BUILT FORM OVER TIME

BY OLINA TERZI

EXPERIMENTS ON URBAN RULES
Foreword
In September 2016 at the Faculty of Architecture of TU Delft, a collective research thematic is set: the potential of adaptable architecture over time.

As part of ‘The Why Factory’ graduation studio - MVRDV’s think tank, focusing on the development of future urban visions and ‘fantastic’ architecture- the present catalogue studies current and past urban rules that have guided the adaptation of the urban fabric over time.

By understanding the challenges and potentials of rules, the graduation project recognises them as important research tools for the development of a design strategy for adaptive architecture.
The built environment is, to an extent, already adaptable. Cities adapt to changing demands, by design or spontaneously.

Considering the global western city; the epitome of regulated adaptation through top-down urban plans and regulations, and on the other hand cities of the global south; as exemplary instances of informal adaptation, it becomes evident that adaptation is an inherent quality of the urban realm.

The project, consciously avoiding the romanticisation of informal urbanism, centres on a research fascination in regulated or designed adaptation.
What mechanisms are in place today guiding the adaptation of built form over time?
An adaptable city demands something more than fixation. What is ‘fantastic’ about it today is that due to the low updatability and flexibility of current legal frameworks cities can be adaptable only macroscopically.

On the building scale, where the timeframes of demand change are significantly shorter, the challenge to adapt on time is severe. A building cannot change its use, facade, massing, access, or services without undergoing long bureaucratic processes of permission and taxing.

Adaptability on the building scale is therefore practically very unlikely, almost punishable.
What makes our cities adaptable but our buildings so fixed?
Cities, in contrast to buildings absorb quite effectively change over of built form over time. A close understanding of the mechanisms of urban mutation through urban rules is therefore the focus of this first research booklet.

The goal is to accelerate the phase of a building’s adaptation to use demand from 40-50 years to a daily or monthly basis. This way, buildings can become dynamic and reflective of user demand, rather than limiting and fixed.
If intelligence from urban mutation is combined with novel architectural solutions, the adaptability of buildings could rise.
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Cities are defined by the mutation of their built forms over time. This mutation is of varying scales and can be either formal; carried out in a coordinated manner by top-down mechanisms, or informal; manifesting directly bottom-up spatial desires.

What these two processes have in common is that they are both guided by rules; written or unwritten. Intentionally or not, such rules become impactful tools for the regulation of built form over time.

In an effort to investigate how the constituent parts of a functioning whole mutate over time, this paper studies a global sample of urban rules understanding their underlying mechanisms of freedom and control. It does so via a series of experiments.
Informality is not always illegal.

Pictured above is Athens, Greece, a city whose form has largely been shaped by urban regulations, determined by social structures and norms. Below is, Kowloon City, Hong Kong, an illegal but self-sustained slum recently demolished due to security concerns.

What they share is a high level of social intervention in the urban rules that govern their forms, which in Athens is completely legal but in the meantime in Hong Kong completely illegal.
Cities over time can develop in immensely different ways based on the rules that are in place during their development.

A simple condition, such as the presence of an urban grid, can determine how urban conflicts are settled or prevented, how dense or how safe an environment becomes, as well as the level of urban intervention allowed to its inhabitants. In contrast, in historic settlements, like Casbah in Algeria, where more open legal frameworks that gave more freedom to urban stakeholders, conflicts on urban space are settled more organically.
The city of the future is a city of time.
“Occupied by temporary inhabitants, the city of time displays a constantly changing shape, structured by the material and immaterial flows of movements and exchanges and by multiple spatial scales.”

We read cities by their rules.
“Regarding rules as design tools offers a valuable urban design attitude - departing from an approach of overall control, towards a non-fatalistic form of control between freedom and coercion.”

-Alex Lehnerer (2016) in “Grand Urban Rules”
An urban rule is a principle that influences built form over time.

This archive consists of 30 urban rules that have been categorised and analysed in order to understand the underlying mechanisms of how built form has been controlled over time in the past.

The rules are categorised according to their type, scale, intention and spatial impact. Each rule is first explained in simple words noting its wider impact and importance and accompanied by a small representative sketch.
The archive consists of a *global sample* of urban rules that have arisen during different historical periods in different parts of the world. It aims at creating an unbiased image of the topic while considering and learning from diverse contexts.
Urban rules arise either as written or as unwritten principles.

They can take the form of statute documents, regulations, official instructions or minimum standards; or simply as socially accepted practice, customs, norms or an interpretation or selective application of official instructions.

Whether a rule is written or unwritten is of minor importance, as both can become equally impactful for our cities.
Urban

Building
Rules may address a wide range of spatial scales.

They can refer to a small part of a building (window or balcony), an entire building and its layout (fire safety regulations), a group of buildings or neighbourhood (the porosity of built volume, amount of greenery), or the city and regional scale (instructions on urban growth).

Interestingly, these scales are interrelated, as a rule referring to a part of a building might have a distinctive urban impact too.
Economic

Environmental

Safety

Aesthetic

Infrastructure
The intentions behind rules address different sectors of public life.

These may be Economic, Environmental, Safety, Aesthetic or Infrastructural concerns of a community, municipality or state. It is not necessary that a rule serves only one intention, while it is not always the case that a rule’s motivation is straightforward or openly stated.

The following archive will note the most evident intentions behind each rule, based on their most distinctive impact on built form.
Massing

Facade

Structure

Access

Services
The identity of any city is formed by rules that address its smallest grain, the building.

Through the study of urban rules we thus discover the core building elements of cities: Massing, Facade, Structure, Access, and Services.

Despite their intended scale of impact, all rules somehow relate or are reducible to one of these elements.
• More than one landlords are allowed to own a property per plot

• Ownership takes the form of appartments sharing common services and having common responsibilities

• Special provisions were made for the division of responsibilities for maintainance, such as the weekly/monthly owners’ assembly and the annually assigned task of block administrator

Intentions of Urban Law:

• Densification of cities

• Accommodation of national immigrants

• Boosting of economy which centered around the building sector
Each floor of the “Polykatoikia” had ultimately a different owner
Both faces of a window should be capable of being cleaned from within the building such that there will not be a threat to the cleaner from a fall.

Design for reach should accommodate the 5th percentile of the UK adult population. Windows within 4m of a fixed surface can be cleaned from that surface. Guarding to a balcony should be provided to a height of 800mm.

Intentions of Urban Law:

Health and Safety: Safety is the “state of freedom from unacceptable risks of personal harm”. Buildings should be designed to consider the safety and the welfare and convenience of building users.
If professional cleaning service not included in rent, window sizes become highly standardised (social housing).
• Ground floor and Mezzanine level occupied by shops or offices. Second, piano nobile floor with a balcony, third and fourth floors similar but less elaborate and sometimes lacking balconies. Fifth floor with a single, continuous, undecorated balcony.

• Mansard roof, angled at 45°, with garret rooms and dormer windo

Intentions of Urban Law:

• Napoleon Bonaparte also had ambitious plans for rebuilding the city: “Paris is the heart of France. Let us apply our efforts to embellishing this great city.”

• The goal was also for public authority to better control a capital where several regimes had been overthrown since 1789. Some real-estate owners demanded large, straight avenues to help troops manoeuvre
The Haussmann façade was organized around horizontal lines that often continued from one building to the next: balconies and cornices were perfectly aligned.
The allowed plot coverage for any given plot in the city centre was restricted to 70% built volume.

The footprint of the construction could vary but 30% was the required outdoors area to be provided.

Intentions of Urban Law:

- Environmental considerations for the protection of green in the city.
A total of 30% of a property must be left unbuilt.
This law aimed at discouraging large surface parking areas; the use of materials to differentiate public and private parking areas; and landscaping for improved aesthetic.

Key elements of the by-law states that all off street parking is screened by trees of at least 1.5m, and on-site parking cannot exceed 250 spaces.

Intentions of Urban Law:

City officials wanted a more welcoming city and people friendly parking areas.

Improved aesthetic of parking areas. Large parking areas are split up.

An increase of trees and shrubbery in cities; improving air and environment quality.
250 parking spaces split into two areas with trees and greenery providing a pleasant streetscape.
Env 2 - Public realm provision
Glasgow, Scotland
2009

• This regulation requires a percentage of every new development over 2000 sq/m in Glasgow to be allocated to open space or the public realm

• New residential development must provide access to good quality recreational open space.

• City Centre developments must contribute to public realm areas.

Intentions of Urban Law:

• Provision and maintenance of high quality spaces.

• Well designed public realm.

• Spaces that are accessible safe and available for community use.
Any retail development above 2000m² is obliged to provide 12sqm of public realm per 100sqm gross floor area.

Any housing development (flatted) of the same size should provide 1.25 hectares of recreational open space per 1,000 population.
• Once you reached 25 percent of your lot area, you could build a skyscraper of any height.

• The city centre was divided into districts according to the permitted ratio of building height and street width. That meant that a building could rise at a height of 1, 1.5, 2 or 2.5 times the width of its adjacent street before it needed to set back 1 foot for every 5 feet it added in height.

Intentions of Urban Law:

• The idea was that light and air would reach the sidewalk

• For the purpose of relating and limiting the height and bulk of new buildings
Setting back according to the given dimensions was not compulsory, so relative freedom was given to the architect.
Property Tax Policy
Amsterdam, Netherlands
1600

- Property taxes depended on the frontage of the residence, specifically on the amount of windows present on the facade. Houses of more than 6 windows were to be taxed.

- The more windows included the more the rate per window would escalate

- In 1747 one would be taxed sixpence per window for a 10-14 windows house, while ninepence for one with 14-20 and a shilling for one with over 20 windows.

Intentions of Urban Law:

- Easy tax calculations from the street level

- More houses on prime land with canal views
A 12-window house would be taxed 6 pence per window, adding up to 6 shillings overall tax. Fake windows are added for symmetry and staircases are made unusually narrow and steep.
• This was a height restriction law, whereby limitations depend on the width of the street on which a building fronts, and on whether the street is a business or a residential street.

• The law limited the height of buildings to 90 feet (27 m) for residential and 110 feet (34 m) for business, or to the width of the street in front, whatever was smaller.

• It made an exception for buildings on business streets 160 feet (49 m) wide, which were permitted to be 130 feet (40 m) tall.

Intentions of Urban Law:

• In response to the construction of the 164-foot (50-meter) Cairo Hotel in 1894.

• Preservation of the human scale and identity of the city.

• Prevention of the Cathedral’s distinctive appearance in the city’s skyline.
The 1910 height restriction has made nowadays Washington known for its unusually ‘humane’ cityscape as compared to other American cities.
• The concept of the fina, an area of about 1.0 to 1.5 meters in width alongside the external wall(s) of a building, extending also vertically, abutting streets and access paths. The owner or tenant of the building has certain rights and responsibilities associated with his fina.

• The configuration and possibility of bridging the public right-of-way emanates from the concept of the fina, and is called a sabat. It allowed the creation of additional space attached to a building.

Intentions of Urban Law:

• Deal with change in the built environment by ensuring that minimum damage to pre-existing structures

• Stipulating fairness in the distribution of rights and responsibilities among proximate neighbours

• Ensure the equitable equilibrium of the built environment during the process of change and growth
Balconies were usually closed off with full height shutters, conserving the existing balustrade and adding glazing behind it.
• At least fifty percent (50%) of the total glazed surface area of the building, (excluding glazed areas with back insulated panels), must have a north orientation which includes 150 degree angle started from east toward North West.

Intentions of Urban Law:

• “To keep Dubai a healthy city that follows the highest standards of sustainable development and has clean pollution-free environment”
50% of all glazed surfaces should be directed towards the North.
• Floor area or dimensions of any of the rooms of a building shall not be less than the following minimum levels:
  Shop 120 sqf (11 sqm) (8 feet min side)
  Office, Residential room 100 sqf (9.3 sqm) (8&9 feet min side)
  Kitchen 40 sqf (3.7 sqm) (5 feet min side)
  Bathroom 30 sqf (2.7 sqm) (5 feet min side)
  Toilet 15 sqf (1.4 sqm) (3 feet min side)

• Minimum width of public traffic corridors:
  5-6 feet for Residential & Office Buildings,
  10 feet for commercial corridors/passages

Intentions of Urban Law:

• Regulate minimum space for health and safety

• Common acceptable living standard
Minimum domestic spatial requirements with minimum allowed side length.
Applies to all non-dwelling buildings

A refuge space can be:
- An enclosure such as a compartment, protected lobby, protected corridor or protected stairway
- Any area that is sufficiently protected from any fire risk and provided with its own means of escape

Each refuge should provide an area accessible to a wheelchair of at least 900mm x 1400mm in which a wheelchair user can await assistance.

Intentions of Urban Law:

- Securing reasonable standards of health and safety of persons in and about buildings. This is intended to include all people, including people with disabilities.
Floor compartmentisation with more than one escape routes, and refuge space in protected staircase.
Every male citizen turning 30 can claim a free plot of land of 1000 sqm in the form of a 33 by 33 m square and an interest free loan to build his house.

Plots of different sizes and shapes can be distributed for investment in housing, offices or industries. The public authorities then provide the technical infrastructure to connect the plots.

These plots are often surrounded by a wall and separated from each other by a 2 m wide empty corridor.

Intentions of Urban Law:

Government aimed at handling the fast growing wealth of the emirates with care to avoid internal conflicts: The rulers set up a system of distributing the wealth equally among the emirate citizens aiming at social peace.
An orthogonal grid encloses an suburban cityscape which largely contains voids or oversize or partially vacant plots.
• The law postulates the maximum travel distances in a small two or three storey premises with a single protected stair to each storey

• The escape routes from any storey should be of such a number and so situated that the distance of travel from any point to the nearest storey exit does not exceed the appropriate limits

Intentions of Urban Law:

• Prevention of casualties due to poor escape route design

• Securing reasonable standards of health and safety of persons in and about buildings. This is intended to include all people, including people with disabilities.
The maximum travel distance to the escape exit is 27m if on ground floor and 18m for upper floors.
• This law presents limits for the maximum floor area enclosed by structural walls

• The guidance of this section assumes that no floor enclosed by structural walls on all sides exceeds 70m², and that no floor without a structural wall on one side exceeds 36m².

Intentions of Urban Law:

• Adequate provision to ensure that the building is stable under the likely imposed and wind loading conditions.
The maximum area enclosed with 4 structural walls is 70m², while 3 structural walls can enclose up to 36m².
Innumerable buildings all over Greece have steel girders protruding up from what appears to be the roof. The structures are complete and inhabited, but if the girders remain in place, the building is deemed unfinished and therefore is not liable to the taxman.

The taxable value of a property is calculated after multiplication with coefficients corresponding to factors that are considered by the law to affect the property values. Special status coefficients: 0.80 for listed buildings, 0.75 for expropriated properties and 0.40 for unfinished buildings.

Intentions of Urban Law:

- Tax evasion.
- Layered building construction that follows family extensions. Parents usually provide their children with housing on the upper floors when they get married.
- Investment of savings in the building sector. As soon as people got hold of many, it was thought as the best financial option to directly invest it in built volume.
Inhabited ground floor unit with unfinished first floor
Although the law theoretically does not legitimise any action or property that has recognised a private street, the specific article is only put into force with the publication of a ministerial decree.

- Large plots in the heart of the city are subdivided to as small sub-plots as possible to maximise profit and connected via non-regulated private street layouts.

Intentions of Urban Law:

- Political motivations and clientism were at the core of this system.
Unregulated subdivision of plots resulted in narrow and overshadowed streetscape with poor air flow
Bay windows mean windows with projected window sills. It is a design feature commonly adopted by property developers in Hong Kong.

Bay windows’ sill is raised above the floor and do not reach until the ceiling.

The specific regulation postulated that bay window areas can be exempted from Gross Floor Area (GFA) calculation, making the space efficiency of an apartment appear higher by including their area in the net area of the flat.

Intentions of Urban Law:

More precise calculations of ‘carpet area’ and real estate market accuracy.
Real estate agents include the bay windows area in usable space calculations to raise the space efficiency and rent.
The law referred to the indigenous typology of the ‘s “Plex”, rowhouses consisting of three to four stacked apartments.

The law made setbacks mandate on newly-built residential streets, and also increased apartment sizes in the downtown from 20 by 60 feet to 25 by 100 feet.

This indirectly encouraged the use of outdoor staircases and made apartments.

Intentions of Urban Law:

• Prevent street overcrowding

• Raise the urban quality of the street
Each floor is owned by different landlords, thus private access is sought. Steel staircase used as public seating of social space.
• The defined setback ranges from 3-9 meters depth and no physical development is legal within this zone

• Within this zone is built the ubiquitous fences that define property boundaries, but also the ditches, the only drainage infrastructure in the city, which every property is required to provide

Intentions of Urban Law:

• Higher urban quality of streets

• As a means to define an easement that the State can use for road infrastructure expansion
Nothing is legally sanctioned within this zone, while spontaneous and informal development is ignored within this zone, because it occurs ‘at-risk’.
The law demanded that 6.6% of the floor area of any residence should include balconies.

This law followed an earlier balcony encouragement that stated that uncovered balconies would allow a landlord to build an additional of 7% of plot area.

Later on, giving in to residents' seeking for a Legal Balcony Closure Permit, the legislation made it legal to close off.

**Intentions of Urban Law:**

- Balcony demand aimed at protecting urban gardens and the enjoyment of nature within the city, as well as access to sun and air.
- Additional need for privacy and additional interior space created a social pressure of closing off balconies.
Balconies were usually closed off with full height shutters, conserving the existing balustrade and adding glazing behind it.
• Drainage fields or mounds should be designed and constructed to ensure aerobic contact between the liquid effluent and the subsoil.

• The distribution pipes should be laid at a minimum depth of 500mm below the surface.

• Drainage trenches should be from 300mm to 900mm wide, with areas of undisturbed ground 2m wide being maintained between parallel trenches.

Intentions of Urban Law:

• To ensure the buildings are serviced appropriately and efficiently, while they connect effectively to public infrastructure.

• To minimise the risk of blockage or leakage of foul water drainage system.

• To decrease the vulnerability of buildings to flooding and ease maintainance work.
The pipework should be of certified materials and laid out based on minimum dimensions.
• Every branch creates a no connection zone on a stack, where no other branch may be fitted such that its centre line falls inside the zone, instead it can be on the boundary, in order to avoid crossflow into any other branch pipe (A).

• A branch discharge pipe should not discharge into a stack lower than 450mm above the invert of the tail of the bend at the foot of the stack in single dwellings of up to 3 storeys.

Intentions of Urban Law:

• To ensure the buildings are serviced appropriately and efficiently, while they connect effectively to public infrastructure.

• To minimise the risk of blockage or leakage of foul water drainage system.

• To decrease the vulnerability of buildings to flooding and ease maintenance work.
A case of an angled connection of 50mm angled parallel junction where a branch discharge pipe would enter into the WC no connection zone.
• Sufficient dwelling is one of the prerequisites for the distribution of a residency permit

• Every non-EU citizen, member of a family over six, has to be allocated twelve square meters of living space. Members between two and six need ten square meters, members under two years old are exempt from the regulation.

• All members must be able to share kitchen, bathing and other secondary facilities, while a 10% deviation from required sizes is harmless.

Intentions of Urban Law:

• Sufficient living space for immigrants and ensured minimum quality of life

• The gainful employment and the integration of foreigners in the federal territory
12m² 12m² 10m² secondary facilities + 45m²
• Fences, walls, or hedges shall not exceed eight feet (2.4m) in height when located in a required side yard or rear yard. They shall not exceed forty-two inches (1m) in height when located in a required front yard.

• If the adjacent property owner(s) that share a common property line nearest to the fence, wall or hedge have agreed, then a proposed increase in height may take place.

Intentions of Urban Law:

• To settle numerous complaints regarding fences, hedges and walls violations placed between 2003-4
Ornamental attachments atop a fence, wall, or hedge shall be permitted up to 300mm above the maximum height limit.
A parking chair is a chair that is used by a vehicle owner to informally mark a parking space as reserved for oneself. Other objects are also used for this purpose, including trash cans, ladders, ironing boards, and other similar-sized objects that are commonly found in households.

Curbside parking spaces are public property and are available to vehicles on a first-come, first-served basis. Still, respecting these makeshift markers has been accepted by citizens as a common courtesy during snowstorms.

Intentions of Urban Law:

The practice is common in snowy weather within urban residential areas where vehicle owners do not wish to risk losing their vehicle’s previously occupied space in its absence.
Two chairs marking a parking space as informally reserved.
• Newly constructed Group R occupancy buildings of 10 occupied floors or less that apply for a building permit shall install solar photovoltaic systems and/or solar thermal systems.

• The total nameplate capacity of photovoltaic collectors shall be at least 10 WattsDC per square foot of roof area.

• Solar thermal collectors shall be designed to generate annually at least 100 kBtu per square foot of their roof area.

Intentions of Urban Law:

• To help San Francisco meet its goals under Ordinance No. 81-08, to have a greenhouse gas-free electric system by 2030.

• To reduce greenhouse gas emissions city-wide to 40% below 1990 levels by 2025 and 80% by 2050.
The solar zone shall be located on the roof or overhang of the building, or on the roof or overhang of another structure located within 250 feet of the building or on covered parking installed with the building project.
§ 275-20 Zoning: Common review and approval procedures
City of New Berlin, WI
2016

• No principal or accessory use, development, structure, or sign shall hereafter be located, erected, moved, reconstructed, extended, enlarged, structurally altered, occupied, or reoccupied; no site or premises shall be altered, used, changed, modified, or occupied; and no grading undertaken, until after the owner has applied for and the Department of Community Development and/or the Plan Commission has reviewed and approved an application for a zoning permit.

Intentions of Urban Law:

• Promote compatible development;

• Promote stability of property values

• Foster the attractiveness and functional utility of the community as a place to live and work

• Protect certain public investments in the area
Zoning permits are not transferable from one applicant to another without approval of the Plan Commission. Zoning permits are site-specific and thus are not transferable from one site to another under any circumstances.
• Each household in Cardiff registered for Council Tax is entitled to receive a recycling and waste collection service.

• Collection of household waste commences only after the developer or new resident of a property makes payment for wheeled waste bins.

• Householders are responsible for the storage of waste containers within their property lines, as well as for their safe keeping and cleaning.

Intentions of Urban Law:

• Promote compatible development;

• Promote stability of property values

• Foster the attractiveness and functional utility of the community as a place to live and work

• Protect certain public investments in the area
“Please return your emptied bins and food caddies to your property boundary by 9.30am the day after collection. This will limit the potential of theft and/or damage by another person.”
Ibn al-Imam Building Code
Kairouan, Tunisia
10th century

• Diagram A shows how to determine the height from the interior of a dwelling if the opening overlooks the private domain of the neighbours.

• Diagram B indicates how to determine the height of the window sills from the street so as to prevent looking into the interior.

• The original codes do not specify dimensions but rather intentions for performance. The dimensions shown are interpretations by author Besim Hakim.

Intentions of Urban Law:

• Prevention of privacy
A. When levels of street and interior are approximately the same
B. As determined from the exterior
Milieuschutz zones are designated by local authorities and impose restrictions on what property owners are allowed to do to increase the value of buildings within the zone. They may be unable to upgrade their apartments by adding balconies, under-floor heating, a lift, guest bathrooms or knocking two smaller apartments together to create a single, larger apartment.

Not all upgrades and modernisations are banned; the rule requires that owners submit an application and gain official approval for the work they intend to carry out.

Intentions of Urban Law:

The law is designed to stop individual streets and districts from becoming “too gentrified” and to preserve their “original” character and social mix.

Guaranteeing transparency, tampering free market excesses and protecting the architectural mix of individual neighbourhoods.
Adding second bathrooms or adding balconies is a typical strategy employed by landlords to maximize their return. Long-term, this can be as effective a tool of displacement as straightforward eviction.
Urban rules arise as a result of different causes and conditions.

Some rules remain active for long periods, having distinctive manifestations on the built fabric, almost creating new spatial identities. Others may arise as solutions to temporary or lasting problems, social conditions or cultural trends or they might simply be based on good or bad practice of the past.

This chapter presents various factors that have created urban rules around the world.
Politics

The urban rules imposed in 1858 by Georges Eugène Haussmann, during the reign of Napoleon III in Paris, included the construction of new boulevards that violently cut through the city creating wide corridors; as well as an imposed aesthetic character for all buildings fronting these arteries. The principles that guided the reconstruction of the city originated solely from the Emperor and were historically criticized as tools of social manipulation, facilitating prompt military intervention in case of social unrest.
Practicalities

The Frankfurt Kitchen by Austrian architect Margarete Schütte-Lihotzky was designed in 1926 with principles of usability in mind. A milestone in domestic architecture, considered the forerunner of modern fitted kitchens, was a kitchen built after a unified concept, designed to enable efficient work and to be built at low cost. Connected to the emancipation of women, the kitchen was designed for everything to be close at hand and easy to reach, so that work could be as rational as possible and nice to work in.
Edinburgh, Scotland
Safety

The United Kingdom is famous for its Health & Safety restrictions that guide all building design and aim to prevent casualties from activities like cleaning the exterior surface of windows, or standing by large openings with the danger to fall off. Safety, sometimes taken to an extreme, is therefore a driving force and origin of urban rules that once minor, when applied consistently create distinctive and site specific forms.
In the early 20th century New York was a city of setback buildings. Its skyline was characterised by such ‘wedding cake’ shapes which aimed at the maximum utilisation of inner city plots without obstructing public access to wind and sun rays. The identity of the city had been stamped for ever, with most such skyscrapers being present today on prime land locations.
The government aimed at handling the fast growing wealth of the emirates with care to avoid internal conflicts: The rulers set up a system of distributing the wealth equally among the emirate citizens aiming at social peace. Nowadays, every male citizen can claim a free plot of land from the government after his 30th birthday. This has resulted in the suburban sprawl of the city based on an orthogonal grid, which is largely made up of urban voids.

Happy Birthday!
HIS HIGHNESS
SHEIKH MOHAMMED
BIN RASHID AL MAKTOUN
The Building regulations 2010

Fire safety

APPROVED DOCUMENT

VOLUME 2 - BUILDINGS OTHER THAN DWELLINGHOUSES

B1 Means of warning and escape
B2 Internal fire spread (linings)
B3 Internal fire spread (structure)
B4 External fire spread
B5 Access and facilities for the fire service

 Came into effect April 2007

For use in England

2006 edition

Incorporating 2007, 2010 and 2013 amendments

DESIGN FOR VERTICAL ESCAPE

4.24 Where simultaneous evacuation is to be used, the capacity of stairs widths from 1000 to 1800mm in Table 7.

4.25 As an alternative to using Table 7, the capacity of stairs width (w) or (for simultaneous evacuation) can be derived from the formula:

$$P = 200w + 50 (w - 0.3) - 1$$

where:

- $P$ is the number of people that can be served
- $w$ is the width of the stair, in metres
- (h) is the number of storeys served

Note 1: Stairs with a rise of more than 300mm should not be wider than 1400mm unless provided with a central handrail (see paragraph 4.15).

Note 2: Separate calculations should be made for stairs serving basement stonies and those serving upper storeys.

Note 3: The population served should be divided by the number of available stairs.

Note 4: The formula is particular useful when determining the minimum width required for stairs serving a building (or part of a building) where the occupants are not distributed evenly - either within a storey or between storeys.

Therefore both stairs should be at least 1070mm wide. But if this is not possible to increase the minimum widths needed for 110 persons in Table 4.

- a is the number of people that can be served
- $w$ is the width of the stair, in metres
- (h) is the number of storeys served

Note 5: In the formula, the first 200w represents the number of persons estimated to live on the floor above the one where the fire is reported.

The second 200w + 50 (w - 0.3) represents the number of persons estimated to be accommodated on the floor above the one where the fire is reported.

Therefore both stairs should be at least 1070mm wide. But if this is not possible to increase the minimum widths needed for 110 persons in Table 4.

- a is the number of people that can be served
- $w$ is the width of the stair, in metres
- (h) is the number of storeys served

Note 6: The formula is particular useful when determining the minimum width required for stairs serving a building (or part of a building) where the occupants are not distributed evenly - either within a storey or between storeys.

Therefore both stairs should be at least 1070mm wide. But if this is not possible to increase the minimum widths needed for 110 persons in Table 4.

- a is the number of people that can be served
- $w$ is the width of the stair, in metres
- (h) is the number of storeys served

Worked examples:

A 6-storey building comprises 12 stores of offices (ground + 11) with the top two stories containing flats served by separate stairs. What is the minimum width needed for the stairs serving the office floors, a population of 1400 people (including the ground floor, which does not use the stairs), using simultaneous evacuation? Two stairs satisfy the travel distance limitations.

a. The population served is distributed evenly.

As the top office floor will be served as well, there should need no lobby protection (see paragraph 4.16). Therefore, both stairs are entered at each level via a protected lobby, then both stairs can be assumed to be available (see paragraph 4.27).

P = $1200w + 600, n = 11

From the formula:

- $600 = 200w + 50 (w - 0.3)(11 - 1)$
- $600 = 200w + 50 (w - 16)$

Therefore both stairs between the 9th floor landing and the top floor should be at least 1200mm wide. But this needs to be increased to 1500mm as the formula applies to stairs 1100mm or wider (see paragraph 4.25).

This width will also be adequate when one storey exit is found in accordance with paragraph 4.31 and the need to comply with paragraph 4.38 (i.e. the stair widths are not less than the minimum widths needed for 110 persons in Table 4).

b. The population is not distributed evenly.

Such e.g. 1000 people occupy floors 1 to 3 in 3 groups of occupants.

As the top office floor is a height greater than 18m, both stairs need lobby protection (see paragraph 4.16). Therefore, both stairs are entered at each level via a protected lobby, then both stairs can be assumed to be available (see paragraph 4.27).

P = $1200w + 600, n = 11

From the formula:

- $600 = 200w + 50 (w - 0.3)(11 - 1)$
- $600 = 200w + 50 (w - 16)$

Therefore both stairs between the 9th floor landing and the top floor should be at least 1200mm wide. But this needs to be increased to 1500mm as the formula applies to stairs 1100mm or wider (see paragraph 4.25).

This width will also be adequate when one storey exit is found in accordance with paragraph 4.31 and the need to comply with paragraph 4.38 (i.e. the stair widths are not less than the minimum widths needed for 110 persons in Table 4).
Anecdotal reports of a fire set on the 9th of May 1911 at the Empire Palace Theatre in London, form the evidence base for UK’s safe egress fire regulation, on account of the safe egress of the 3,000 spectators. The audience reportedly escaped within the time it took the band to play the national anthem, which lasts around 2.5 minutes. This measure has been taken as a standard and as such is embedded within national and international building codes.
Unfinished structures occupy nowadays not only Athens, but most urban or rural settlements around the country. The legislative loophole was combined with the local tradition of layered or phased construction; that is, a building is expected to grow through time as means of accommodating a larger number of family members and their families; to become a significant constituent part of Greek urbanism today.
Throughout the 20th century the prominent Israeli ground-floor balconies transformed their relationship with the street. Initially as projections extending above the street, (conserving however the full transparency of the indoors with elaborate steel balustrades), and ultimately after the 1960’s obsessively protecting privacy of the interiors by means of full-height shutters. Requests for balcony closure became a social norm, if not pressure.
A prescription would be a rule that defines in detail what to do in a given situation. It is about laying down of authoritative directions as in ‘Thou shalt’, for example, you shall setback from your front boundary by (x) meters, and from your side boundaries by (y) meters regardless of site conditions.
A proscription is a template for defining prescriptive rules, a pattern for a rule. It is an imposed restraint synonymous with prohibition as in ‘Thou shalt not’, for example, you are free to design and manipulate your property provided you do not create damage on adjacent properties.
Rules concerned with dimensions are expressed in terms of prescriptive numerical measures that have to be abided.
Performance

Those concerned with performance set conditions that should not be violated, but the means to conform to the latter is not disclosed.
The presence of rules can at times deprive urban agents of interaction. Fixing the specifications of hedge heights, for example, forces conflicts to be resolved in standardised ways excluding the potential of negotiation.
In contrast, in historical settlements where conflicts did not have pre-defined solutions, urban negotiation, cooperation, interaction, compromise and exchange could give rise to unexpected outcomes.
Use-based codes, or traditional planning, focuses on the regulation of land use and is concerned with parameters such as density, setbacks, floor area ratios, maximum heights etc.

The outcome form remains unpredictable.
Form based codes address the types of form and mass of buildings in relation to one another, and prescribe parameters such as number of floors, percentage of built site frontage, build-to-lines.

The outcome form is entirely predictable.
However, within use-based codes in overregulated contexts like the United Kingdom, built form can be entirely predictable.

For example, UK’s front yard, regulated by its setback rule, is known as the most functionally prescribed area of private property were rules control its contents, form and functions.
Interpretation

On the contrary, the very same rule, within a context of high social interpretation and disregard for official instructions, like Lagos, Nigeria, the same in-between area, becomes the epitomy of informal economy; a very active zone containing informal development ‘at-risk’.
Laws that allow for individualised solutions and give the freedom of multiple interpretations contain the risk of multiple interpretations. Luckily in Montreal its setback rule which did not contain instructions on the handling of circulation, left the city with more sociable streetscape.
On the contrary, this same risk is contained in cases where regulators mistakenly do not disclose crucial details concerning a rule. This can lead to the so-called “loopholes”, that can be destructive for the urban realm.
Regulations might be expressed in specific numerical values concerning their width, height, or volume. An acceptable range of values is defined, aiming at inclusive design solutions allowing access for all, or purely at the safety and well-being of occupants.
Other instructions are expressed in relation to a second quality of the building, usually related to ownership or programmatic function. Shared to private volume, built to unbuilt, socially inclusive to exclusive development. The aim is to preserve a balance between two ends.
Cities become built chronicles of urban regulations, creating a superimposition of urban layers. The limited lifetime of regulations and their ever-changing mutual relations, make these layers unique. Rules emerge, change, expire, update.

- Facade
- Floor
- Aesthetic
Lifetimes

And based on the architectural scale they refer to, they impose conditions whose lifetime can be temporary or even eternal. Some of these lifetimes have been discovered and listed below.
Bibliography
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Building proposals
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Kaisersrot Project, Chair or CAAP at ETH Zurich, 2008

Wijnhaven Masterplan by KCAP
Alex Lehnerer, an architect and urban designer, currently holds a position as assistant professor at ETH Zurich in Switzerland. Prior to that he was based in Chicago, where he was a professor at the University of Illinois, School of Architecture. He received his PhD from ETH Zurich, his MArch from the University of California in Los Angeles (UCLA), is partner of the firm Kaisersrot in Zurich, and founded the Department of Urban Speculation (DeptUS) in Chicago. His Zurich based architectural practice CIRIACIDIS LEHNERER ARCHITEKTEN tries to understand architecture as cultural practice by relentlessly exploring urban and architectural conditions— their forms, ingredients, and rules. He is also author of the book Grand Urban Rules, which is the main anchor point of our discussion. His work has been very inspirational and educative on the topic of using urban rules as design tools that are capable of providing more freedom— morphological or else— in the urban fabric of the future. He lectures and writes extensively on the topic, while also conducting real-life experiments.
Cards for discussion

In order to create a more interactive discussion, the interviewee was presented graphic images along with most of the questions. Both are available in their original format in the separate booklet handed in.

Pairing questions with graphics helped clarify the intention or reference of a question, while presenting an opportunity for reflection and initiating a more informal discussion. The interview was initially structured in 16 questions, however eventually the number increased to more than 22, as the interviewee’s responses sparked more discussion.

The Interview

The interview took place in Zurich Hoenggerberg, at the Faculty of Architecture of ETH, Building HIL at Stefano-Franscini-Platz 5. The duration of the interview was 1 hour and 20 minutes and it was sound recorded. The full transcript is available upon request. What follows is an edited and shortened version that encompasses the most representative moments in our discussion.
In terms of your research on urban rules, am I right to say that you propose proscriptive to prescriptive rules? Something more flexible as a framework?

Yes, I think so.

“I think of rules as an alternative methodology to design, without the plan.”

A good plan only works if it is successful in all its ways, only if it produces the result that it preconceived. But with the rules you can adjust control. You don’t need to have hundred percent control in order to get to the goals you want to achieve. Whether you call it flexible or not. Flexible is a difficult term, I’m not so happy about that. You are flexible in certain regards only; not with the ambitions you have, they’re pretty fixed, but with the way you achieve it, there’s a certain liberty to it with these rules.

“So [rules] are not really flexible tools, they are very specific and very precise tools, but there are certain leeways or Spielraum included in that.”

Room to manoeuvre, that’s what it is. That’s the biggest advantage of these rules, you don’t fix a plan but you set a rule as a base. Also [the advantage of] subverting it, that’s always the joy within them, and the creativity to go into the loopholes. In the end, that is not always bad, it also produces differentiation and individuality within the collective idea of a rule that stipulates public interest.

Historic settlements, like Casbah in Algeria, have been functioning on more open frameworks with rules giving more freedom to urban stakeholders. But in some sense nowadays these have failed, while prescriptions have substituted them. Why do you think that is the case? (Figure 1)

Yeah, but it also depends on the scale. Every building code allows for individual interpretation. Each rule, ordinance, convention or tradition, works very prescriptively in some ways, some things are implicit and some others aren’t. There’s always this space that is free because it is not being
talked about. If the building code stipulates the colour of the building, the form is not stipulated by that and vice versa. That really works in a way that freedom is created by the things that are not concerned.

**And by freedom you mean morphological freedom?**

[Freedom] in all kinds of ways. This book is concerned mainly with morphology, but not always. Rules are also not specific to a certain discipline. Every society works on certain rules and the beauty of that is that they are very specific and precise, but they are still general ways to establish society and collective.

**“No collective works without rules.”**

Do you think that this freedom has to exist in parallel with more specific rules on technical matters, considering the increasing urban complexity of cities today? (Figure 2)

Yeah, but that is even questionable, whether the complexity in our cities increases. I don’t believe in that, it was always difficult, and cities are always difficult to describe and to understand. There was always something such as technology, so, I don’t think the ones we have now are specifically more difficult to handle.

Yes, trying to comply with these technical rules is really difficult, every architect knows a lot about it. It is saving problems in the end. You have rules that you just have to adhere to and prevent casualties because of fire, so you don’t have to spend time on thinking how to.

**“So it [regulation] is kind of a normality, its a civilising act.”**

There was one guy that said, civilisation means that you can do more and more things without having to think about it, you just do it. So these rules might say that you need to have maximum 35m to the next fire door and you just comply to it.

**But that becomes a prescription then.**

Yeah, that’s a prescription but
it is also liberating because
you don’t have to think about
it yourself. But, of course,
we should not adhere to it
like sheep, and that’s also
part of the ambition of this
book, that it [rules] should
not be something abstract,
that we cannot discuss the
very rule itself, we should
have a critical eye on them. If
the fire egress rule becomes
overly deterministic because
the fire department wants
to have increasingly safe
buildings and you think the
rule becomes too much, you
should be able to say that its
now preventing every kind
of good solution and our
quality [as architects] in some
other way. It has to do with
the understanding that all
these rules are not done by
some abstract unquestionable
authority, they are something
that should be discussed and
questioned, scrutinised.

This is an art piece by a
French artist, could you
imagine what kind of rule
could guide this kind of
diversity, morphologically or
else? (Figure 3)

This is the kind of clique of
diversity or self-expression.
I think there is the tendency,
not necessarily a bad
tendency to simulate diversity,
but this of course is fake.
Architects try to produce a
morphology that looks as
if it was done by multiple
[people], where everybody
can express him or her self.
That’s an image of that. It
doesn’t mean that everyone
behind those windows is
fully able to express himself
individually, its an impression
of the heterogenous.
You could look at this
individual windows, but you
could also look at this giant
volume, and suddenly if you
look at it you forget about the
individuality of each window
but you think that there’s a
hundred something people
living in this giant box, which
is so simple and so trivial,
which completely lacks any
kind of individuality.
The whole urban diversity
idea is not a bad ambition but
sometimes its not done with
these images.

“But I think the good
thing about these rules
and the potential freedom
they include is, that there
is room for individual
involvement, and that’s
beautiful. Individual
expression which
could lead to different window shapes, but not necessarily.”

Trump Tower, New York, is an example you often give and refer to it in a positive way. I am tempted to contradict it with this one of Athens, where people have similarly exploited a legal loophole in a way that does not benefit the city. Why do you refer to such practice as something creative and positive? (Figures 4, 5)

Yes, I love this example, its hard to talk about Donald Trump these days! I think there is a lot of creativity in this deal-making and trying to find the loophole. Here [in Athens] it becomes a regularity.

But what stops Trump-like development from becoming a regularity too? If rules encourage this interplay it will become the norm.

It also depends on the scale you look at. Here, within a more or less evenly set morphology, the outcome suddenly produced a huge difference. I like this mechanism, that you set a benchmark, even the ambition to get close to it is important. That people, him and others, feel that a publicly set standard is to be challenged. I find it a good example of how the individual and the collective get into friction. If that doesn’t happen it’s kind of a dead thing.

“The common sense about rules is that because they comply, they also go for everyone, that they produce homogeneity, boring, timid environments. But they actually don’t…”

and New York is one of the best historical examples where this did not happen. That has to do with a couple of things that are always forgotten about.

“Rules are not set in stone for ever, they always get amended and changed.”

In New York, they have a cycle of about 40 years, when they change their complete code, when nothing that was valid yesterday is valid anymore. The ’61 Ordinance is a good example, that major revision.
You get a coexistence of different structures over time that comply to different codes and that produces a variety and difference. But it means that these rules, no matter how good they are, they need to be changed, they only have a certain lifetime. And they need to have.

And do you think that 40-50 years is an appropriate duration for that?

It is a little too long. After 30 or 20 years they should start to see that some things should be changed. It is what also Jane Jacobs had said, the coexistence of difference, to allow for a temporal view of the city, that all structures are to be mixed. And here its almost like the buildings of a certain code are able to stand next to buildings of a former code.

Another example could be the Hong Kong bay windows (Figure 6), which is a rule that was exploited by real estate. That’s using this Spielraum as means of speculation and profit. How do you prevent the market taking over this creativity?

Architecture is a market-driven discipline. No building will be built without capital.

“So you cannot drive these things [rules] against it [capital], you cannot drive creativity against the market.”

It’s not about preventing one another, there’s good and bad examples of it. Good examples manage to subvert this power of the capital for other public pleasures, but some just try to use their creativity to fulfil their clients’ needs in the best possible way. We have to accept this, because otherwise you cannot talk about cities, the buildings in it are the prime examples of capital investment.

But if not by prescriptive conditions how do you ensure the qualitative use of creativity by the market? Examples like Paley Park are positive expressions of New York’s ’61 Ordinance for instance, but according to the Planning Department of the city, 41% of public spaces created due to that rule were of limited utility. (Figure 11)
Yeah, that’s a difficult one. There was a time in NY, where there was an urban design initiative by mayor John Lindsay, who really tried to invite architects, sociologists, not only lawyers to make the rules, to think from the side of the city and in terms of quality. And in London there was the ‘Design for London’ initiative by Ken Livingstone. He hired them and they worked with the investment of the city and the architects as a team to be on an eye level and not only to give ordinance but also to work with them to implement the projects. And that was very good, the city really tried to get involved in a discussion on the qualities and that’s one way of doing it.

“But a rule even if it encourages nice things like doing water fountains, it is not per se producing qualities automatically, that’s what it can do.”

So its the urban evaluation after the implementation of the rule that is important maybe...

Yeah, of course, these rules were made with the very best intentions but then it goes a little wrong, and that’s of course when you have to readjust. That’s the toughest question people struggle with.

So, what would you say are the ingredients of a good rule?

First I think it needs to be only a few, it shouldn’t be a tone of them. We experimented with it, and [observed] it should be less than four. Because its tempting to keep adding, but suddenly everything is totally determined and its hardly any different than a plan, so if you work with that kind of method you should be clear that it is a good alternative to a plan.

“So you need to always check back and forth whether it allows for things that you have not really thought of, that would also include that you can be surprised by a positive but also a negative way.”

There is no recipe for making good or bad rules. The attempt of this book was to give an overview of some that work and some that don’t, some that are based on good intentions but have bad
results and some which are based on bad intentions and produce some good ones.

“Good rules should allow for some freedom and not just for some design choice. You should not get a catalogue and be asked to choose from preconceived variety, but really to act yourself.”

Bad rules expect no personal involvement, they give some choice but not actual freedom. Choice and freedom is something different.

This is another example you refer to, its a rule based on a condition. (Figure 9)

What’s your thought on parametric design methodologies for modelling and testing urban rules?

I first realised the potential of that when we did the Kaisersrot project, but the more I think about it, I don’t think you need the computer for that.

Because then you start to simulate different outputs. If the condition that must be fulfilled is as simple as that it mustn’t be seen from the road, then you don’t need the computer. If its two or three [conditions] then its fine, but with parametric design you try to find the versions within that freedom and that’s a task of the guy that builds this house. But for simulating it might be fine to do it, but I don’t think its necessary. These conditions don’t have to be fed into computers. They develop their beauty or badness without it.

“But it lends itself quite well, because rules are always first steps of abstraction, of some kind of abstract manifestation, or abstract notation, that of course then in the next step could be used in a computer code.”

How does the use of rules work with clients in real projects? Using a few simple rules to guide the design process lends great clarity to the outcome I suppose.

That’s a by-product of these rules because they come across almost objectively, so its a very nice thing to talk to clients, it helps. First they see the liberty in them, that’s why they see themselves in it, and
then they see the rationality behind it. For a client that invests money, nothing is a better argument than rationality, the explanation of something. If you set an envelope, an abstract perimeter, within which the building needs to evolve, the investor sees his potential to go as close as possible to this envelope. That includes other city stakeholders as well, it allows for two even opposing parties to get into a discussion.

“These rules are there to enable a discussion on a smaller scale and on a different level than on the big plan and that then comes close to what people refer to as participation.”

What was the ambition of Kaisersrot project (Figure 7)?

We make an argument and we’ve also found an image for it, all these different colours, it is a lot similar to the image you showed with the windows, it tries to sell you some idea of flexibility. Individual expression within a more or less predefined structure, grid.

Did you work with real clients or were desires simulated?

Yes we did, we had clients but of course the investor didn’t actually know which of these people would actually move there, so the wishes or desires that we could work with were not clear. So we had to also come up with them ourselves, so it actually also failed. Because that’s the problem of it, there’s a second or third market of these buildings and quarters and you can’t always adjust. When you move you might also not build your dream-house, you move to certain conditions and then you adjust. And here the idea was that the built fabric can adjust once to all your needs but also only once.

“So there is a structural problem to that idea, to let all the individuals decide freely. I think it works to produce a plan, but also when this guy moves out and another moves in he has to live in conditions not set for him.”

There’s always this example of the Berlin Mietskaserne, which works so perfectly for all kinds of needs. There can be
apartments in there, there can be offices, shops, its perfect. The Berlin block with these huge apartments, that have a really flexible layout, corridor, rooms, nicely spaced rooms and then ceiling height, this is probably the best thing you can do, theoretically.

“Overall, I think there is nothing more flexible than the Berlin apartment.”

Do you think rules of the future could somehow encourage more tailor-made architecture over time?

I don’t know if that should be the ambition. A rule might be fitting for one condition, one client, but buildings have bigger lifespan so no I don’t think so.

“I don’t think that this [tailor-made architecture] has anything to do with one another [rules], and I’m not sure if it needs to.”
Appendix B

Interview Cards

Visual stimuli was a very effective way to trigger discussion and make the interviewer’s point clear in terms of references.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8
Appendix B

Interview Cards

Visual stimuli was a very effective way to trigger discussion and make the interviewer’s point clear in terms of references.

Figured 9

Figured 10

Figured 11
The “Mietskasernen” typology was designed by Adolf Erich Witting in 1872. It quickly dominated almost the whole central Berlin, sprang up in working class areas in response to the need to provide housing for the rapid influx of workers.

Typically they were five stories high and arranged in a series of blocks surrounding a central courtyard with minimum dimensions of 5.3 by 5.3 metres as specified by police regulations. They could be subdivided internally into almost any combination of individual rental dwellings depending on the number and size of rooms installed.

Each dwelling would contain two rooms in the form of a family room with a kitchen stove, a living-cum-bedroom, and a private lavatory. Communal laundries would be housed in the basement and a bathhouse would meet the personal hygiene needs of tenants. Business uses such as shops occupied the ground floor.

In 30% of these apartments the tenants were taking in night lodgers, to be able to afford the exploitative rents.
Participation

In a nutshell, the interviewee recognises a significant potential in using urban rules as design tools that enable greater individual participation.

He proposes rules as an alternative methodology to urban plans, to serve predefined goals just like plans do, but without hundred percent control over the spatial outcomes.

This is thought to enable real participation and expression of urban agents, contradicting pseudo-participative processes, that employ methods such as selection from a predefined catalogue of choices.

He envisions an interaction between urban agents and the legal authority, that will aim to create a feedback loop for the questioning and improvement of rules over time; although it remains unclear exactly how he imagines that being done.

Freedom

Lehnerer also points out that freedom in the regulation of cities is created in two respects.

Firstly, due to the things that are left unsaid in urban regulations, giving individuals the chance to interpret/interact with a written rule, or become creative in abiding a certain limitation.

Secondly, freedom is created by aiding the designer in dealing with problems already dealt with in the past, ultimately saving their time and resources. Here, he points out that rules are in part an act of civilisation.
Conclusions

Impact

Contrary to one of my first research observations; that (over)regulation produces homogeneity and standardisation, Lehnerer very interestingly points out that that’s what rules can do, but not always do.

In my observation wrongfully the human factor had been excluded from the equation, when this is what creates the greatest unpredictability in the spatial outcome.

The human factor poses an even greater risk in the case that the proposed freedom is incorporated into the rules in the first place. The city-maker will need to accept the possibility of a rule being used in a positive and qualitative manner for the collective, but also stands equal chances to be used in a less beneficial or negative manner. This is an inherent risk of allowing freedom in the urban realm.

Time

Lehnerer proposes an interactive process between the individual and legal authorities that should specify when a rule’s impact has become “too much” or too negative for the city. This is said to define a breaking point when the rule is thought to be in need of re-adjustment or update, ideally every 20-30 years.

However, it remains slightly unclear how this breaking point should be determined and by whom.
This chapter will present a sequence of experiments via which the application and use of rules impact a standardised block. Measuring standards are initially set, with a sample dwelling used as a starting point for all experiments, as well as a theoretical model resembling a location; the block.

Experiments introduce an increasing number of rules on the block and observe the impacts on built form.
This subchapter will set a common numerical base for all experimentation to follow. It is important to make all outcomes comparable and relating to a common three dimensional unit of space, that is more relevant to occupancy of dwelling space than the square meter and more understandable.

Setting such standards will take place in three scales, the *unit*, the *dwelling* and the *block*; that is, from human to urban scale.
Small boxes

1.75 m

2.4 m

1.2 m

1.2 m
The unit

Prior to any experimentation, a frame of reference is developed which is based on a three dimensional unit of space, previously used in all relevant projects of ‘The Why Factory’; the voxel.

This three-dimensional elementary value relates uses and space in a 3D equivalent of a pixel, a dimension of 1.2m x 1.2m x 1.2m. One voxel accommodates useful everyday equipment; while two voxels stacked on top of each other permit the passage of a walking man.
Toilet
2 voxels

Bathroom
4 voxels

Kitchen
8 voxels

Minimum views
View from one opening
[1 facade]

Minimum outdoors
Balcony for standing person
[1.4 m³ voxels]

Minimum structure
9 columns
[1.7 m³ /column]

Minimum accessibility
spiral staircase
[8 voxels]
The minimum dwelling

Prior to any experimentation, a frame of reference is developed by setting non-negotiable spatial standards for size and spatial qualities. These will be common to all individual dwelling units.

They will form the minimum dwelling, a dwelling unit that will be used as a common frame of reference to make experiment outcomes comparable.

Footprint: 30 voxels
Volume: 60 voxels
A common testing ground is defined; a framework which organizes the urban situation without placing importance on the form or context.

The basic geometric shape of a cube appears to be the most objective and adjustable shape. The form is easy to understand and convenient to voxelize.

50x50x50 meters is a dimension between the building and the neighbourhood scale that will provide a medium sized plot for testing.
Understanding the scale

The four cities on the left give a better understanding of the scale of the block and what it could fit in real urban conditions. All four chosen parts are residential areas.

Depending on the scale of the urban grain in each location, the density of the block changes, as does its content in green, transportation, services etc.

Therefore depending on the location chosen to accommodate the theoretical block model, the latter acquires different characteristics.
25% 

0.5 voxel/floor

2 dwellings per 
staircase shaft

x

h

4.2

162
After realising how large an impact rules have on the urban fabric, but also on the task and outcome of the architectural profession, a slightly sarcastic experiment focuses on 5 rules, each relating to one of the core sectors of building, all of which are to be followed blindly.

For each case study, the rule itself is initially explained in simple terms with the use of the voxel unit and its impact on built form is crystalised through simple diagrams.

What follows is the use of each rule to populate an urban area equal to the size of the defined block.

Four points are then explored: the definition of a minimum module for the reproduction of the rule in the block, a critical point when one rule is no longer able to produce a spatial impact by oneself, the berlin population, and finally the maximum population that can be accommodated based on the defined module.
Zoning ordinance
New York, United States of America
1916
For a better understanding of the New York rule, a sample building is introduced. It’s height is fixed based on the width of the adjacent high street, namely 5 voxels. Assuming the plot has the maximum allowed height of 2.5 times the street’s width, its allowed height is therefore 10 voxels, which allows the stacking of 5 minimum dwellings and an occupancy of 5 people.

In order to add more floors, each of them being 2 voxels high, the necessary setback for each is approximately half a voxel. This restriction creates increasingly smaller floors. When the footprint reaches 25% of the original one, the height becomes unlimited.

Technically, what the rule does is to connect the footprint of buildings to their height. It also relates it to adjacent void space. This fixes a ratio for void to built volume above a defined height.

Setback balconies

Spire typology
Zoning ordinance
New York, United States of America
1916
Impact

Applying exclusively this one rule in the context of the block sets a maximum density and a specific formal organisation for the built fabric.

The critical population represents the point where the need for a second rule arises, in this case concerning the access to light in the back facing facade of the sample volume.

Berlin density

Maximum population
Crete’s unwritten rule of layered construction can be thought of as a reservation of volume vertically for future construction by the same owner. Let’s assume that 50% of inhabitants will engage in such practice.

If not reserved, different owners are to stack their properties on top of each other using the extending metal rods to connect to the existing structural grid.

The spacing of vertical supports will determine the flexibility in using the existing grid for different layouts.

The rule’s percent relates the number of dwellings on one floor to that of the floor above while the flexibility of the structure depends on the type of structure used on ground floor.

**The larger the percent of inhabitants abiding the rule the less floors can be created, and less people can inhabit the building.**
General Building Regulations
Crete, Greece
1985
Impact

The rule would pose a significant problem in the dense context of a block. New comers’ alternatives for building would drastically decrease as time passes, demonstrating a clear Time Hierarchy in construction. The percent of people abiding the rule would become a measure of density.

Consequently, with the restriction of density the height of the block would be limited as would be its shape.

Berlin density

<table>
<thead>
<tr>
<th>Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum population</td>
</tr>
<tr>
<td>111</td>
</tr>
<tr>
<td>246</td>
</tr>
</tbody>
</table>
Building Regulations
Montreal, Canada
1900’s

Access for 2 dwellings per staircase shaft

Occupancy of 1 person

2 dwellings per staircase shaft
The Montreal ‘plex’ is a typology that consisted of two to three separate properties; a small groundfloor apartment for the owner, and one to two rented apartments on the upper floors. These were accessed via an exterior staircase hovering above a groundfloor front yard.

Therefore, each staircase was privately used by a maximum of two households and each front yard consisted of one staircase.

In terms of massing, each groundfloor volume supports double its volume on top, while accessibility routes can be shared by a maximum of 2 people.

If this model is used for expansion, the maximum amount of apartments that can be stacked depends on how many vertical shafts fit in the groundfloor’s yard; namely, three.
Building Regulations
Montreal, Canada
1900’s
Fixing the extent to which neighbours share access within a dense environment, defines a different density for the block, depending on the extent of sharing - in this case 72 cases of shared access shafts by a maximum of 2 people.

A critical point in the population of the block, namely when an additional rule is needed, is when the built volume reaches its maximum height and additional volumes have to be placed nearby. The rule needed will concern the spacing of adjacent structures.

Worth noting is that if sharing was agreed for more than 2, the density and layout of the whole block would change drastically.

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**Berlin density**

<table>
<thead>
<tr>
<th>Maximum population</th>
</tr>
</thead>
<tbody>
<tr>
<td>168</td>
</tr>
<tr>
<td>246</td>
</tr>
<tr>
<td>175</td>
</tr>
</tbody>
</table>
Town Building Scheme
Tel Aviv, Israel
1926
Tel Aviv’s rules on balcony construction and closure can be understood as an exchange of indoor and outdoor space. If we assume that 6% of the minimum dwelling is enclosed in 1 voxel, then this is the compulsory amount of outdoor space for every owner. If along with that rule we add the further encouragement of an additional 7% indoor volume, that gives us approximately another voxel of space. Since the reasoning behind Tel Aviv’s obsessive balcony closure by residents was related to their balconies adjacency to public streets and relevant privacy concerns, we can image that as we get further away from public streets the residents will chose to include more balconies in their properties to win increasingly more indoor space as a reward. This will result in larger dwellings and balconies in the block’s core.
Town Building Scheme
Tel Aviv, Israel
1926
The extent to which a facade can be extended, closed off or left uncovered, has created a block that is open and sociable in the inside -where the rule is followed to the maximum creating large balconies- and one whose more public sides follow the rule to its minimum, that is, contain the minimum postulated.

This relationship of the public and private realm also impacts the amount of porosity of the block that can additionally serve as light corridors, possibly resulting in the utilisation of the full height of the block.

**We can easily imagine a courtyard building typology originating from such a rule on balcony coverage.**

Berlin density

Maximum population
Green Building, Environment Code
San Francisco, California
2017
California’s rule on energy production per built volume relates the height of a building to its energy producing surface area. Assuming that energy production is only achieved on the rooftop with photovoltaic panels, roof area is connected to height.

This means that doubling the height as shown on the left needs double the rooftop area, or footprint.

Photovoltaic panels are ultimately directed towards the South in area of the Northern hemisphere and must be placed such that overshadowing from the surroundings is limited.

**Such a condition can impact neighbouring buildings, in terms of their distance to a given rooftop or their height.**
Green Building, Environment Code
San Francisco, California
2017
Considering the roof area of the minimum dwelling, each building needs 20 photovoltaic panels of 200W each to produce the necessary energy postulated by the rule.

Repeating the same module of 10 units throughout the footprint of the block forms the critical population that can be housed based on solely this one rule.

The higher density options, crystalise the relationship that this rule sets between neighbouring volumes. The height of neighbouring buildings depends on the angle of the panels, which makes the lower buildings define the height of their surroundings.

For example, a building of 10 units must be separated by a distance of approximately 23m from a double-its-height building, to ensure that sunlight reaches its energy-collecting surface.
This first experiment has assisted the analysis of rules by making them more understandable on the building scale, but also crystallising how their impact can span the urban scale irrespective of the original rule’s scale of application. Their simplification, although containing an extent of speculation which probably was never within the intentions of the original law, itself has pushed each rule to its own extreme, pointing out the absurdity of every single rule when followed solely and blindly, with the lack of flexibility, and in isolation.

Another important contribution of the exercise was turning rules from words to spatial organisations and relationships between spatial qualities of built form like height, density, porosity, spacing etc.

This has created a more architectural understanding of rules not merely as instructions of practice but as important design tools that impact our cities much more than one realises.
Conflicts

This second experiment is a first attempt to depart from the analysis of existing rules and discover when we really need them and for what. A dense urban condition is constructed within a hypothetical Berlin block and possible interactions are mapped.

What happens in an already occupied block when part of it becomes available?

What kind of conflicts arise between inhabitants trying to occupy different parts of it?

What kind of rules will be needed to solve conflicts over time? How many rules do we need?
Methodology

The experiment was completed by populating an assumed partly empty Berlin plot with an increasing amount of spatial demands over time. Clients and their respective spatial desires were simulated and expressed in terms of volume, structure, views and accessibility.

Neighbours’ interaction is initially guided by no rules. The aim of the experiment was to observe what kind of conflicts will arise and how these can be handled with simple rules. Rules are added over time, while design solutions that enable more flexibility in the arrangement of volumes are inspired by simple conflicts.
Neighbour #1

Desired volume

Rules

1

2

3

4

5

6

\[ t_1 \quad t_2 \quad t_3 \quad t_4 \quad t_5 \]
Conflicts

No conflicts
Neighbour #2

Desired volume

Rules

1

2

3

4

5

6

\( t_1 \quad t_2 \quad t_3 \quad t_4 \quad t_5 \)
Conflicts

Restricting neighbour’s view

No action is taken as the obstruction is not severe
Desired volume

Rules

1. No overlap with existing volumes
2. Follow existing structural grid
3. No obstructions to neighbours’ views

$\begin{align*}
t_1 & \\
t_2 & \\
t_3 & \\
t_4 & \\
t_5 & 
\end{align*}$
Conflicts

Overlapping volumes

Outcome volume

Obstructed views

Programme is rearranged on site

\[ t_6 \quad t_7 \quad t_8 \quad t_9 \]
**Desired volume**

**Rules**

<table>
<thead>
<tr>
<th>1</th>
<th>No overlap with existing volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Follow existing structural grid</td>
</tr>
<tr>
<td>3</td>
<td>No obstructions to neighbours’ views</td>
</tr>
<tr>
<td>4</td>
<td><strong>Follow existing structural</strong></td>
</tr>
<tr>
<td>5</td>
<td><strong>No obstructions to neigh</strong></td>
</tr>
</tbody>
</table>

| $t_1$ | $t_2$ | $t_3$ | $t_4$ | $t_5$ |
Conflicts

Blocked access route

Outcome volume

Volume is slightly displaced to allow for neighbour’s access

grid

ours’ views

\[ t_6 \quad t_7 \quad t_8 \quad t_9 \]
Desired volume

Rules

1. No overlap with existing volumes

2. Follow existing structural grid

3. No obstructions to neighbours’ views

4. Follow existing structural grid

5. No obstructions to neighbours’ views

6. 

\[ t_1 \quad t_2 \quad t_3 \quad t_4 \quad t_5 \]
Conflicts

No conflicts

As long as density is low, there are always spots were minimum or no conflict at all might occur
**Rules**

1. No overlap with existing volumes
2. Follow existing structural grid
3. No obstructions to neighbours’ views
4. Follow existing structural grid
5. No obstructions to neighbours’ views
6. $t_1$, $t_2$, $t_3$, $t_4$, $t_5$
Conflicts

Disruptive structural grid  Outcome volume

Volume is sculpted to fit the existing structural grids

2 views

\[ t_6 \quad t_7 \quad t_8 \quad t_9 \]
Rules

1. No overlap with existing volumes
2. Follow existing structural grid
3. No obstructions to neighbours’ views
4. Follow existing structural grid
5. No obstructions to neighbours’ views

Sharing existing access routes, shafts and views
Conflicts

Overshadowing

Outcome volume

Structural reinforcement

Vertical shaft used for structural support, while volume is slightly relocated

Sharing existing access routes, shafts and views

\[ t_6 \quad t_7 \quad t_8 \quad t_9 \]
Desired volume

Rules

1. No overlap with existing volumes
2. Follow existing structural grid
3. No obstructions to neighbours’ views
4. Follow existing structural grid
5. No obstructions to neighbours’ views
6. Sharing existing access routes, shafts and views

$\text{t}_8$

Neighbour #8
Conflicts

Outcome volume

New volumes is reshaped to avoid overlaps and allow for some of the desired views.

Sharing existing access routes, shafts and views

\[ t_6 \quad t_7 \quad t_8 \quad t_9 \]
Neighbour #9

Desired volume

Rules

1. No overlap with existing volumes
2. Follow existing structural grid
3. No obstructions to neighbours’ views
4. Follow existing structural grid
5. No obstructions to neighbours’ views
6. Sharing existing access routes, shafts and views

$t_9$

$\begin{array}{cccccc}
  t_1 & t_2 & t_3 & t_4 & t_5 \\
\end{array}$
Follow existing structural grid
No obstructions to neighbours’ views
Outcome volume

Multiple structural & access overlaps

Loadbearing slabs instead of columns are employed to transfer the weight independently of neighbouring grid

Sharing existing access routes, shafts and views

Conflicts

207
Inevitably the process of gradual growth over time is guided by **Time Hierarchy**.

Structures that are placed prior to others establish some limiting factors for newcomers. This begs the question of whether or to what extent should individual demands be limited beforehand, either in size or qualities, to ensure more favourable conditions for later times.

It was observed that the use of a simple ruleset is necessary to solve conflicts. Desires in terms of Massing, Facade views, Structure and Access become the focus of all arising conflicts over time.

The need for the establishment of **minimum standards** in terms of all the discovered main spatial elements has become evident.

One of the main challenges was the placement of different volumes **vertically**, as **structure** posed significant practical problems. Sharing of access shafts that can be combined with loadbearing walls for support, as well as spreading the load horizontally with loadbearing thick slabs instead of columns, have hinted towards possible solutions to structural concerns.

Sharing of infrastructures such as light and access routes has also been proven an efficient way of combining desires.

It becomes evident that the gradual development of a building over time and by different agents, will require a new way of urban interaction. **Ad-hoc conflict resolution** allows for more flexibility in spatial outcomes but its efficient in terms of time economy is questionable.

**Conclusion**

209
This experiment tests the issues raised in the second experiment, but in a larger urban area.

The mapping of conflicts can be more fruitful due to the higher density that will give rise to more intense and complex conflicts.

This experiment is based on one rule: that infrastructures like Structure, Access and Services are decentralised, thus all units must share homogeneous systems of load distribution - here, inspired by the Cretan metal roof rods, service pipework, and circulation routes.

Every unit serves as a module of a continuous system and divides responsibility to all inhabitants.

What kind of problems would arise from such an arrangement?
The theoretical model of an urban block in Berlin is now enriched to represent a moment of redevelopment of a whole neighbourhood. It is imagined that the latter is demolished and the area becomes a tabula rasa, occupied gradually by individuals. Every one of them builds a dwelling at a spot of their choice and is limited by one rule only:
Methodology

“To provide for oneself and ensure that no neighbour is deprived from, access to minimum resources related to Massing, Structure, Accessibility, Services and Light”
How to stack structures vertically over time?
Should structural compromises be made?
Can pipework follow non-vertical placement of facilities?
Who is responsible for the maintenance of services?
How to make accessibility routes more efficient?
How to protect and regulate accessibility routes over time?
Can collectivities arise from sharing resources?
While conducting this experiment I found myself setting rules for the development of the building unintentionally. The main problem was that since all demands were controlled by me, the experiment lacked any systematism in evaluating outcomes.

On the positive side, for the first time, I look at demands more holistically, observing how individual dwellings’ become parts of larger infrastructures necessary for the functionality of the block, and what kind of problem stem thereafter.

Moreover, topics like sharing and neighbourly interaction come to the fore as solutions to common problems, like access to light, or access. Sharing is seen as a means to raise the efficiency of spatial arrangement over time, which implies that
Conclusion

a large part of the final arrangement depends on the occupiers of the ground floor and their choices.

But the topic of Time Hierarchy has been discovered as early as the first experiment. What this test has added to my understanding is that the ‘first served’ can become great losers if no regulation of neighbourly interactions is put into place. Early access routes can get cut off, or balconies and access to light may be blocked.

Last but not least, questions relating to ownership and maintainance have been posed, seeing that for any infrastructure to work without central regulation is almost impossible.
Whereas all previous experiments followed a more qualitative -and non-objective- evaluation, this last experiment employes a more quantitative approach to make all sectors more comparable.

This test aims to elaborate on the impacts of sharing and program distribution. The 5 aspects of building are explored separately and their evaluation includes different parameters. For each sector, alternatives are compared, to derive the most preferable arrangement.

The aspect of sharing is explored, by employing different variations of the minimum dwelling in terms of its inclusiveness of private amenities.

Can we derive an ideal ruleset to guide built form over time?
PRIVATE AMENITIES

DENSIFY

GROUP

MIX

ACTIONS

DENSIFY

GROUP

MIX

Variable unit scale

PRIVATE AMENITIES

DENSIFY

GROUP

MIX

ACTIONS

PRIVATE AMENITIES

DENSIFY

GROUP

MIX

ACTIONS
The experiment is presented in a series of colour-coded diagrams representing the volumes of the following programmatic functions: *Private, Shared, Business, Technical*.

The starting point is a hotel arrangement where the private module contains only sleeping quarters and its occupancy is limited to one person.

Following, 3 *Actions* are applied: Densify, Group and Mix. The private unit is then enriched with more *Private Amenities* in 4 steps: Sleep, Live&Work, Leisure and Business areas.

The analysis departs from the creation of volumetric models, collects data from each to finally enable comparisons, in search of the best-fit scenario, creating a good balance of density and programme.

3D Model  Measurements  Comparisons
No. of units
120

Programme distribution

Total built volume

PRIVATE    SHARED    BUSINESS    TECHNICAL

% BUILT VOLUME
Massing Scenarios

Private
Sleep, WC

Shared
Reception, Lounge, Dining, WC, Housekeeping, Roof terrace
1-person units

**Sleep**

- **Private**: Sleeping quarters only
- **Shared**: Reception, Living room, Dining, Kitchen, WC

**Live & Work**

- **Private**: Sleep, WC, Kitchen, Living, Desktop
- **Shared**: Reception, Lounge, Roof terrace
DENSIFY

Leisure

- Private: Sleep, WC, Kitchen, Living, Desktop, Leisure
- Shared: Reception, Lounge, Roof terrace

Business

- Private: Sleep, WC, Kitchen, Living, Desktop or Business
- Shared: Reception, Living room, Roof terrace

246

% 73 70 20
% 54

% 30 6 52 12
% 61
4-person units

Sleep

- 62%
- 29%
- 50%
- 21%

Private
Sleeping quarters only

Shared
Reception, Living room, Dining, Kitchen, WC

Live & Work

- 62%
- 58%
- 18%
- 24%

Private
Sleep, WC, Kitchen, Living, Desktop

Shared
Reception, Lounge, Roof terrace
GROUP

Leisure

- Insufficient volume

Business

- 61%

Private
- Sleep, WC, Kitchen, Living, Desktop, Leisure

Shared
- Reception, Lounge, Roof terrace

Private
- Sleep, WC, Kitchen, Living, Desktop or Business

Shared
- Reception, Living room, Roof terrace
Assorted units

Sleep

Private
Sleeping quarters of various occupancies

Shared
Reception, Living room, Dining, Kitchen, WC, Roof terrace

Business

Private
Varies, some include businesses

Shared
Reception, Lounge, Dining, Kitchen, WC, Roof terrace
MIX

Business

118

Private
Varies, some include businesses

Shared
Reception, Lounge, Dining, Kitchen, WC, Roof terrace
Layout and placement of core
Access Scenarios

Core **attachment area** is defined as the vertical surface enclosing a core, which depending on its area can allow for flexibility in the way dwelling units plug-in to the structure.

The **footprint** refers to the coverage of ground floor area by the core.

**Distance to exit** is the measured distance in meters from the furthest point away from a staircase shaft, namely the emergency exit.

**Distance to service lift** refers to the maximum distance away from a service lift.

**Maximum buildable distance** denotes the maximum length away from the core that a dwelling unit is able to span while remaining in the bounding box of the block.
3823 m²

27m

27m
Floors
8
DIAGONAL
3.8 km²
1303 m²
27 m
27 m
32 m
245
1726 m²
12m
18m
Best-Fit

GAMMA

Floors  11

DIAGONAL

Floors  8

257
Distribution of vegetation
Outdoors Scenarios

The **cumulative green area** refers to the amount of green area in the block.

The **green area average** considers all green parcels deriving their average.

The percentage of **garden views** refers to the amount of units that have a direct view to green areas.

Lastly, **maximum distance to green** is measured from the furthest unit possible to a green area, measuring both vertical and horizontal distances.
GROUND FLOOR

1084 m² 306 m² 41% 51 m

1106 m² 552 m² 100% 84 m
ROOF + SHARED SPACES

1137 m²  121 m²  59%  21 m
1266 m²  180 m²  100%  50 m
GROUND FLOOR + ROOF

1342 m² 268 m² 41% 35 m

1765 m² 588 m² 100% 50 m
BALCONIES

361 m²  9 m²  100%  14 m

1137 m²  9 m²  100%  14 m
Structure Scenarios

FLOOR & SLAB

HOOK

FLEXIBILITY
ENERGY
WEIGHT

FLEXIBILITY
ENERGY
WEIGHT
As far as massing is concerned, with the increase of occupance and this unit volume, came the need for increased circulation space. This forced a rearrangement of shared spaces to new spots, such as the roof, but also a higher amount of service areas, not necessarily reflected on the programme percentages as the net built volume was higher.

Moreover, when sharing is decreased, the porosity of the block was observed to drop to a minimum, as more volume is used up and technical areas are increased.

On the other hand, it has been misleading that businesses appeared to save space compared to dwelling units. The reason for that is that the former only included one-person occupancies, therefore their volumes were on average smaller. It is ex-
pected that with larger offices, the impact on volume would be the much different.

As far as accessibility is concerned, it was observed that the testing phase was biased in terms of what kind of alternatives were tested. All alternatives contained porosity on the outer side of the block and did not consider an internal one that could allow for the utilisation of the block to its height and footprint maximum limits.

Overall, the need to experiment more with distribution and amount of shared amenities was evident. Sharing has presented significant opportunities for the coexistence of both typologies, not only because of space saving within the same typology, but more so in the merging of the two into a single one.
Epilogue
My research and experimentation with urban rules has formed the basis of my design methodology. The second part of the research will focus on design rules or ‘fixations’ relevant to the building sectors discovered herein. Based on such spherical understanding of current limitations on built form, the architectural proposal will then present an alternative, driven by the best qualities discovered both in the urban and design field.

Architecture is explored as a process of setting conditions for the future to allow a multitude of unexpected spatial scenarios. The future role of the architect is thus envisioned to deviate from the design of objects, to that of processes of inhabitation.