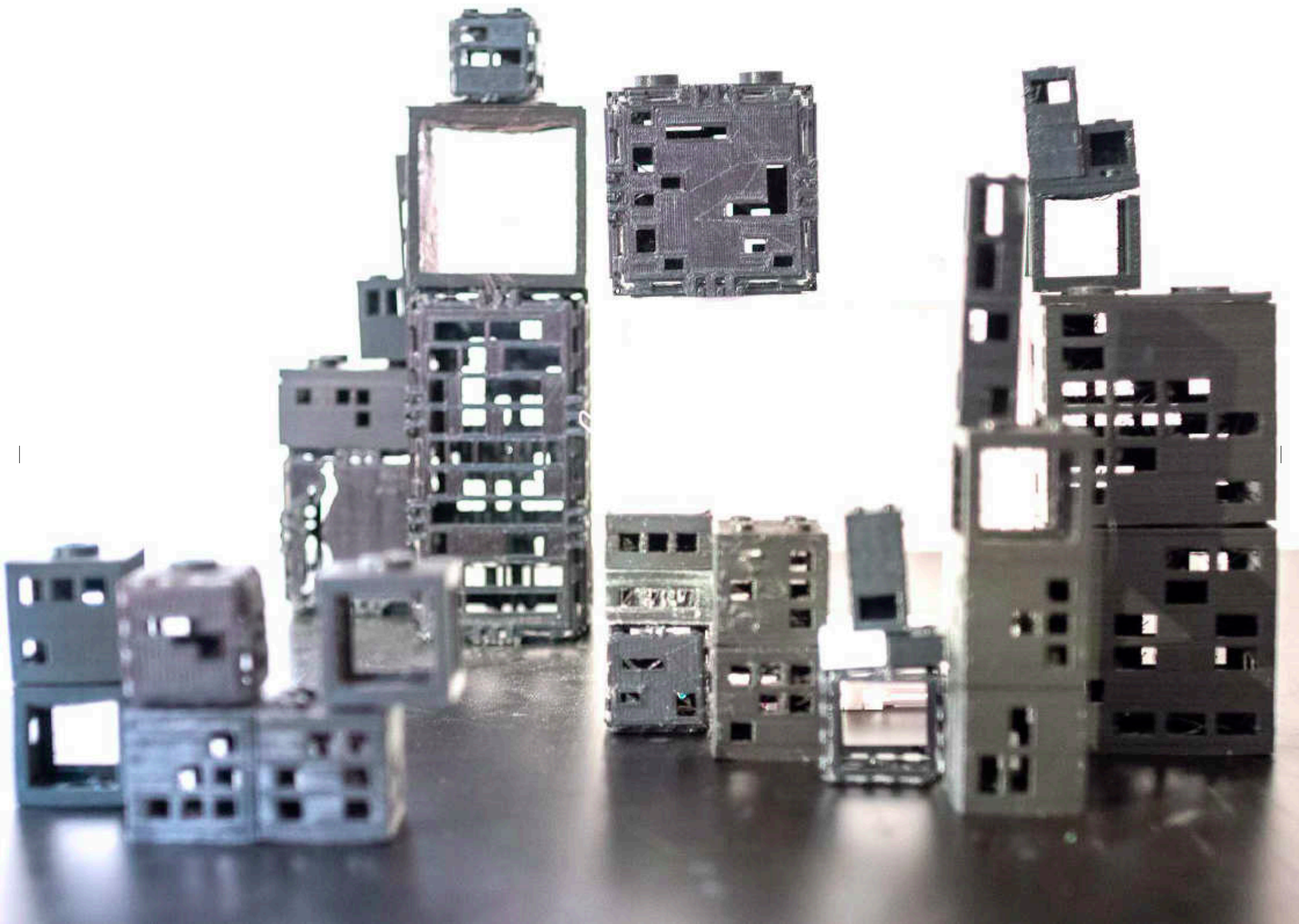
After the list was generated and exported to the spread sheet. This sheet can be loaded into the Urban Dice Script. It is only necessary to set the file path and the right sheet name. Then turn from manual input to *.xls input, start the automation, and a new and detailed Urban Cloud is built into the Rhino view-port, or one selects the option to export each Urban Die into a separate 3d file for rapid manufacturing.

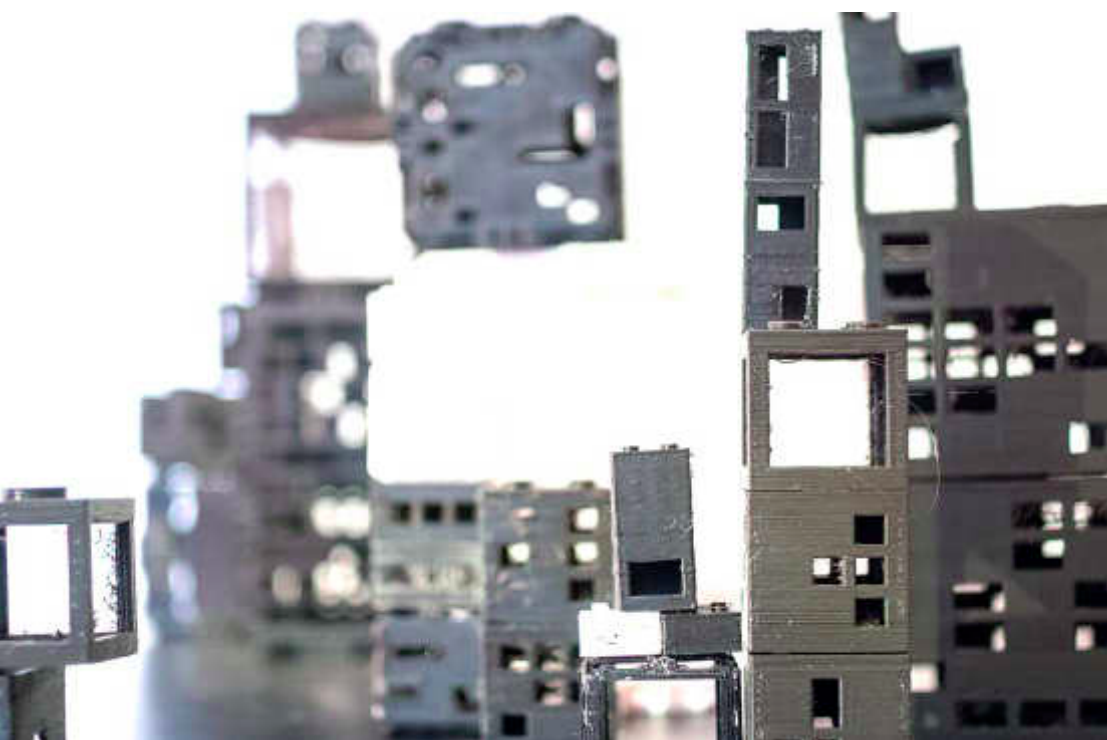
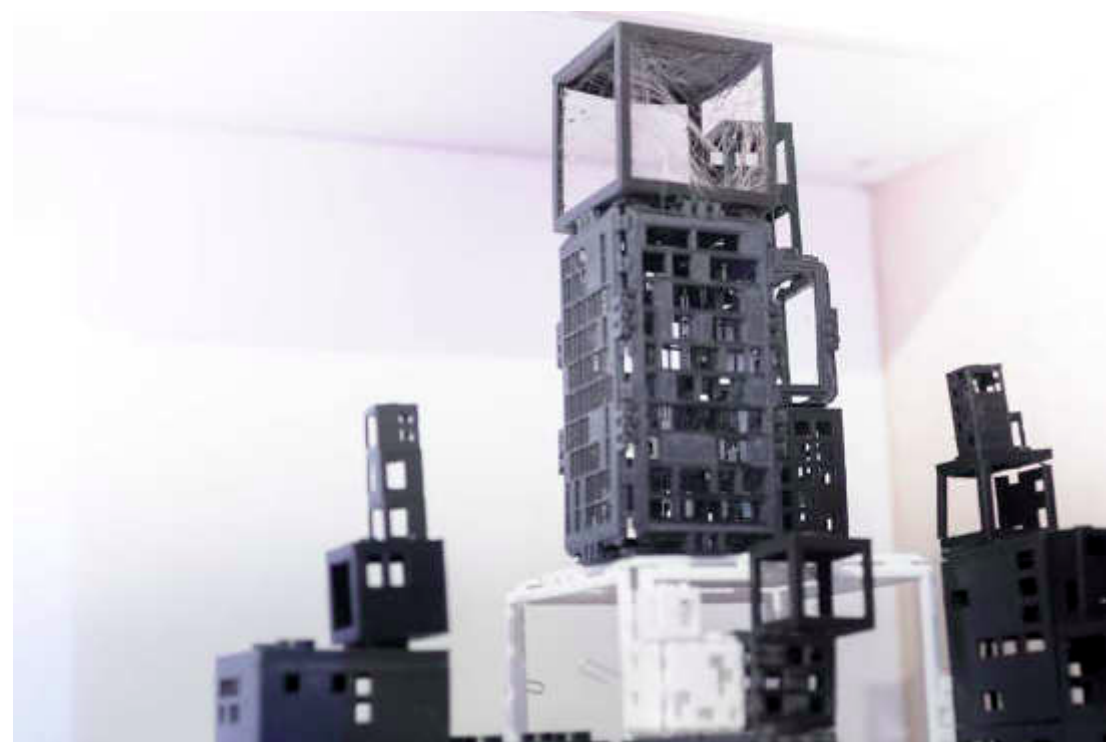
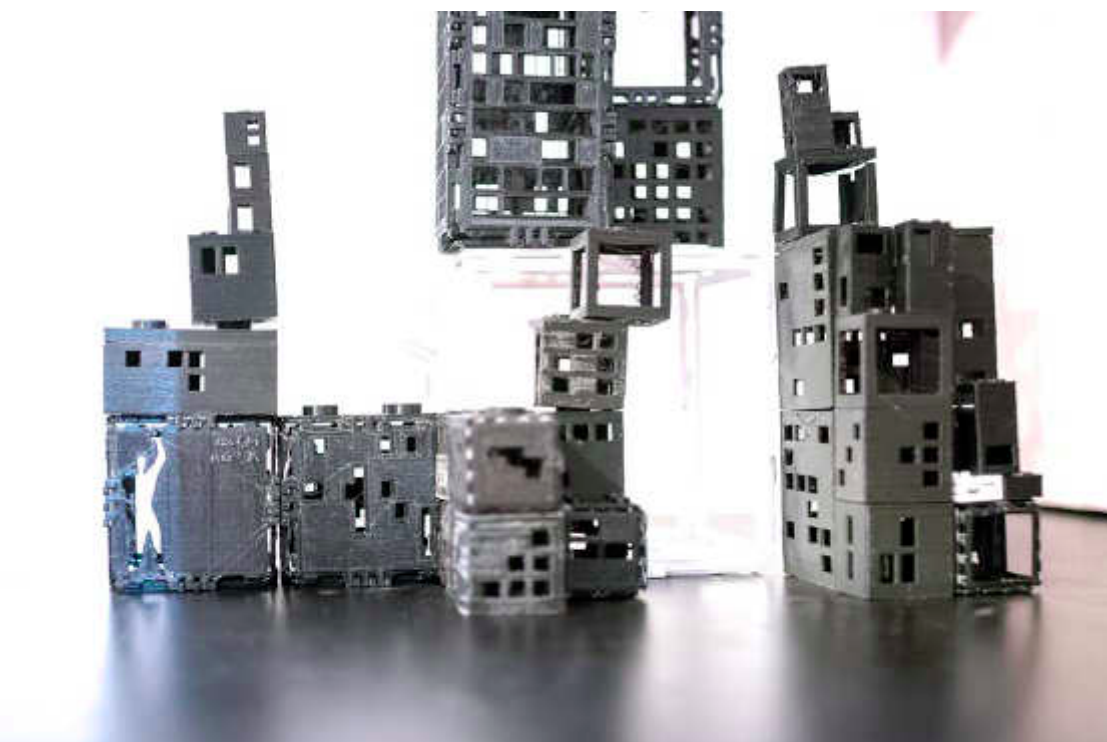
	A	B	C
1	Unit size	1-div-by-128	1-div-by-128
2	Scale	1:128	1:128
3	Count of holes (Best with four)	4	4
4	Four(True)/One(False) Pin	One	Four
5	Type of production	Foldable with hinges	Foldable with hinges
6	Height modification	Heigt ONE	Heigt ONE
7	Fasad type	Horizontal openings	Horizontal openings
8	Fasad empty wall	Vertical openings	Setting-P
9		Frame only	
10		Square openings	
11		Old version horizontal	
12		Old version vertical	
13		Mixed UP A	
		Mixed UP B	
		Mixed UP C	



The Game Can Begin

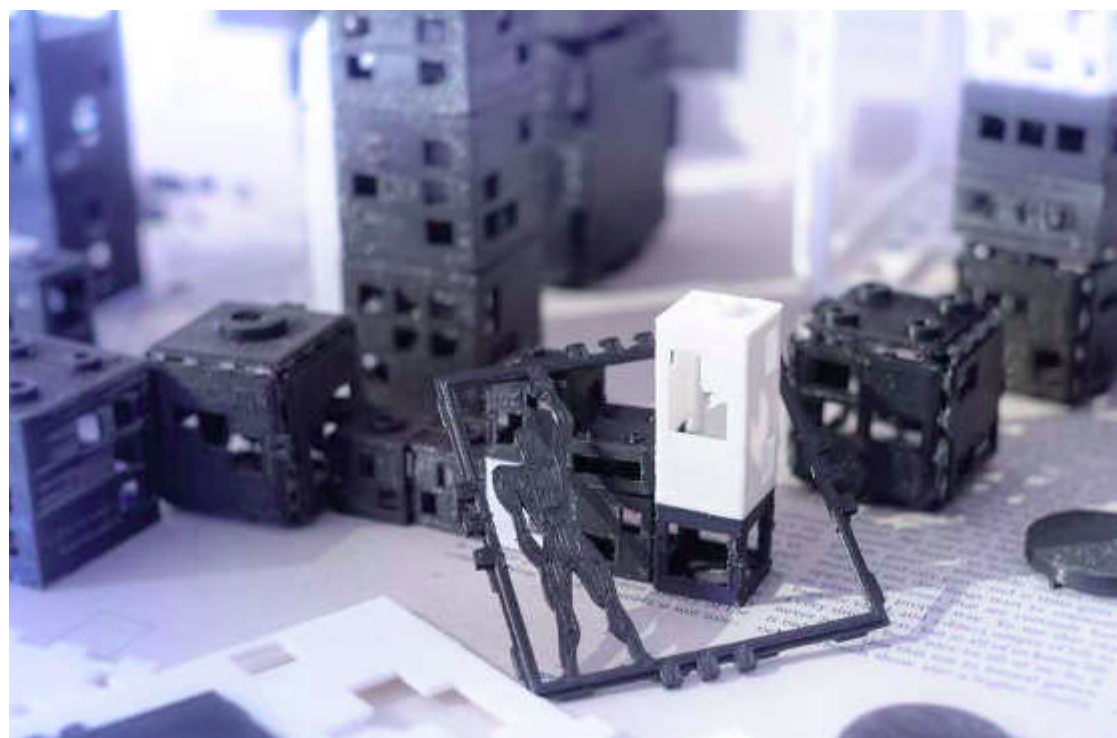
Play the Urban Dice, explore their possibilities.

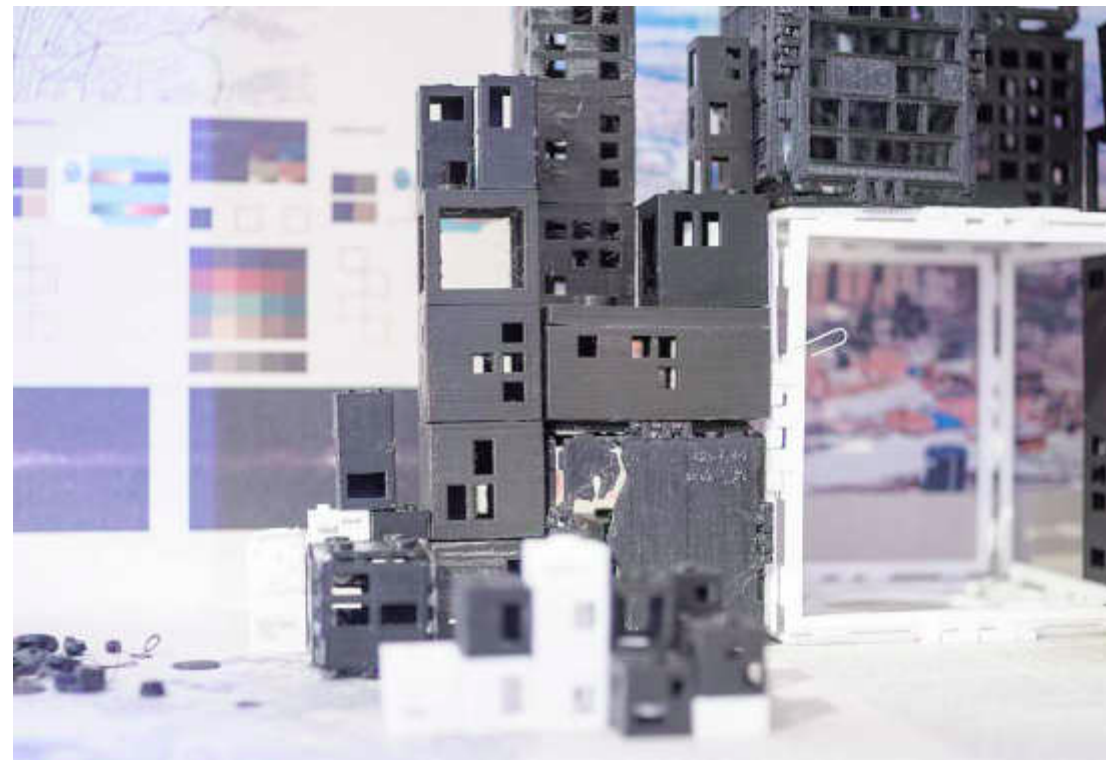
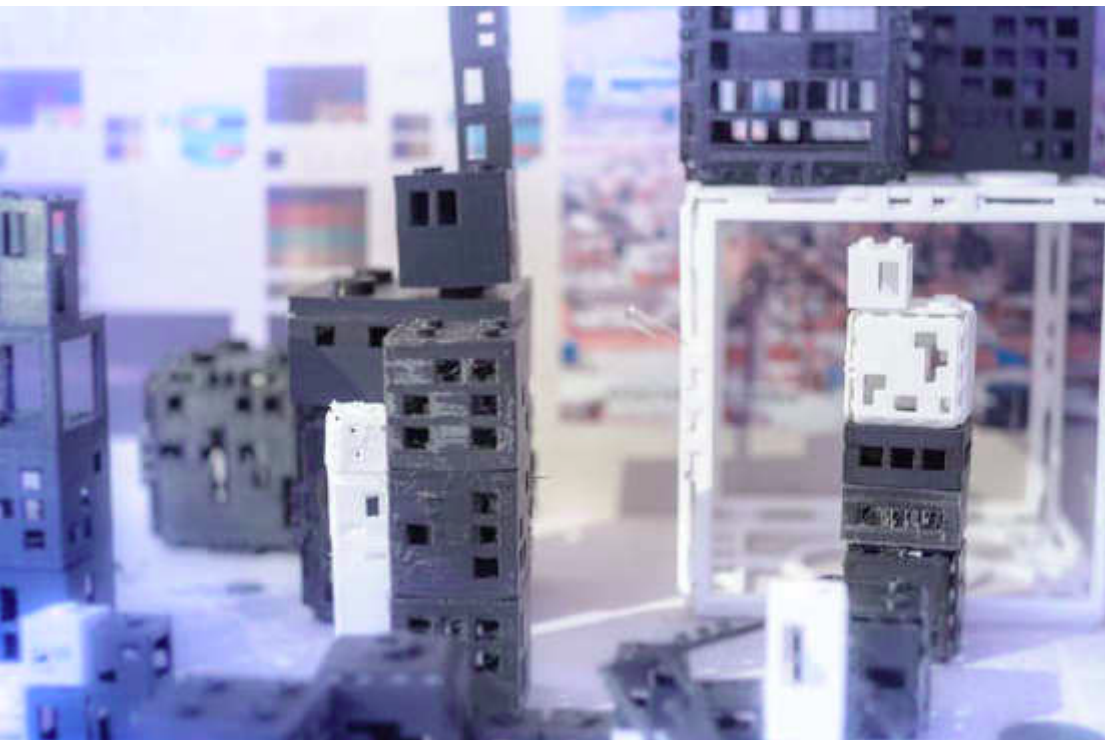


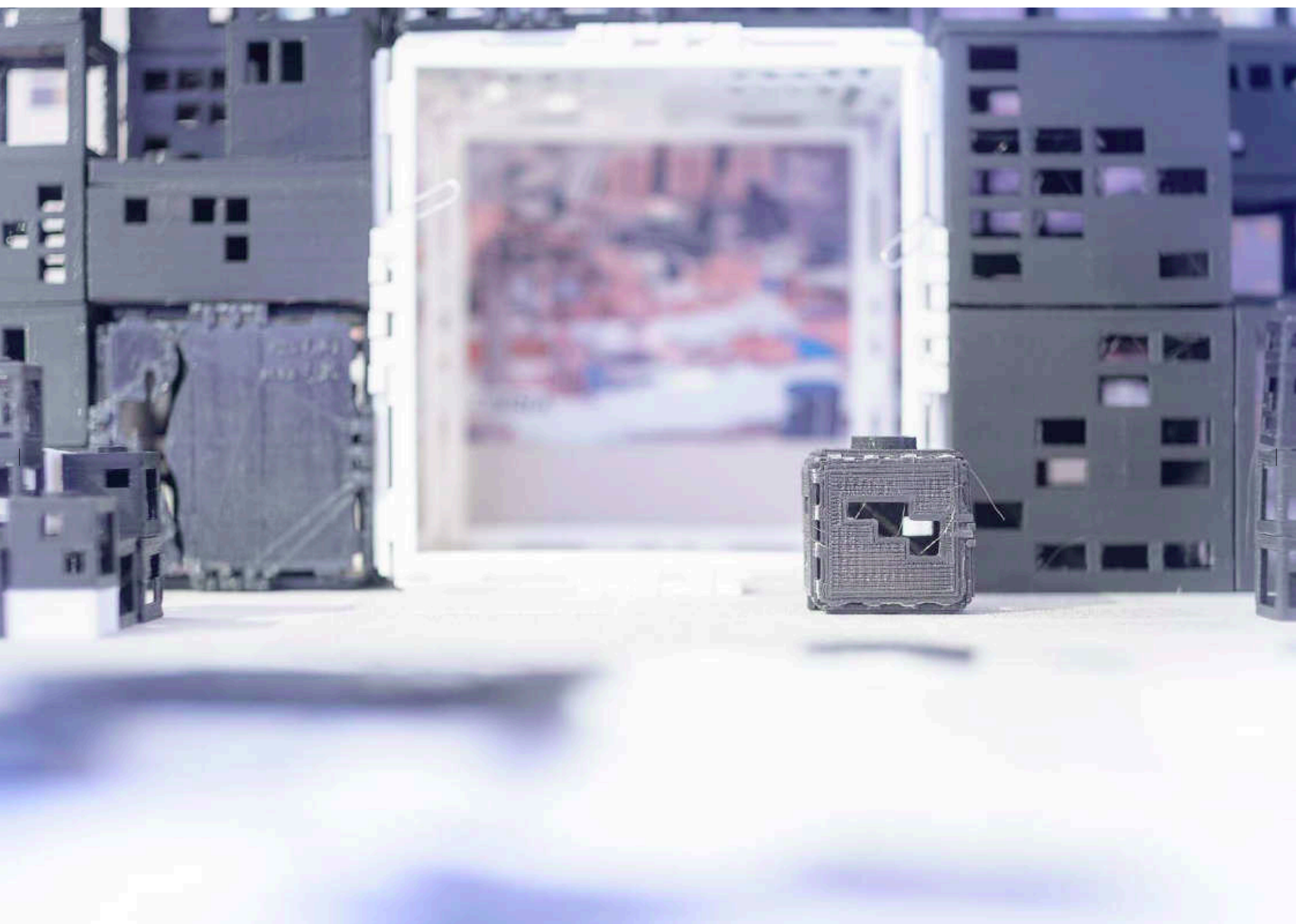


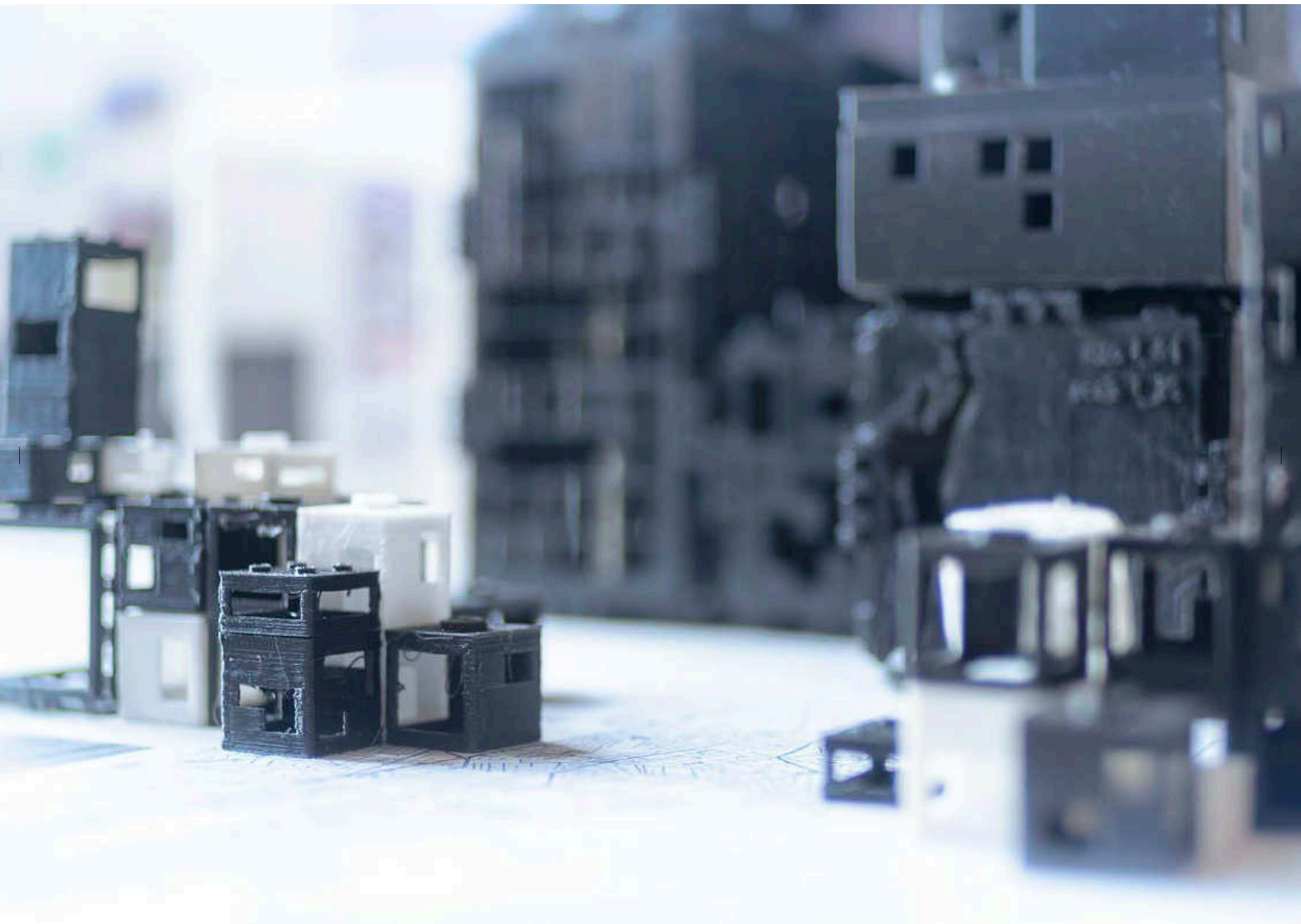


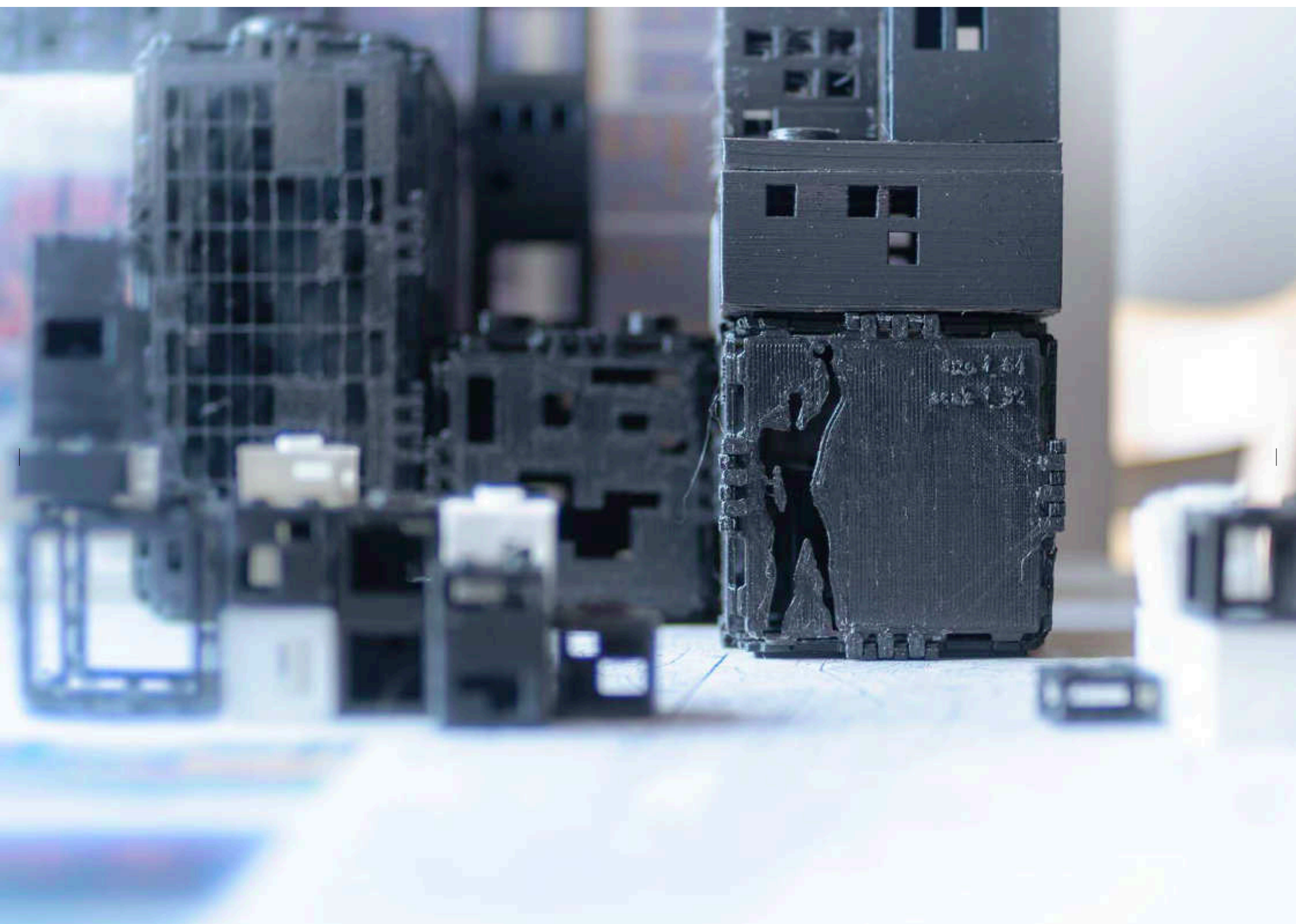


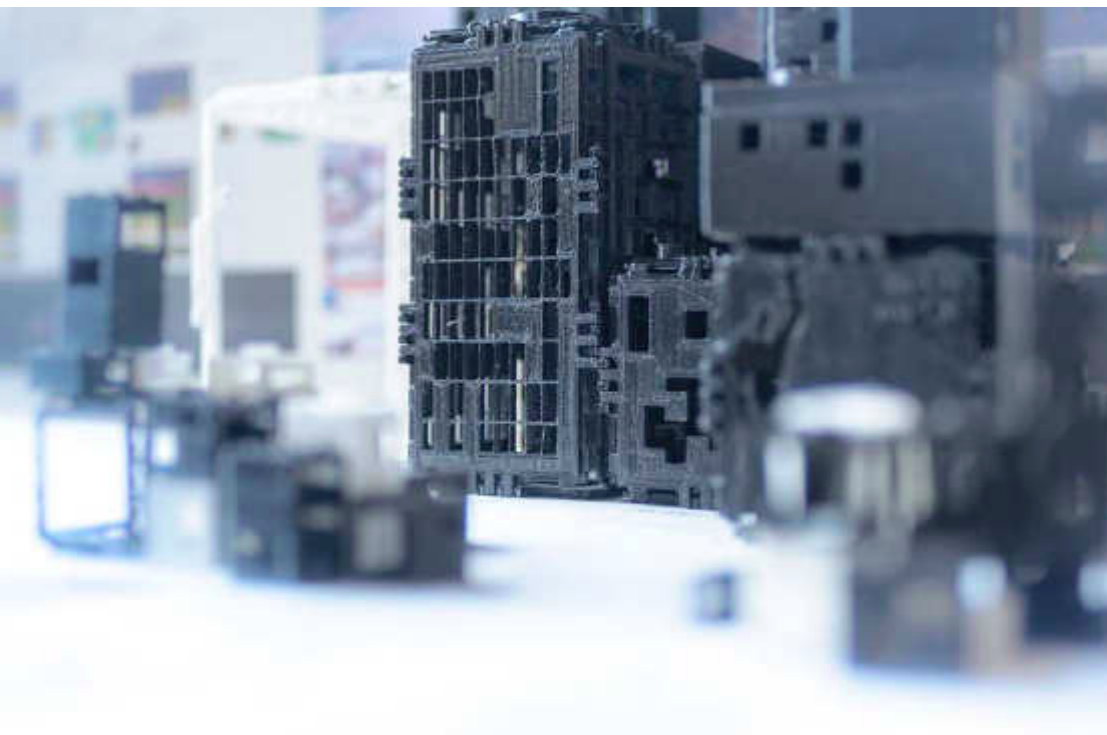
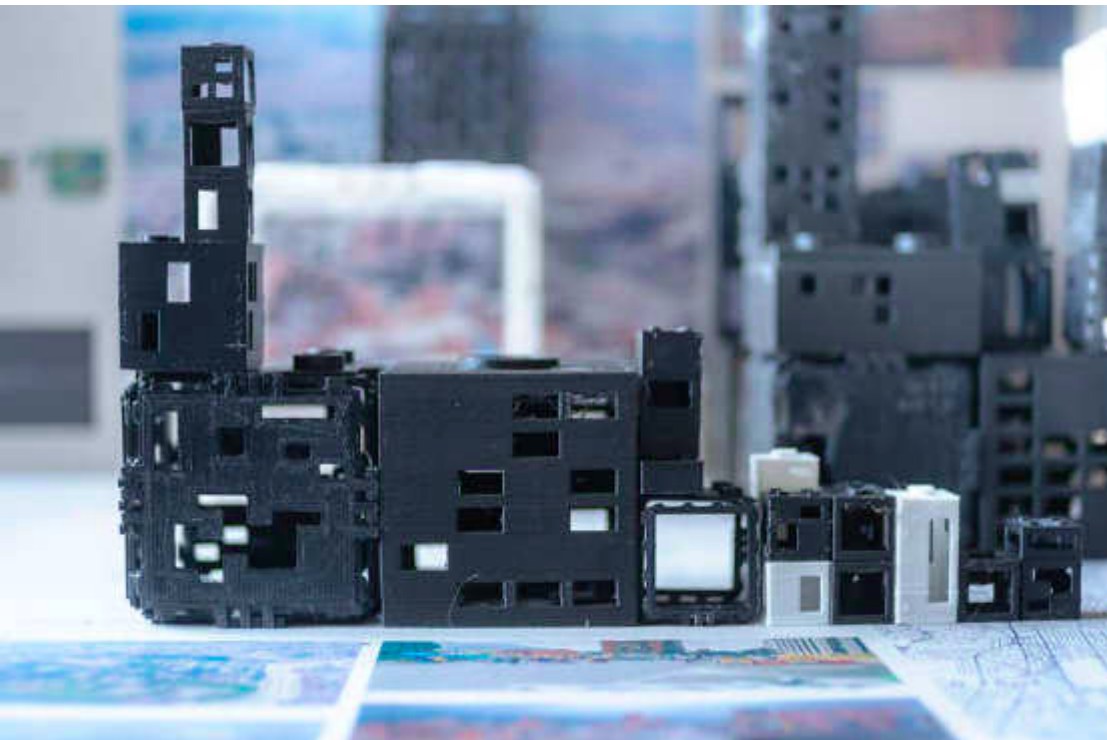


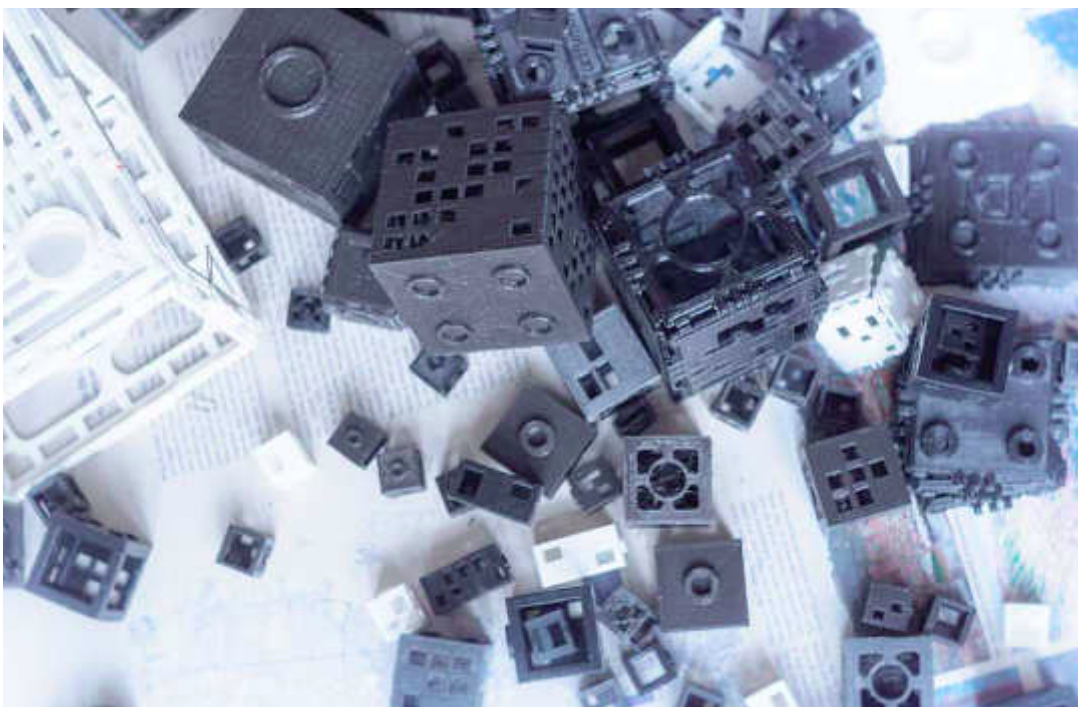












Let's Shake the Dice!





Appendix

Résumé

All matters in this thesis are associated with various journeys. Many real places I have been to, places that left impressions and formed my thoughts, my personality. The situation of the many people whose ways crossed mine have not been in such a lucky position as I am in. People who are challenged every day to have some food on their plates and living in conditions most of us would call inhumane. Not seldom are these people are the ones who manage their daily life with a positive attitude, and if you ask them how they manage, often they tell you that they are doing well.

We (me and the people I know, here in Austria) are privileged with having no lack of any substantial qualities, and still we are often not as happy. This was a big reason for me to take the challenges of seeing the world, see things with my own eyes and meet people from the many cultures and societies I have been to. With the work that led to this thesis, I followed one of my biggest interests, urban planning and the related social life. Many problems that crossed my path cannot be solved easily and it would take much more than a grand solution. Many injustices need more than just one dimensional interventions, to solve complex problems of inequality many things must be done concurrently, like a change of paradigms in society, to foster the willingness to achieve equality and to speak to each other as equals.

Utopia, these thoughts of a perfect social world have been written often, and have sourced the vivid imaginations of many. And the written word is often is the best way to support our imagination, it keeps Utopia in our minds and thoughts, each of us getting our own perfect world, if we wish to. The best place for Utopia is in our mind, the most perfect things we can have are the ones in our imagination in our thoughts and this mostly hard if not impossible to put to reality.

I finally ended up doing exactly this, designing a Utopia: As this is the place where I can put my ideals and ideas without the need of realism. Things just work as they are meant to and this allowed me to think of things that could never have found any plausible setting outside of imagination.

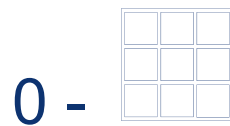
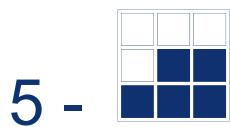
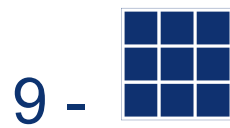
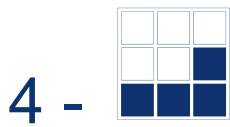
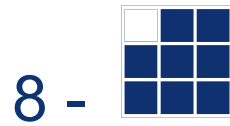
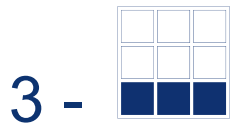
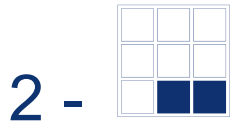
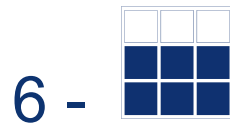
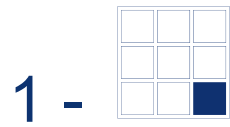
It stands to say: “I rate these travels to real world problems, utopian and mind expanding places, as one of the best experiences in my life.”





Epilogue

“La Cuadra”, the creation of a font for the page numbering in this document.




A “urban” font, counting from one to ten in city blocks, la cuadra - a city block in Spanish.

In Ma.Ad.Man. Utopia, 8 stays for communal space. The count of Urban Dice that would fit in a Communal Dice.

One Urban Die = 

One Communal Die = 

A Public Space = 

Algorithmic and Parametric Design (in Grasshopper).

As a tool for many things.

Digital tools enable us to define by values entire urban structures.

Algorithmic and parametrised design in Grasshopper for Rhino allows persons like me to make use some of the unlimited possibilities programming has to offer.

No matter if it is simple conversion of a curve or a font into squares or the complex visualisation of entire cities.

One of the most catching facts is the output of countless possibilities on a mouse click.

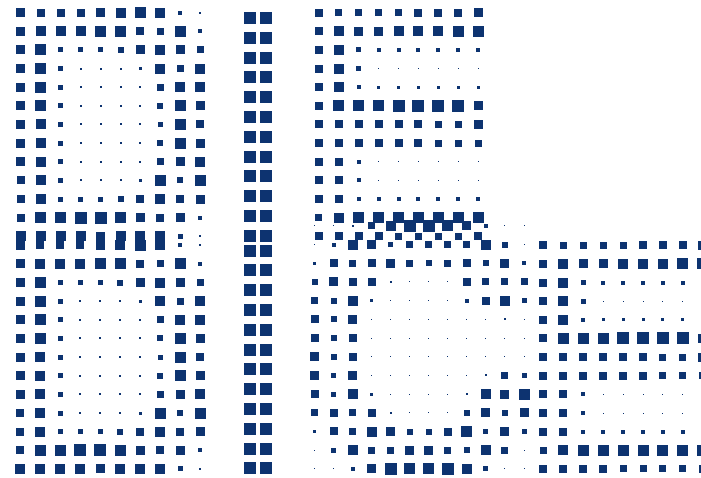
In my scripts, the Urban Cloud Script and the Urban Dice Script, I made use of many different mathematical principles and algorithms.

I just touched the surface of the possibilities, and with the continuation of the Urban Cloud Script, more powerful programs can be implemented. One of them is already implemented - Cellular Automaton.

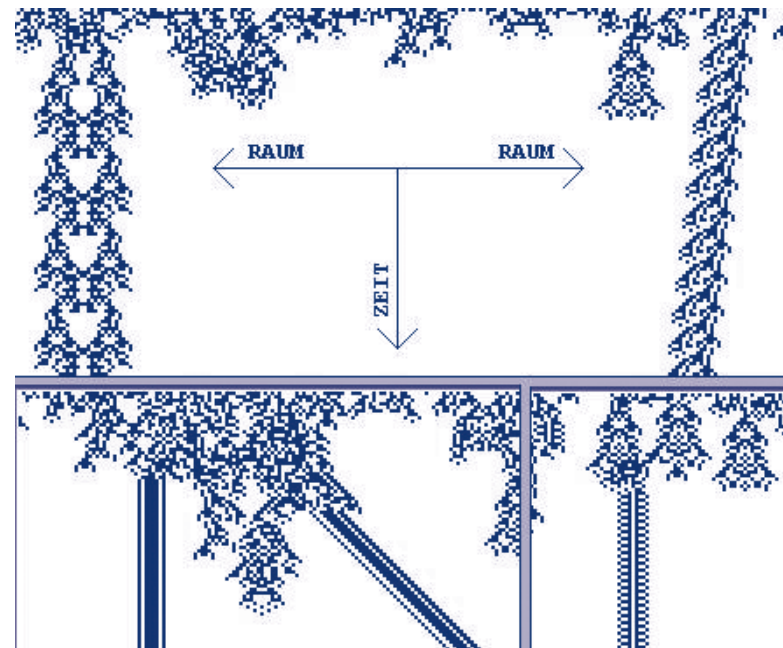
Cellular Automaton^{*1}

1940 Stanislaw Marcin Ulam introduced a programming model for the description of complex systems, the roots of cellular automaton. Further development by John von Neumann transformed this concept into a universal calculation model. A self-reproducing pattern that continuously changes the state of its elements.

A basis for calculations and modulations of for self-organising urban development.



309 Generated from curves with a self-made script



308 Wolframs One Dimensional Universe



- 90% of all earthquakes occur along the Ring of Fire, and the ring is dotted with 75% of all active volcanoes on Earth. Source: <http://education.nationalgeographic.com/encyclopedia/ring-fire/>
- ■ ■ ■ ■ • Sources: http://earthquake.usgs.gov/earthquakes/world/events/1972_12_23.php, 2015 09 22
- ■ ■ ■ ■ • Engineering Report on the Managua Earthquake of 23 December 1972: A Report, <https://books.google.at/books?id=8z4rAAAAYAAJ&pg=PR1&dq=managua&hl=de&pg=PA13#v=onepage&q&f=false>, 2015 09 22
- ■ ■ ■ ■ • 172: By Author; with data from Science, Vol. 182, No. 7, pp. 981-990.
- ■ ■ ■ ■ • 176: Source: <http://luirig.altervista.org/cpm/albums/geolus-57/31709-Nicaragua-Earthquakes-December-1972--Managua--Central-Managua--l.jpg>, 2015 10 30
- ■ ■ ■ ■ • Sources: ^{1*}, <http://urbanland.uli.org/economy-markets-trends/which-cities-are-worlds-most-innovative-winner/>
- ■ ■ ■ ■ • General Sources: <http://cityminded.org/2013-innovative-city-of-the-year-6358>, 2015 09 18; <http://online.wsj.com/ad/cityoftheyear>, 2015 09 18;
- ■ ■ ■ ■ • <https://en.wikipedia.org/wiki/Medell%C3%ADn>, 2015 08 19;
- ■ ■ ■ ■ • Sources: ^{1*}, http://www.forbes.com/2010/10/07/cities-china-chicago-opinions-columnists-joel-kotkin_slide_4.html, 2015 08 10; ^{2*}, Gazetteer of the Bombay Presidency: Ahmedabad. Google Books 2015 (Public Domain text). 7 January 2015. pp. 252–253., 2015 08 12; ^{3*}, <http://architectureindevelopment.org/project.php?id=492>, 2015 08 06; ^{4*}, Ahmedabad” (ebook), by Ragesk Sarjun, AnVi OpenSource Knowledge Trust, p. 27, e-book link: <https://books.google.at/books?id=y06dCgAAQBA-J&pg=PA27&ots=C1CjzrVWqr&dq=Metro%20Link%20Express%20Gandhinagar%20and%20Ahmedabad%202018&hl=de&pg=PA27#v=onepage&q=Metro%20Link%20Express%20Gandhinagar%20and%20Ahmedabad%202018&f=false>; ^{5*}, archplus 185 “Indischer Inselurbanismus”, 2007, p. 52-53; General Sources: http://www.ucl.ac.uk/dpu-projects/Global_Report/pdfs/Ahmedabad_bw.pdf, 2015 08 07; http://cept.ac.in/UserFiles/File/CUE/Working%20Papers/Revised%20New/26CUEWP%2026_City%20Profile%20Ahmedabad.pdf, 2015 08 08; http://www.ahmedabadbrts.org/web/About_JanMarg.html, 2015 08 07;
- ■ ■ ■ ■ • Sources: Personal talking to Detroit residents in 2012, <http://www.nytimes.com/2014/12/11/us/detroitbankruptcyending>.
- ■ ■ ■ ■ • [html?_r=0](http://nextcity.org/daily/entry/detroitmichiganavenueparkletpopup) 2015 09 25, <https://nextcity.org/daily/entry/detroitmichiganavenueparkletpopup> 2015 09 17, <http://www.somacn.com/p469.php> 2014 03 12
- ■ ■ ■ ■ • Sources: densityatlas.org by MIT Massachusetts Institute of Technology, and approximate calculations with numbers explained in this thesis.
- ■ ■ ■ ■ • ^{1*} Source: <https://en.wikipedia.org/wiki/Brick>; 2015 07 21
- ■ ■ ■ ■ • Source: <https://de.wikipedia.org/wiki/Mauerziegel>; 2015 07 21
- ■ ■ ■ ■ • Source - Duplo Image: https://upload.wikimedia.org/wikipedia/en/5/53/Old_duplo_bricks.jpg; no Copyright
- ■ ■ ■ ■ • Source: ^{1*}, Zelluläre Automaten als einfache selbstorganisierende Systeme, René Schlossus and Sebastian Walther, Dezember 2006
- ■ ■ ■ ■ • 305 Page 6



Table of Figures, Maps, Aerial Views and Photos

- 001 Date 30.09.2015, Graphic by author, Data Source: openstreetmap.org and publicly accessible aerial views
- 002 Chart by author, World land use and coverage of the earth's landmass
- 003 Chart by author, Distribution of Urban Areas with a population higher than 500.000
- 004 Chart by author, Distribution of the World Population by its share from Rural to Megacities
- 005 Chart by author, World Population in billions - tendencies
- 006 Graphic by Author, Growth of urban regions, 1970 - 1990, Source: <http://esa.un.org/unpd/wup/Maps/CityGrowth/CityGrowth.aspx>; 2015 01 01
- 007 Graphic by Author, Growth of urban regions, 1990 - 2014, Source: <http://esa.un.org/unpd/wup/Maps/CityGrowth/CityGrowth.aspx>; 2015 01 01
- 008 Graphic by Author, Growth of urban regions, 2014 - 2030, Source: <http://esa.un.org/unpd/wup/Maps/CityGrowth/CityGrowth.aspx>; 2015 01 01
- 010 Graphic by Author, Grade of Urbanization, 1990, Source: <http://esa.un.org/unpd/wup/Maps/CityDistribution/CityPopulation/CityPop.aspx>; 2015 01 01
- 011 Graphic by Author, Grade of Urbanization, 2014, Source: <http://esa.un.org/unpd/wup/Maps/CityDistribution/CityPopulation/CityPop.aspx>; 2015 01 01
- 012 Graphic by Author, Grade of Urbanization, 2030, Source: <http://esa.un.org/unpd/wup/Maps/CityDistribution/CityPopulation/CityPop.aspx>; 2015 01 01
- 009 Graphic by Author, Grade of Urbanization, 1970, Source: <http://esa.un.org/unpd/wup/Maps/CityDistribution/CityPopulation/CityPop.aspx>; 2015 01 01
- 013 World Countries - World Map Based on: http://www.mappinghacks.com/data/TM_WORLD_BORDERS-0.2.zip
- 014 World Image, Source and Copyright; ArcGis base map, downloaded June 2015, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
- 015 Bogotá paths, Map by author based on data provided by openstreetmaps.org,
- 016 Bogotá Density Chart, by author, based on data provided by www.unpopulation.org
- 017 Bogotá Population Chart, by author, based on data provided by www.unpopulation.org
- 018 Date 06.04.2013 A farm 30 minutes walk from Bogotá's historic city centre, A film about the family who lives in this house, <http://www.cultureunplugged.com/documentary/watch-online/play/9089/LA-CASA--THE-HOUSE->
- 019 Date 18.02.2013; rudimentary housing, Soacha, Suburbs of Bogotá
- 020 Date 18.02.2013; rudimentary housing, Soacha, Suburbs of Bogotá
- 021 Date 05.03.2013; The further extent of Ciudad Bolivar, Bogotá; Columbia's biggest informally built area
- 022 Date 18.02.2013; Informal settlements, Soacha - Bogotá, behind Ciudad Bolivar
- 023 Date 18.02.2013; Housing machinery in the middle of informal housing, Soacha south of Bogotá
- 024 Date 11.04.2013; Bogotá, View of the "Universidad Nacional sede Bogotá", a vital part in the middle of Bogotá,
- 025 Date 11.04.2013; Avenida Las Americas, Bogotá,
- 026 Date 03.02.2013; Bogotá, Ciclovía; About the half of the city's main roads are closed for cars every Sunday. The city turns into a huge place for spare time activities.
- 027 Date 07.02.2013; Transmilenio, Bogotá; To get from south to north took three hours, now it takes one.
- 028 Date 07.02.2013; Día sin Caro, Car free day in Bogotá takes place once a year, Bogotá Calle 26
- 029 Date 18.02.2013; A usual day in Bogotá, Calle 26 (Avenida El Dorado)
- 030 Date 06.04.2013; The future of Bogotá, View from the eastern mountains
- 031 Bogotá Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 032 Bogotá Aerial View Scale 1 to 33.333, an ArcGis base-map download, August 2015
- 033 Vienna paths, Map by author based on data provided by openstreetmaps.org,
- 034 Vienna Density Chart, by author, based on data provided by www.unpopulation.org
- 035 Bogotá Population Chart, by author, based on data provided by www.unpopulation.org
- 036 Wien, Rosenhügel 1891
- 037 Haus mit einer Mauer, Sketch, Adolf Loos 1921
- 038 Werkbundsiedlung, Advertisement 1932
- 039 Date 12.06.2015; Werkbundsiedlung, Woinovichgasse 11, Vienna; Building designed by Hans Adolf Vetter, opened in 1932 as a model house settlement designed by 32 architects
- 040 Date 12.06.2015; Social or socialist housing, Karl Marx Hof, built by Karl Ehn between 1927 and 1930,
- 041 Date 12.06.2015; Haus mit einer Mauer, design by Adolf Loos, was designed to be extended
- 042 Date 12.06.2015, Danube island, 20 kilometres of recreational area, about 40 kilometres of beach and in fact also serves as flood protection for Vienna. In the Background Donau City an important area for Vienna's city development. About 1500 housing units
- 043 Date 23.05.2010; The preservation of Vienna, Oberes Belvedere seen from the botanical gardens
- 044 Date 12.06.2015; Wohnprojekt Wien, a residential joint building venture, planned by Eins zu Eins Architects, finished December 2013
- 045 Date 23.05.2010; The tearing down of the "Südbahnpf" to make place for the new "Hauptbahnhof"
- 047 Date 02.09.2015; Seestadt Aspern, Development steps, scale 1 to 24 000, source: <http://www.aspern-seestadt.at/resources/files/2015653749150113-etappen.pdf>
- 046 Date 13.03.2011; View of Vienna, from the 15th district towards the Quartier Belvedere, which is to be finished soon, after about 2 billion Euro of investment
- 048 Date 12.06.2015; Erste Campus, Area of the former "Südbahnhof", Quartier Belvedere, design by Henke und Schreieck Architects
- 050 A satellite town for Vienna in the middle of crop lands, the first step from the development plans for the Seestadt Aspern. The development of commuter cities have often encountered difficulties and often resulted in sleeper cities. In Aspern, the planning and design professionals tried to get ahead of the known problems. Weather the planners, developers and architects have succeeded will shown the future. Maybe it takes a hundred years for the failing of this sub-city centre to finally develop into a well-used neighbourhood.
- 049 Date 30.08.2015; Seestadt Aspern, ASP Wohnbau, design by Querkraft und Berger+Parkkinen
- 051 Vienna Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 052 Vienna Aerial View Scale 1 to 33.333, an ArcGis base-map download, August 2015
- 053 New York City paths, Map by author based on data provided by openstreetmaps.org,
- 054 New York City Density Chart, by



- author, based on data provided by www.unpopulation.org
- 055 New York City Population Chart, by author, based on data provided by www.unpopulation.org
- 056 Date 1865; Viele Map - Sanitary and Topographical map of Manhattan by Egbert Ludovicus Viele, with the Central Park
- 057 Date 1811, The Rendel Map, Similar to the known remake of the Commissioners plan
- 059 Date 12.10.2012, New York City, Brooklyn, new waterfront development, shiny housing, seen from Manhattan
- 058 Date 1975
- 060 Date 19.12.2014, Source Openstreetmap.org, as-built map, prepared by the author
- 061 Date 15.10.2012; Detailed, balanced and sustainable architecture in the Times-square district, New York Times Tower, opened 2007, Design by Renzo Piano
- 062 Date 12.10.2012, Brownstone Building, Market St. Two Bridges, View from the Manhattan Bridge, Location:<https://goo.gl/maps/mgnYu>
- 063 Date 16.10.2012; Imagine - imagination of the future, John Lennon Memorial, Strawberry Fields, Central Park, New York City, Designed by Naples/Italy based artists
- 064 Date 25.09.2009; People view the construction site for the new World One Trade Center, Downtown Manhattan, New York City
- 065 Date 15.10.2012; Conney Island the industrialized amusement park
- 066 Date 16.10.2012; New York City, Manhattan, Chelsea, designed by Diller Scofidio + Renfro, James Corner and others
- 067 Date 12.10.2012, The layers of our cities, Brooklyn Bridge and Manhattan Bridge, seen from Columbia Heights, Brooklyn, New York City
- 068 Date 05.10.2009; New York City, Central Park, seen from the Rockefeller Center
- 069 New York City Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 070 New York City, Manhattan Aerial View Scale 1 to 33.333, an ArcGis base-map download, August 2015
- 071 Mumbai Density Chart, by author, based on data provided by www.unpopulation.org
- 072 Mumbai Population Chart, by author, based on data provided by www.unpopulation.org
- 073 Date 18.02.2014; Welcome to Dharavi: View from the flyover close to the Mahim Phatak bus stop, Mumbai, Maharashtra, India
- 074 According to the 2011 census 6.5 million lived in the approximately 2000 Slum Pockets of Mumbai, map adapted by author; Source: <http://www.pkdas.com/published/PK-Das-Slums-Redev-and-Affordable-Housing-Integration.pdf>, SLUMS REDEVELOPMENT AND AFFORDABLE HOUSING INTEGRATION THE CASE OF MUMBAI PART - 2, P.K DAS & ASSOCIATES; 2015 09 28
- 075 Date 13.03.2014; Mumbai, Kurla Railway Station, aerial view from the plane South
- 076 Date 16.02.2014; Mumbai, Waste collecting, City Railroad Network of Mumbai, transports around 7.5 million passengers daily
- 077 Date 03.03.2014; Andheri Railway station, aerial view from the plane North
- 078 Date 13.03.2014; CST Road, aerial view from the plane West
- 079 Date 12.03.2014, Mumbai, The next door city. Slums, housing, and offices right around the corner, close to the beginning of the Marine Drive
- 080 Date 17.02.2014 ; Mumbai, Monorail columns, the capacity of this Metro/High-Line might not have enough capacity for the densely populated city of Mumbai
- 081 Date 12.03.2014; One of the many marginal settlements on the seaside, Mumbai, Colaba
- 082 Date 12.03.2014; Mumbai, hard to say, weather this is a slum clearing or civil works to secure the coast line
- 083 Date 03.03.2014; Aerial view close to the Mumbai Domestic airport
- 084 Mumbai Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 085 Mumbai Aerial View Scale 1 to 33.333, an ArcGis base-map download, August 2015
- 086 Chandigarh paths, Map by author based on data provided by openstreetmaps.org,
- 087 Chandigarh Density Chart, by author, based on data provided by www.unpopulation.org
- 088 Chandigarh Population Chart, by author, based on data provided by www.unpopulation.org
- 089 Date 28.02.2014; Ramp – a house at the Civil Secretariat Punjab and Haryana, design by Le Corbusier, Chandigarh, India
- 090 Date 28.02.2014, Small informal area, Chandigarh, India
- 091 Date 27.02.2014; Manhole Cover with the city map of Chandigarh, India
- 092 Date 28.02.2014; Repetition - Rest-rooms in middle class housing areas, Chandigarh, India
- 093 Date 28.02.2014; Aerial View from the Civil Secretariat Punjab and Haryana, Chandigarh, India
- 095 Date 28.02.2014; High Court Chandigarh, design by Le Corbusier
- 094 Date 28.02.2014; Residential Area, Chandigarh, India
- 096 Chandigarh Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 097 Chandigarh Aerial View Scale 1 to 40.000 , an ArcGis base-map download, August 2015
- 098 New Delhi paths, Map by author based on data provided by openstreetmaps.org,
- 099 New Delhi Density Chart, by author, based on data provided by www.unpopulation.org
- 100 New Delhi Population Chart, by author, based on data provided by www.unpopulation.org
- 101 Date 25.02.2014; New Delhi, highway, fighting the air pollution in New Delhi is one of the biggest problems. No other megacity is known to have such bad air
- 102 Date 26.02.2014; New Delhi, highway; What steps will be made to change the air in New Delhi?
- 103 Date 23.02.2014; New Delhi, men in front of their trucks, cooking over an open fire. Are people just not aware how bad the situation with the air is, or don't they see another opportunity to cook? (as I took this picture the truck drivers were blinking their lights in greeting)
- 104 Date 25.02.2014; New Delhi, Slum, colourful and full of life -, that is how it might seem to some: No problems at all, at least at first glance.
- 105 Date 23.02.2014; New Delhi, Subway station. New Delhi's subway network is state of the art. Will the planned subway network be enough to get cleaner air for New Delhi
- 106 Date 23.02.2014; New Delhi, , raised subway station
- 107 Date 23.02.2014; New Delhi, subway station; Small informal structures around the subway station.
- 108 Date 01.03.2014; DLF City, A man mops the public square, a place between office towers at DLF City.
- 109 Date 02.03.2014; Street life Old Delhi, around Chandni Chowk



- 110 Date 02.03.2014; Street market, Close to Nehru Place. Delhi
- 111 New Delhi Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 112 New Delhi Aerial View Scale 1 to 40.000, an ArcGis base-map download, August 2015
- 113 Barcelona paths, Map by author based on data provided by openstreetmaps.org,
- 114 Barcelona Density Chart, by author, based on data provided by www.unpopulation.org
- 115 Barcelona Population Chart, by author, based on data provided by www.unpopulation.org
- 116 The standardized Manzanas
- 117 Original "Eixample" concept of 1859, Plan de los alrededores de la ciudad de Barcelona y del proyecto para su mejora y ampliación de Ildefonso Cerdá y Suñer
- 118 Date 10.10.2008; Sagrada Familia, Eixample Barcelona, Photography by Gabriel Doblinger
- 120 Date 11.10.2008, Panoramic photography Barcelona, seen from Montjuic Castle
- 119 Date 11.10.2008; Eixample, Photography by Gabriel Doblinger
- 121 Barcelona Eixample figure ground plan, Map by author based on data provided by openstreetmaps.org,
- 122 Barcelona Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 123 Barcelona Eixample Aerial View Scale 1 to 50.000 an ArcGis base-map download, August 2015
- 124 Lima paths, Map by author based on data provided by openstreetmaps.org,
- 125 Lima Density Chart, by author, based on data provided by www.unpopulation.org
- 126 Lima Population Chart, by author, based on data provided by www.unpopulation.org
- 127 Urban evolution of Lima, By Author based on http://eudora.vivienda.gob.pe/OBSERVATORIO/mapas/LIMA_EVOLUCION.pdf?AFQjCNEQNM-13puvPBX6p91WloU8Imii0Q
- 128 Date 27.02.2013; Lima seen from the plane; the city fades into dust
- 129 Date 27.03.2013; North-West of Lima, marginal structures?
- 130 Date 27.03.2013; A part of Lima's housing agenda was and is to give land to those who have at least a little bit of wealth, the built-up structure is to be considered informal.
- 131 Date 27.02.2013; Huaca Pucllana an adobe and clay pyramid built during the Lima Culture about 1500 years ago, Miraflores, Lima
- 132 Date 27.03.2013; South-West Lima, the city grows up the slopes, often informally
- 133 Date 27.03.2013; Bus stop of the Metropolitano, the Lima BRT - Bus Rapid Transit System
- 134 Date 27.03.2013; A shopping centre for the well-to-do built into the cliff line of Lima, Miraflores, Lima
- 135 Date 23.02.2013; A "modern" development, close to European standards, Barranco, Lima
- 136 Date 24.02.2013; The coast of Lima is becoming a more and more attractive as a local recreational area.
- 137 Lima Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 138 Lima Aerial View Scale 1 to 25.000, an ArcGis base-map download, August 2015
- 139 Quito paths, Map by author based on data provided by openstreetmaps.org,
- 140 Quito Density Chart, by author, based on data provided by www.unpopulation.org
- 141 Quito Population Chart, by author, based on data provided by www.unpopulation.org
- 142 Date 1786; Colonial center of Quito with typical Spanish colonial style grid pattern
- 143 Date 22.02.2013; Colourful development on a slope towards the south east of Quito: The rainy season could cause troubles, Seen from the Virgin of Quito
- 144 Date 22.02.2013; The northern part of Quito, seen from the historic centre, the paradigms of contemporary cities start to transform Quito
- 145 Date 22.02.2013; Eastern central slopes of Quito
- 146 Date 22.02.2013; Buildings arranged like stairs on the slopes of Quito, Calle de la Ronda, Quito
- 147 Date 22.02.2013; Up-front the historic Quito and behind the "modern" Lima with high rising buildings, Seen from the Virgin of Quito.
- 148 Date 22.02.2013; Very common, structural steel for the next story, in- years can pass between phases of building, in the centre of Quito
- 149 Date 22.02.2013; The buildings are arranged like they have been naturally grown on these slopes, They are however endangered by slope slides, central west of Quito, Seen from the Virgin of Quito.
- 150 Date 22.02.2013; On the right, a bus-stop of "El trolebús de Quito" of the Quito BRT system, Underneath, the construction site for the Quito Metro
- 151 Date 25.03.2013; Aerial view of northern of Quito facing East, taken from the plane
- 152 Date 22.02.2013; Like something organic? These buildings are green as well. Quito, Ecuador
- 153 Quito Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 154 Quito Aerial View Scale 1 to 33.333, an ArcGis base-map download, August 2015
- 155 San José paths, Map by author based on data provided by openstreetmaps.org,
- 156 San José Density Chart, by author, based on data provided by www.unpopulation.org
- 157 San José Population Chart, by author, based on data provided by www.unpopulation.org
- 158 Date 19.10.2012; Walls and fences, an emerging neighbourhood in San José
- 159 Date 19.10.2012; Street close to the University Campus, San José
- 160 Date 20.10.2012; Brutalism meets diversity? Caja Costarricense de Seguro Social, San José , Costa Rica. Architect: Alberto Linner.
- 161 Date 20.10.2012; One of the main roads of San José , a lot of traffic, a lot of noise, and not many positive qualities
- 162 Date 20.10.2012; In San José almost every private property is behind a fence, mostly these fences look frightening.
- 163 Date 20.10.2012; Seldom, a street without traffic, San José
- 164 Date; Central San José
- 165 San José Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 166 San José Aerial View Scale 1 to 40.000, an ArcGis base-map download, August 2015
- 167 Managua paths, Map by author based on data provided by openstreetmaps.org,
- 168 Managua Density Chart, by author, based on data provided by www.unpopulation.org
- 169 Managua Population Chart, by author, based on data provided by www.unpopulation.org
- 170 Aerial view after the Managua earthquake of 1972,



- 171 The heavily affected area of the 1972 earthquake, in the dark area most of the buildings have collapsed.
- 173 Date 20.11.2012; Natural hazards are mostly invisible or look harmless if there is for example not an eruption, fuming Volcano San Cristóbal, Nicaragua
- 172 Date 15.11.2012; Art critical of society in Nicaragua, Galería de Arte Contemporáneo Códice, by Fredman Barahona*Elyla Sinvergüenza who grew up and lives in Old Managua
- 174 Date 09.12.2012; Old Managua, Ruins of colonial style patio houses filled up with marginal housing
- 175 Center of Managua after the earthquake in 1972
- 176 Date 11.12.2012; View of buildings which endured the earthquake of 1972, In the centre, the former Bank of America building built in the 60's cracked but did not collapse, statics by Lin Tung Yen, Managua
- 177 Date 06.12.2012, Old Managua on the top right, on the left the peer on lake Managua
- 178 Managua Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 179 Managua Aerial View Scale 1 to 25.000, an ArcGis base-map download, August 2015
- 180 Managua Aerial View Coast of Managua towards the Lake Managua, Taken from the Plane by aUthor; 06.12.2012
- 181 Medellín paths, Map by author based on data provided by openstreetmaps.org,
- 182 Medellín Density Chart, by author, based on data provided by www.unpopulation.org
- 183 Medellín Population Chart, by author, based on data provided by www.unpopulation.org
- 184 Date 24.04.2013; Medellín's expanding skyline, some 140 new high rising buildings are under construction, seen from Diez Hotel Categoría Colombia, Cl 10A #34-11, Medellín, Antioquia
- 185 Date 24.04.2013; View towards the south west of Medellín, seen from Diez Hotel Categoría Colombia, Cl 10A #34-11, Medellín, Antioquia
- 186 Date 21.04.2013; View towards the South of Medellín, seen from the Biblioteca España
- 187 Date 21.04.2013; The main bus terminal, Terminales Medellín, in the centre with the subway station up front,
- 188 Date 22.04.2013; Seen from the "Metro-Cable" station Santo Domingo Savio, Medellín
- 189 Date 21.04.2013, The metro of Medellín, actually a high line
- 190 Date 22.04.2013; Marginal development, central-western part of Medellín
- 191 Date 24.04.2013; View towards south-eastern Medellín
- 192 Date 21.04.2013; Metro Cable Linea K, gondolas and pillars
- 193 Date 21.04.2013; Metro Cable Linea K, view from the inside of the cabin
- 194 Date 21.04.2013; One of the neighbourhoods around the Metro Cable
- 195 Date 21.04.2013; Biblioteca España, one of several architectural interventions in Medellín
- 196 Date 21.04.2013; Adaptation of the public space beneath the Metro Cable
- 197 Date 21.04.2013; Public space originated with the development of the Metro Cable
- 198 Medellín Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 199 Medellín Aerial View Scale 1 to 25.000 an ArcGis base-map download, August 2015
- 200 Ahmedabad paths, Map by author based on data provided by openstreetmaps.org,
- 201 Ahmedabad Density Chart, by author, based on data provided by www.unpopulation.org
- 202 Ahmedabad Population Chart, by author, based on data provided by www.unpopulation.org
- 203 Date 20.02.2014; Rich wooden decoration, the Walled City of Ahmedabad
- 204 Date 20.02.2014; A cow in the courtyard of a "Pol", as these patio houses are called, Walled City Ahmedabad
- 207 Date 20.02.2014; Jamad Masjid, in the centre of the formally Walled City of Ahmedabad, behind these walls is the smell and the noise of a crowded Indian city, built in the early 15th century
- 205 Date 20.02.2014; The colourful life, dens and partly vertically arranged stalls in a market within the Walled City of Ahmedabad
- 206 Date 20.02.2014; A another arrangement of "Pol's", Walled City Ahmedabad
- 208 Date 20.02.2014; A bus stop and the separated bus line of the Janmarg or BRTS Ahmedabad, Bus Rapid Transit, first operated in 2009, running some 160 buses by now
- 209 Date 21.02.2014; Sabarmati River Front, one of the top goal-developments in Ahmedabad, entirely straightened river banks can cause problems in high rain seasons
- 210 Ahmedabad Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 211 Ahmedabad Aerial View Scale 1 to 25.000, an ArcGis base-map download, August 2015
- 212 Detroit paths, Map by author based on data provided by openstreetmaps.org,
- 213 Detroit Density Chart, by author, based on data provided by www.unpopulation.org
- 214 Detroit Population Chart, by author, based on data provided by www.unpopulation.org
- 215 Detroit Population trends, Data: World Bank and <http://www.somacn.com/p469.php> 2014 12 03, Chart by author
- 216 Date 26.04.2012; Seemingly at random one comes across vacant buildings, half of this building no longer exists the other half has been renovated, Atwater Street 1801, Detroit
- 218 Date 25.04.2012; The Heidelberg Project, an artistic way of dealing with decline, Heidelberg Street Detroit
- 217 Date 24.04.2012, A randomly chosen picture of a gutted building, which could have been nearly anywhere in Detroit
- 219 Date 23.04.2012; Not everywhere in Detroit is to see vacancy, a vital part in the middle of Detroit, Lafayette Park, Designed by Mies van der Rohe, 1958-1960.
- 220 Date 23.04.2012; 1In 1913 the first passengers boarded at Michigan Central Station, the last trains left the station in 1988, since then there have been several plans for a new use, it was eventually in 2014 when renovations started, but the further use stays uncertain.
- 221 Date 23.04.2012; The Packard Plant, luxury automobiles were built here until 1958 when the plant was closed, since then this complex, designed by Albert Kahn, became more and more vacant, in 2010 the last remaining users moved out, in 2014 renovations started to bring new uses.
- 222 Date 23.04.2012; Urban farming? Or is it already ordinary farming? Detroit Earthworks Urban Farm, a cooperative that serves food to indigent people.
- 223 Date 26.04.2012; Behind PJ's Lager House, will Detroit be again what it was once?
- 224 Historical aerial view of Detroit in 1949, stitched by author, Source: http://claslinux.clas.wayne.edu/photos/part1/low_res/aerial_photos/wayne/1949/detroit49index.pdf 2015 10 10, no



Copyright restrictions found

- 225 Historical aerial view of Detroit 1961, stitched by author, Source: http://claslinux.clas.wayne.edu/photos/part1/low_res/aerial_photos/wayne/1961/detroit61index.pdf, 2015 10 10, no Copyright restrictions found
- 226 Detroit Aerial View Scale 1 to 168.000, an ArcGis base-map download, August 2015
- 227 Detroit Aerial View Scale 1 to 25.000, an ArcGis base-map download, August 2015
- 228 The current village of Dholera, Aerial View, Source: ArcGis
- 229 DMIC - Delhi, Mumbai Industrial Corridor overview, Based on data provided by <http://www.dmicdc.com/downloadfile.aspx?D=-/uploads/files/UploadFile6.pdf> 2015 10 10
- 230 Map of Future Dholera by author based on data provided by <http://dholerasir.com>, 2015 10 10/
- 231 New York City path map miniature based on data provided by openstreetmap.org, September 2015
- 234 Quito path map miniature based on data provided by openstreetmap.org, September 2015
- 232 Mumbai path map miniature based on data provided by openstreetmap.org, September 2015
- 235 San José path map miniature based on data provided by openstreetmap.org, September 2015
- 233 Chandigarh path map miniature based on data provided by openstreetmap.org, September 2015
- 236 Managua path map miniature based on data provided by openstreetmap.org, September 2015
- 239 New Delhi path map miniature based on data provided by openstreetmap.org, September 2015
- 242 Medellín path map miniature based on data provided by openstreetmap.org, September 2015
- 237 Bogotá path map miniature based on data provided by openstreetmap.org, September 2015
- 240 Barcelona path map miniature based on data provided by openstreetmap.org, September 2015
- 243 Ahmedabad path map miniature based on data provided by openstreetmap.org, September 2015
- 238 Vienna path map miniature based on data provided by openstreetmap.org, September 2015
- 241 Lima path map miniature based on data provided by openstreetmap.org, September 2015
- 244 Detroit path map miniature based on data provided by openstreetmap.org, September 2015
- 245 New York City aerial view miniature, Source: ArcGis August 2015
- 248 Quito aerial view miniature, Source: ArcGis August 2015
- 246 Mumbai aerial view miniature, Source: ArcGis August 2015
- 249 San José aerial view miniature, Source: ArcGis August 2015
- 247 Chandigarh aerial view miniature, Source: ArcGis August 2015
- 250 Managua aerial view miniature, Source: ArcGis August 2015
- 253 New Delhi aerial view miniature, Source: ArcGis August 2015
- 256 Medellín aerial view miniature, Source: ArcGis August 2015
- 251 Bogotá aerial view miniature, Source: ArcGis August 2015
- 254 Barcelona aerial view miniature, Source: ArcGis August 2015
- 257 Ahmedabad aerial view miniature, Source: ArcGis August 2015
- 252 Vienna aerial view miniature, Source: ArcGis August 2015
- 255 Lima aerial view miniature, Source: ArcGis August 2015
- 258 Detroit aerial view miniature, Source: ArcGis August 2015
- 260 Date 20.02.2014, Ahmedabad, Walled City, at daytime a market, at night time a kitchen
- 261 Date 20.02.2014, Ahmedabad, Walled City, wire and motor workshop
- 262 Date 15.02.2014; Strawberries being sold in Mumbai, India
- 263 Sketches by author, From a Hamlet to a Megalopolis
- 265 Date 11.01.2013; Eastern Mountains Bogotá
- 264 Date 11.01.2013 A film about the family who lives in this house, <http://www.cultureunplugged.com/documentary/watch-online/play/9089/LA-CASA--THE-HOUSE->
- 266 Credit: NASA Earth Observatory image by Robert Simmon using NASA Earth Observatory/NOAA NGDC images, Source: http://eoimages.gsfc.nasa.gov/images/imagerecords/79000/79765/dnb_land_ocean_ice.2012.54000x27000_geo.tif
- 267 Layers of urbanities and their (in) visibilities, sketch by author
- 268 Date 21.05.2010; Cycling, maybe the most efficient way of increasing mobility in a city, Critical Mass - Vienna
- 269 Space plan of the city of Vienna, close to Westbahnhof, Source: www-wien.gv.at/flaechenwidmung/public/
- 270 How to define density? The introduction of Built-Up Volume Ratio - BUVR, by author.
- 271 Examples of different densities, by author.
- 272 Sketches of Urban Elements, by author
- 273 The modular concept of bricks, by author
- 274 A Brick - most versatile, sketch by author
- 276 Elevator to the moon, by author.
- 275 No Limits, by Madlyn Miessgang
- 277 City means everything is close, sketch by author
- 278 Certain urban qualities, sketch by author
- 279 Delphi, Site-plan of the sanctuary of Apollo, Source: https://en.wikipedia.org/wiki/File:Santuario_de_Apolo_Pitio.gif, 2015 10 18
- 281 Copy and Paste Urbanity, sketch by author
- 280 Urban Signal lights, sketch by author
- 282 The Map for the "user" of a city and the drawing and thoughts of a well renowned architect, OpenStreetMap view of Chandigarh, Overlay - Master-Plan by Le Courbsier on the right and a detailed Masterplan on the left. Sources: openstreetmap.org, 2015 10 25; <https://landlab.files.wordpress.com/2011/04/chandigarh-plan-2.jpg>, 2015 10 25, <https://landlab.files.wordpress.com/2011/04/chandigarh-plan.jpg>
- 283 Growth of cities, by Madlyn Miessgang
- 284 Date 07.08.2015; Small square in a fishing village in Croatia, an inviting place to bump into each other and start talking. Fažana was discovered in the 19th century as a summer resort and soon became very popular as a starting point to travel the Briuni Islands. It still has this charming centre with several small squares.
- 285 A sketch of the initial ideas about wolrdblock.org, by Author



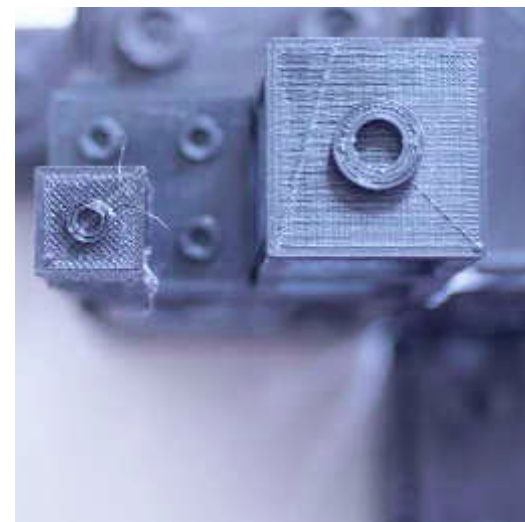
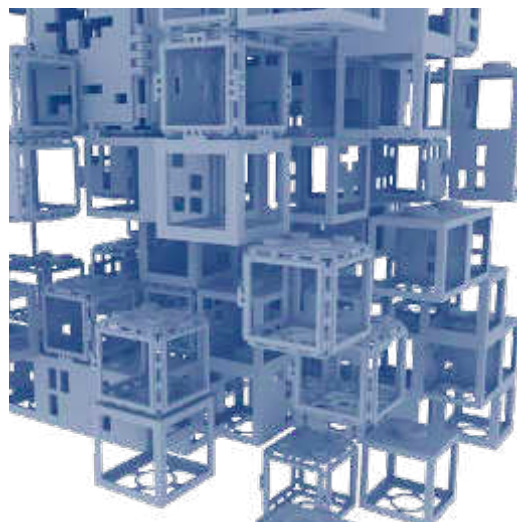
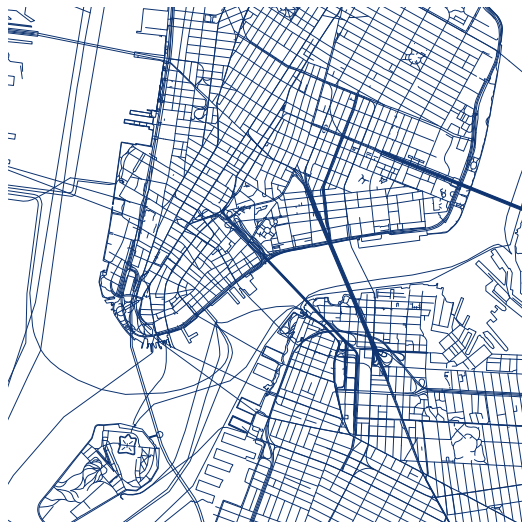
-  286 *Design approach with Lego Digital Designer, an informal city block, one grown over time*
-  288 *The unit of Minecraft, a 3 dimensional pixel, a block with 1 x 1 x 1 m translated to the real world*
-  289 *Minecraft 3D Block game, a design approach for a building, generally there is one standard size*
-  291 *worldblock.org mindmap, by author*
-  292 *Thomas Morus, Utopia, 1515, Source: <https://www.gutenberg.org/ebooks/2130>, a German version <http://www.gutenberg.org/files/26971/26971-h/26971-h.htm>*
-  293 *How to use Space? Sketches by author*
-  294 *Ideas behind Ma.Ad.Man. Urbanization, sketches by author*
-  295 *Date 13.10.2015, A uniform grid as base*
-  296 *A city inversed inside of a single cube, by author*
-  297 *Milky Way, source: <http://www.eso.org/public/images/eso0932a/>, 2015 10 26*
-  298 *Sketches by author*
-  299 *New Possibilities have been found in Space*
-  300 *Rendering by author; Source background image, <http://www.eso.org/public/images/eso0932a/>, 2015 10 26*
-  301 *The Urban Cloud gets as many surfaces and people reside in the Cloud, "Unique Faces For Each Dice"*
-  302 *The generated Urban Dice in the Rhino View Port*
-  303 *The first prototypes looked quite different.*
-  304 *This script part bakes the newly defined Urban Dice as a printable file into a selected folder*
-  305 *CPU Wafer, some of the most complex manufactured structures, could be a map of a urban neighbourhood; Source: www.intel.com 2015 10 28*
-  306 *Automated opening of shared walls*
-  307 *XLS - Urban Dice List Generator*
-  309 *Generated from curves with a self-made script*
- 308 *Wolframs One Dimensional Universe*

From page 216 all images, drawings, plans, illustrations and photos are made by the author if not quoted differently.



Authors comment: “A journey to a place called urbanity, everywhere and nowhere, we can call it UTOPIA, or a fantasy. But often it is the harsh reality that takes thoughts down to bitter facts. Cities are optimized towards technical standards. Often it is forgotten that this, the built-up structures are meant to be our place, the place where we live. There is loss of any human scale, with no traces of life left.”

This is an investigation of urbanity and utopia outside of the corset of regulations and limitations. Urbanity that is mobility, standardized to be individual, and finally made for a better understanding of urbanity.



*Matters in urban planning
and the investigation of a tool
for urban development
with the invention of a utopia
and the design of an urban toy.*