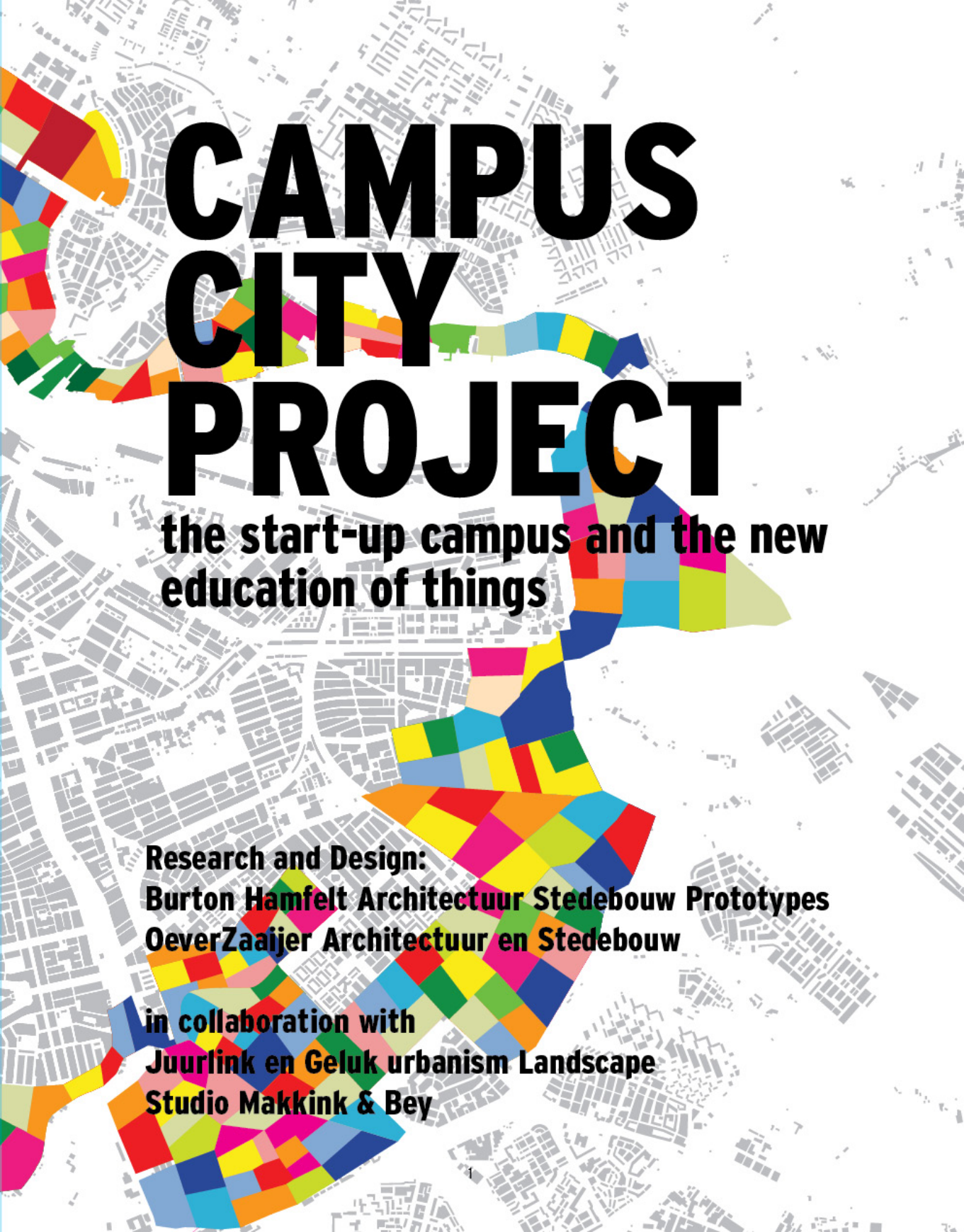
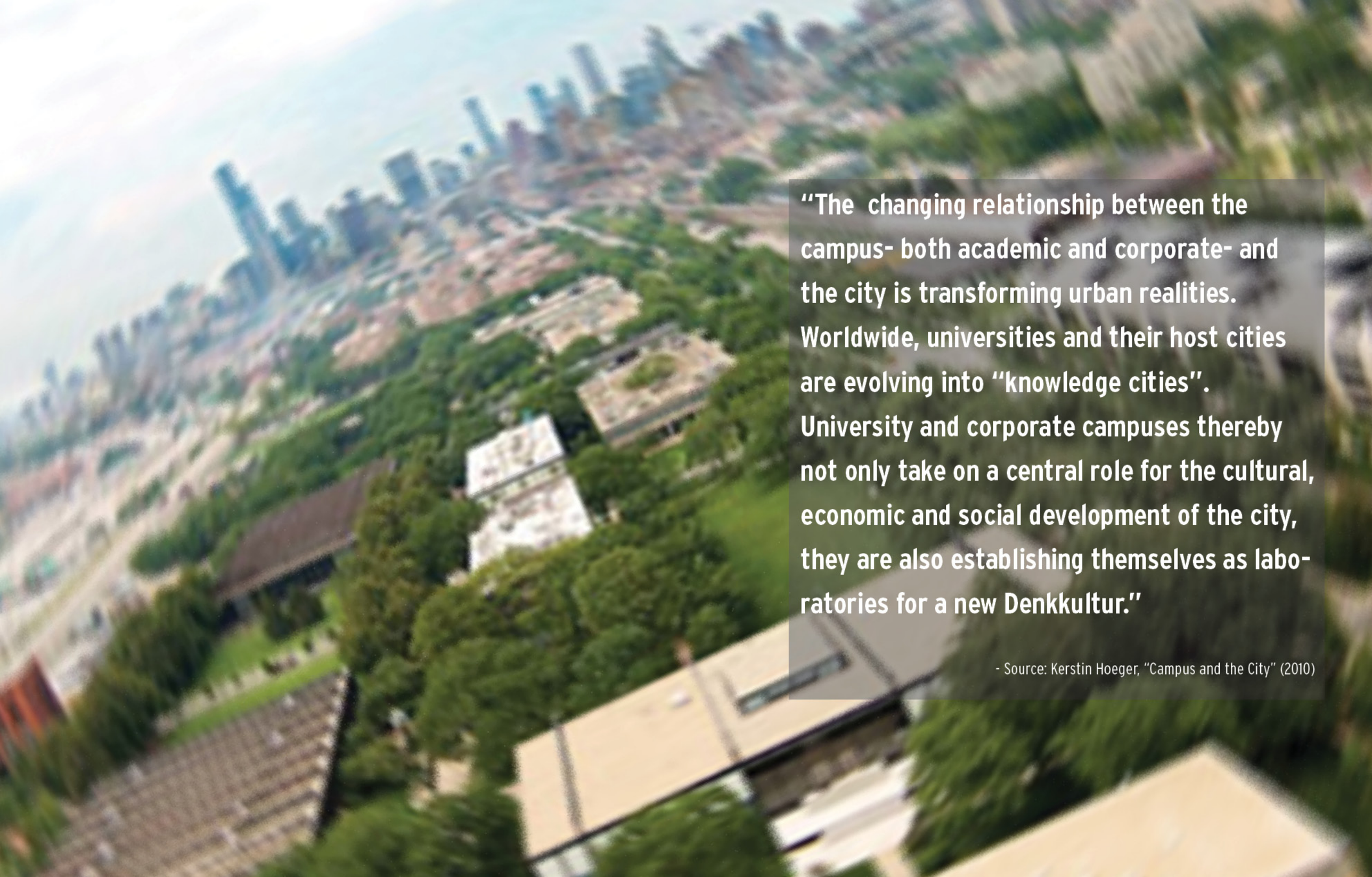


# CAMPUS CITY PROJECT

## the start-up campus and the new education of things


**Research and Design:**
**Burton Hamfelt Architectuur Stedebouw Prototypes**
**OeverZaaijer Architectuur en Stedebouw**

**in collaboration with**
**Juurlink en Geluk urbanism Landscape**
**Studio Makkink & Bey**



"The changing relationship between the campus- both academic and corporate- and the city is transforming urban realities. Worldwide, universities and their host cities are evolving into "knowledge cities". University and corporate campuses thereby not only take on a central role for the cultural, economic and social development of the city, they are also establishing themselves as laboratories for a new Denkkultur."

- Source: Kerstin Hoeger, "Campus and the City" (2010)

"This is the moment to reconceive the campus not as a discrete community set apart from others but as an urbanity capable of engaging both new forms of cities and city living brought about in physical and virtual space... such a concept of urbanity cannot be created solely within the confines of the university's walls."

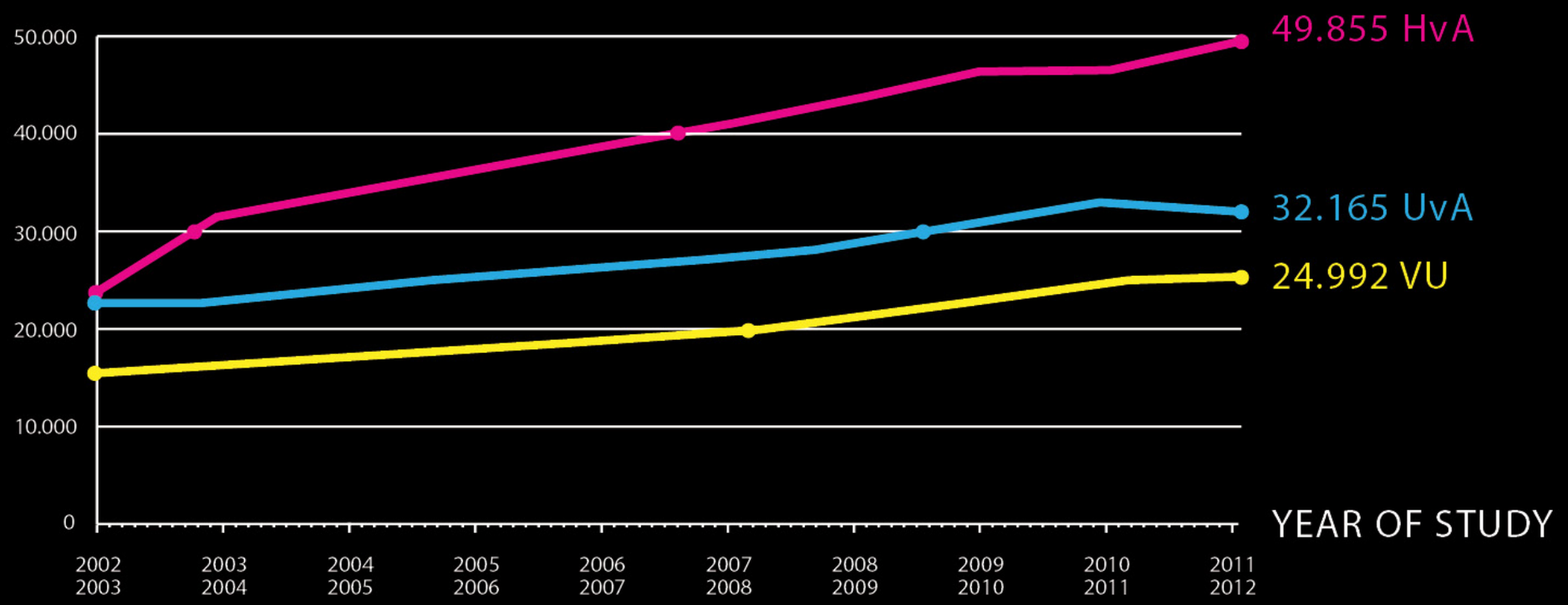
-Source: Sharon Haar, "The City as Campus" (2011)

# There are 1,190,993 students in the Netherlands...

If we were to count the teachers and related staff we are at 10% of the population who are focussed primarily in the career related education industry. There is over the years a fluctuating proportional increase of number students in the Netherlands in career related education, compared with a decrease in the amount of the money invested in education by the government. Current number of people according type of education are: University level (WO) total 245.000, Higher College level (HBO) 423.719 and Vocational Colleges (MBO) have in total 522.274. In addition to the total there are 948,949 students in secondary school.

- Source: CBS 2012

# ...where Amsterdam has 191,512 students and is still growing.*




* The growth of the total number of students over the last ten years for the University of Amsterdam, Vrije Universiteit and Hogeschool van Amsterdam have more than doubled. Total figure includes 84,500 (MBO) college students attending schools in Amsterdam but not the ca. 38,500 post secondary students attending schools in Amsterdam.

* source: OCW/DUO/CBS/Univ. (2011)

# The question is, where do we put them all?

# CAMPUS CITY PROJECT

## - the start up campus and the new education of things

**June 06, 2013**

**Research and Design:**
**Burton Hamfelt Architectuur Stedebouw Prototypes**
**OeverZaaijer Architectuur en Stedebouw**

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the Netherlands Architecture Fund

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The authors would like to thanks the following people for their input at this stage during the research and design project:
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**With contributions from:**
Oscar de Bakker, Jurgen Bey, John Bosch, Emeline Cosijnse, Henry Gao, John de Groot, Burton Hamfelt, Huub Juurlink, Ilse Landwehr Johann, Chanida Lumthaweepaisal, Vissarion Naoum, Roksena Nikolova, Pedro Piernas, Wilco Spruijt, Kristina Strecker, Joost de Wit



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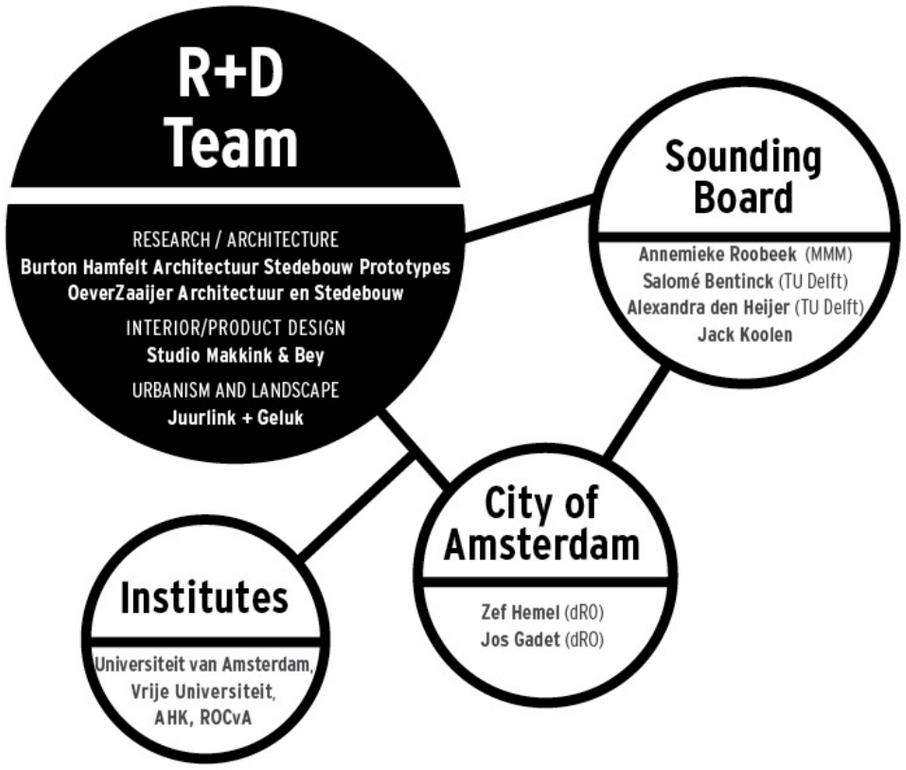



**Organisation of the research and design, "Campus City Project" phase 2 of project, "Campus without Boundaries"**



## Preface

*Campus Without Boundaries* and the *Campus City Project* are research and design based projects that study the meaning of the campus and it's increasing relevance to the growth and revitalization of our cities. *Campus Without Boundaries* examines how globalization has generated an international market for universities and the spatial effects it is having on our cities. If cities want to engage in this type of talent migration, high level decisions need to be made in order to accommodate the unique demands of an emerging innovation based economy. Universities, cities and industry need to collaborate better together towards forming new kinds of educational environments that often do not comply with the traditional campus model. *The Campus City Project* in turn asks, "Can the next generation campus be an urban model for the city in the future?" There is growing evidence on how cities with both universities and strong connection with research and innovation outperform other more industrial based cities in their economic growth and resilience to change. *Campus City Project* takes this starting point as a basis for exploring what the knowledge and innovation based economy can mean to the city of Amsterdam in the future when examined from the perspective of the increasingly mobile student. *Campus City Project* capitalizes on the potential for organically expanding the center to the edges of the inner city to the A10 ring road. The project sets up a multi- scalar approach to create a new type of circular urban space, bringing research and design to bear on the built environment from a variety of fields. The next generation campus is about migrating away from dedicated closed off and static knowledge based environments to exploiting the spatial consequences of distributing education, industry and student start ups within the city as a closed circuit; the ubiquitous campus. *Campus City Project* literally circulates around this new type of campus start up model proliferating itself as a responsive and interactive system empowering and kick starting urban regeneration.

Burton Hamfelt and John Bosch

# PART 1
## Research

# The Changing Economy And Globalization of Education

Zernike Science Park

Adidas Headquarters Herzogenaurach

Vitra Campus Weil am Rhein

Zernike Science Park

University of Alicante

Ghangzhou University City

Science Park Amsterdam

Northampton University

Adidas Headquarters Herzogenaurach

University & Technology Park of Bremen

Polytechnic University

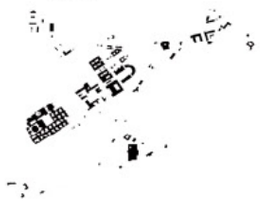
ETH Zurich

Garching TU Munich

Novartis Campus Basel

High-Tech City, India

FU Berlin



University of Gambia

Istanbul Bilgi University

Karlsruhe University

University of Konstanz

Otaniemi Science Park

Philips, Eindhoven

New School of Economics, Vienna

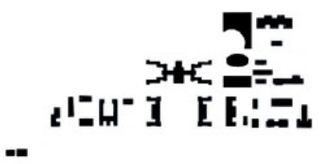
Asian University for Women, Bangladesh

Harvard University

Polytechnic University, Lausanne

Mobile Life Campus, Wolfsburg

Moscow Lomonosov University



TU Delft

Uithof Campus, Utrecht

University of Montreal

Trent University

Illinois Institute of Technology

Microsoft Corporate Campus, Seattle

Nike World, Oregon

Simon Fraser

Stanford Research Park

University of Toronto

University of Pennsylvania

University of Amsterdam

Massachusettes Institute of Technology



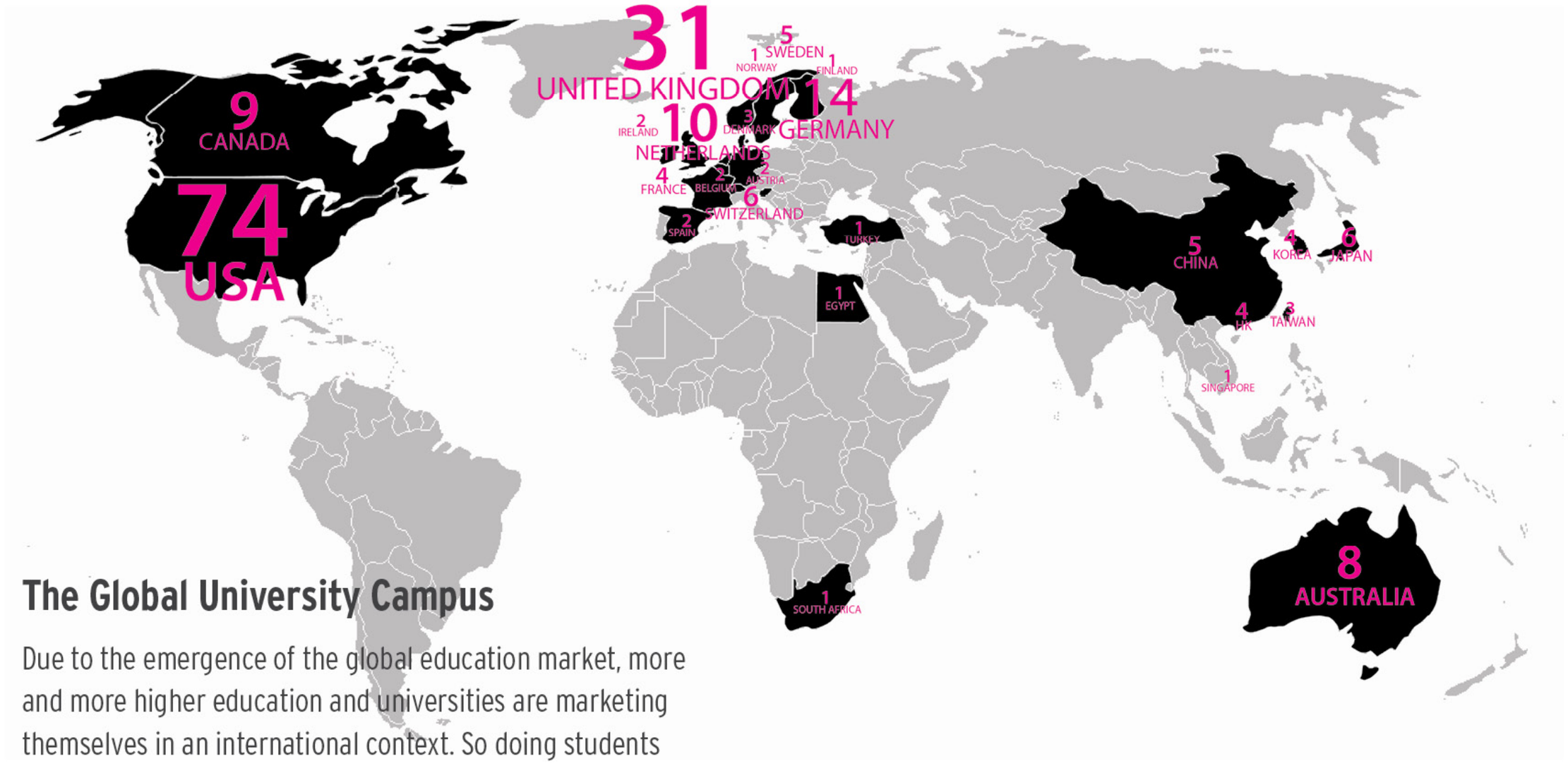
Rutgers University, New Jersey



London School of Economics



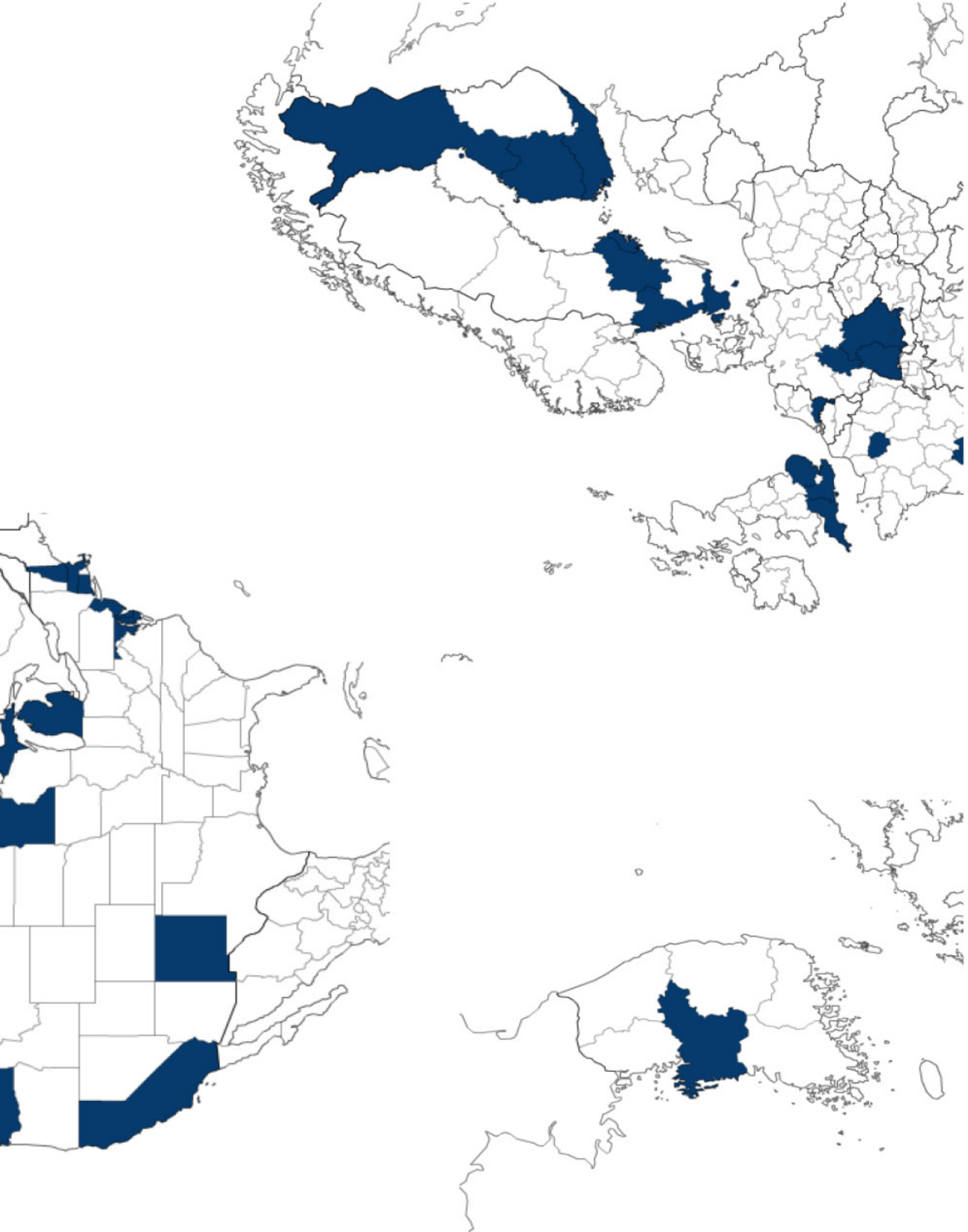
University of Sydney




## The Global University Campus

Due to the emergence of the global education market, more and more higher education and universities are marketing themselves in an international context. So doing students and top talent are, and will become, informed consumers making rational choices of higher education and institutions based on a universities international ranking.

Top World Ranking Universities per country, according to the Times Higher Education World University Ranking 2010



## Innovation is the new driver

An OECD report on the "Categorization of OECD Regions Using Innovation Related Variables," elaborates that innovation based regions in contemporary knowledge economy have repositioned knowledge and technology hubs as high priority for the economy, urban growth and attracting talent.

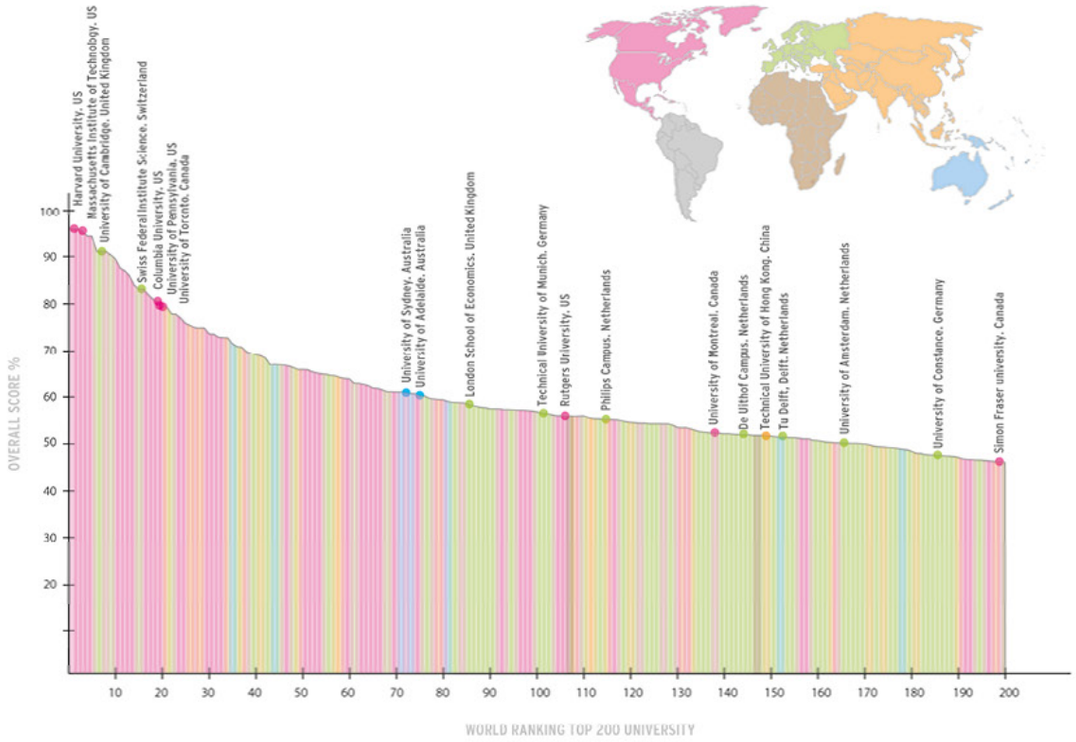
- Source: "Categorization of OECD Regions Using Innovation Related Variables", OECD (2011)

figure - 'Knowledge and technology hubs' Giulia Ajmone Marsan, Karen Maguire 2011

## If education is a global business, how is the Netherlands performing?

Oxford University (UK) is internationally orientated: there are 21,872 students at Oxford, of which more than 8,161 (37.3%) are from 140 different countries and territories. While 41% of the academic staff are citizens of foreign countries. Oxford consistently ranks in the top 3 universities according to the Times Higher Ranking lists.
In comparison, the Vrije Universiteit (VU) in Amsterdam: in 2011 the VU has 24,517 students of which 1170 international students (4.7%) and ranks 159.

- Source: www.timeshighereducation.co.uk, www.vu.nl






## Anglo Saxon countries outperform the rest of the world

The Times Higher Education is the accepted university ranking indicator provider worldwide. The 2010 ranking is based on a new methodology using thirteen performance indicators. These indicators fall into five categories with different weighting in the final ranking score: citations (32.5%), research (30%), teaching (30%), international mix of staff and students (5%), and industry income (2.5%). The teaching and research scores are based to a large extent on academic reputation surveys (50% and 65% respectively).
In the first round of the new Times ranking, published in September 2010, the University of Amsterdam is ranked 165th. Ten Dutch universities are listed in the top 200, all of them ranking in the hundreds. THE also publishes a top 50 per subject area. The UvA is ranked 39th in Arts and Humanities.

- Source Top World Ranking Universities per country according

## "Our goal is to educate a billion people around the world."

Harvard University and the Massachusetts Institute of Technology (MIT) recently announced "edX", a transformational new partnership in online education. Through edX, the two institutions will collaborate to enhance campus-based teaching and learning and build a global community of online learners. The new venture, called edX, will provide interactive classes from both Harvard and MIT – for free – to anyone in the world with an Internet connection.

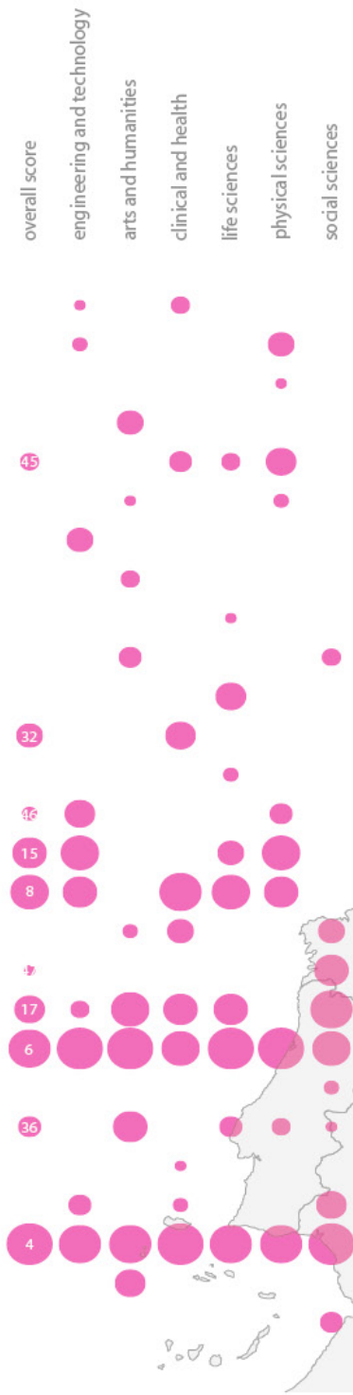
- Source: http://www.edxonline.org (2012)

## 10 highest ranked European universities per subject

(Times Higher Education World Rankings 2011/'12)

Position number 4 of the world

Position number 1 within Europe


| | |
|---|---|
| Belgium | Katholieke Universiteit Leuven |
| France | École Polytechnique Palaiseau |
| | Université Pierre et Marie Curie |
| Germany | Humboldt Universität zu Berlin |
| | Ludwig Maximilians Universität München |
| | Universität Heidelberg |
| the Netherlands | TU Delft |
| | Universiteit Leiden |
| | Universiteit Utrecht |
| | Universiteit van Amsterdam |
| | Wageningen Universiteit |
| Sweden | Karolinska Institute |
| | Uppsala University |
| Switzerland | École Polytechnique de Lausanne |
| | ETH Zürich |
| United Kingdom | Imperial College |
| | Kings College London |
| | London School of Economics |
| | University College London |
| | University of Cambridge |
| | University of Durham |
| | University of Edinburgh |
| | University of Glasgow |
| | University of Manchester |
| | University of Oxford |
| | University of St. Andrews |
| | University of Warwick |



# Universities are moving away from generalized education to specialized education.

In a country like Canada, because of limited funds in public spending, governments are asking universities and colleges to specialize more. This economic rationale means that the government must choose priorities and have schools compete for funding in those areas to ensure dwindling dollars are well spent. According to countless studies on the matter universities and colleges are reluctant to specialize further. Despite the Ontario government's call for more specialization by colleges and universities – less overlap, more differences between them – schools have failed to come up with enough ways to differentiate themselves and government must start to do it for them, a blue-chip panel has concluded.

source- Toronto Star 08 February 2013




## Universities, Airports and the European Super Innovation Valley

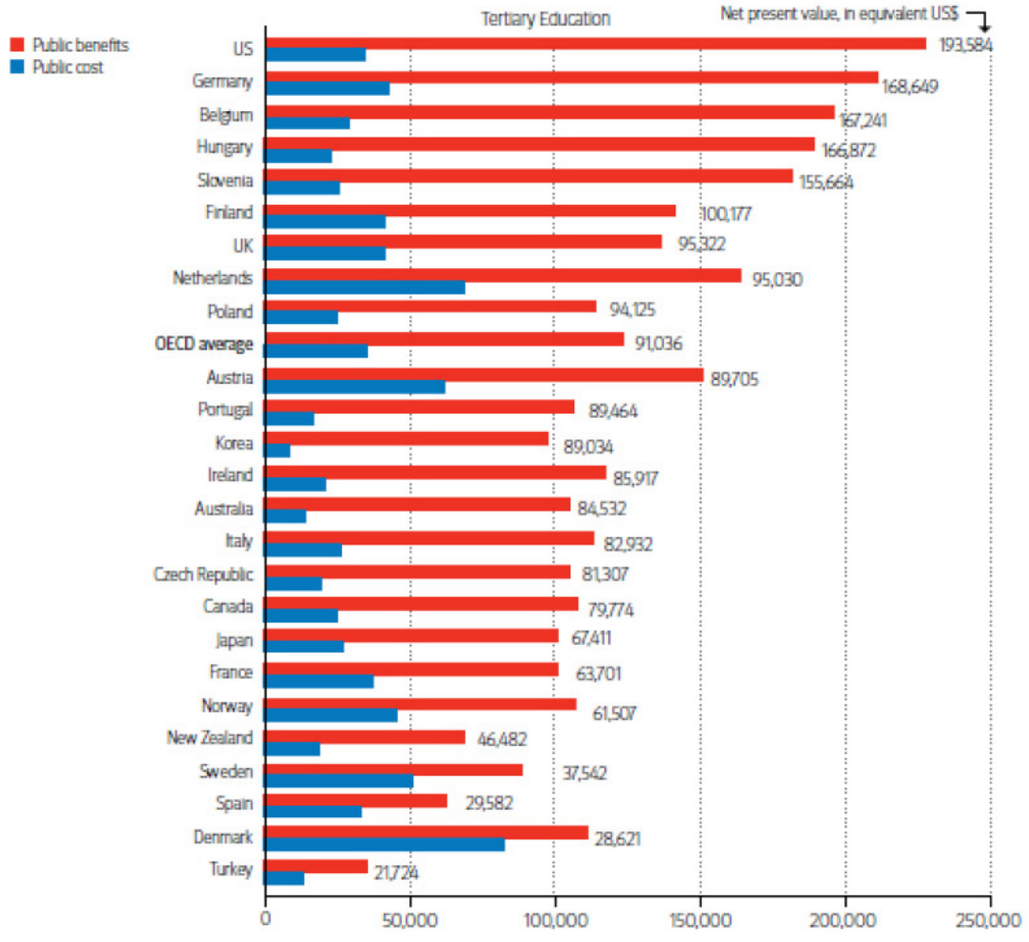
According to the Times Higher education ranking and the QS World University Ranking, there is a clear concentration of top ranking universities and knowledge based cities located in the middle of northern Europe forming an innovation valley. Busy international airports play also a key role in this concentration. While the United Kingdom leads in total amounts, the Netherlands is placed in the centre of this new emerging European Innovation Valley.

- Times Higher Education Ranking 2011/2012

## In order to excel in the world, the Netherlands needs to attract more international talent

The percentage of foreign students studying in the Netherlands is rising. In 2011 one in every 10 student at university level came from another country. Five years ago the percentage was 7% or one in every 14. This is especially the case for Masters students in comparison to bachelor students. According to UNESCO there are 3.4 million students outside their homeland. The percentage that are Dutch rose between 2000 and 2008 from 0.7% to 1.2%, an increase by 70% overall. If Dutch students are travelling more to excel in their studies the Netherlands needs to compete for more international students.

- 2011 Nuffic, www.nuffic.nl






## Higher Education Pays

A 2011 report from the OECD states that higher education is growing and expanding at an increasingly international scale. The number of students attending institutions outside their country of origin has tripled between 1985 and 2008. Just as education is becoming more global it is also becoming more competitive. Universities are heavily investing on how to manage their facilities to attract more students and researchers. MIT for example is an enormous magnet for talent, only 10% of the total enrolment comes from the region with 90% coming from the rest of the world. A quarter of all ex-MIT students start their own business with headquarters in the Boston area. Of the 5,000 through old foreign students started businesses 2,340 started in the USA to test out their talents and contribute to the economy.

Figure: Public costs and benefits for a man obtaining tertiary education. 2007 or latest year

## Brains over Buildings

Detroit once had 1.85 million inhabitants. Now it has fewer than 740,000. Cleveland and St. Louis, too, are half the size they were in 1950. Across the Atlantic, Liverpool and Leipzig are also dramatically smaller. When so many cities are booming, why are some trapped in decline? Cities naturally rise and fall as technologies change. According to Harvard economist Edward Glaeser, there is a growing evidence on how cities with both universities and a strong connection with research have outperformed other (more industrial based) cities in their economic growth and resilience to change.

Better said, to rejuvenate urban areas look at teachers and entrepreneurs. Look at education as a spatial question.

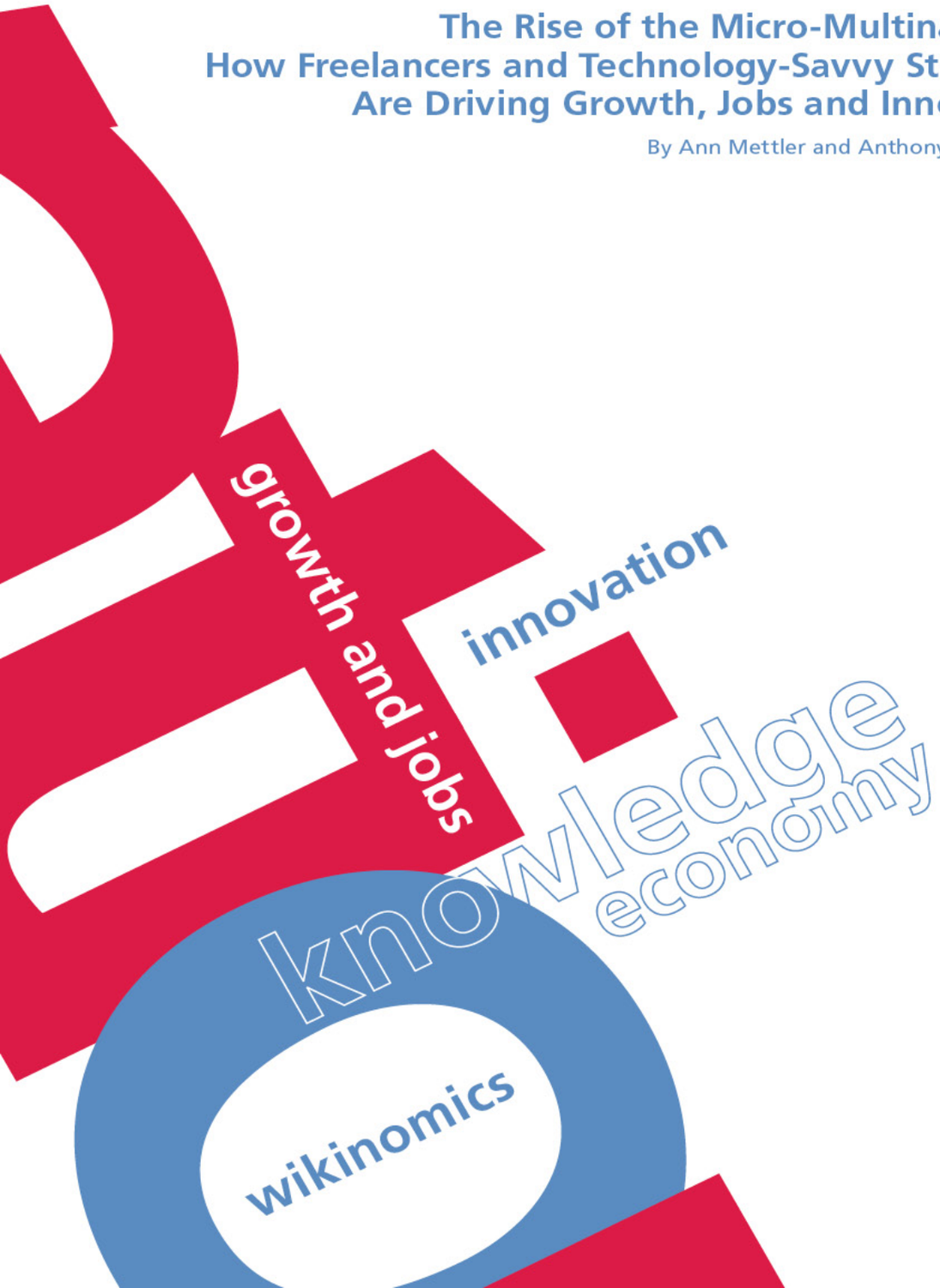
-Source: 'Brains Over Buildings', Edward Glaeser, Scientific American (September 2011)

theLisboncouncil

Policy Brief

# The Rise of the Micro-Multinational: How Freelancers and Technology-Savvy Start-Ups Are Driving Growth, Jobs and Innovation

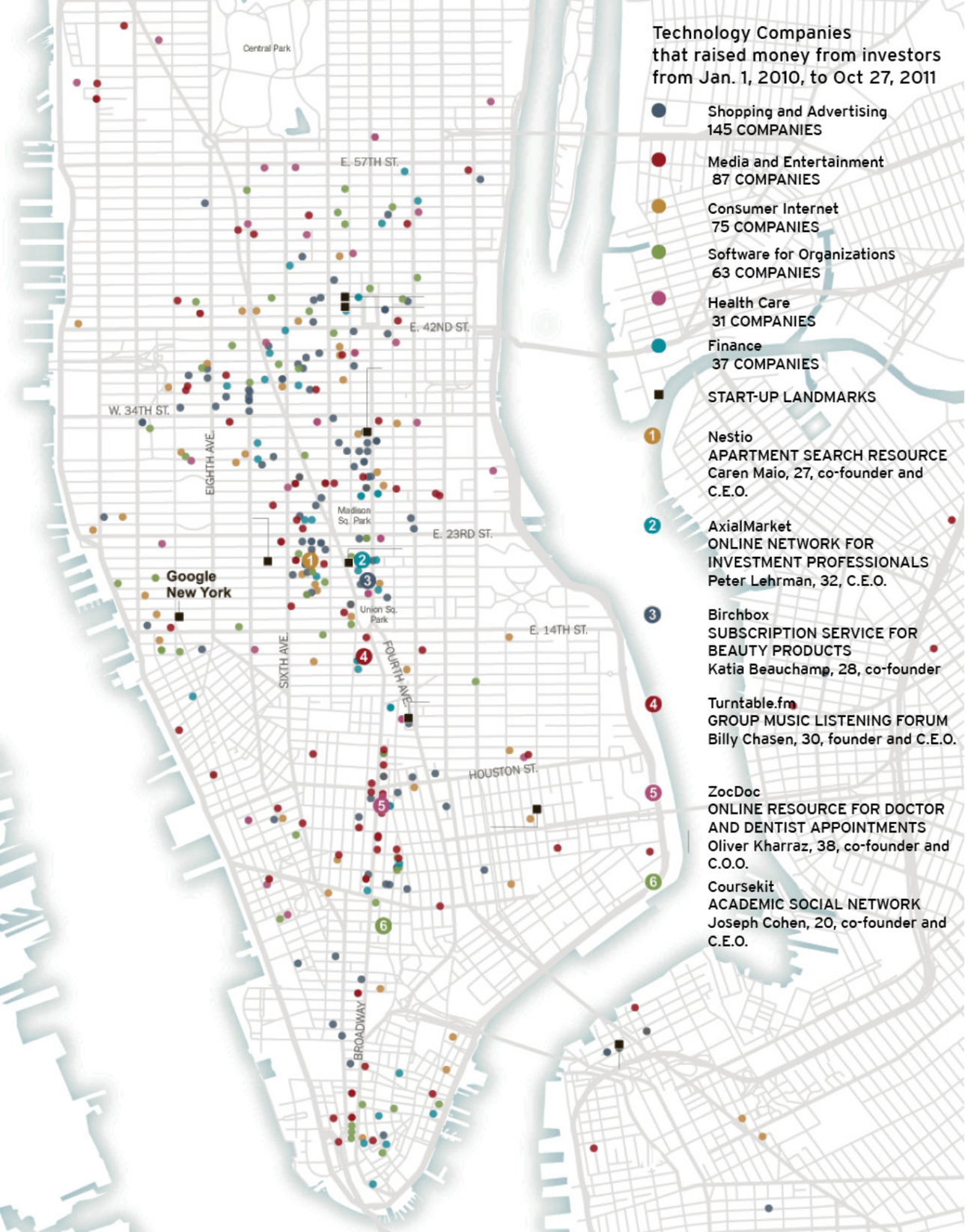
By Ann Mettler and Anthony D. Williams




## The rise of the Micro-Multinational

And as the financial crisis engulfs the world's leading economies, the new leaders of growth and employment will be, according to 'The Lisbon Council', the entrepreneurs, free-lancers and the self employed. Unlike ever before they are to become the engines of jobs, growth, innovation and future prosperity. The future will be determined by people working in companies with less than 10 people.

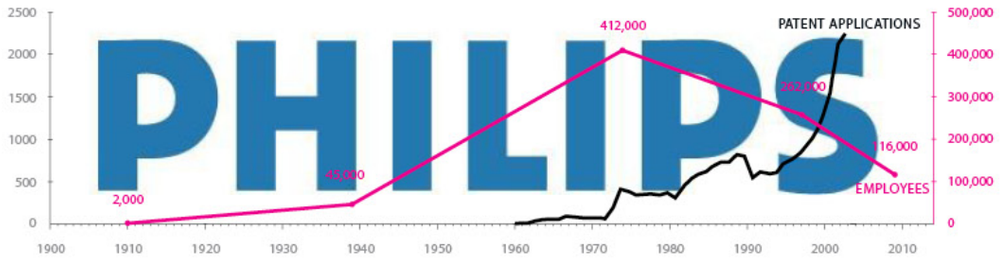
-Source: 'The Rise of the Micro-multinational', Ann Mettier and Anthony D. Williams
The Lisbon Council (2012)




## Technology footprint: starting up in New York

"An analysis of public records shows that more than 400 technology start-ups in New York City have raised money from investors in the last two years. The vast majority of these companies have landed in Midtown South, within blocks of venture capital investors and veteran start-ups. The area's affordable rent and popular restaurants and bars are a big draw. Many of the companies are working to use technology to reshape the city's established industries, like retail, finance, health care and entertainment."

figure - recent technology start ups in New York City (2011)




Total of patent applications and employees of Koninklijke Philips N.V.
source: 'Onderzoek naar de ontwikkeling van open innovatie',
P. Derksen 2009, Universiteit Twente, (patents).
www.philips.nl;
'Philips onder 10.000 werknemers in regio', ED juni 2009;
(employees)



## Let's Make Things Smaller

The history of Philips is an interesting reflection on the principle change from large scale production of things to the smaller scale production of innovation and ideas. Their relocation to Amsterdam and their continuing consolidation of their operations represent a change in focus that is line with our times. Less production, less employees, more patents.

source: 0+S Amsterdam fact sheet 'Ondernemerschap in Amsterdam, 2010'

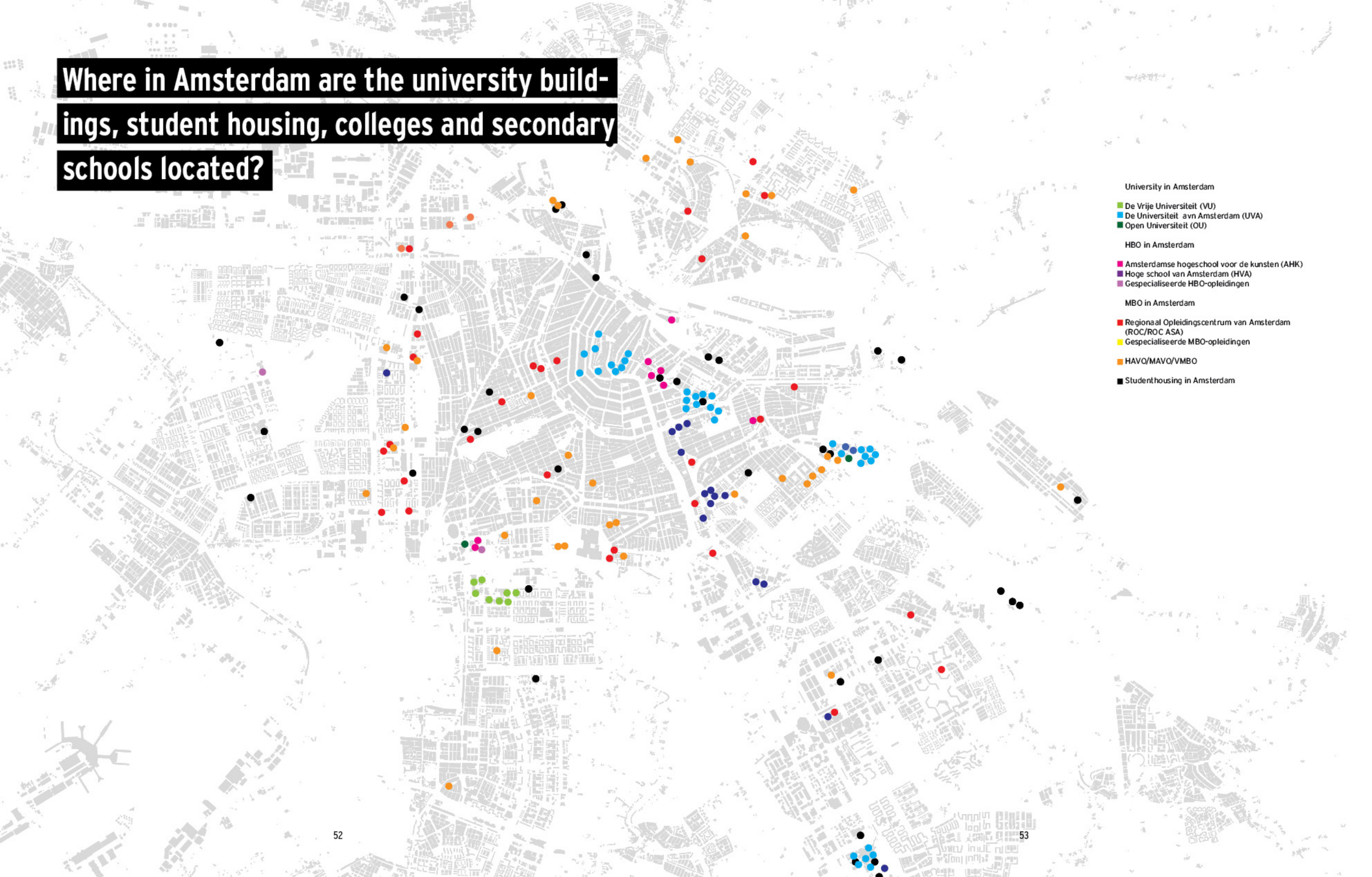
## If Steve Jobs was an architect....

But the "innovative" and "knowledge based society" puts new demands on universities, such as online learning, higher enrolment, higher requirements, less costs, and cooperation with the surrounding community. For the universities this calls for new discussions and new planning methods. Yet there still appears to be a need for an academic culture, thus for reflection, the protection of research and sublime isolation. Is the campus a park for lonely wolves?  A fenced off zoo? A gigantic $5 billion headquarters?

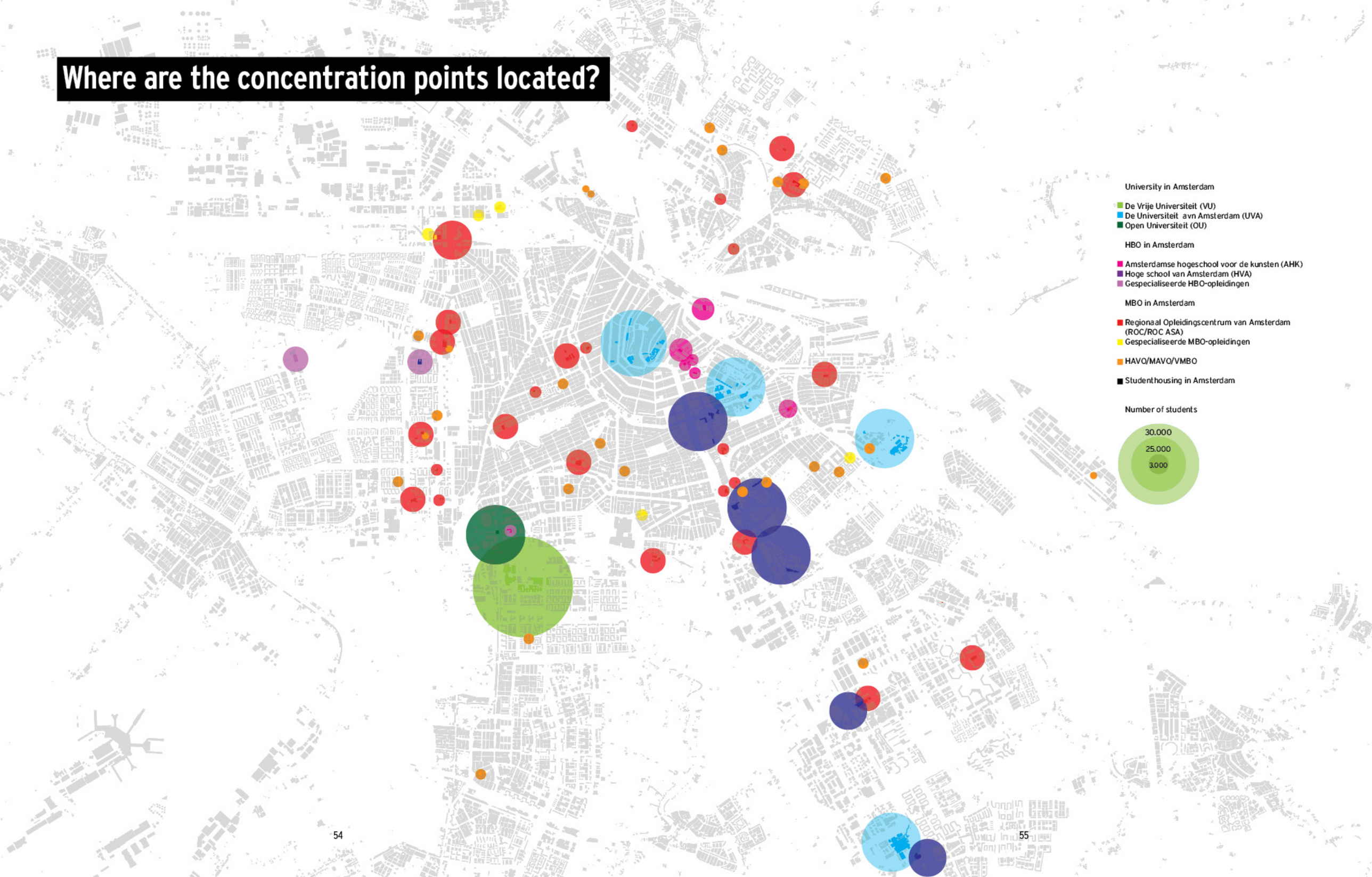
figure 4- Apple Computer new campus building Cupertino - under construction

# Amsterdam and the New Education of Things

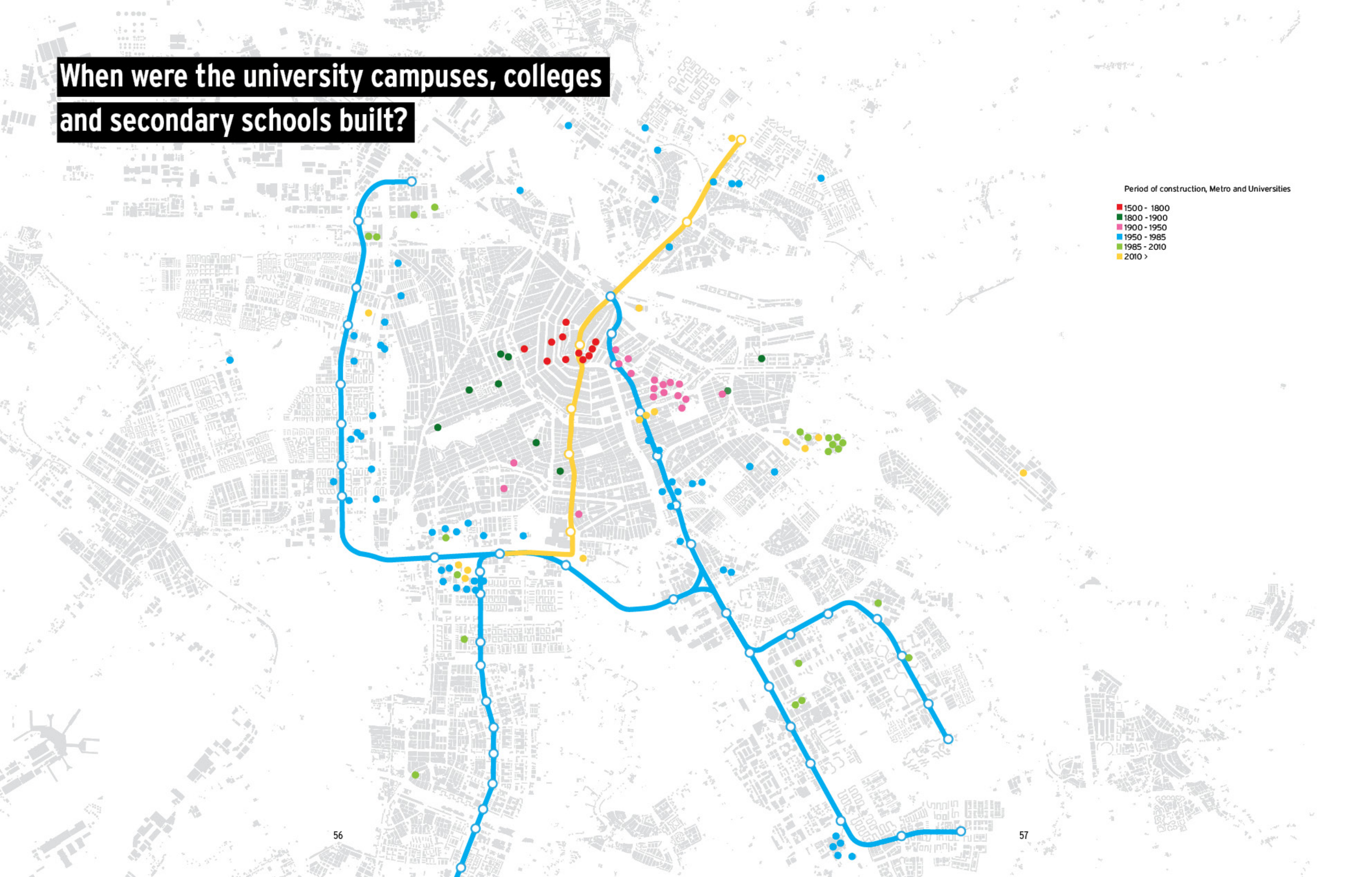
# Where in Amsterdam are the university buildings, student housing, colleges and secondary schools located?



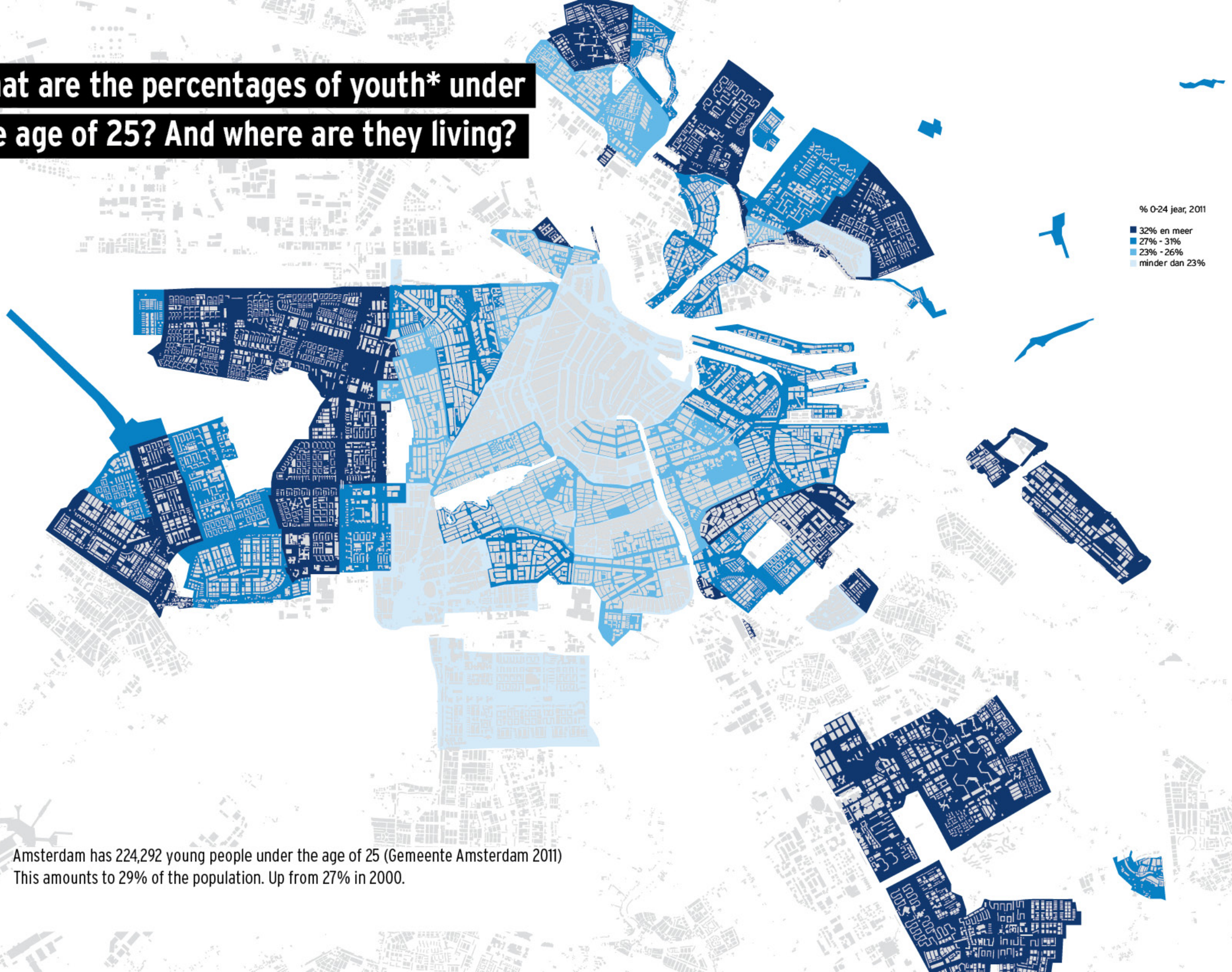
# Where are the concentration points located?



# When were the university campuses, colleges and secondary schools built?



# What are the percentages of youth* under the age of 25? And where are they living?




Amsterdam has 224,292 young people under the age of 25 (Gemeente Amsterdam 2011)
This amounts to 29% of the population. Up from 27% in 2000.


## Companies are getting smaller and growing the hardest in the centre

In all of the city districts of Amsterdam companies are becoming smaller. This trend can be seen throughout many western countries that had to deal with the transition from an industrial to a post-industrial society. This means a shift from (large) industrial activities to (smaller) service oriented companies, an innovation-driven economy aiming at competition through entrepreneurship and innovation. In Amsterdam the biggest share of entrepreneurs is located within the city centre. Small companies are the driver of growth: 90% of the companies in Amsterdam have less than 10 people working for them.

source: O+S Amsterdam factsheet 'Ondernemerschap in Amsterdam, 2010'





## U-Turn back to the City

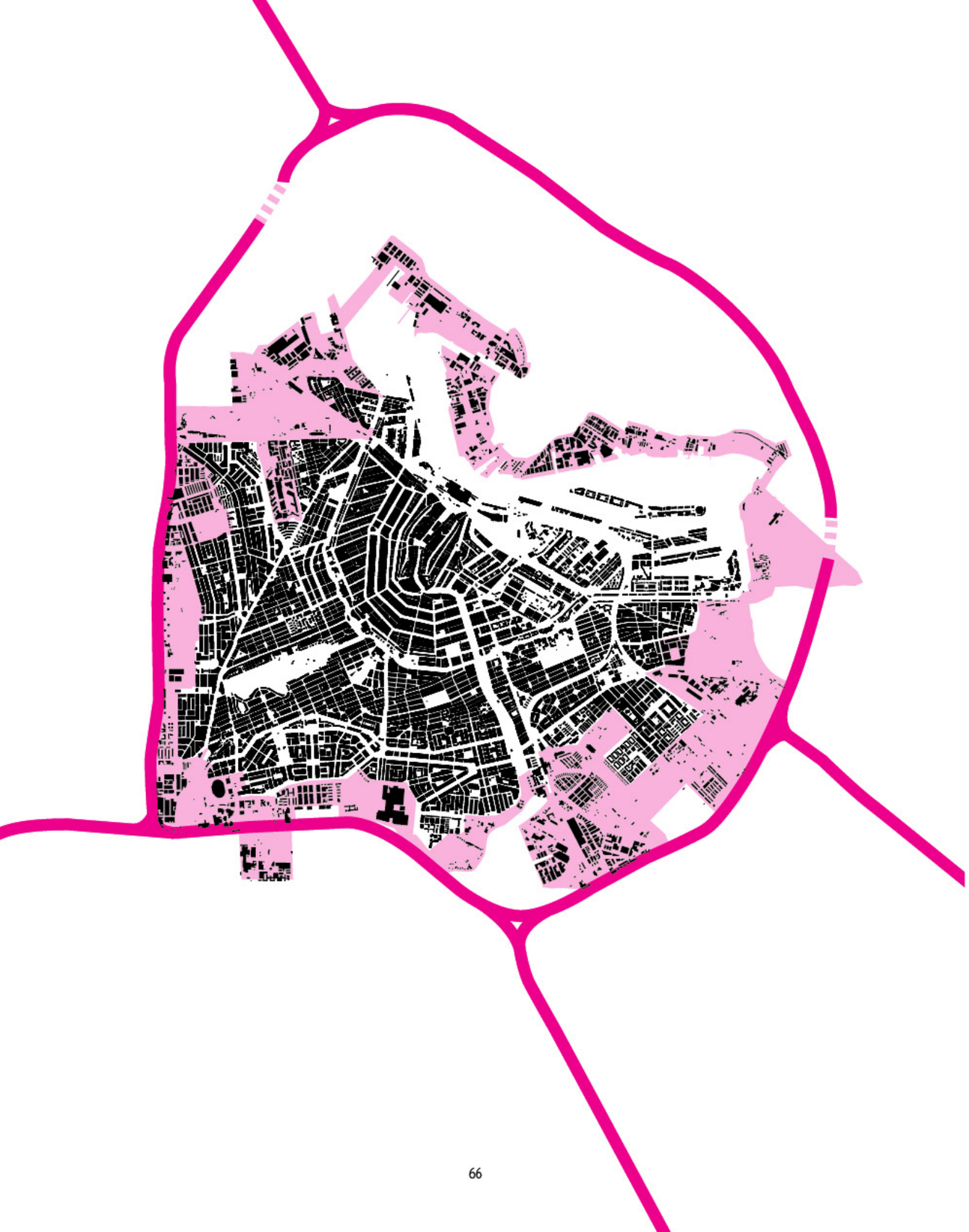
The edges of the city can be drawn when you can turn 180º and see something completely different.
Urbanity 'rolls out' of the city, says Jos Gadet, urban sociologist at the City of Amsterdam. The inner city of Amsterdam, an organic city par excellence once bounded in the beginning by its canals, has grown and has a much larger area because of its special characteristics of urbanity. Take the Amsterdam neighbourhood, 'de Pijp' for example. Inner city urbanity translates in the ratio workers to residents as 'one to one'. Almost no other city in the world can match this ratio. Creative and knowledge economy thrives in such an urban environment.

- "Terug naar de Stad", Jos Gadet 2011

## Here is where students, companies, start-ups, new comers and many young families want to be

Research has shown that Amsterdam is popular for highly educated people and their children because of its high level of urbanity. The most desired places to live for students and the highly educated segment of the population is the inner city in Amsterdam bordered by the 19th century ring. With all the cultural and social facilities close by, good schools and places to start up business, the new entrepreneur and student naturally choose the inner city. But is there enough space, ease and freedom to start up innovative projects and new experiments in education?

-Source: Residential Practices of Middle Classes in the Field of Parenthood, Willem Boterman 2012

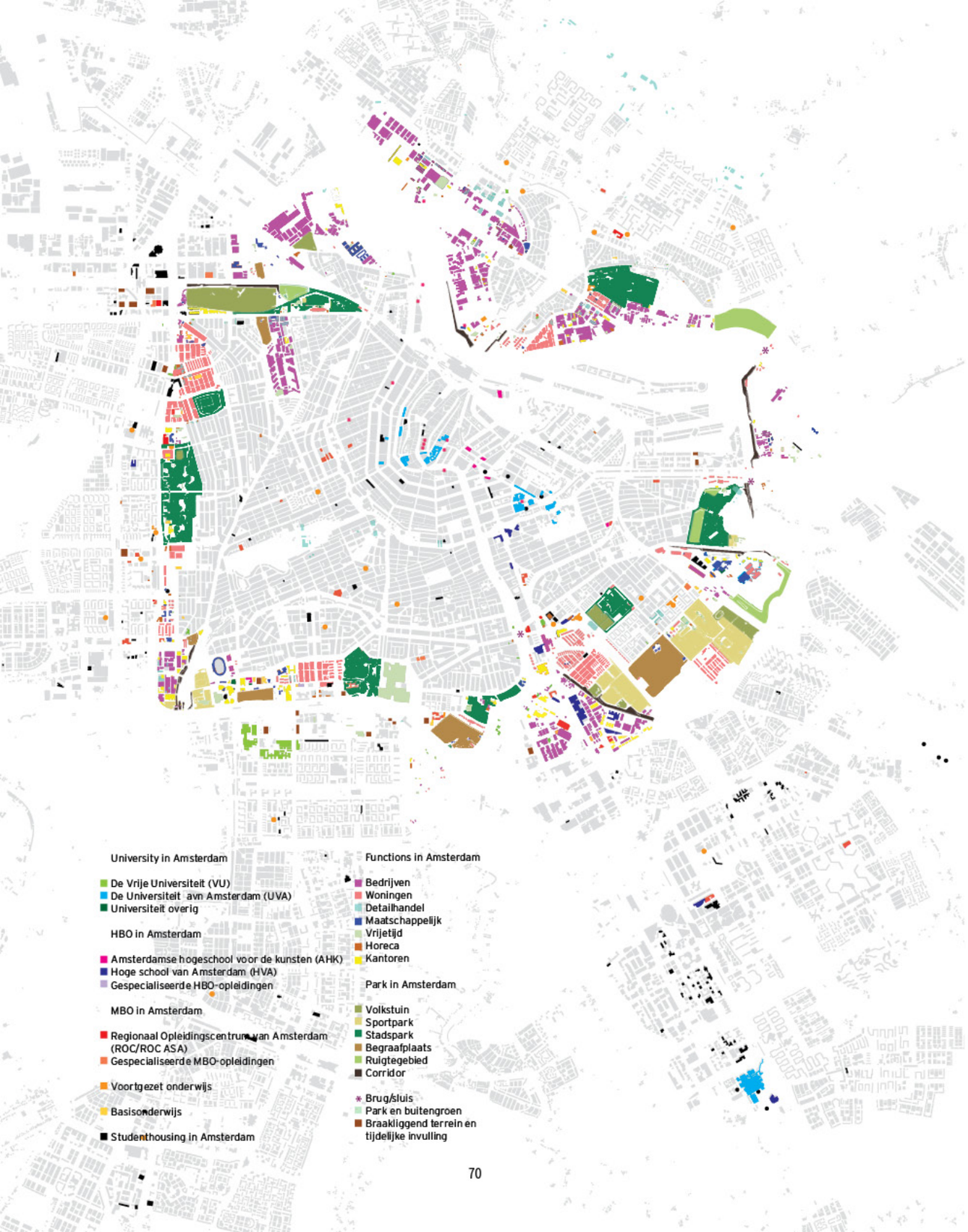


## Fill in the gap - a new form of partnership between the entrepreneurial center and big industry around the A10 ring road.

Campus City Project capitalizes on the potential for organically expanding the center to the edges of the inner city to the - A10 ring road. The project sets up a multi- scalar approach to create a new type of circular urban space, bringing research and design to bear on the built environment from a variety of fields. The next generation campus is about migrating away from dedicated closed off and static knowledge based environments to exploiting the spatial consequences of distributing education, industry and student start ups within the city as a closed circuit; the ubiquitous campus. Campus City Project literally circulates around this new type of campus model proliferating itself as a responsive and interactive system empowering and kick starting urban regeneration.

## The Wall of Knowledge - a new circular inner city space for students, start-ups and newcomers

The campus of the future will be one that needs to accommodate change; a testing ground for new ideas and innovation. The campus of the future will be one that accommodates both the global and the local, young and old, the historic city and the post war city, urban density and vast landscapes. The margins of Amsterdam's inner city are characterized by a lack of coherent urban form. This veritable open wall around the city is a space of connectivity, a place where universities can be at the centre of knowledge where new ideas can come from. A continuous zone to connect the inner city with the outer city through new forms of educational campus environments. A wall of knowledge, the third university of Amsterdam.






## What are the spatial qualities of the 'wall of knowledge' as a campus?

The in-between spaces are primarily green, open and diverse. Large scale and small scale buildings coexist together and there are no fixed urban plans that could limit growth and change. This urban void made up of under used and ambivalent urban spaces is at this point neither connected to the inner city fabric or with the post war city expansion. A new kind of campus space could develop here that breaks free of the restraints of the traditional campus model and uses the in-between spaces of the city as its classroom, meeting places and new types of shared university buildings, like student centres and industry related research labs.



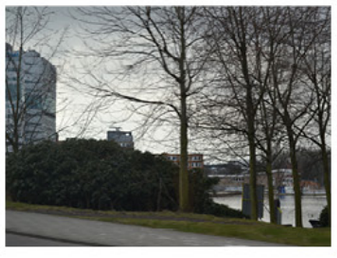










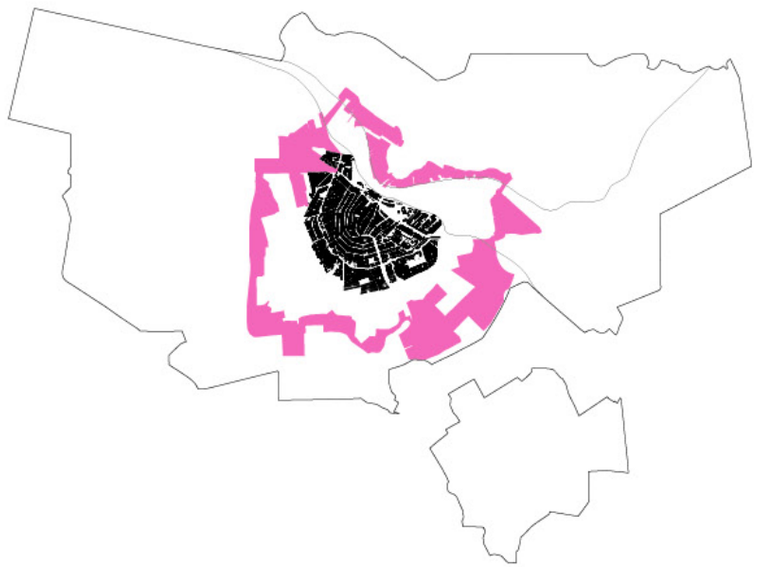




## What does it look like?

Here is it still possible to develop alternative urban visions for Amsterdam. A study of the morphological development of Amsterdam urban planning clearly shows that a unique zone inside the A10 highway ring and bordering the boundaries of the inner city has, uncharacteristic to Amsterdam city building, not been subject to a large scale coherent urban master planning. It is both the most accessible place in the city and the most forgotten place in the city at the same time. It is half park, half city, half empty and half full, half ugly and half beautiful.

# Morphology



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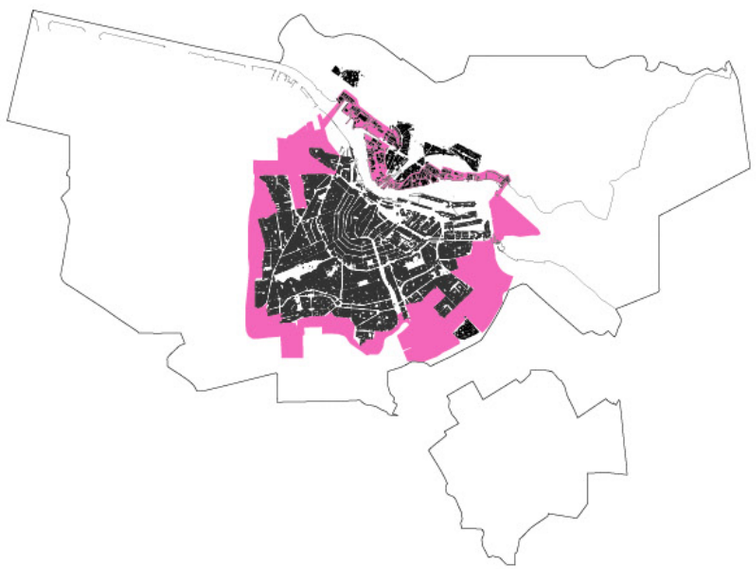
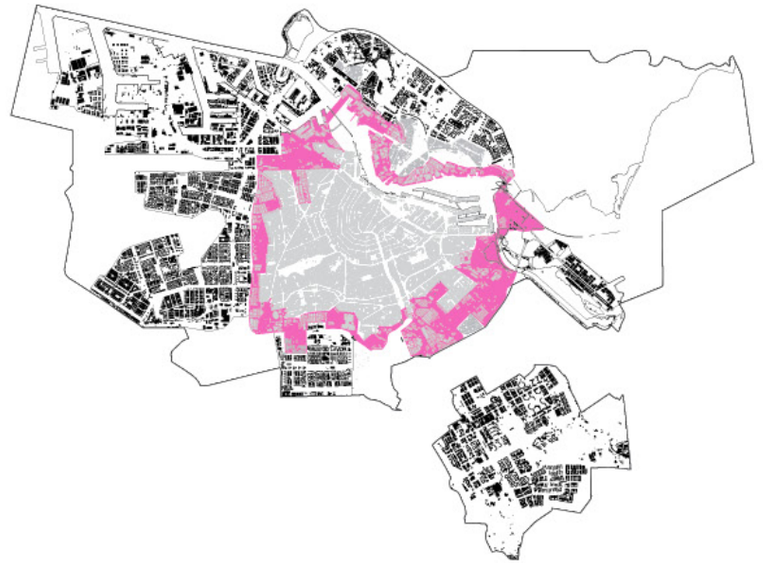
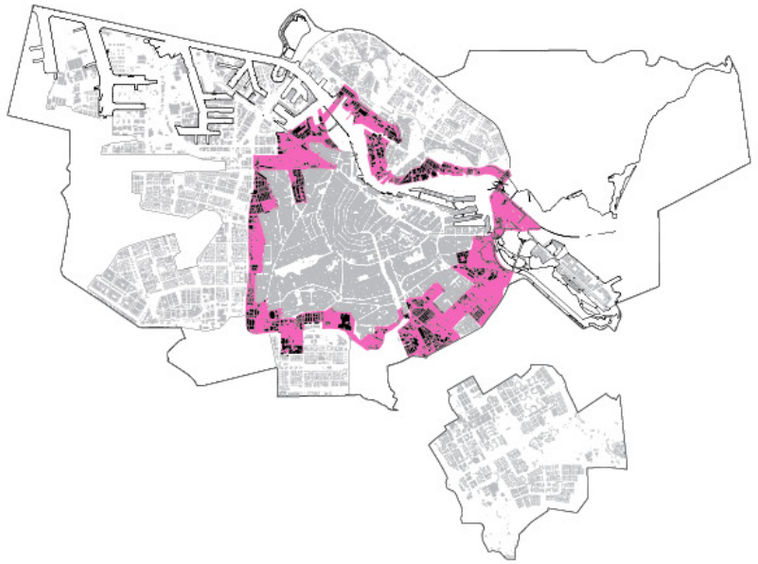


> 1934



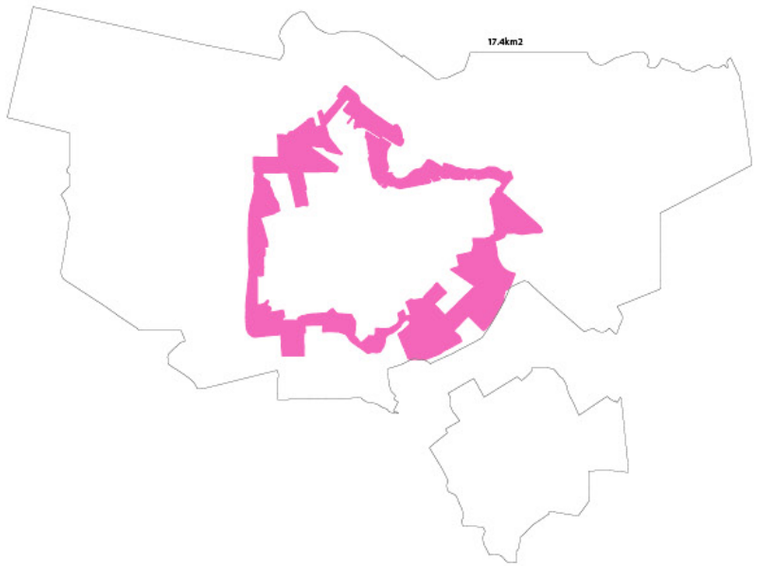


> 1995

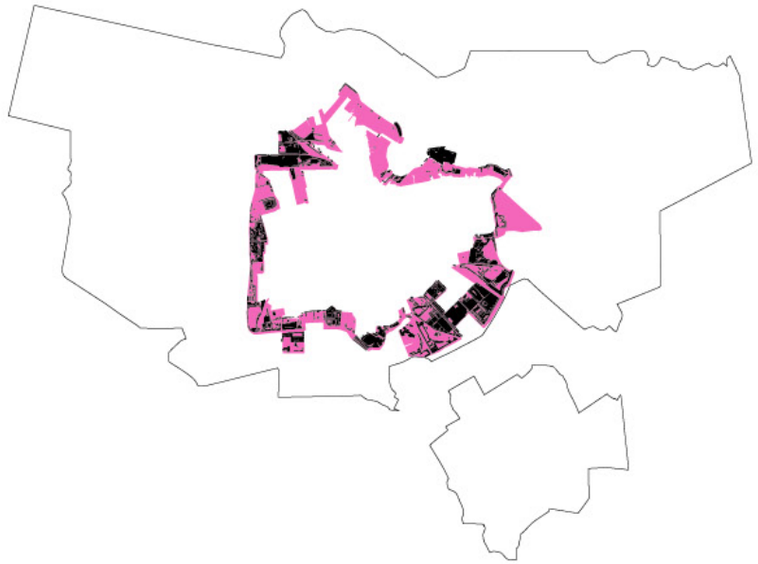


> 2015

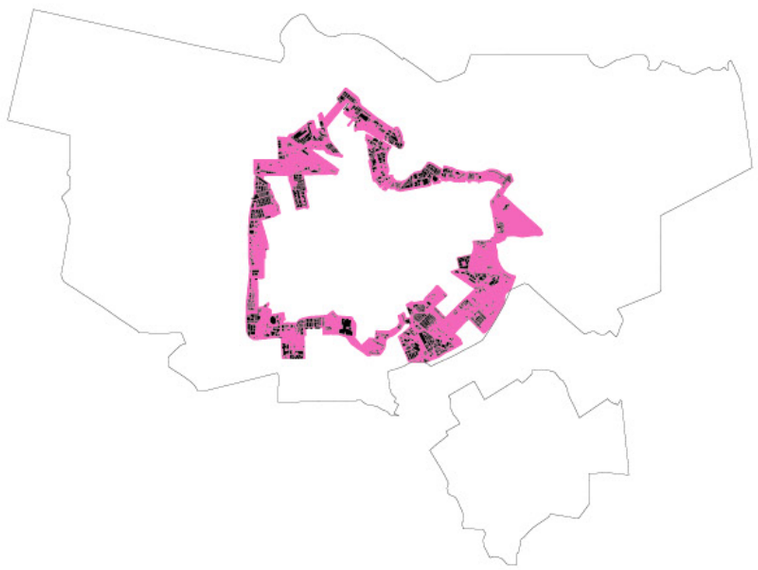
# Numbers




Surface area = 17,400.000 m2

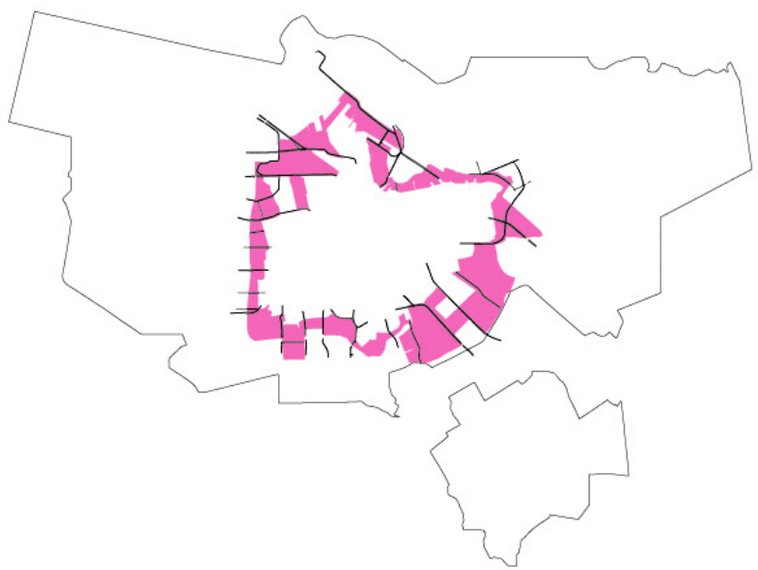


15 parks, 6 cemeteries, 8 Sport Parks, 8 park strips, 9 Allotments



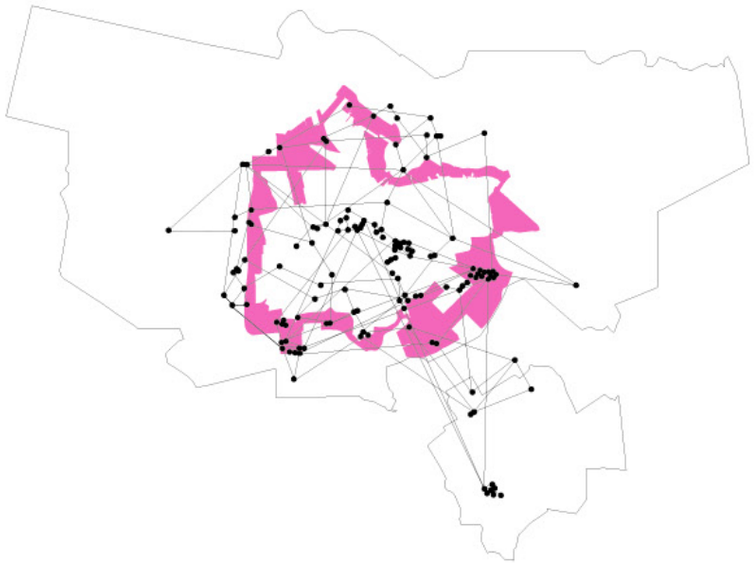
1,293 buildings



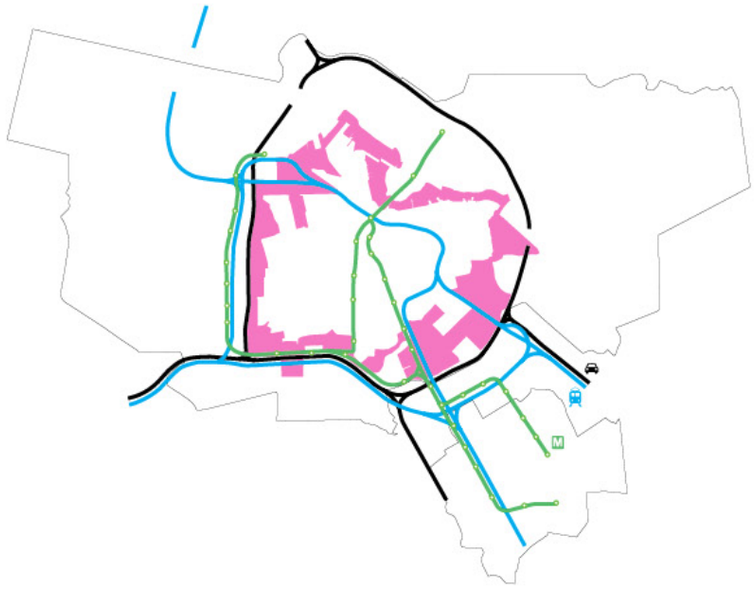


26 cross Through roads

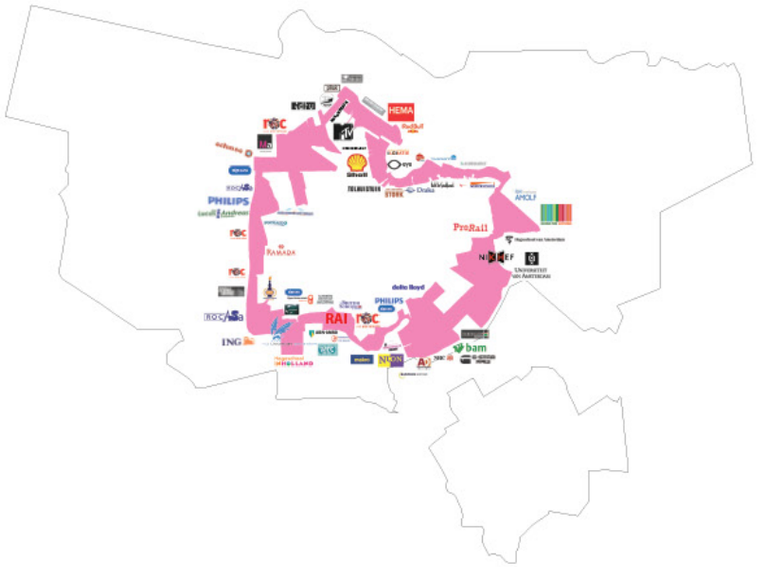
# Potentials



Connectivity: universities, colleges and schools



Accessibility: Trains, metros and highways

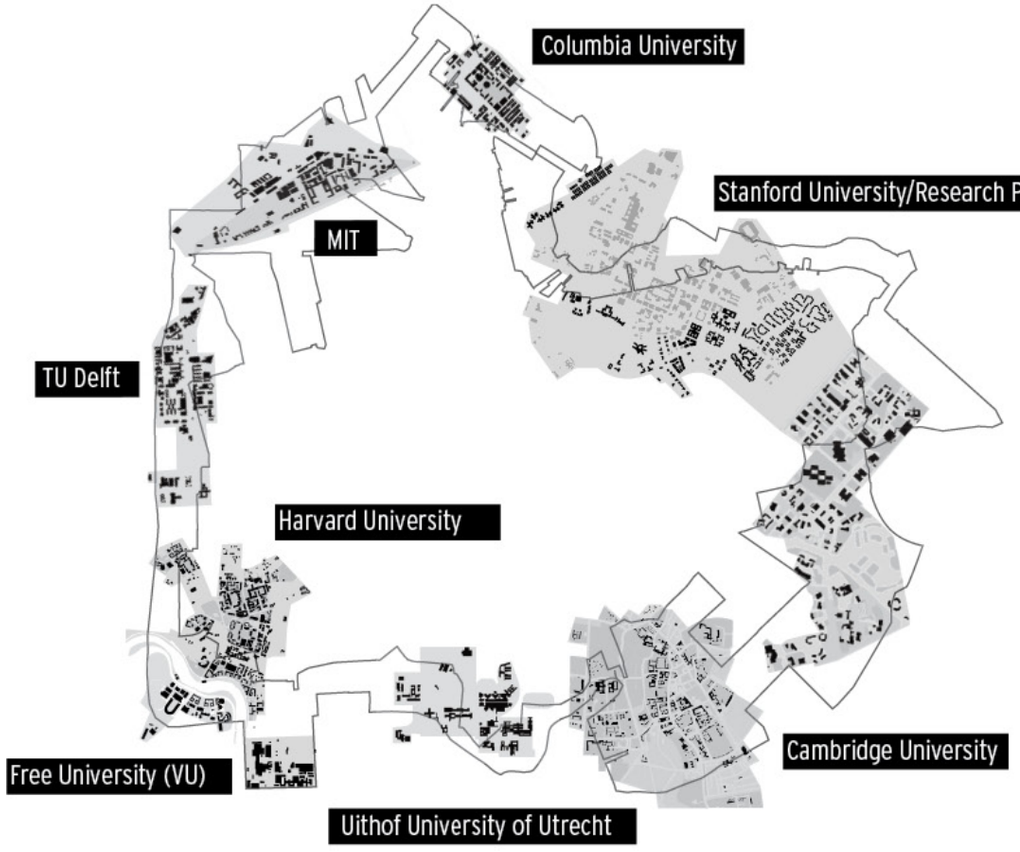



Inter activity: Business along the ring

Metropolitan: large scale Areas in Amsterdam

# Scale


Campus City Project




Big enough to fit all the leading universities - combined

**Metropolitan green spaces flow directly into and circulate around the campus city ring**

## Campus City Project as a new center for knowledge creation and ideas at a metropolitan scale

Train
Highway

Amsterdam Opent

I ambitious®

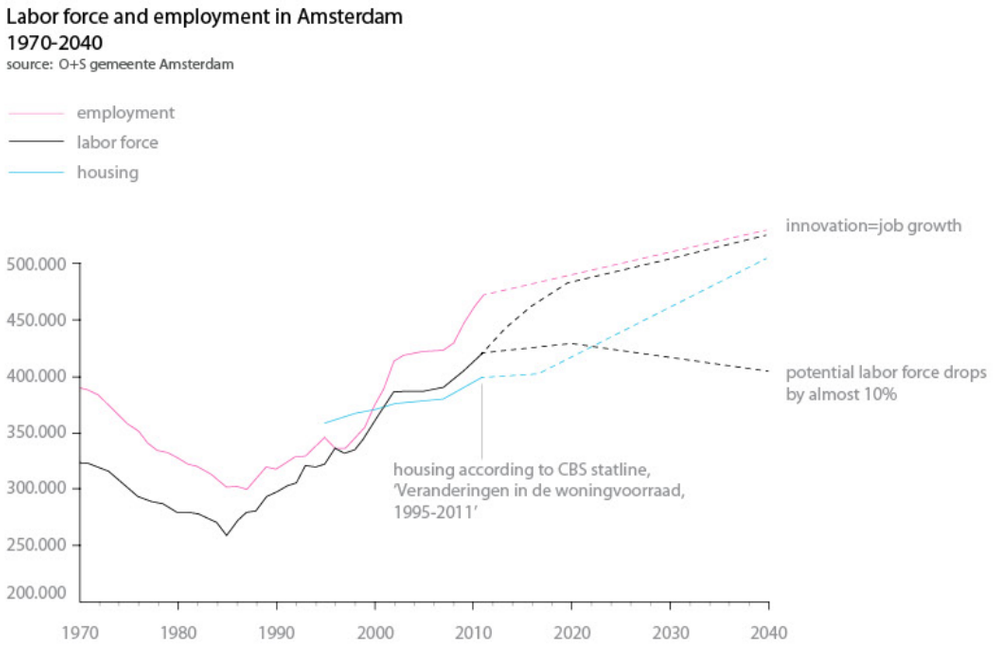


## Will Amsterdam be a smart city? Or a city for smart people?

The Internet has brought new opportunities to orchestrate collaboration between cities, fostering the creation of a large base of commons in code, user generated contents and even telecom infrastructures with the emergence of Bottom-up broadband networks.

But what if we were to market Amsterdam based on the ambition of its inhabitants and future talent pool instead of just their personal identity? Why not brand Amsterdam on the strength of the city to attract (international) talent that come to Amsterdam in order to study and pursue their ambition?

Labor force and employment in Amsterdam
1970-2040
source: O+S gemeente Amsterdam

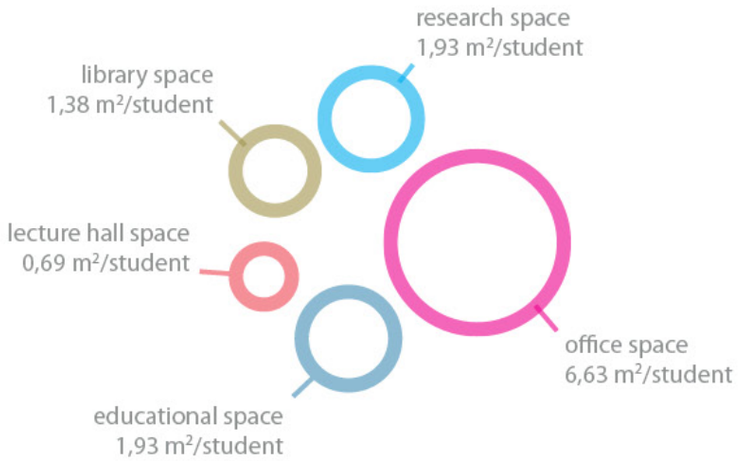




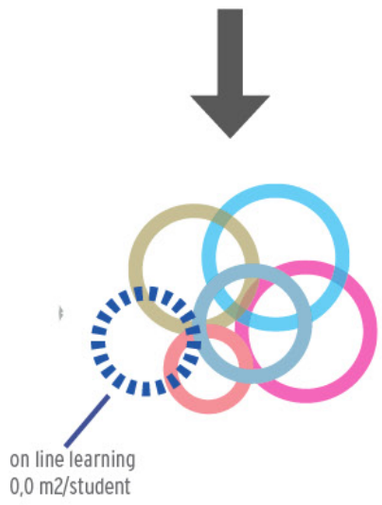

## Long Live Learning

The percentage of people in age of 20-65 years will have dropped from 67.6% in 2010 to 58.4% of the total population in 2040. Labour force is a percentage of this group. In the future people will live and work in closer proximity in order to offset this imbalance. This will help bring down daily long distance commuting and kick start alternatives to car travel. In sharp contrast to the past, people will be working longer, changing their profession more often and as a consequence retraining and re-educating themselves more frequently.

source: 'Nationale Atlas Volksgezondheid,' Ministery VWS




Current campus functional space norms




Future campus functional space norms

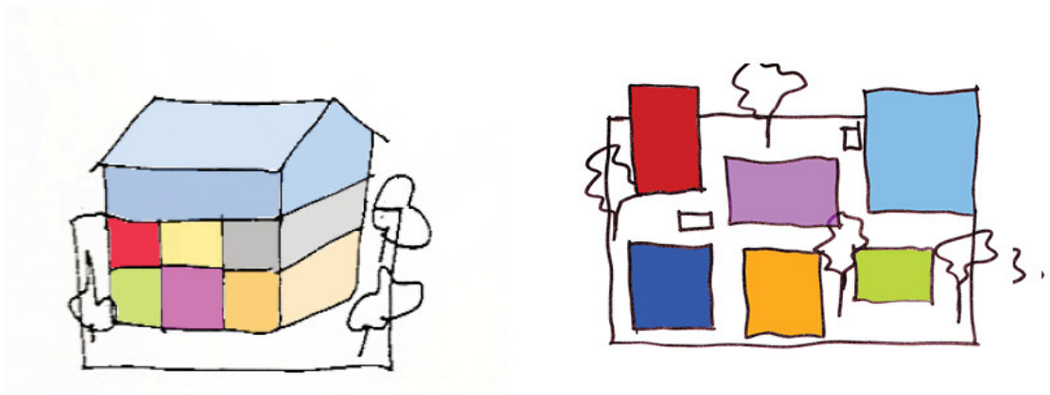


## From more students to less square meters

While there is an increased demand for new educational buildings and facilities, there is not necessarily an increased demand for more surface area per student.
Current spatial requirement norms are based on a per student area ratio. This will need to change in the future.
Educational institutions face a scenario characterized by shrinking budgets in combination with increasing demands for services by students. Therefore the next generation campus will be about less office space, more research, more library and meeting spaces. Things will be grouped more and more together not by age but by shared interests and common research topics.

- source: Planon database d.d. oktober 2009
(Meerjaren huisvestingsplan Universiteit van Amsterdam, 2010)


From institutes → To community

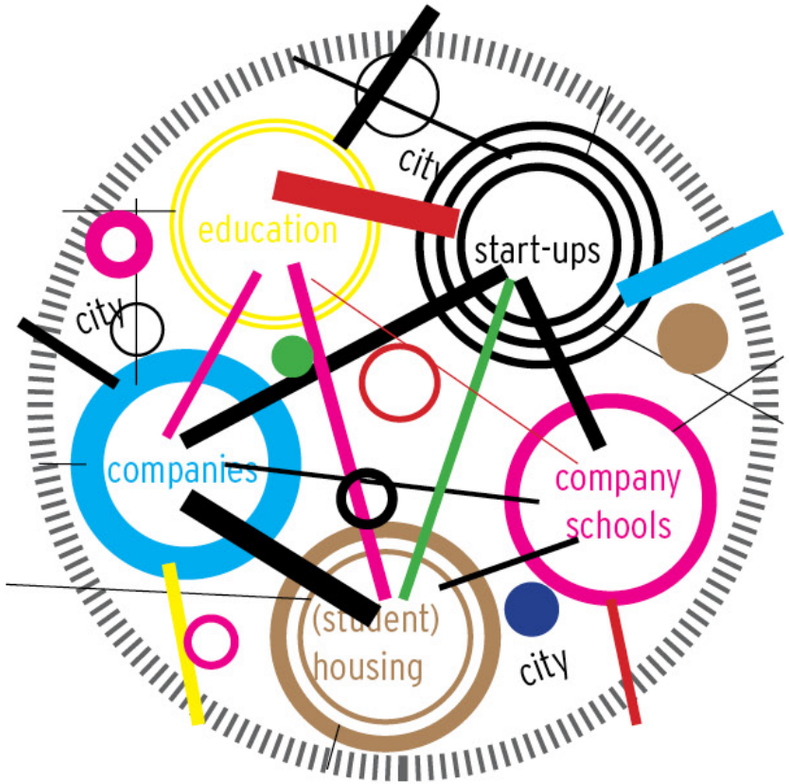


From buildings → To urbanism



## From buildings to urbanism

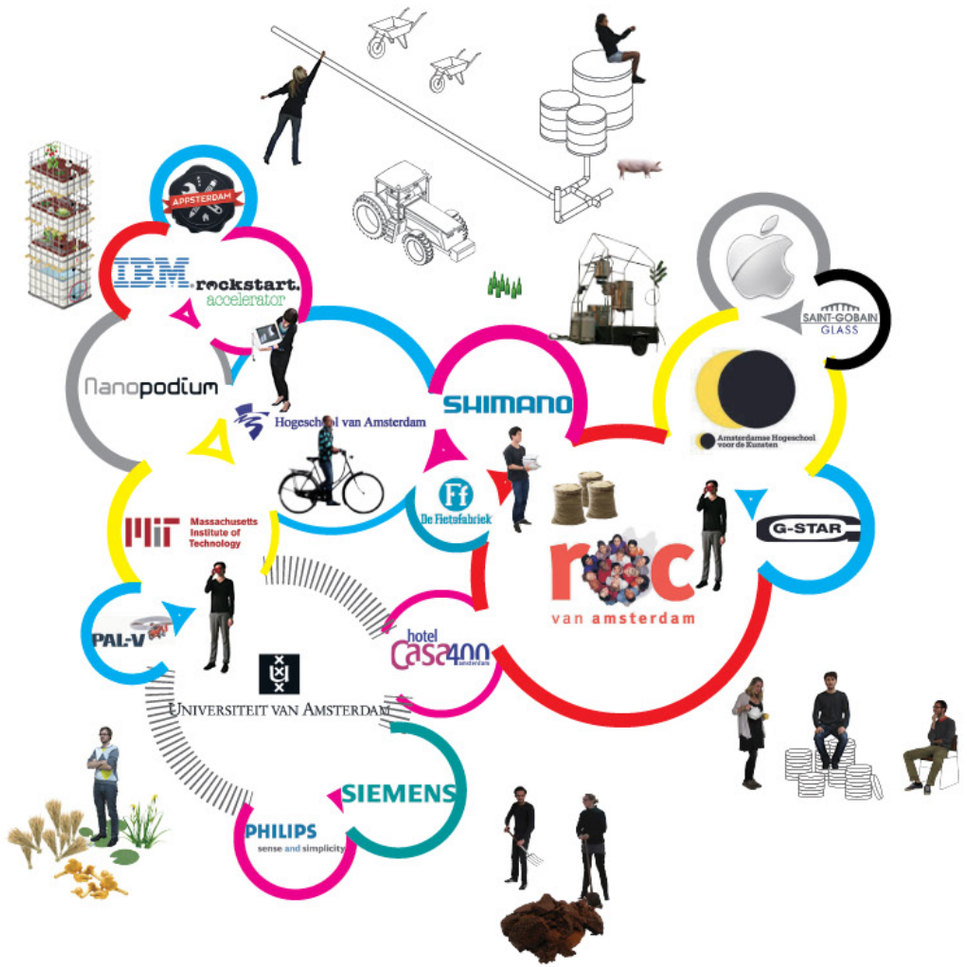
We are entering a new phenomenon in education and society that work outside traditional academic and educational parameters in search of conditions related to innovation. In the past, higher education has been described as a series of "silos" (departments, divisions, colleges within a university), where carefully created boundaries limit true collaboration and interaction. Student life is not confined to classrooms, but highly flexible, dynamic spaces that must meet a wide needs of needs, often on a 24/7 schedule.




The education of things

## From Brain Parks to the Education of Things

The changes going on in education, the economy and urban development today are asking for new spatial and social models. If the internet of things is about equipping all objects in the world with technological devices that could be transforming our daily lives so that objects could be altered remotely based in accordance with user demands. Is this not what the Campus city project can be about? By replacing 'objects' with "cities" and 'devices' with "education" we come to a completely new 'user driven' concept for the role of education and the campus in the future growth of the city. The education of things.




## From taking tests to starting businesses

Schools are producing "test takers" while businesses and industry need thinkers and innovators.
Educational institutions are in search of new ways of learning that better connect to the needs of society and companies.
How can we bring campus thinking into education, industry and urban development together? Make the campus clusters more open to both industry and the community to create new synergies, spin-offs and local work opportunities for the entrepreneurial student. The start up campus is learning by doing as a collective customized project.
Experiential education.

EDUCATION

LIVING

CREATIVE INDUSTRY

START-UPS

GROWING FOOD

EATING

SPORTING

MOBILITY

NIGHT LIFE

CULTURE

LIBRARY

CYCLING

PARKING

COFFEE HOUSE

WORKSHOP FACILITY

LEISURE

EVENTS

OFFICE

HOTEL

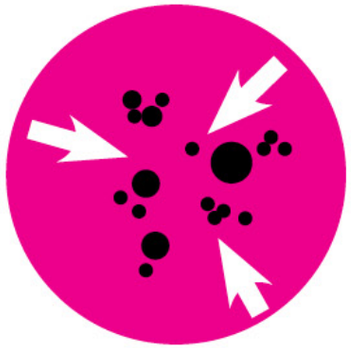
START-UP INCUBATOR



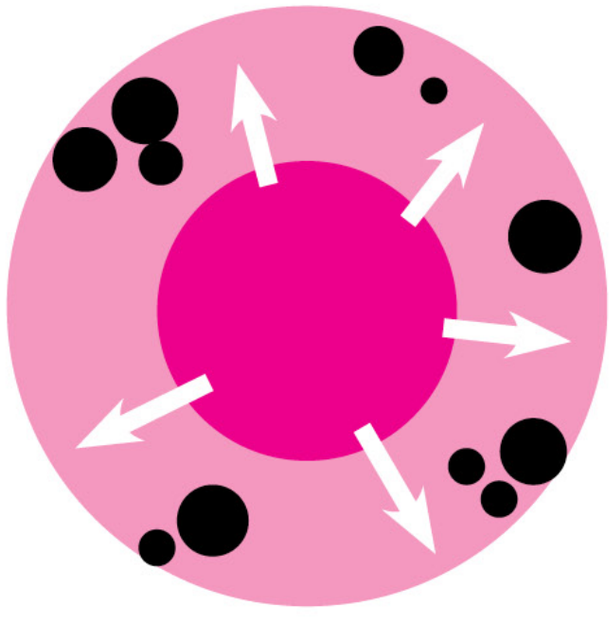
## From air conditioned atria to open air education

While there is increasingly economic based argument to bundle and internalize educational buildings into larger entities, learning is no longer happening just in school buildings. In fact it is happening less and less inside the confines of school. If fresh air, lots of daylight and enough space to move are the driving qualities in new school buildings today, why not take learning more outside? Link learning with education as work related experiences. An overview of the components of the new campus provides a matrix on how to do this.

# What will the campus of the future look like?

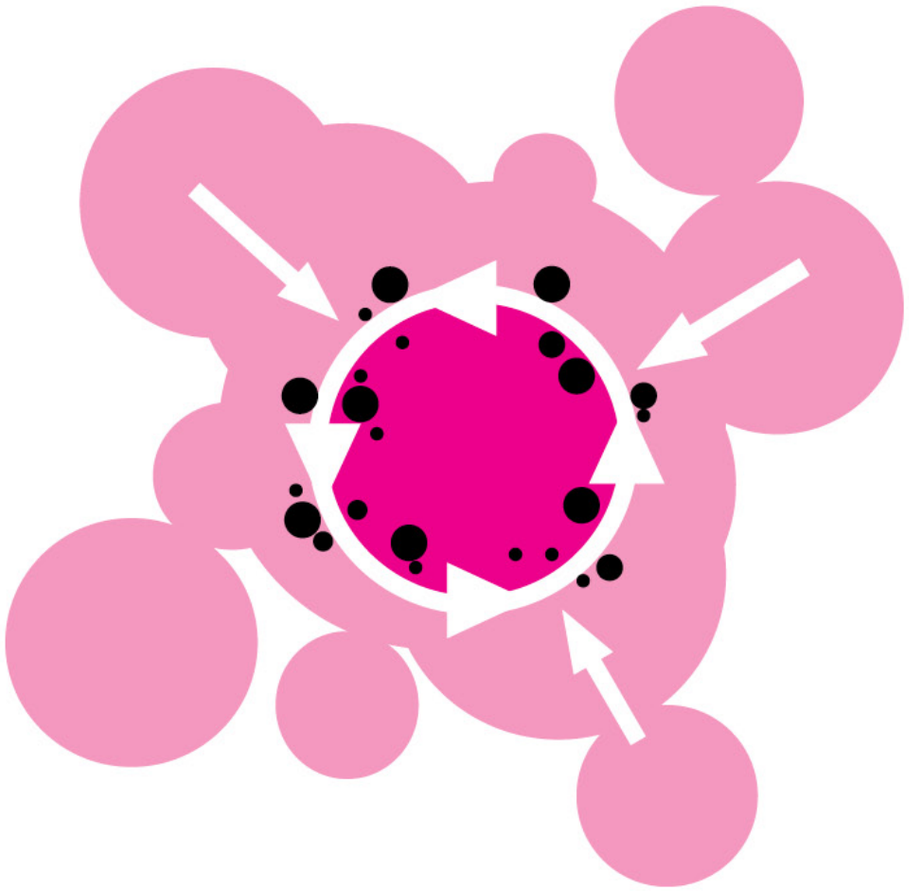


**First generation campus**
-Civic, integrated scale, exclusive and central



**Second generation campus**
- Utopian, large scale, knowledge focused and outside the city





**Third generation campus**
- Metropolitan, experiential, smaller scaled, entrepreneurial and urbane



# Conclusion: Campus City Project and the New Mobility

**Campus City Project**

"Campus without Boundaries" is a research project that grew out of a call for architects and other design disciplines to openly speculate over future spatial models for education in the age of the knowledge based city. The expansion of access to education over the last 50 years has meant that educational buildings, in a country like the Netherlands, have also been expanding through fusions and adding functions in the name of efficiency. While the motivation for this increase in size is primarily pragmatic and economically driven, it remains unclear what the added value of this scale jump has been for education and the city. Educational institutions today are suffering from the dual paradox of increased (environmental) demands made on their buildings at the same time that public budgets are decreasing. On one hand education is no longer happening within 4 walls while on the other hand there is a growing trend towards educational institutes taking on larger scale urban campus plans. What this new and expanded civic role means for public space and the growth of the city forms the background of the follow up study, "Campus City Project."

Cities particularly in North America are actively encouraging higher education to not only to spark growth but to carry it out as well. As Sharon Haar suggests in her book, "The Campus as City," if knowledge production in all its forms - economic, cultural, scientific and social - is the key mission of the university and at the same time critical to urban growth and revitalization, the current ideas into design thinking of educational environments and in particular the campus will need to reflect this new relationship. Higher forms of education and university campuses are struggling with the complaint of inadequate buildings that do not keep up with technological developments, energy use, internal climates, overcrowding and outdated buildings. Moreover

changes in education are reflected through the changes going on in society. This suggests that the user driven technological devices and rapid urbanization process we are now experiencing in our daily life are having, or will have, a direct impact on how and where we educate ourselves. Given the rapid changes in the economy, we live in a time when education is not exclusively for the young anymore, the need to re-educate ourselves due to career changes and personal ambition means that the gap between how we learn and how we live is closing at an unprecedented rapid rate. In keeping with these trends schools, universities and increasingly industry are trying merge and cooperate towards a system of continuous education. The new urban reality is creating new spatial questions concerning where and how learning will occur in the future. "Campus City Project" is an ongoing research and design initiative that realigns the changes occurring in education and the knowledge based economy with the growth and revitalization in our cities. Will the next generation campus will be a model for the growth of the city in the future?

**Education of Things**

The growth and revitalization of our cities will need to take a closer look at how education in the future will work, what its needs will be and how to plan this. The international market for universities and students have meant that global talent migration will have a direct impact on the spatial policies of knowledge based and innovation driven cities, if they are not already. This is why governments are now paying increasing attention to international comparisons as they search for effective policies that enhance individuals' social and economic prospects, provide incentives for greater efficiency in schooling, and help to mobilise resources to meet rising demands. The 2011 report from the Organization for Economic Co-operation and Development



(OECD) has shown that the relationship with public benefits are exponentially greater than the costs associated with education. MIT for example has 25% of their graduates starting up their own business in the Boston area. A large proportion of this figure is the foreign talent that remains in the Boston area in order to start their own business and contribute to the local economy.

If the "internet of things" is about equipping all objects in the world with technological devices that could transform our daily lives so that objects could be altered remotely in accordance with user demands, is this not what is also happening in education today?  By replacing 'objects' with "cities" and 'devices' with "education" we can begin to understand a completely new 'user driven' concept for the role of education and campus thinking in the future city. The education of things is about equipping the city for new spaces for learning that are much more personalised and project based in order to generate spin offs beyond the campus. In the past schools were producing "test takers" while all evidence suggests that in the future businesses and industry will be needing thinkers and innovators. Educational institutions are in search of new ways of learning that better connect to the needs of society and companies where the enterprising role of the student will be the key. We will need to bring campus thinking into education, industry and urban development together to stimulate start ups. These new start up campus clusters will be more open to both industry and the community in order to create new synergies and local work opportunities for the entrepreneurial student and beyond.

**Brains over Buildings**

The motivation behind examining the city of Amsterdam as a test case for the Campus City Project came through the absence of any clear spatial policy

regarding the future planning of the knowledge based economy in the current Amsterdam Structure Plan of the City for 2040. This absence is remarkable given the exploding growth of student numbers, the dramatic need for student housing and educational facilities , which is in sharp contrast to the currently envisioned and struggling large scale plans for housing, office and commercial real estate developments. Moreover there appears to be a mismatch in the ambitions of Amsterdam's future planning scenarios; earmarking the outskirts of the city for future spatial planning against the compelling evidence that suggests that young people, new talent migrants and families, especially the highly educated, entrepreneurial and innovative start-ups want to be located in the inner city.

The conditions that make the Campus City Project possible in Amsterdam emerge through the new economy of cities, what Harvard economist Edward Glaeser refers to as "brains over buildings." A new resilient economy that now requires maximum use of existing smaller scale infrastructure together with strong connections to universities. The ability to attract knowledge workers and the kind of urban environment that they are seeking can be utilized to break open under used spaces in Amsterdam earmarked for change. Cities themselves are eagerly searching for talent both local or foreign to relocate and start up new businesses where under utilized sites and existing building stock offer potential for innovation that benefits both the direct neighbouring environment and the economy. While bringing more foreign students is key, decreasing public funds and increasing demands by students will throw into question more conventional notions of the campus in search of new educational environments that are smaller, more personalised and more project based. By repositioning the student for example as the



developer new innovative forms of the campus environments driven by experienced based education, organic economics and low key urban planning will emerge. This 'brain driven' approach is low cost alternative to urban planning method as opposed to large scale investment based urban planning that has characterized the last 15-20 years of real estate development.

**The Wall of Knowledge**

If the dense urban core still represents the most popular and fertile ground for small companies and young start ups in Amsterdam, why do we not let it grow? Closely integrating the student economy and the way it moves with new forms of campus start-ups towards the fringes of the inner city can encompass a vast range of benefits that can spin off in all directions. This new spatial economy of campus start ups can be found in the interstitial spaces surrounding the inner city where sites and buildings can be re-developed to provide increased density and better use of space with improved sustainability and amenity. The Campus City Project map came about through a natural process of analysing the break lines between the dense urban fabric and disjointed peripheral urban zones. This veritable wall of knowledge allows the inner city Amsterdam to expand organically outward making places for new educational environments to emerge and bridging the gap between the outer city (outside the A10 highway) and inner city (inside the A10 highway).

The solution for the growing numbers of students and demands from universities in Amsterdam is not to dump students wherever space is cheap and far away or to view education as a necessary burden to our public spending. It is time to turn the situation completely around and try to facilitate the new spatial demands made by the knowledge and innovation based economy to

kick start urban growth and change. The benefits will be more innovation, the shaping of more enterprising students, developing and reconnecting disjointed neighbourhoods, forming new networks between professionals, bringing costs down (student labour) and exploring new educational markets. The start up campus can be an attempt to give form to the student economy in how learning by doing as a collective customized project can revitalize the forgotten edges of the Amsterdam's expanding urban centre.

**The Studentrepreneur**

Can we create a new financial structure that can support the Campus City Project? The student economy is one of the most vital and growing markets. The increased role of industry and the public sector in joining forces to kick start more ingenuity in our urban reality will demonstrate that higher education pays. The doubling of the amount of university students in Amsterdam over the last 10 years have created a new momentum and economic motor for Amsterdam and all cities with universities to study and harness this phenomena.  Although the costs of education are rising there is a considerable market to explore through the growth of student enterprises how we can at the same time help bring costs down. A variety of new spatial, social and low end financial structures are imaginable that can facilitate the growth of a parallel student economy and give it form. This economy will grounded on the new urban realities facing society today and how student initiated projects will be utilized as a low cost effective means to stimulate knowledge based talent into action. Students are globally on the prowl, in search of new challenges and experiences and it will be the role of cities to connect their talent for self empowerment, innovations and new markets.













**The New Mobility**

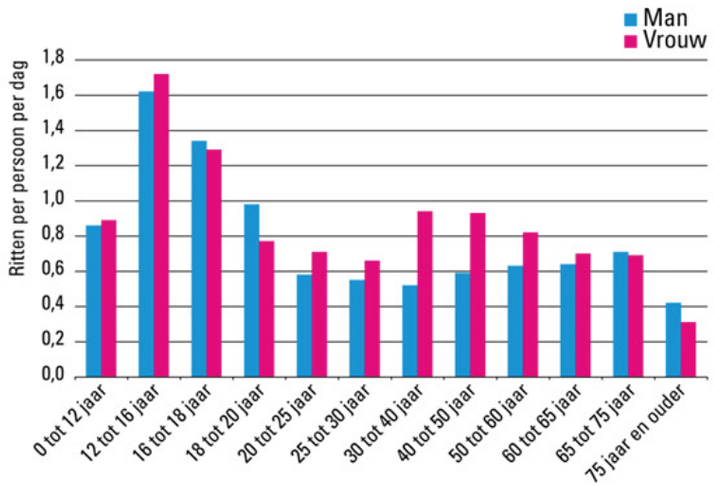
Can a new low cost mobility network be designed that can replace the car for long distance travel within Amsterdam and beyond?

Across the developed world car ridership is, according to a source form the The Times (UK) in November 2012, declining while urban populations have been increasing. In Central London for example, traffic fell by 19 per cent between 2000 and 2009. The number of cars in the area peaked in 1990 and has fallen by 37 per cent since 2000. An ageing population, more single-person households, young people and "empty nesters" returning to high-density, inner-city living and a proliferation of home working and mobile computing are all thought to be contributory factors. So too is a sharp rise in fuel and car insurance costs and a rapid decline in young drivers.

Years of falling traffic volumes suggest that car use has passed its peak and may have entered a long era of decline, a growing body of officials from the Department for Transport and London's City Hall believe.

The implications for how cities are designed and streets are used are enormous if car use really has passed its tipping point. Supporters of "Peak-Car" theory see a future in which the inner cities are given over to pedestrians, cyclists and public transport, and café culture replaces car culture.

But even if the officials are right, they know that they have a hard task ahead trying to convince those responsible for setting roads policy to adopt such a dramatic course. The new economy will bring in a new phase in terms of how we need to think about mobility and roads. The 'new mobility' is about re-imagining mobility beyond the car. The Campus City Project together with the 'new mobility' will entice new forms of bicycles to reconnect the whole city with quicker connections through slower speeds and lower cost infrastructure.




Share of bicycle trips per person per day in age groups in the Netherlands

| Motief | Fietsaandeel |
|---|---|
| Werk | 25% |
| Zakelijk bezoek | 11% |
| Diensten / Persoonlijke verzorging | 18% |
| Winkelen / Boodschappen doen | 28% |
| Onderwijs / Cursus volgen | 50% |
| Visite / Logeren | 21% |
| Sociaal recreatief overig | 31% |
| Toeren / Wandelen | 16% |
| Overige | 26% |

Share of bicycle trips in the Netherlands



## Trips by bicycles related to education make up the vast majority of all bicycle trips

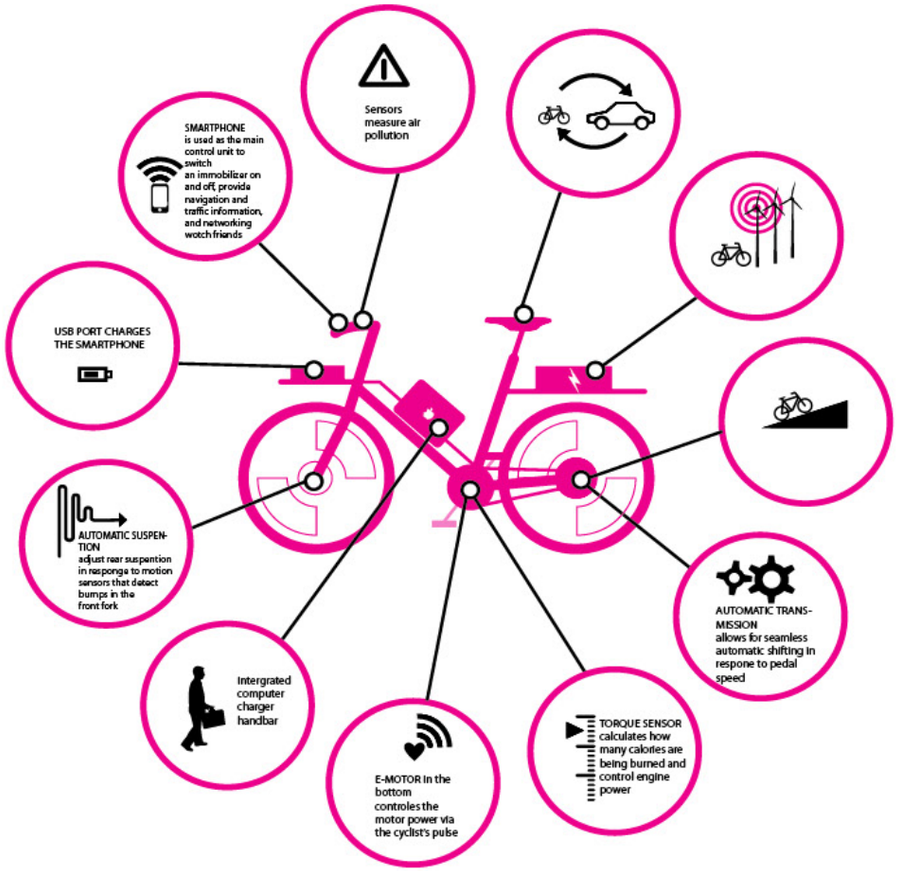
For most purposes in the Netherlands, the bicycle is an important means of transport. The bike is good for 50% of the rides to school and university, a quarter of journeys to work and more than a quarter of the trips to the store.* In a market like Amsterdam over 60% of trips are made by bike in the inner city and 38% of trips are made by bike overall in the greater city area.**In 2006, there were about 465,000 bicycles and the 400 km of bike paths, in Amsterdam alone.***

- Source: *'Mobiliteitsbalans 2012', Kennisinstituut voor Mobiliteitsbeleid (KiM), Ministerie van Infrastructuur en Milieu, 2012
**"Bicycle Cultures Are Man-Made". Amsterdamize.com. Retrieved 7 March 2012.
*** Research and Statistics Division. "Introduction". Traffic and Infrastructure (in Dutch). City of Amsterdam. Retrieved 2008-10-04.


## Introducing the "Stuped" bicycle for smart people.

"This bicycle is exclusively for students! You can buy a funky bike with great advantage! This action is only possible thanks to contributions by ING, nrc.next and Randstad Student...The "Stuped" for students is the ultimate bike: a quality bike at an attractive student price! This "Stuped" can be purchased at 'de Utrechtse Rijwielfabriek' (DURF). In DURF youth work within a close partnership with the labour market. DURF is the "learning-by-doing" principle central. No ordinary education at school, but learn "from your hands to your head." The operations of DURF is largely in the hands of college students. They also learn by doing. They lead a real company. DURF is not subsidized company, but a company that gets its return from the product. By purchasing a bike at DURF you take two good choices: you buy a snazzy bike and you support a fantastic initiative."

source: www.stuped.nl/




**The Utopic E- Bicycle**
- student bike of the future

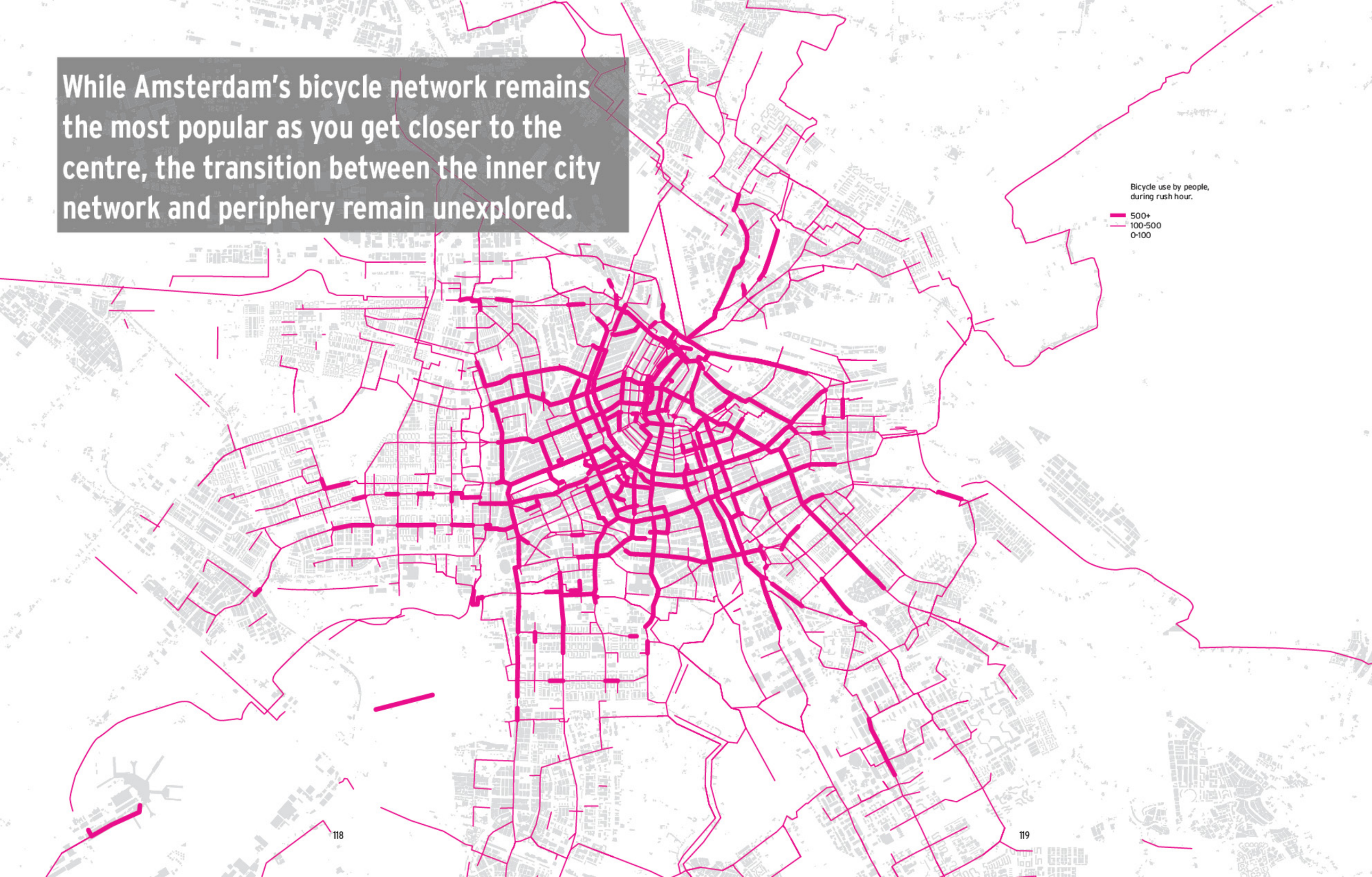


## Students cycling longer distances

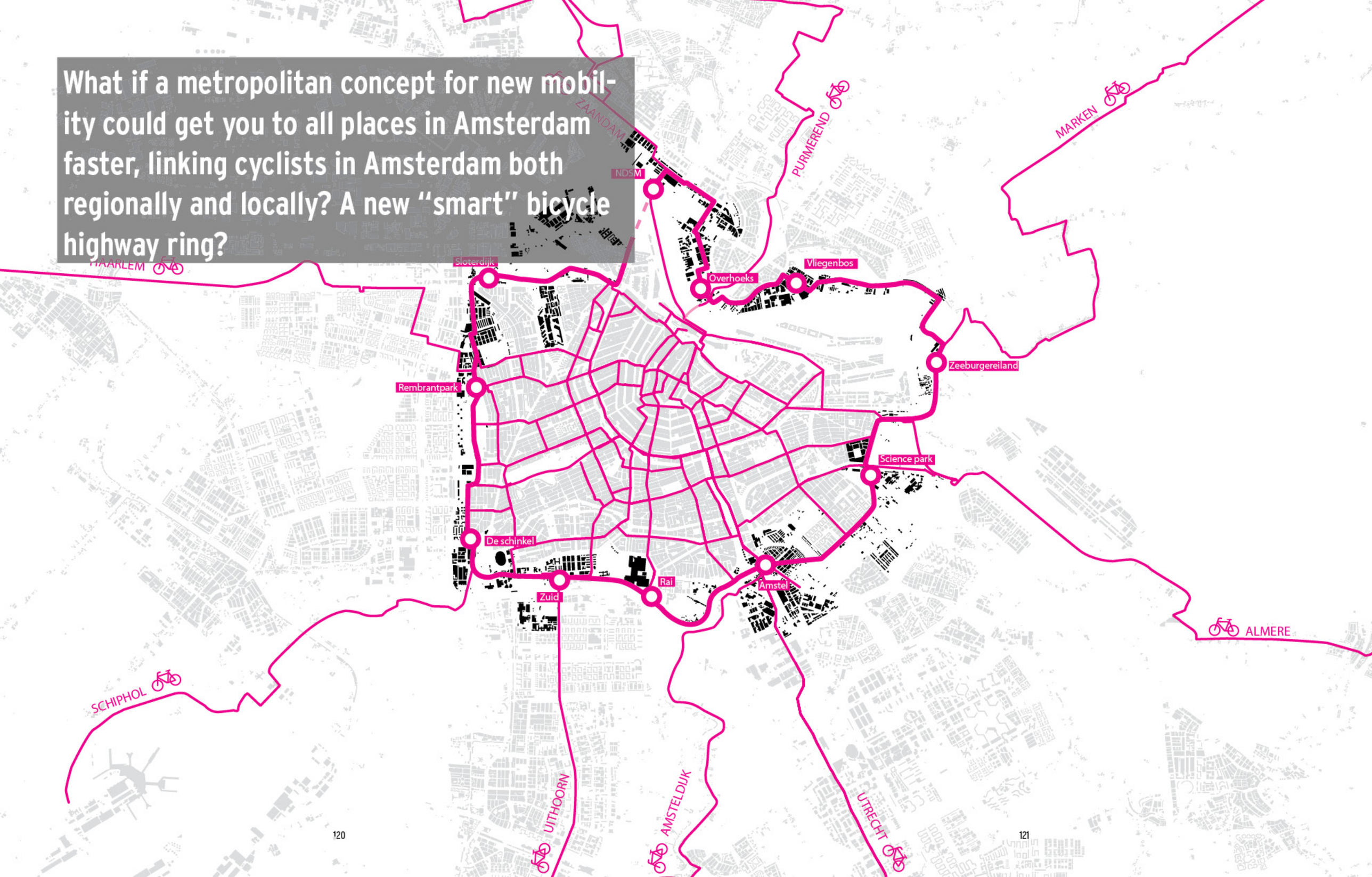
Since 2000, cyclists in the Netherlands travelled a total of 14 percent more kilometres. This is partly a result of population growth and partly due to the fact that people also use bicycles more often and travel longer distances on them. This increase applies for all travel journeys, except for shopping. Older people in particular account for increased bicycle use, as there are now more senior citizens and they cycle more often. Journey distances by bike have increased, which is related to expanding provisions and urban sprawl, which has therefore made home-to-work journey distances longer. Bicycles are increasingly used in combination with train journeys. Currently this applies to 4 percent of all bicycle trips. According to estimates, approximately 6 percent of all Dutch people above the age of 12 own an electric bicycle. E-bike kilometres primarily concern new transport and also replace normal bicycles kilometres.

- Source: 'Mobiliteitsbalans 2012', Kennisinstituut voor Mobiliteitsbeleid (KiM), Ministerie van Infrastructuur en Milieu, 2012

**While Amsterdam's bicycle network remains the most popular as you get closer to the centre, the transition between the inner city network and periphery remain unexplored.**

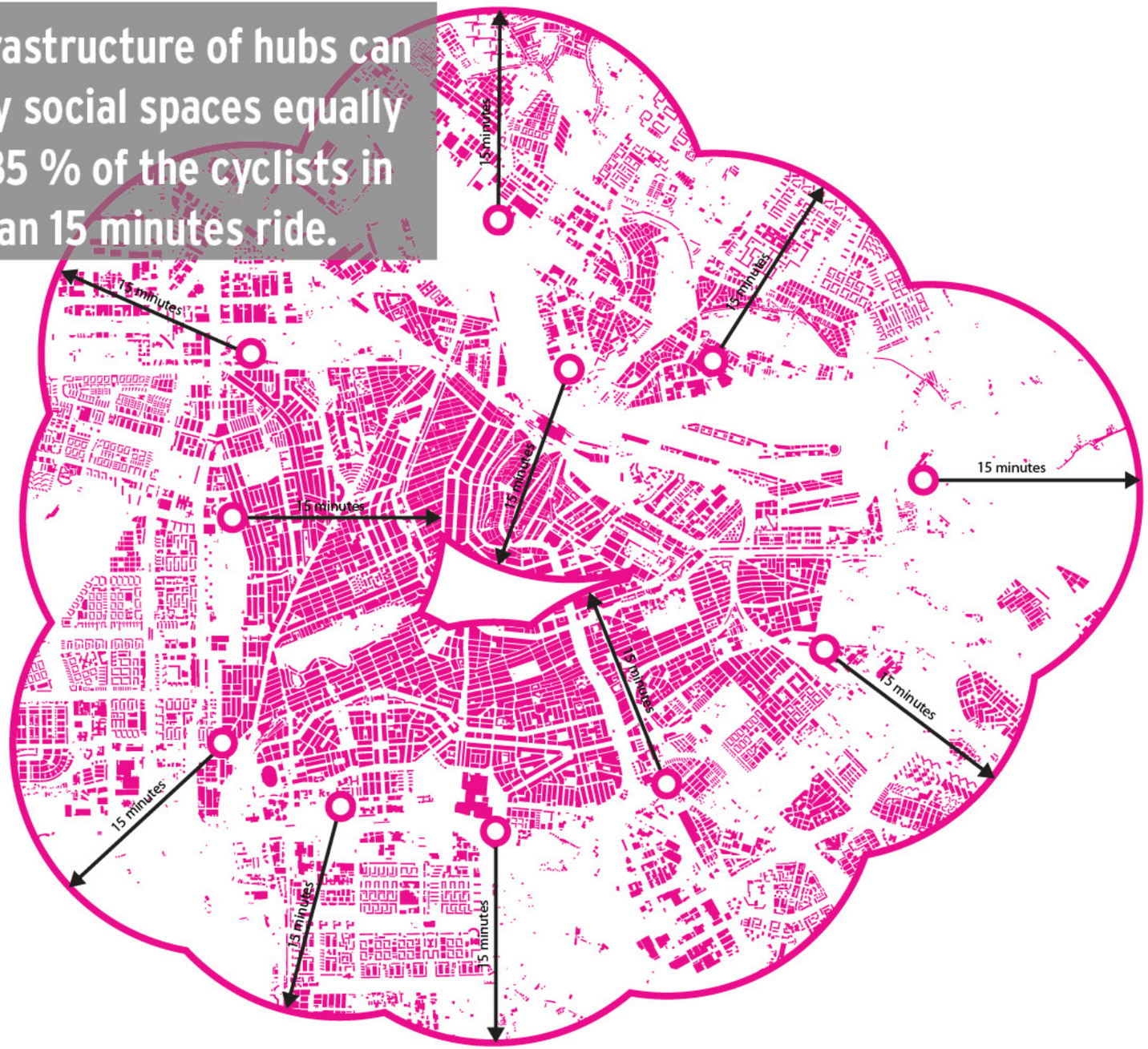


**What if a metropolitan concept for new mobility could get you to all places in Amsterdam faster, linking cyclists in Amsterdam both regionally and locally? A new "smart" bicycle highway ring?**



**This new bicycle hubs can re-invigorate aging infrastructure and under used areas as new in-between stop over points from trains, metro and busses for quicker bicycle journeys.**

**This new mobility infrastructure of hubs can then create new lively social spaces equally distributed for over 85 % of the cyclists in Amsterdam in less than 15 minutes ride.**



**What if these new hubs could function not only as bike stations to transfer to other traffic modes, but also make repairs, for coffee houses, special lecture halls, shared learning spaces and student centres?**

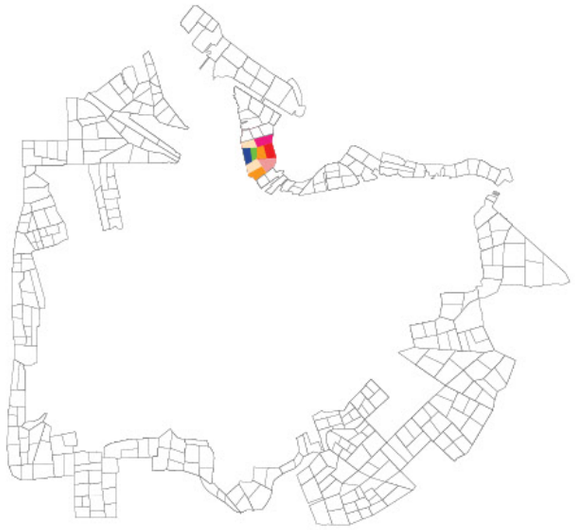
**And what if we were to inaugurate it as the ‘King Willem Alexander Bicycle Highway’?**

# PART 2
# Design



# Pilot Projects

The purpose of the pilot projects was to ask three design based offices of different disciplines (architect, interior/product designer, landscape architect/ urbanist) to explore in greater detail future educational spatial models together with other specialists in the fields of education, the knowledge economy and urban planning. Each team was to choose a site or sites generated by the Campus City Project map and to test out the design potential of the research into the "start up campus" concept as a new and innovative approach to "experience" education.
Each project took as its starting point, the role of the student as entrepreneur, the exploration of new forms of the educational campus and innovation as the new economic motor.

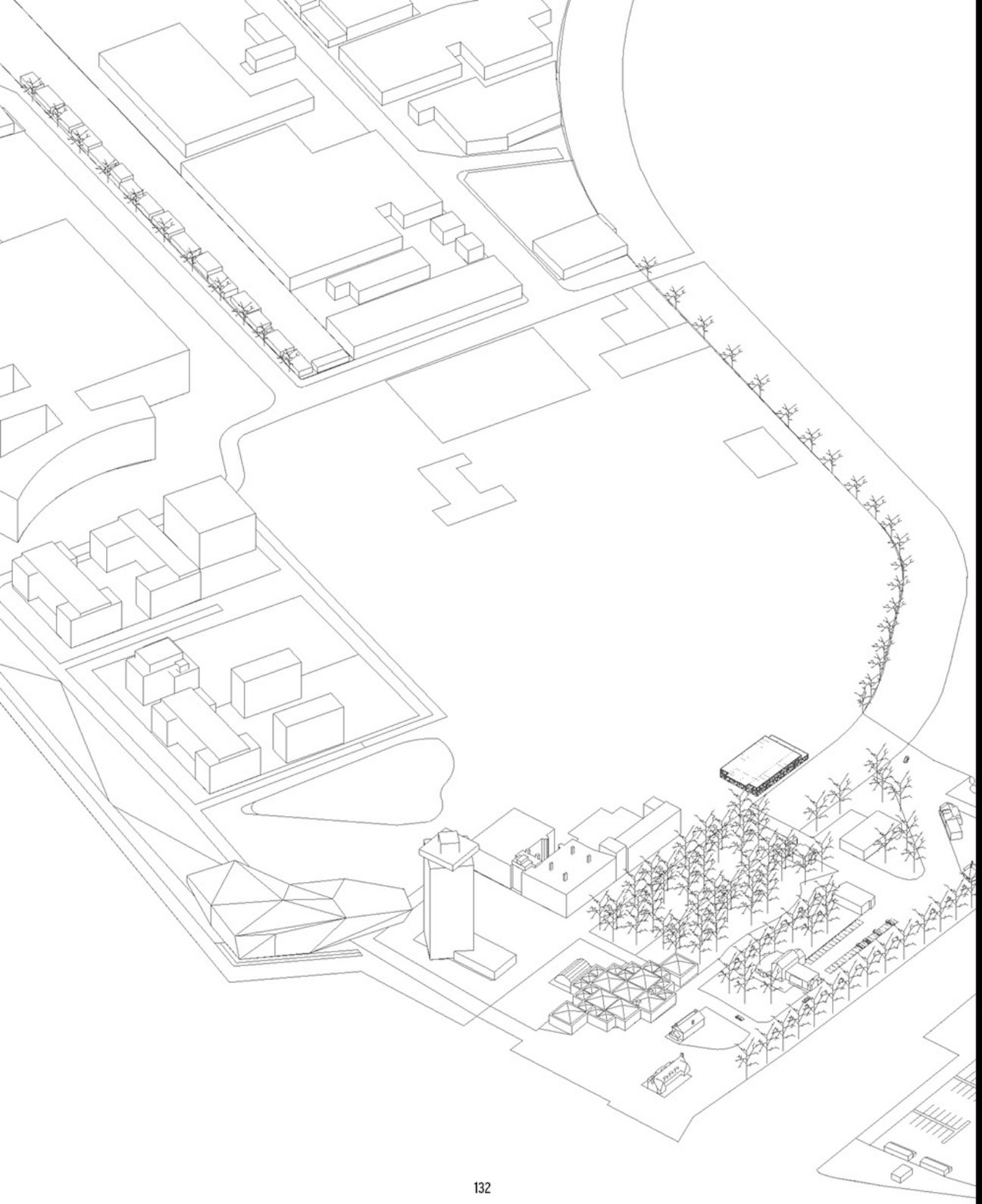




Pilot Project 1

# What happens if we could create an Instant campus?

Project by **OeverZaaijer a+u/Burton Hamfelt A+S+P:**
John Bosch, Wilco Spuijt, Roksena Nikolova and Burton Hamfelt and  Ilse Landwehr Johann



# The Instant Campus

## What if we could create a new real estate structure to develop the Campus City?

Overhoeks area is an ambitious and high quality urban plan in Amsterdam North that due to the economic crisis remains undeveloped and in waiting for better times. Instant campus city explores ways to usurp conventional investor based funding for large scale urban plans and incubate them with smaller scale innovative functions that are both now in high demand and can move in fast and leave easily. Student housing but also temporary alliances with 'study abroad' facilities for top ranking universities in search of new types of educational experiences where the interchangeability is the key driver. Not unlike 'void metabolism' in Tokyo, this is a fast paced interchangeable urban condition develops rapidly through high density super low rise urbanism.

## How can it work?

Through an initial value reduction in the land, new and more opportunistic urban settlements can emerge and build back value into the area and test out new ideas. A modular development grid is established on the site to generate an intense variety of indoor and outdoor spaces. Cars are not allowed and the size of building plots are intentionally kept small. This allows for an expanded and very flexible user base because of low step-in costs and increased market potential. Much needed student housing, new types of project based university/college enterprises can be provided through close collaboration with the local and multinational businesses already located on Buiksloterhampolder.

# Towards a new symmetry
## - towards a new campus model

Imagine a stadium full of supporters creating a lot of noise when suddenly, out of nothing, they collectively synchronise their clapping or create waves or, after the game, spontaneously mocking an inner city event. Once a choice is made other choices fall out of the equation. This form of collective transition in quantum physics is called, spontaneous symmetry breaking.

Spontaneous symmetry breaking is a mode of realization in a physical system, where the underlying laws are invariant under a symmetry transformation, but the system as a whole changes under such transformations. Most simple phases of matter and phase-transitions, like crystals, magnets, and conventional superconductors can be simply understood from the viewpoint of spontaneous symmetry breaking.

Can we imagine the development of cities over time in a similar way, a history of phases, a series of points in which spontaneous symmetry breaking have occurred? If we consider our urban environment as a spatial result of economic conditions, a specific symmetry belonging to a particular period of economics, say the industrial era, can the present economic crises be seen as a new spontaneous break in the old symmetry?

Although the Netherlands as a whole seems to camp in an enduring recession, the economy of Amsterdam is still buoyant, attracting young people to settle in the city where opportunities are the best for them either to find a job or start their own company. Recent research by the Lisbon Council shows us that a large part, 90% of Europe's urban economy is made by companies smaller than 10 people. Even in Amsterdam with its large financial centre, 90% of all companies are smaller that 10 people. But if we compare this reality with what has been built over the last decades we see mainly large offices in isolated areas along highways made for large companies, with easy accessibility an visibility (from that same highway). While the whole building world focussed on this 10% of the market the other 90% stayed invisible. They moved in the old buildings, preferring locations in or close to the city centre. A lot of these locations have a temporary character while waiting to be demolished or renovated for the buyers market.

This buyers market worked well given that money making was the goal. Big companies were attracted by big tax deals. Big offices where easily financed by banks, sold to big (German) investors and the city made big money by selling the land. With the bank crisis this economic system collapsed and a lot of big office buildings stayed empty. Because the rising economy in Amsterdam is based on small companies, they prefer to work in the city, not next to a highway.



The other big buyers market was housing. While young people used to be the ones that wanted to rent, this group moving into the city financed on the basis of their future income were buying apartments in the city centre both from the private sector but increasingly more from housing associations that are selling their housing stock. Young city dwellers income has created whole new thriving neighbourhoods, where trendy shops clubs and restaurants have popped up everywhere. While the city was planning the new far west and far east (IJburg), the young new comers and 'expats', where taking over old east and old west. And now that they are getting older they don't move out to the far areas as they where supposed to do, they want to stay in the area they have created in the centre of the city.

The buyers housing market, including first time buyers, was focused on who could afford to buy a house, the couple that settled down, with careers and a (future) family, not necessarily on those who formed a large part of the demand; the increasing flux of young people who came to Amsterdam to study and work.

In the past ten years the amount of university students in Amsterdam have doubled from 55.000 to 110.000. Although the peak of dutch students is expected in 2020 due to demographic figures, there are indicators that the demand on student housing could still rise. One them is the increase of foreign students another the policy change of the government. Free travelling by public transport encouraged students to live either at cheaper places elsewhere of at home. An increase of affordable student houses in Amsterdam and the abolishment of free travelling in 2014 will create a new group of students who would like to live in the city where they study.

At the same time the group of students and young professionals seeking a future in Amsterdam increases. Couples move to the bigger cities where the chance for both finding the right career start is the higher. The other way around companies move to Amsterdam because the conditions are good and they can find the right people for their business.

**The buyers market was focussed on money, not necessarily on the real demand: the flux of young people who come to Amsterdam to work and study.**


# A short history of temporary urbanism

In 1832, the city council decided to construct a dam of brushwood to deposit the mud from the IJ. The work was accelerated when in 1848, workers in Western Europe rebelled against poverty. However, the money was spent before the work was completed, and a second collection among wealthy individuals was a fiasco. It was then sold to Francis Wessellus Josephus Beukman. He made the reclamation with a steam engine that powered two pumps. Economically it was not a success, it was used by some peasants, but the 200-acre polder remained empty apart from some large discharge areas, for decades empty.

In 1900, Johan van Hasselt, the new director of the municipal Department of Public Works, designed a new large area on the north side of the IJ. The polder would mainly be used for heavy industry and port activity, moving polluting industries out of the centre of the city. The low land costs and the favourable situation on the IJ made it attractive for private companies to settle here. Here and there a village would be founded for the workers of the future factories and shipyards, over time, more and more companies settled in the Buiksloterham.

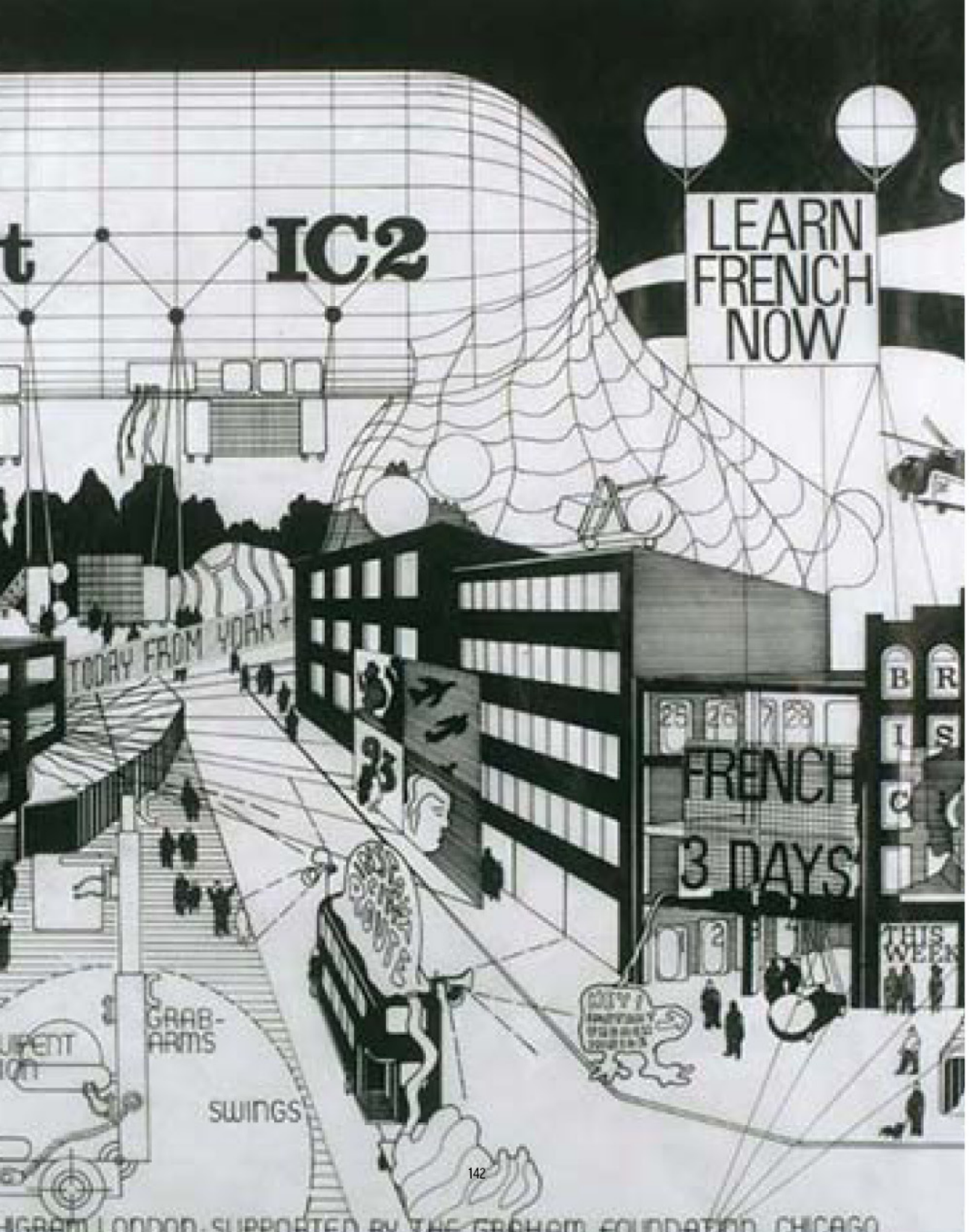
From 1914 the housing shortage increased to unprecedented levels. The newly established Municipal Housing Department commissioned 306 houses, "The orange crates of Wibaut". The houses were of poor quality, with moisture and pest problems as a result. It would exist for only twelve years and after the departure of the last inhabitants in 1929 burned down. In 1919 the ELTA (First Aviation Exhibition Amsterdam) took place. This was the starting point of the industrial activities, when Anthony Fokker in 1919 his first Fokker airplane factory established. In 1951 the company moved to Schiphol-Oost. In 1913 the premises of Fokker were taken over by the Batavian Petroleum Company built a small laboratory in the southern part of Buiksloterham which later formed the basis for Royal Dutch Shell. Shell expanded, in 1938 the ENTOS-site was purchased, together with part of the Tolhuistuin, the IJ pavilion and marina.

The NSM (Dutch Shipbuilding Company) was founded in august 1894 by Jacob Theodoor Cremer, a wealthy politician and moved to the northern shores in 1919. On this site the company grew to become the biggest shipbuilder in the world in 1937. Nine years later it merged with a docking company taking on the now still known name of NDSM. It was to become the first of many merges. At the same time activities were slowing down rapidly through fierce competition from docks in Asia. In 1978 it closed its doors only to re-emerge as small repair dock till these days. The step by step extension of Shell and the rise (and fall) of large industrial buildings created an urbanism very typical for the northern shore area. These unplanned mix of buildings of all sizes and styles built on privately owned land form a diametrical opposite to the strictly government organised housing projects. Initiated at the same time as the Shell laboratories, the Berlage housing areas in Amsterdam are now an urban monument while at the northern shore almost nothing is left of what was built a hundred years ago.


**With the development of Overhoeks on hold it seems as if history is repeating itself. How can we restart, what would be the new symmetry for this area?**

## The history of the nothern shores as a temporary city is possibly Overhoeks most underestimated value for the future.

Rather than the tabula rasa tactic, the urban principle for The Instant Campus would be one that sees the history of unplanned existence, that continues change and temporary character of the northern shores as a starting point. The future of the area would be a future already on its way.  New forms of living and working are already taking place here, new forms of development implemented. The EYE institute, Tolhuistuin, beach places and the creative companies and festivals on the NDSM terrain attract large quantities of people that specifically like these different conditions. The initiative of Twenty 4 with mixed program from club to hotel in the former Shell tower is the latest of these developments.






# The Instant Campus

mind over matter

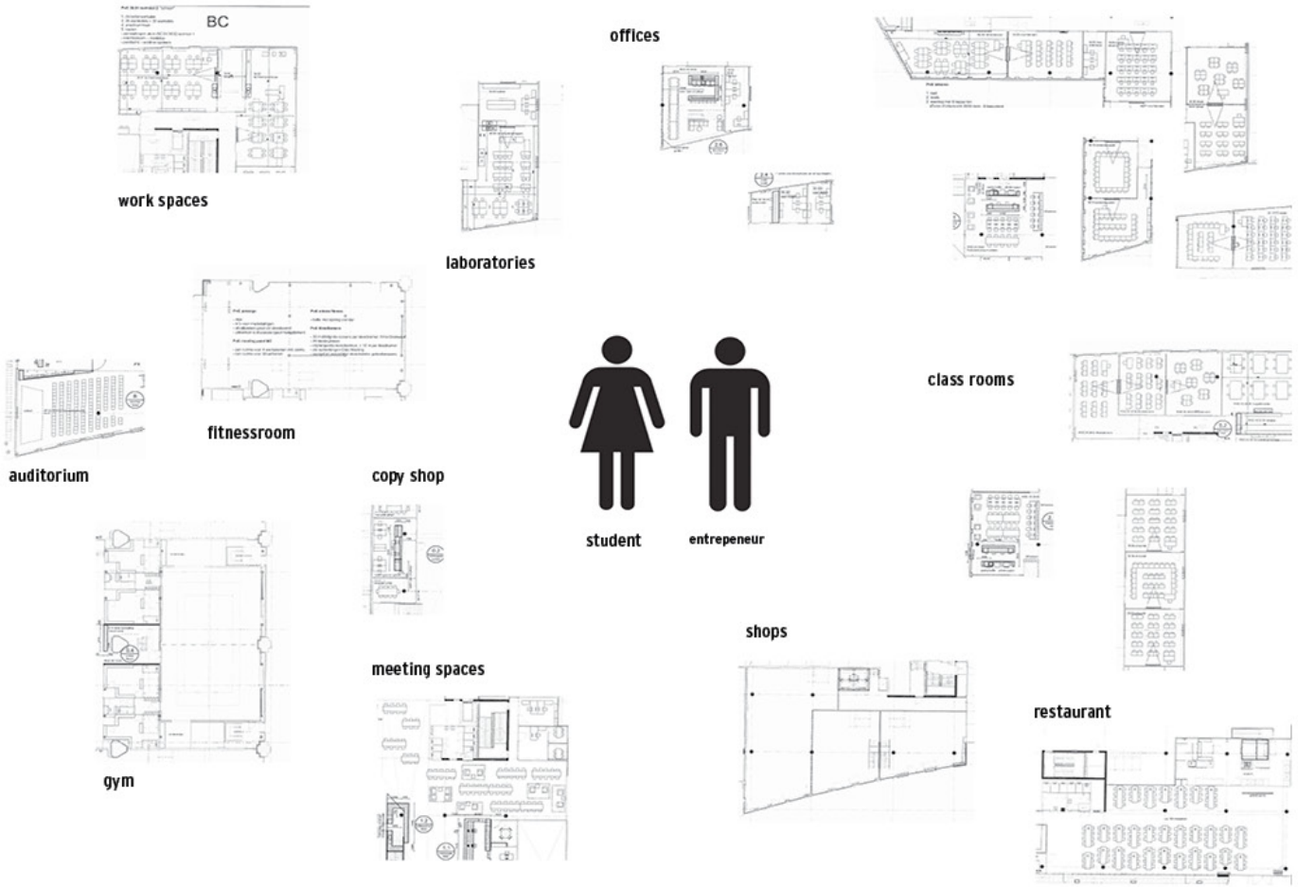
The instant campus takes housing for students, education and young entrepreneurs as an integral part of the cities development. Heavy investments in the purchase of land leaves two options; waiting for the financial crisis to go by and continue in the same way as before or, to start an alternative form of real estate right know. The temporary character of the campus based on the system of renting rather than buying the land, the building or the room, allows for constant change. It allows the area to be built up quickly in order to become valuable over time as more and more buildings occupy the empty parts through private initiatives.

The strategy behind The Instant Campus is to create a form of development that can start within the current financial malaise. Through an initial value reduction in the land, new and more opportunistic urban settlements can emerge and build back value into the area. To start a modular development grid is established on the site with the intention to generate an intense variety of indoor and outdoor spaces. Car access is limited and the size of building plots are intentionally kept small. This allows for an expanded and flexible user based market potential with initial low step-in costs and over time increasing value of land.
Much needed student housing, small working places combined with new types of project based university/college enterprises provided through close collaboration with municipalities and businesses could lead to a new form of development on a unprecedented urban scale.

Plan description

1. Increase quality of empty land with minimal infrastructure and urban agriculture
2. Allow “temporary” student housing over the whole area
3. Stimulate university and companies to start educational initiatives
4. Keep space for developments such as restaurants hotels and other services
5. Sponsor new urban infrastructure (bike ring) with income from private initiatives

Instant City by Archigram 1964




**If we split big educational buildings into smaller functional parts it can be used by students of all levels, start-up companies and by the people living in and around the campus. Rather than separating students in large introvert buildings, the campus would be a place to meet and exchange outside. Rather than efficiency by minimising square meters we propose efficiency in maximising the use of educational buildings. In this system institutes can grow or shrink or change, move in or out without big financial consequences.**



# The Instant Campus as an incubator

- the new economic symmetry of the campus

"Incubators encourage entrepreneurship and minimize obstacles to new business formation and growth, particularly for high technology firms, by housing everybody in one facility, a number of fledging enterprises can share an array of services. These shared services may include: meeting areas, secretarial services, accounting, research library, on-site professional and management counselling, and computer word processing facilities."
(source: Office of Women's Business Ownership)

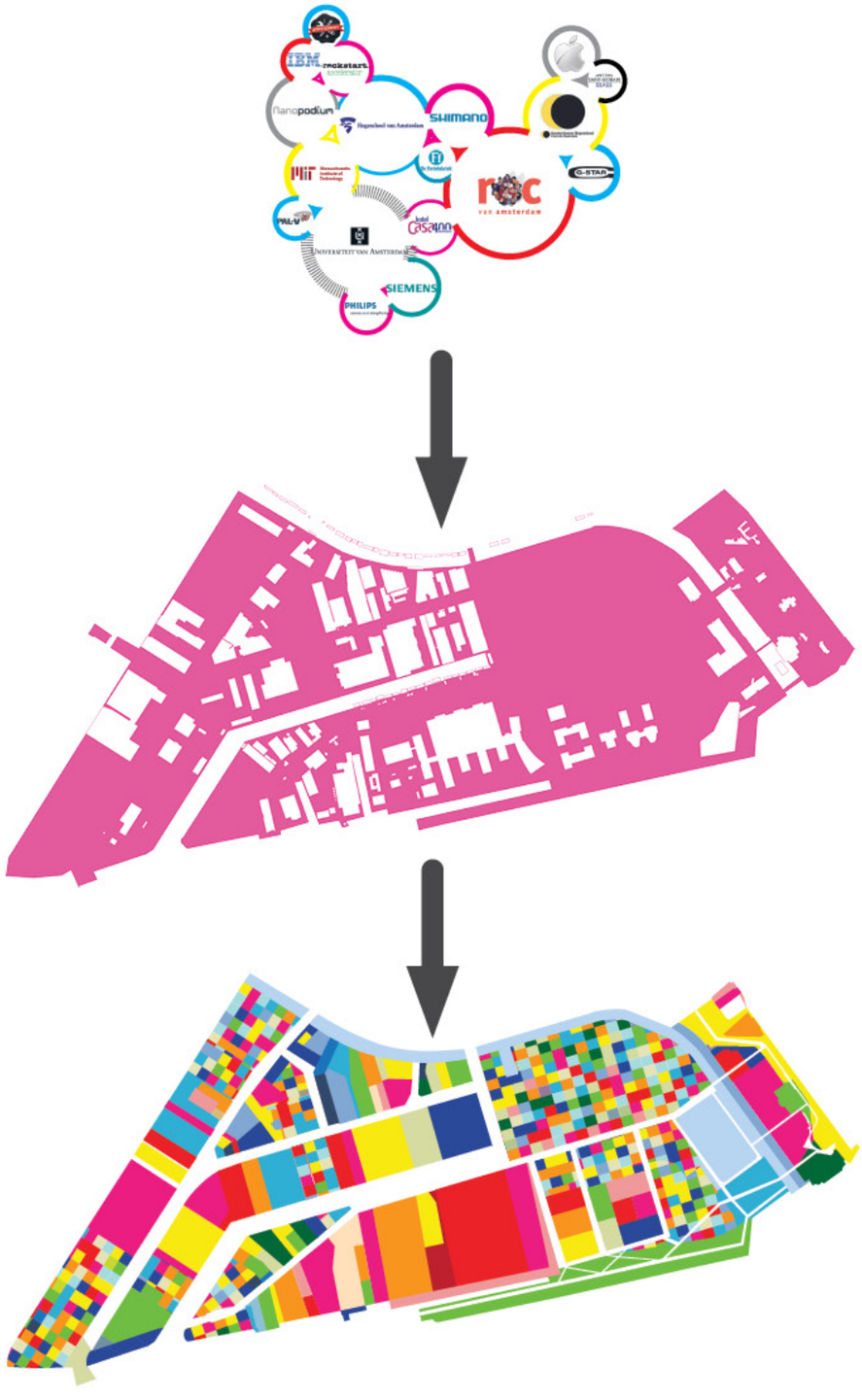
The development of incubators as start ups for new urban development by lowering the threshold for start-up companies, can be a valuable if not crucial addition to the present policy of stimulating the innovative economy. While the traditional Amsterdam policy of "breeding places" focuses on affordable working spaces for artists and creative entrepreneurs, incubators focus on the exchange of knowledge between the academic world and the small start-ups using new techniques that could eventually lead to new high-end companies. Due to its intended locations close to universities and services in the centre of Amsterdam. Incubators are the core of Campus economy. The instant Campus focuses on smart rather than cheap development.
By bringing together housing, places to study, working places and facilities the campus goal is literally to bring together those involved in an inspiring environment.

**The new college for sustainable urbanism**
In the model of the incubator the mix of people, institutes and therefore the urban mix of program is crucial. Cooperation between universities and other educational institutes would be a way to combine existing knowledge from different faculties, from craftsmanship to theoretical studies. Cooperation with companies can lead to new products, new techniques, new solutions for practical problems such as energy or food supply and water consumption or, mobility and so on. In the college of sustainable urbanism the focus would not be on new institutes, a new university or more studies but on the way we can combine knowledge, where synergy can be found and how this can be made available to others.

"plans are nothing planning is everything"

Zef Hemel (deputy director spatial planning - City of Amsterdam)

top view of Tokyo's city fabric implemented on Buiksloterham

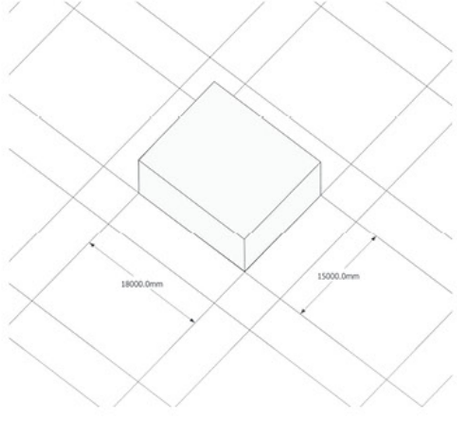



# Small is beautiful

*Small Is Beautiful: Economics As If People Mattered* is a collection of essays by British economist E. F. Schumacher. The phrase "Small Is Beautiful" came from a phrase by his teacher Leopold Kohr. It is often used to champion small, appropriate technologies that are believed to empower people more, in a bottom-up development.

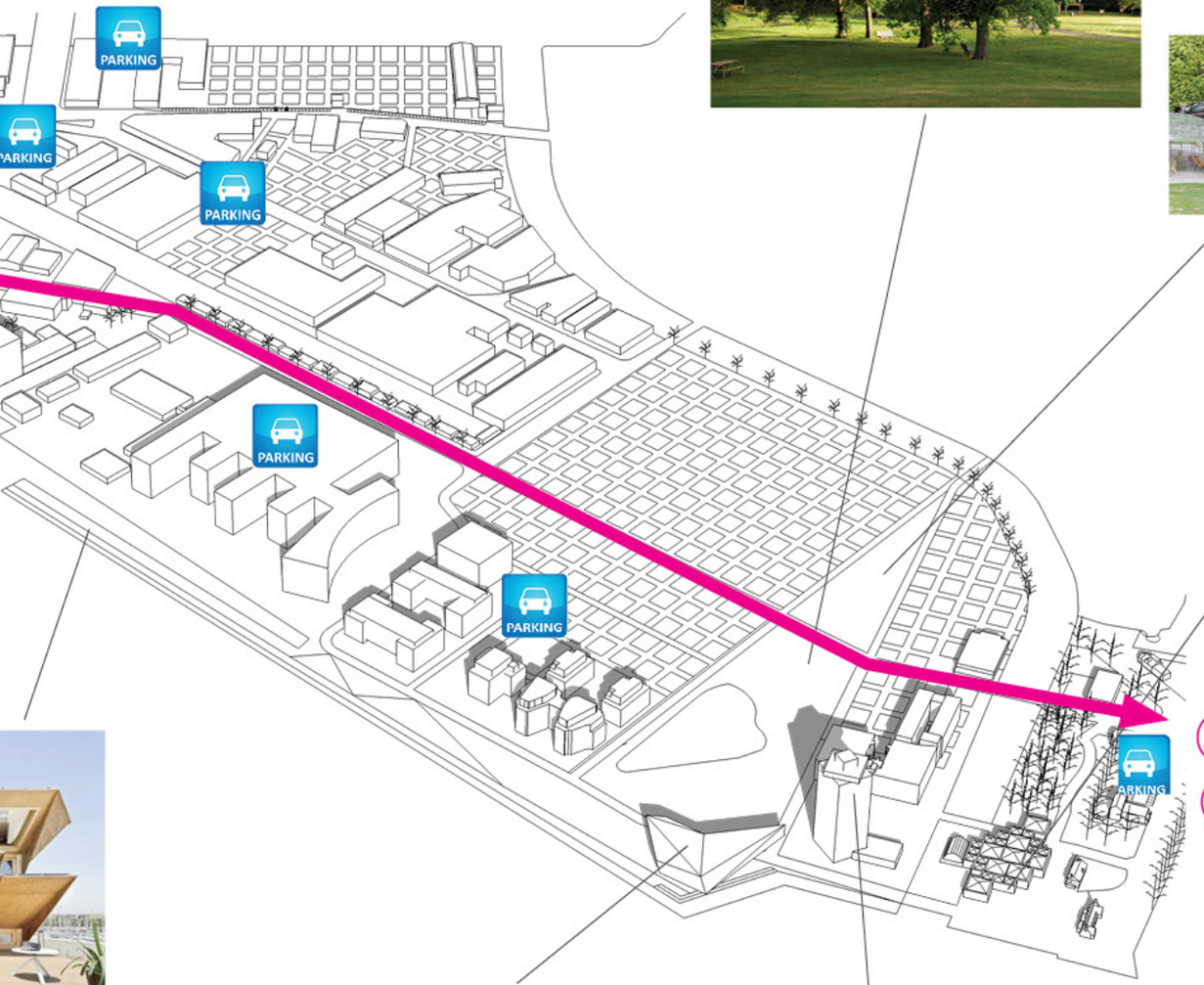
What works in technology as described in the book by Schumacher is applied here as an urban strategy. Breaking up the big educational buildings into smaller, multifunctional and more flexible buildings has been the initial idea behind the "Campus Without Boundaries." This same principle is applied on a urban scale. Small buildings lower the threshold for investment and the risks that are involved. It lowers the complexity and therefore increases the chances of projects being realised. Last but not least it makes the group of potential initiators larger, allows more diversity and potential change of program over time.

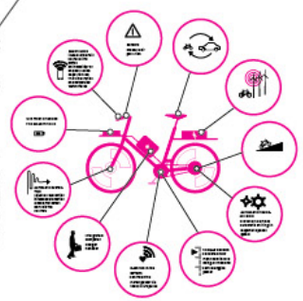
The concept is based on using what there is now. The proposal for the area is based on a plot grid structure. The size of each plot is fixed on fifteen by eighteen meters to fit in a modular system based on three meters. This would make the surface of a building of five floors 1350 m2. It is divided by a space of six meters to allow access including taxi and emergency cars. The rest can be used for other public spaces, storage of bikes etc. The size of the grid allows for small communities and self organising collectively both in realising new buildings and in maintaining them. Investment in infrastructure is minimal. Being a campus so close to the central station the use of cars is limited. Existing parking places can have a double use for both offices and housing so no new parking places have to be made.

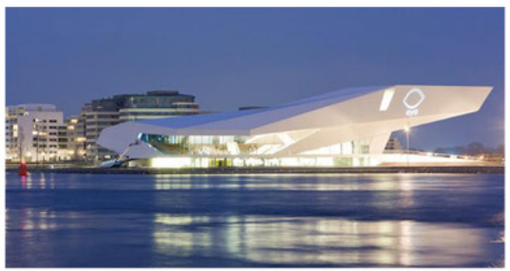


Unlike the rest of the ring, the northern shores are characterised by large buildings surrounded by large open spaces. Here is a possibility to work with large programs. Here the campus could become a small city in itself. It would be the first real campus, an implementation of the "third university" ambitions of the city on a large scale in which student housing is its main driving force.

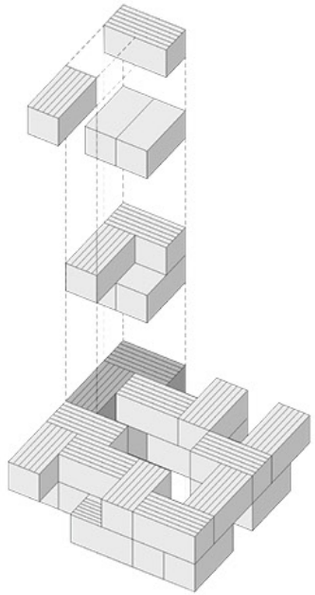
# Metropolitan Features



**The modular building system, based on sale and lease back financing, is the driver for the realisation of student housing, in particular and for the campus as a whole.**



# Modular, prefab, balloon, movable, re-use and other nontraditional building systems

Rather than buildings that demand large investments, building to last for more than 50 years we propose to make buildings that will have a more temporary character. In this world of the instant campus nothing is permanent as it always was on the northern shores of Amsterdam. Here flexibility has taken on a urban scale. Investment is based on financial return rather than the value of a building. Since the character of the buildings are temporal there is no long term value only short term profit both in money and in creating new opportunities such as student housing, sharing knowledge and creating new form of creative industries. Also the financing is different, private investment, crowd funding and above all sale and lease back structures that are based on relatively short 5 to 15 years return, replace the traditional real estate financing.







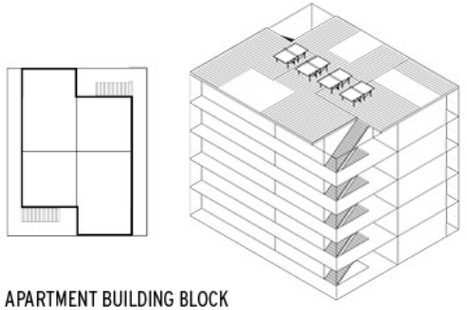




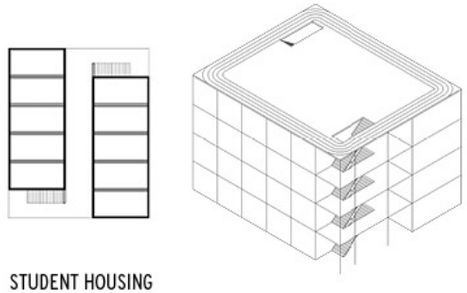




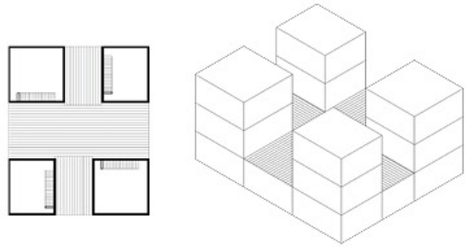

# Modular Prototypes



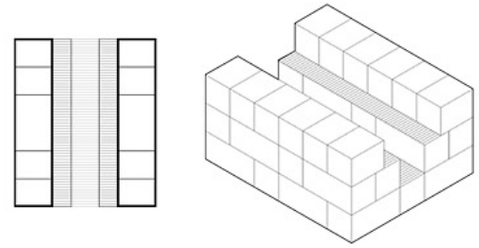
APARTMENT BUILDING BLOCK
(housing)
1250 sq.m



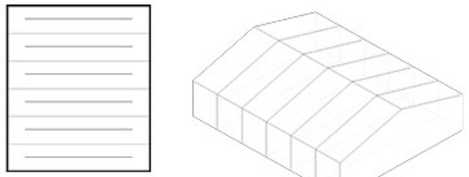
STUDENT HOUSING
(housing)
1000 sq.m



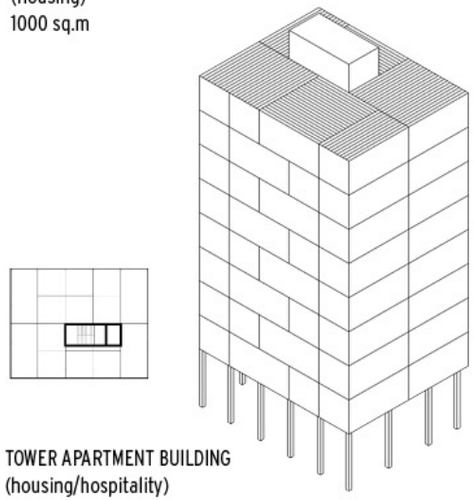
LINKED VILLAS BUILDING BLOCK
(housing)
540 sq.m



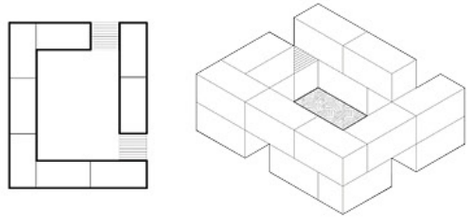
TERRACED STUDIOS BUILDING BLOCK
(housing)
540 sq.m



GLASS HOUSE
(agriculture/public/commercial)
270 sq.m

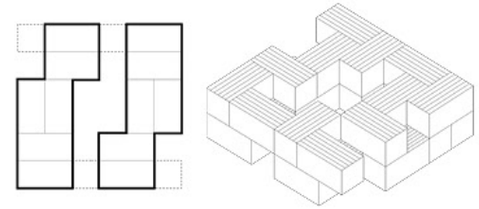


TOWER APARTMENT BUILDING
(housing/hospitality)
1,890 sq.m

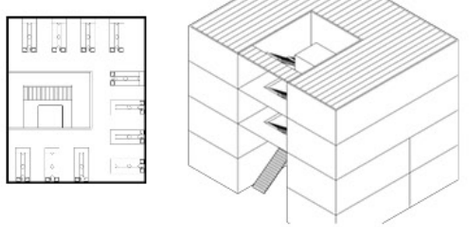


COURTYARD BUILDING BLOCK
(commercial)

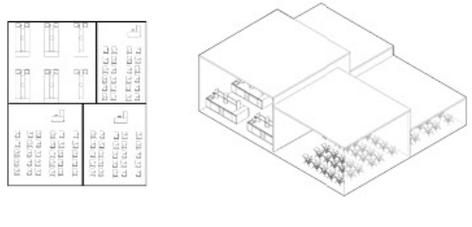
270 sq.m



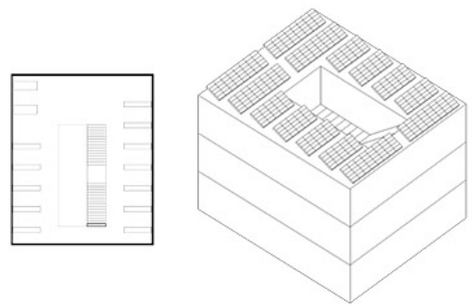
OPEN COURTYARD - STUDY/WORK UNITS
(educational/commercial)
450 sq.m



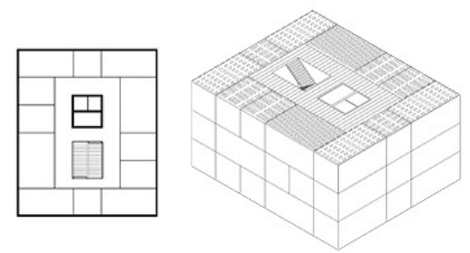
LABORATORY
(educational)
1000 sq.m



CLASSROOMS
(educational)
270 sq.m



LIBRARY
(public)
1000 sq.m

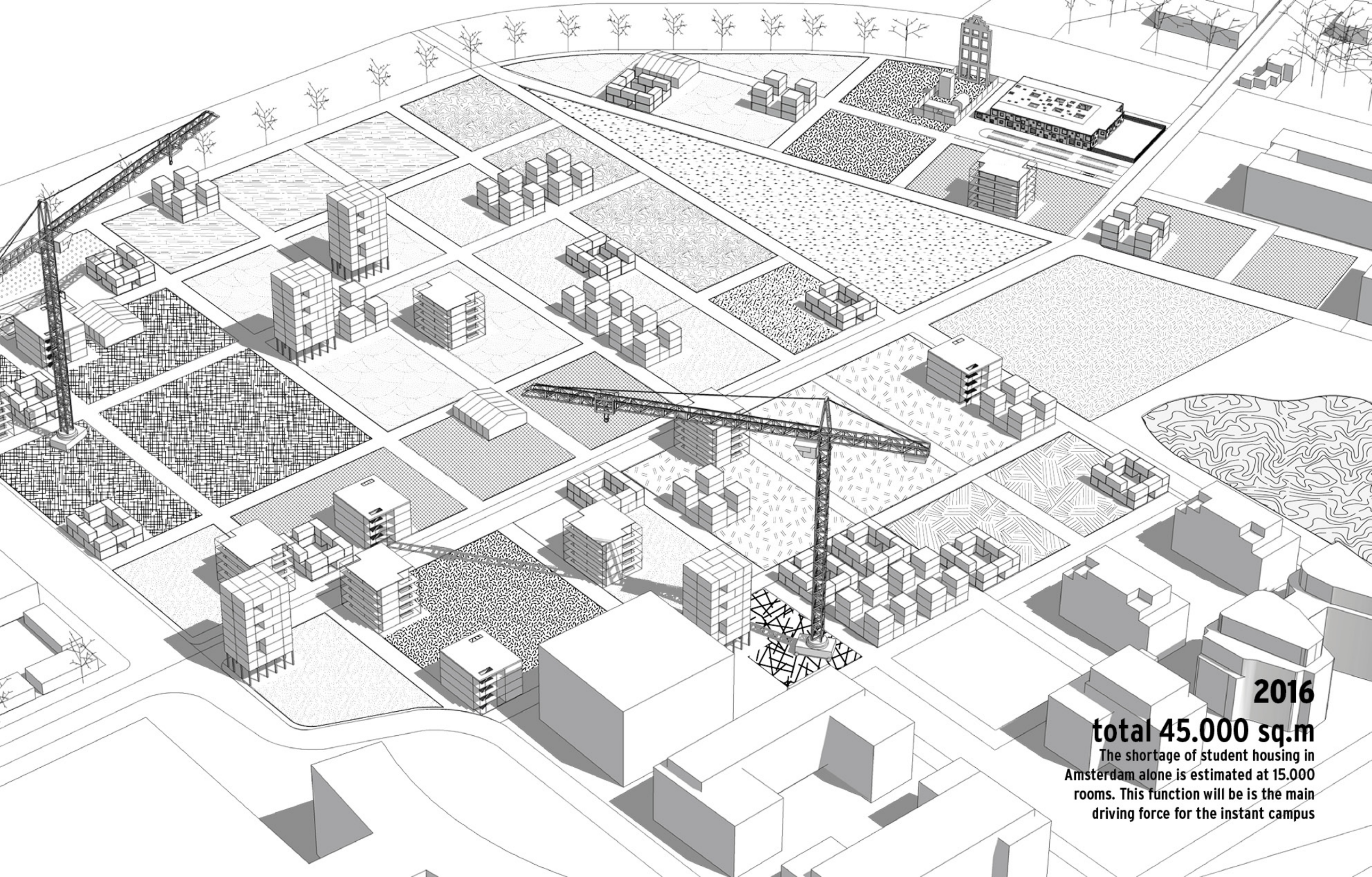


SMALL OFFICE
(commercial)
1000 sq.m

**2013**

**total 3.000 sq.m**

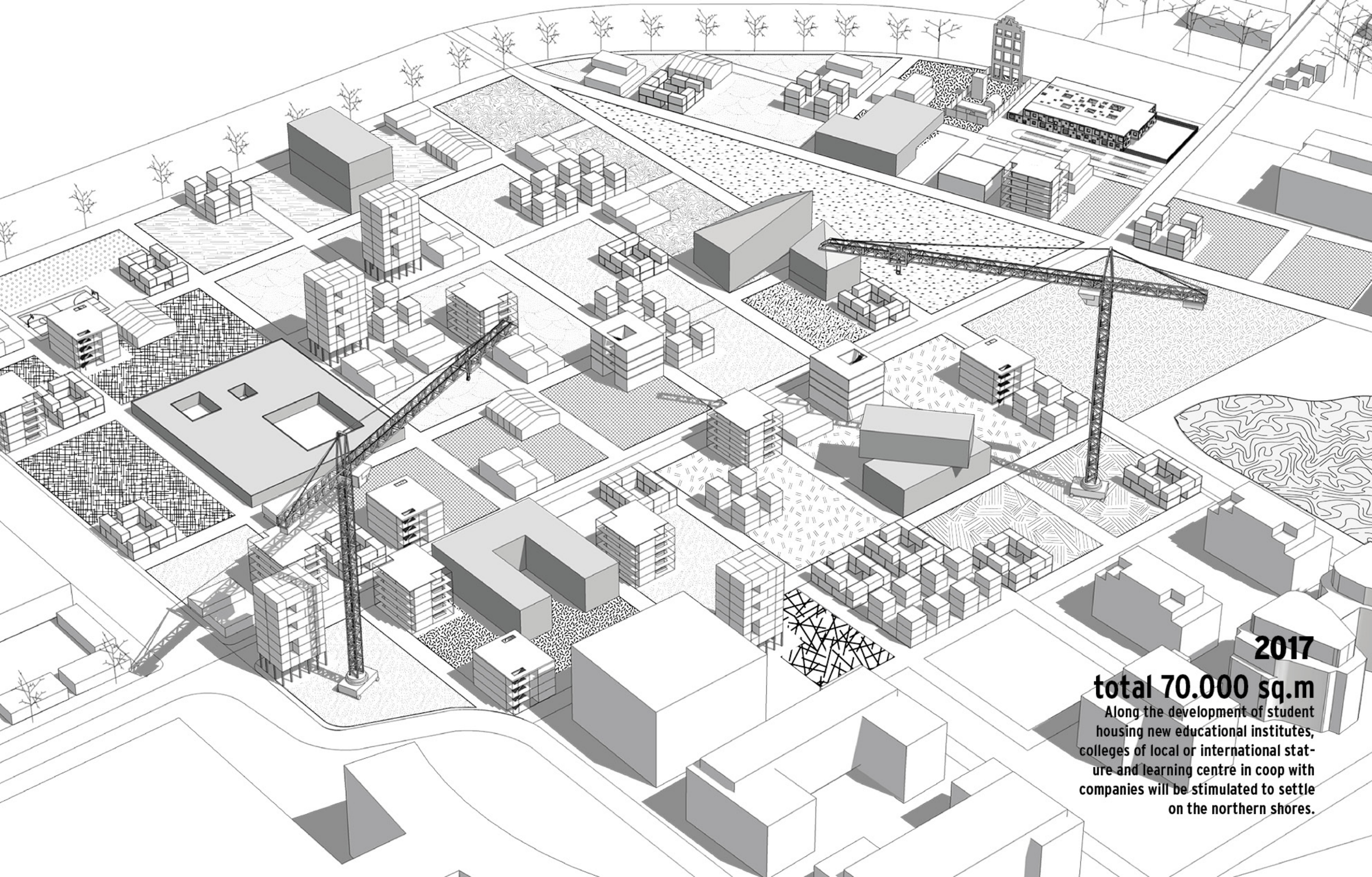
**To immediate improve the quality of vacant land areas are made available for urban farming for free until more intensive use of the plots are developed.**



**2016**

**total 45.000 sq.m**

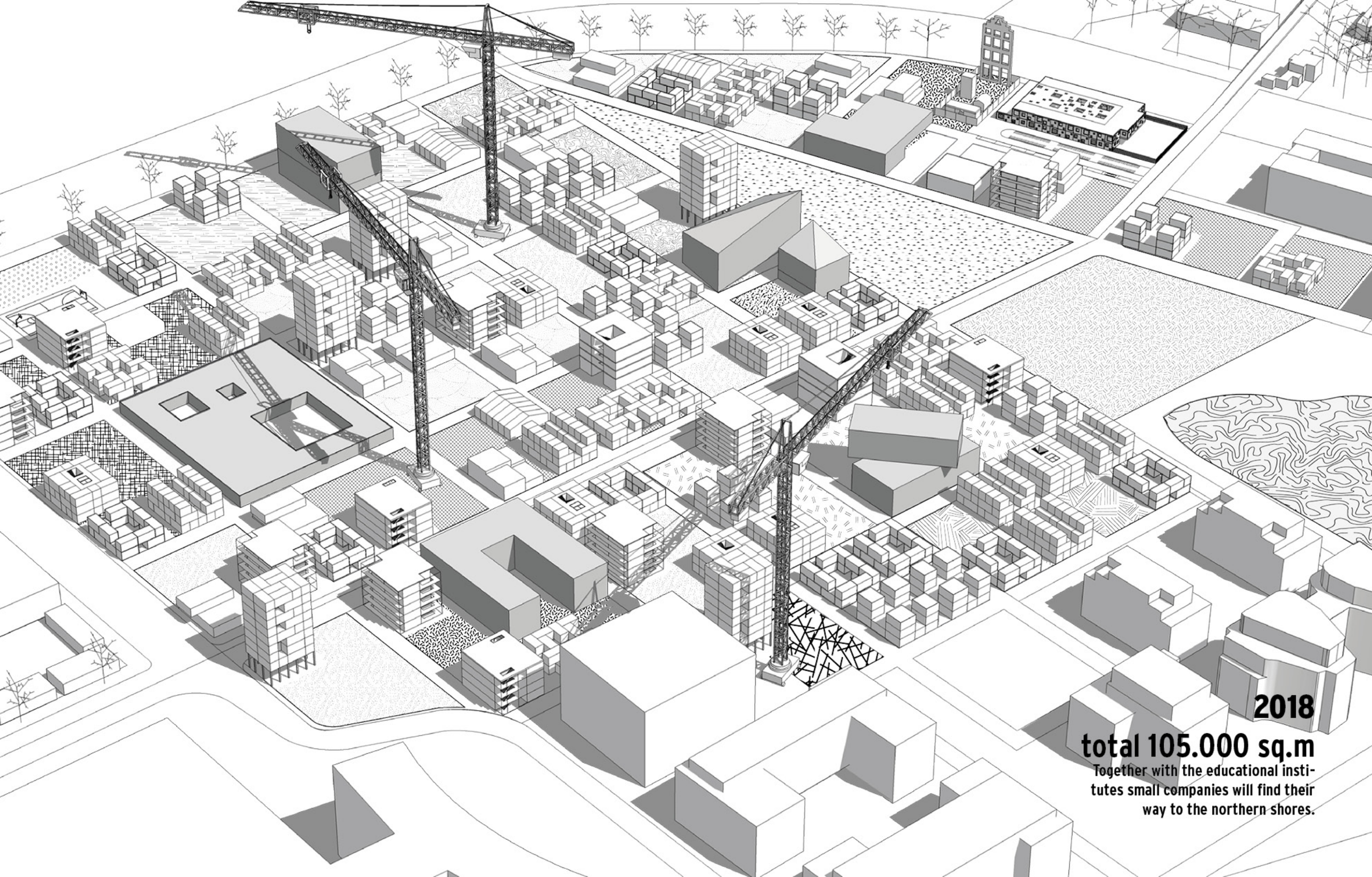
**The shortage of student housing in Amsterdam alone is estimated at 15.000 rooms. This function will be is the main driving force for the instant campus**



**2017**

**total 70.000 sq.m**

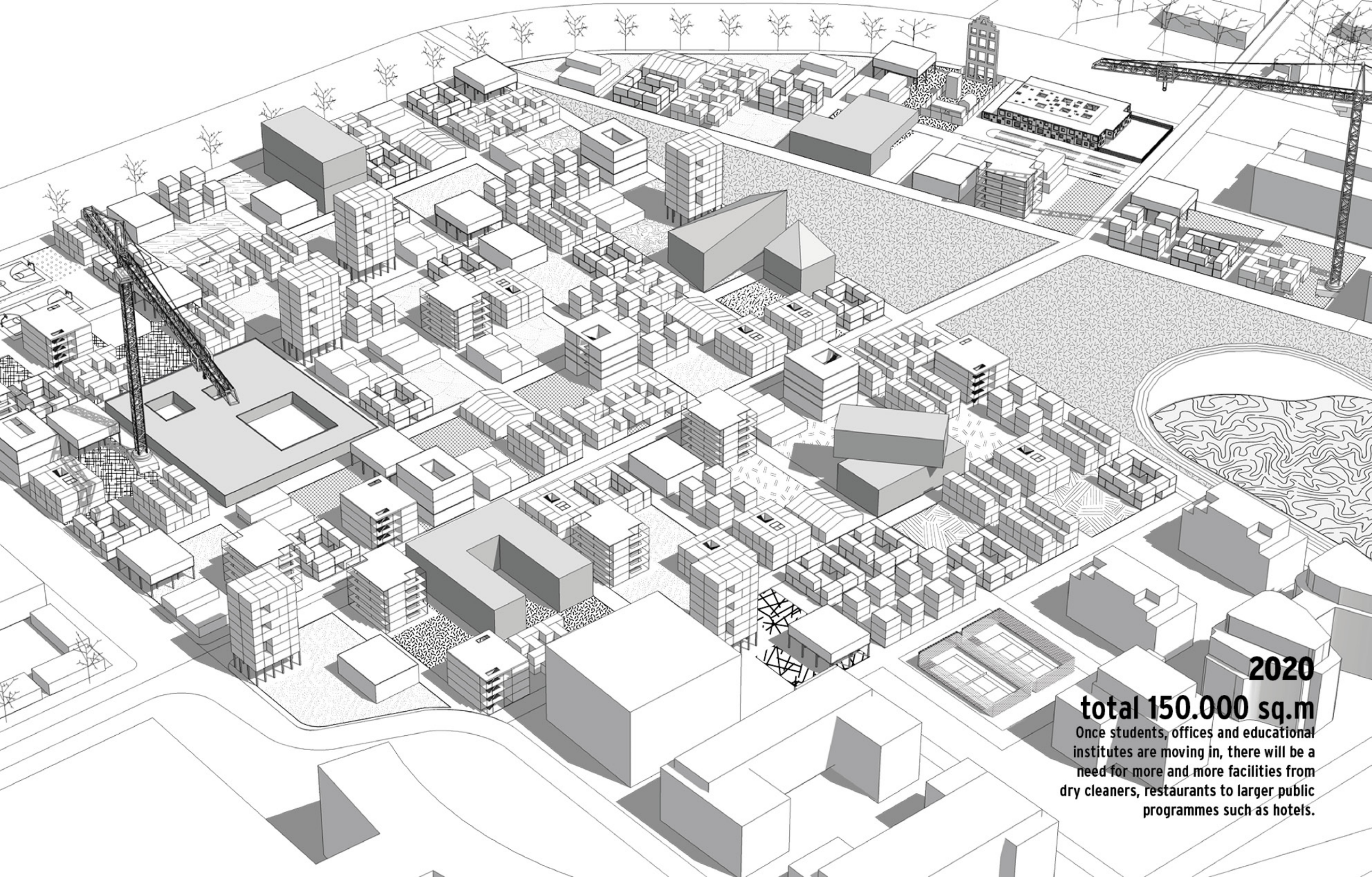
**Along the development of student housing new educational institutes, colleges of local or international stature and learning centre in coop with companies will be stimulated to settle on the northern shores.**



**2018**

**total 105.000 sq.m**

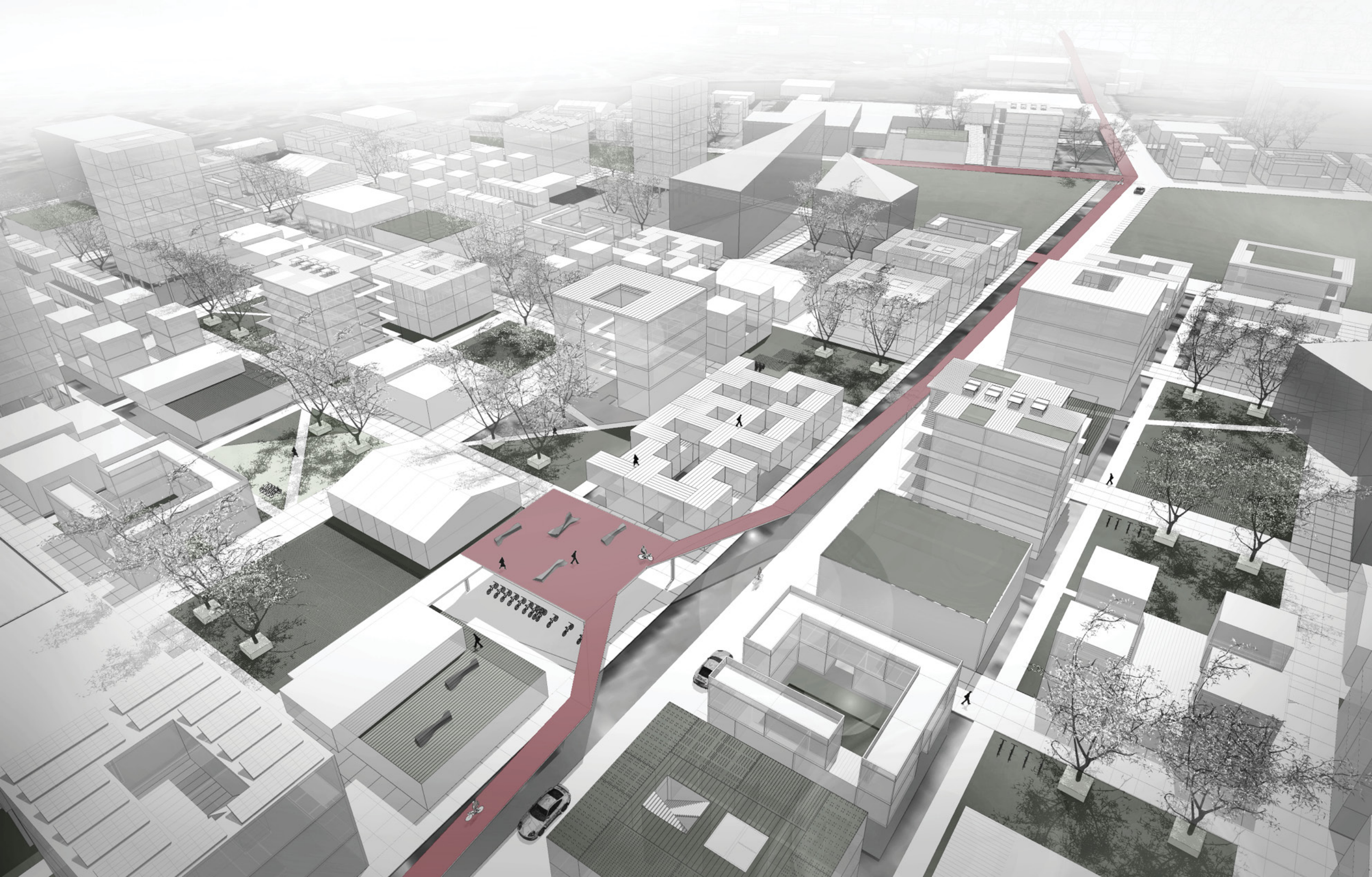
**Together with the educational institutes small companies will find their way to the northern shores.**



## 2020

## total 150.000 sq.m

**Once students, offices and educational institutes are moving in, there will be a need for more and more facilities from dry cleaners, restaurants to larger public programmes such as hotels.**



# Conclusion

"We are all very busy while waiting for things to come" Paulo Mendes da Rocha, Sao Paulo 1997

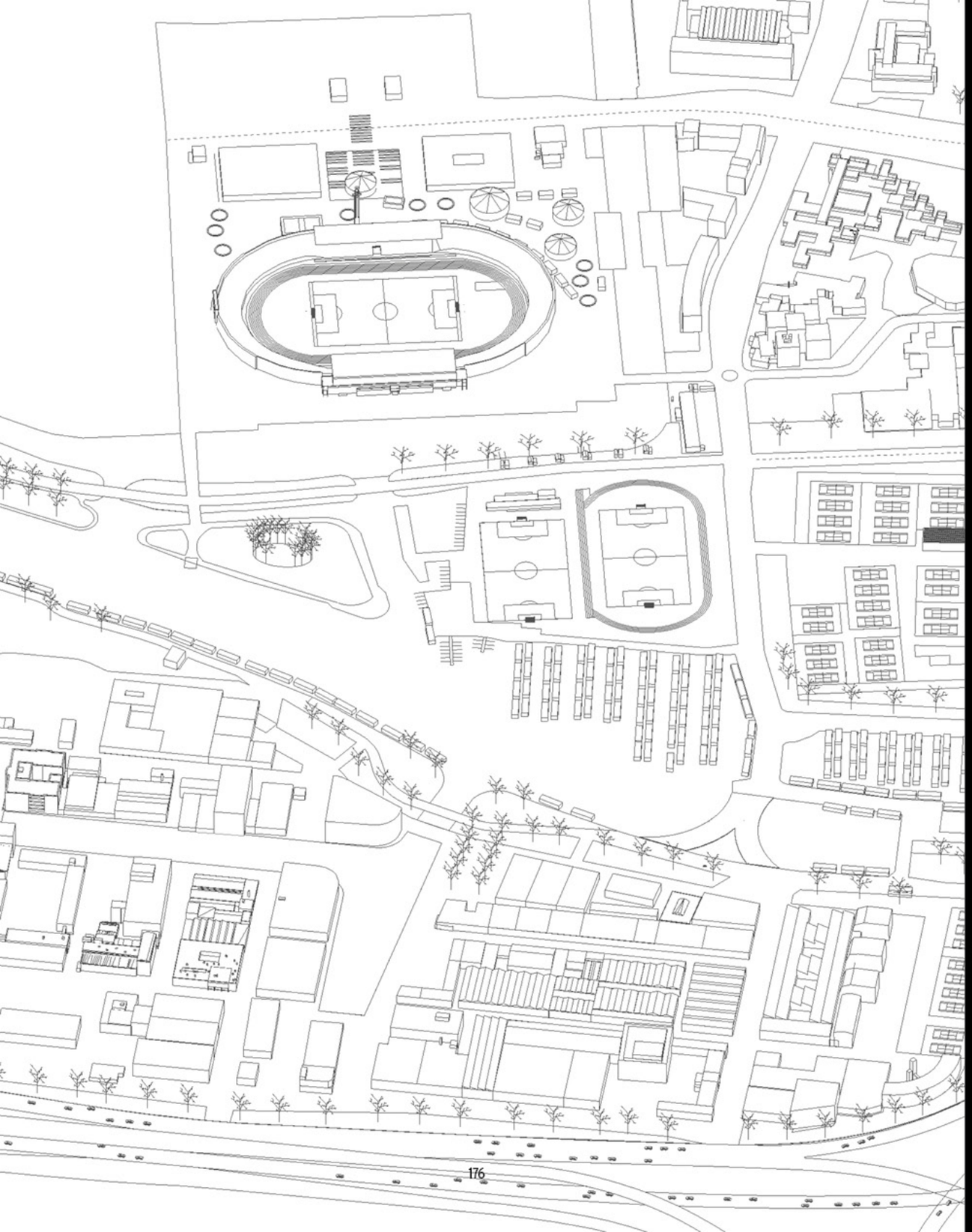
Not only architects but also developers, investors, housing corporations and even cities are all waiting for things to come. But the time that we can build with an unlimited financial funding seems over for good. The campus research shows that education pays; it is an important global economy in itself and that smart use of education stimulates innovative industries. This investment in innovation will at the end lead to new developments in the city. The project combines housing for the real starters, students and young entrepreneurs, with "fragmented" multifunctional education buildings, small offices and facilities. It takes a more relaxed form of planning and building allowing bottom up development. Small scale plots with high density "temporary" modular structures allows for constant change to meet demand and exchange of knowledge. And it can start now! For this we need another financial structure. Small apartments and officers are rented rather than bought and the building volume per plot is small to lower the step in threshold in financing and organisation. Investment is no longer based on long term increase of value of property but on short term return from its inhabitants.
John Bosch



> Pilot Project 2

# What happens if 1 in 5 graduate students start up their own business in Amsterdam?

Project by Juurlink en Geluk: Huub Juurlink, Joost de Wit





# University as economic generator of Amsterdam

## What if urban planning was easier, cheaper and faster?

While large international and established companies can afford to locate in Amsterdam, small companies and starters cannot. But to establish a healthy economic climate of a city, it is essential to generate a constant flow of new initiatives, ideas and technical developments. Innovation is the most important condition for future economic growth. Young power start-ups are the source for becoming new big companies in the future, but also deliver the necessary innovation for the all established companies. The universities of Amsterdam are the source of intellectual and innovative capital. But this resource has not been facilitated in the best way possible. Even worse: high rental and ground prices and time consuming slow planning methodologies in Amsterdam result in a migration flow of young innovative power start-ups out of the city. Resulting in a waste of intellect, innovation and future economic growth. Even the so-called breeding grounds located in old factories and shipyards are quite slow in their adaptability and quite expensive. But are there other possibilities?

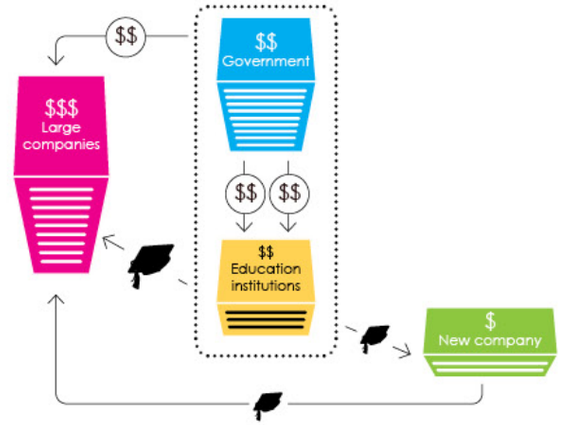
To establish this it is essential that we reconsider our perception of planning as a continuous solid process with clear final images and profits which only pay off on long term time frames. Areas where it is possible to provide the essential conditions to keep the young power start-ups in Amsterdam are:

- Cheaper rental and ground prices,
- A quicker, more flexible and adaptable way of urban planning,
- Therefor a more easier and flexible and adaptable way of technical engineering of sites,
- An idea of public space and environment with minimum investment costs but which generates immediate profit.

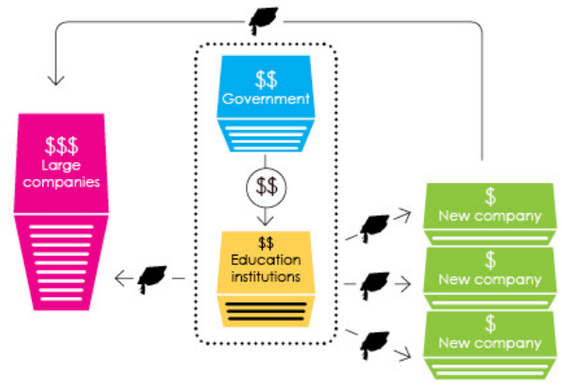
# Creating a vibrant and innovative city: three indispensable components

# The classic differences; three continents and traditions of financing a university are about to change

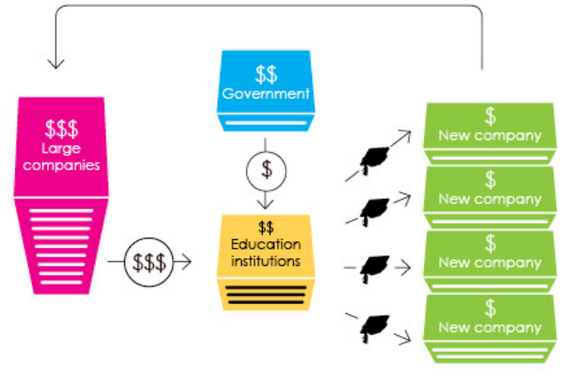
The tendency of the growth of the principles of capitalism all over the world influences the way that universities are financed. Until 2000 the Asian and European model of financing universities is strongly government driven. Due to the shift towards a strong market driven economy and the withdrawal of governmental financing it is essential for the universities itself to locate in vibrant economic areas. In this way they can establish a larger financial source for funding research and innovate their universities. This shift in funding makes it vital for them to facilitate young power start-ups close to the university.




Asian funding model
Government controlled
-
Government pays universities and invests in big companies




European funding model
Partially government controlled
-
Government pays universities and universities deliver new creativity for large companies and some innovative small companies become large companies




North American funding model
Market-driven
-
Cycle of large companies investing in universities, universities deliver new creativity and innovative small companies become large companies

Knowledge
Innovative young power startups
Education institutions
Large companies
Government

# What are the different requirements for developing large companies and young innovative power start-ups?

Amsterdam has an excellent business environment for large companies. The old city centre is vibrant, easily accessible and has a great image with status. But due to high rental and ground prices in combination with complicated slow planning procedures there are no real innovative breeding grounds for young power start-ups. Both large companies and young innovative power start-ups have different requirements and needs for an appropriate establishing environment.

**Large companies**

Slow planning and detailed urban plans with pré investments; expensive

-

Well furnished public space with sufficient spatial quality

-

Good accessibility to public transport, car and slow traffic

-

Status oriented

-

Public facilities incorporated

-

Visible locations in the city centre or business park with sufficient advertisement opportunities



**Young innovative power start-ups**

Quick and adaptable plans to keep up with the innovative power start-ups; cheap and fast

-

Flexibility and temporality

-

Good accessibility

-

Sufficient room for experiment

-

Public facilities nearby

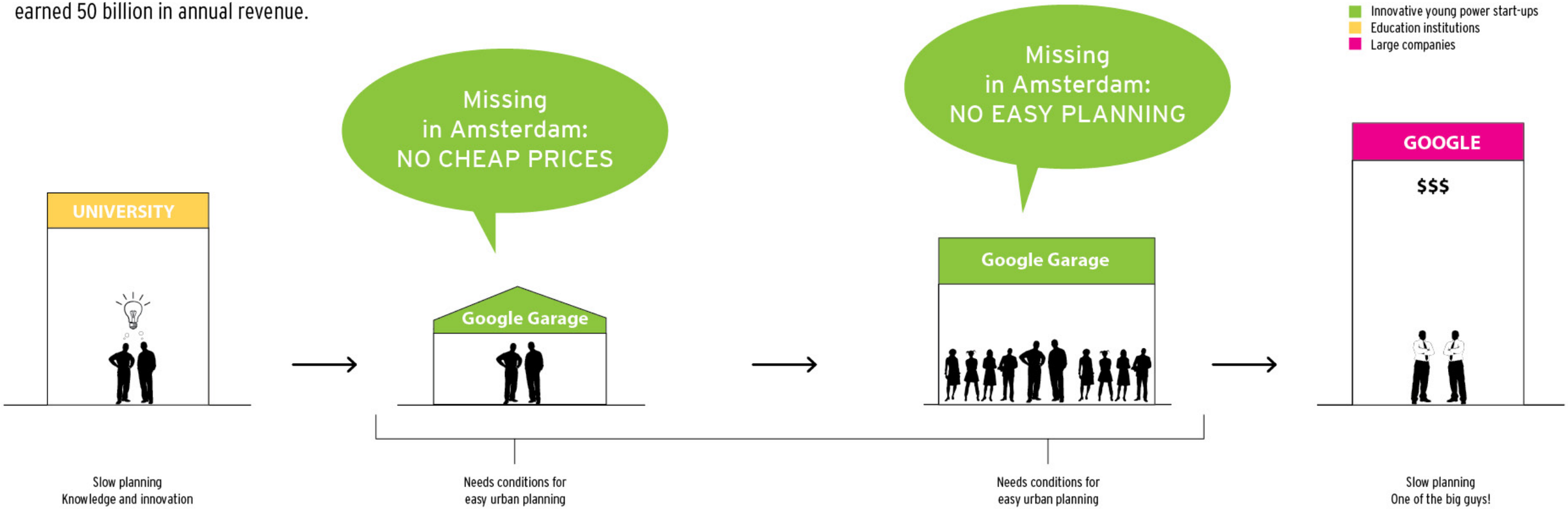
-

Near the centre of an vibrant city centre with adequate recreational possibilities

# Showcase of the cycle of **the vibrant and innovative city:** How Google started!

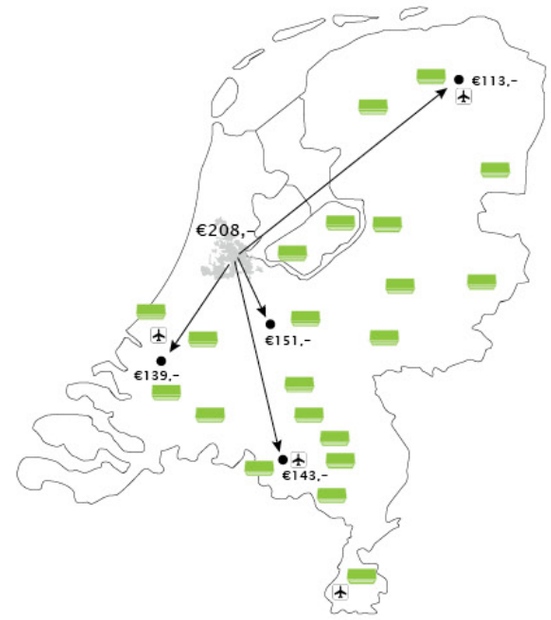
Google started in 1996 as a research project by Larry Page and Sergey Brin at Stanford University in California. They came up with the idea to determine websites relevance by the number of pages, and the importance of those pages. Originally Google ran under Stanford Universities website. In 1998 the company was incorporated, got an own domain and was based in a friends garage in Menlo Park in California. From this moment on the power start-up of Google grows steady until its current size. In may 2011 the monthly visitors of their website surpassed one billion for the first time and by 2012 Google announced that it had earned 50 billion in annual revenue.

The company has 54,000 employees all over the world. With their main offices bundled together Google and comparable firms like Apple and Facebook generate a new economic boost in the bay area of San Francisco. They attract new companies like Salesforce, Twitter, Pinterest and Airbnb. This economic boost provides the fuel for the regeneration of the city of San Francisco. The bad part of Market Street in the city between Castro and Powell Street Station is currently under construction. In 2011 $3.4 billion was spent on new construction projects delivering a major contribution to urban, economic and social development.



# Flight of creative innovative power start-ups

Young innovative companies find a place elsewhere in the Netherlands where rental and ground prices are lower. Another factor is the possibility to locate on sites with cheap and fast plans, enough flexibility, and sufficient room for experiment. In combination with accessible public facilities and near the centre of a vibrant city centre makes certain smaller cities in the Netherlands a very interesting location for young power start-ups.

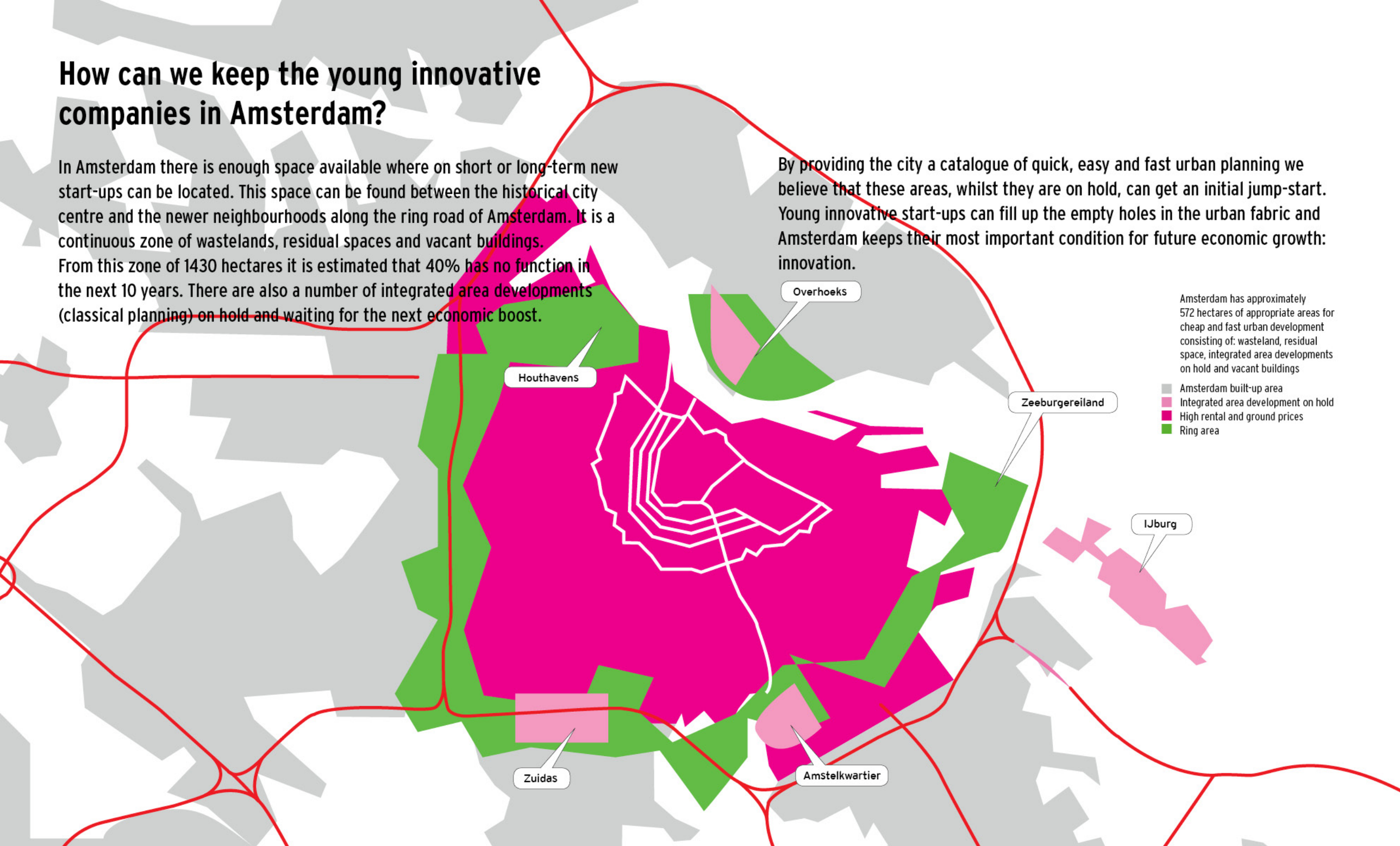



Innovative young power start-ups
[Image: Average indication of rental prices per square meter in the Netherlands, research by Vastview]
Education institutions
Large companies

# How can we keep the young innovative companies in Amsterdam?

In Amsterdam there is enough space available where on short or long-term new start-ups can be located. This space can be found between the historical city centre and the newer neighbourhoods along the ring road of Amsterdam. It is a continuous zone of wastelands, residual spaces and vacant buildings.
From this zone of 1430 hectares it is estimated that 40% has no function in the next 10 years. There are also a number of integrated area developments (classical planning) on hold and waiting for the next economic boost.

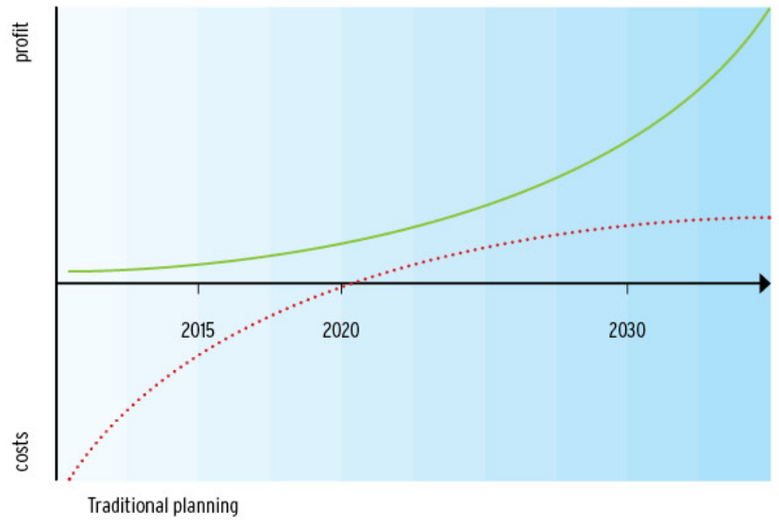
By providing the city a catalogue of quick, easy and fast urban planning we believe that these areas, whilst they are on hold, can get an initial jump-start. Young innovative start-ups can fill up the empty holes in the urban fabric and Amsterdam keeps their most important condition for future economic growth: innovation.



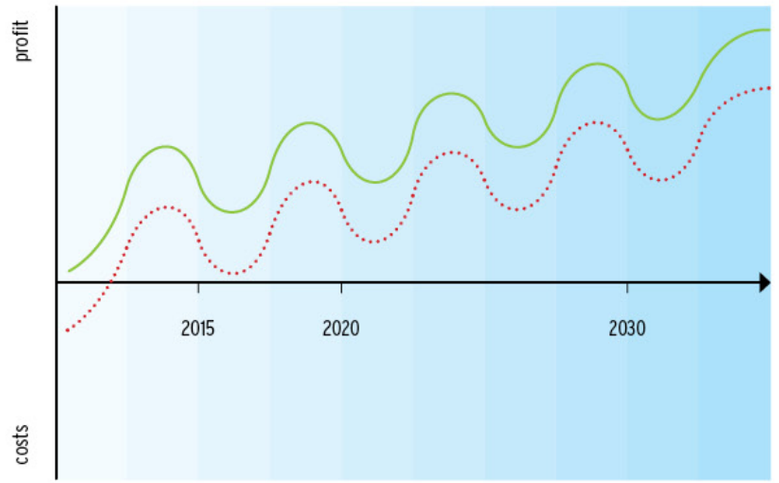
# Making plans with profit

Crucial to facilitate young power start-ups is the way in which urban plans make their profit. Instead of big investments in the beginning, plans should be profitable from the first year on. This means another way of thinking and of constructing these new areas. And it means searching for more profitable ways to establish a good qualitative environment. To make an inventory of the possibilities we composed a library of easy, cheap and fast urban planning. It contains:

- Easy urbanism and architecture,
- Flexible and easy ways to make infrastructure,
- Ways of establishing mixed programs,
- Possibilities in adding cultural program,
- Movable social activities and events,

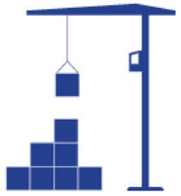


Traditional planning

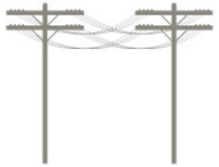


Planning with profit

# Elementary components for the catalogue of easy, cheap and fast urban planning



Easy urbanism



Cheap infrastructure


Mixed program



Light cultural program

Movable social program

Public space with profit

# Catalogue with a range of possibilities

Easy urbanism

Cheap infrastructure


Mixed program

Floating houses

Cables above ground

Flexible work and living places

Recycled material

Pipes above ground

Divide existing industrial building

Portable and removable

Temporary infrastructure

Expansion of industrial buildings


Container park

Temporary bridges

Parasites and sponsoring

Student housing

Elevated sewage

Ateliers



Light cultural program

Movable social program

Public space with profit

Festivals and campsites

Allotment gardens

Arboriculture

Theatres and concerts

Collective urban gardens

Horticulture

Experimental art manifestations

Meeting points

Floriculture

Lectures and crowdfunding

Appropriating public space

Timber

Small gatherings

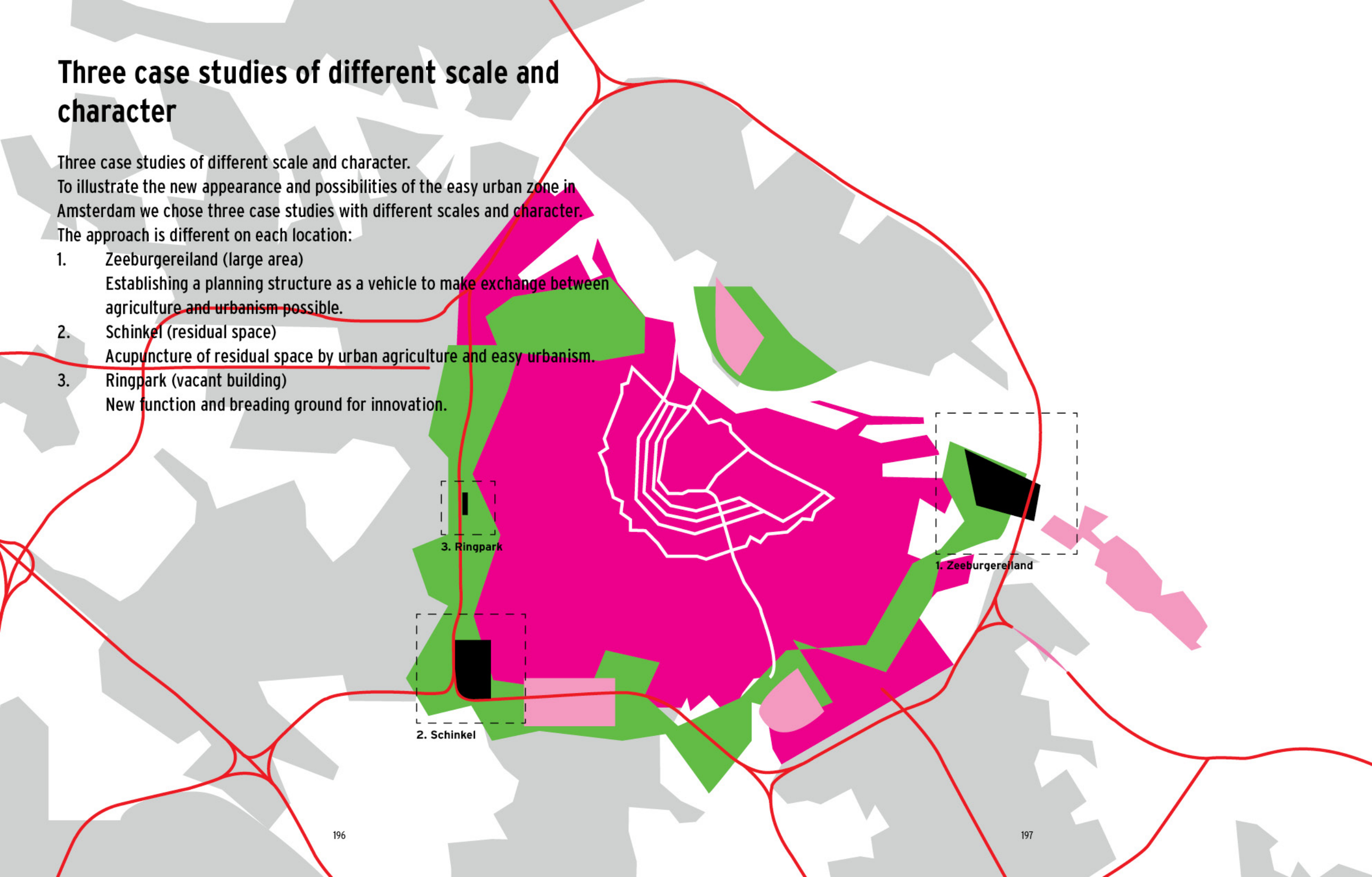
Creative industries

Seeds production

# Three case studies of different scale and character

Three case studies of different scale and character.
To illustrate the new appearance and possibilities of the easy urban zone in Amsterdam we chose three case studies with different scales and character.
The approach is different on each location:

1. Zeeburgereiland (large area)
   Establishing a planning structure as a vehicle to make exchange between agriculture and urbanism possible.
2. Schinkel (residual space)
   Acupuncture of residual space by urban agriculture and easy urbanism.
3. Ringpark (vacant building)
   New function and breading ground for innovation.



# Test area Zeeburgereiland
# Integrated area development on hold

Opportunity map

Public space with profit! Urban agriculture for purification of soil and temporary cultivation of crops that extract pollution from the soil.

Easy urbanism and various forms of living activate the island.

OFFICE

Supplementing existing infrastructure with cheap pipes, lines, materials and managment. Together a grid is formed as a base for future developments.

Creative industry claims empty plots to experiment with movable social program.

Light cultural progam like Magneet festival is used to promote Zeeburgereiland for future users.

Zeeburgereiland has 5km of shore for beaches and recreation.

# Test area Zeeburgereiland
# Urban agriculture as a base for easy urban planning

The central place in Zeeburgereiland is for neighbourhood festivities and vehicle storage. There is also place for a vegetable market.

The lay out of urban agriculture is the base for the easy urban planning model. The development of a grid that makes easy transfers from fields of crops towards partly urbanised fields possible is the major design exercise.

Temporary urban agriculture = public space with profit!

Extended cultural festivals can take place in this area.

Approximately 5km of shores for recreational use like beaches, landing stages for boats and nature development.

# Test area Schinkel
# Residual space

Opportunity map

Easy urbansim by means of floating housing. A watermarket activates the harbour.

Public space with profit wasted areas, empty plots and roofs.


The harbor and quays are used as a meetingpoint, social program and temporary manifestations.

Easy urbanism and mixed program on empty plots and existing buildings.

Spaces for rent.
Possibility to mix program.



Temporary urban agriculture
= public space with profit!


Mixed program creative industry has the oppurtunity to combine flexible housing and small offices.

# Test area Schinkel
## Easy urbanism approach: acupuncture reviving residual space and urban agriculture gives the area a liveable public space

The quay is a popular spot for loading and unloading goods. Vegetables and fruit are sold in stalls along the quay.

Container housing for students and young entrepeneurs.

Movable social program; pumpkin restaurant and café with small theatre and meeting point.

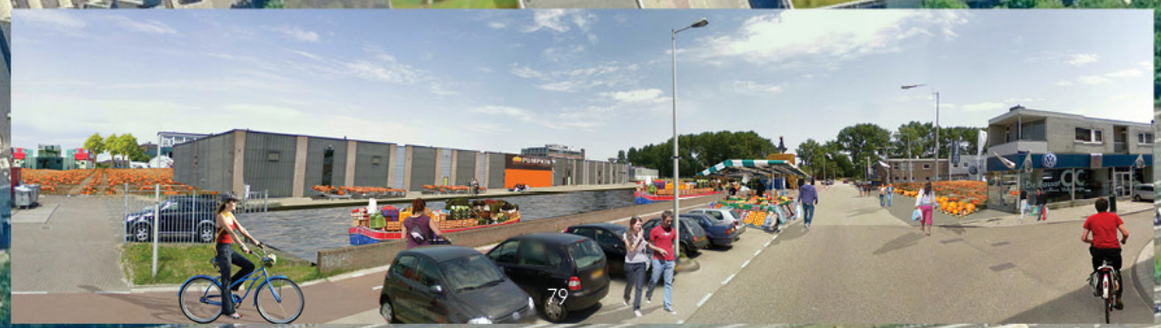
Easy and movable urbanism; floating houses and young innovative companies.

Public space with profit! Allotment gardens.

Revived by new public space with profit, vegetables and fruits.

Existing creative industry experiments with green roofs.

Creative young power startups combined with flexible housing and studios.



# Test area Ringpark
# Vacant building

Opportunity map

Daily food market with fresh products.

Wetlands for purification of the rainwater and park.


Urban agriculture in vacant building and bees on the roof!

Green roofs to increase the biodiversity and filter rainwater.

Restaurant and canteen with terrace on the lake.

# Test area Ringpark

## Direct profitable greenhouses revive vacant building and provide an excellent environment for related innovative companies

Related products are innovated by start-ups who have their office in between the greenhouse areas.

Bio market on the ground floor of the office building.

Greenhouse principles and green facade give the building a new meaning and profit.

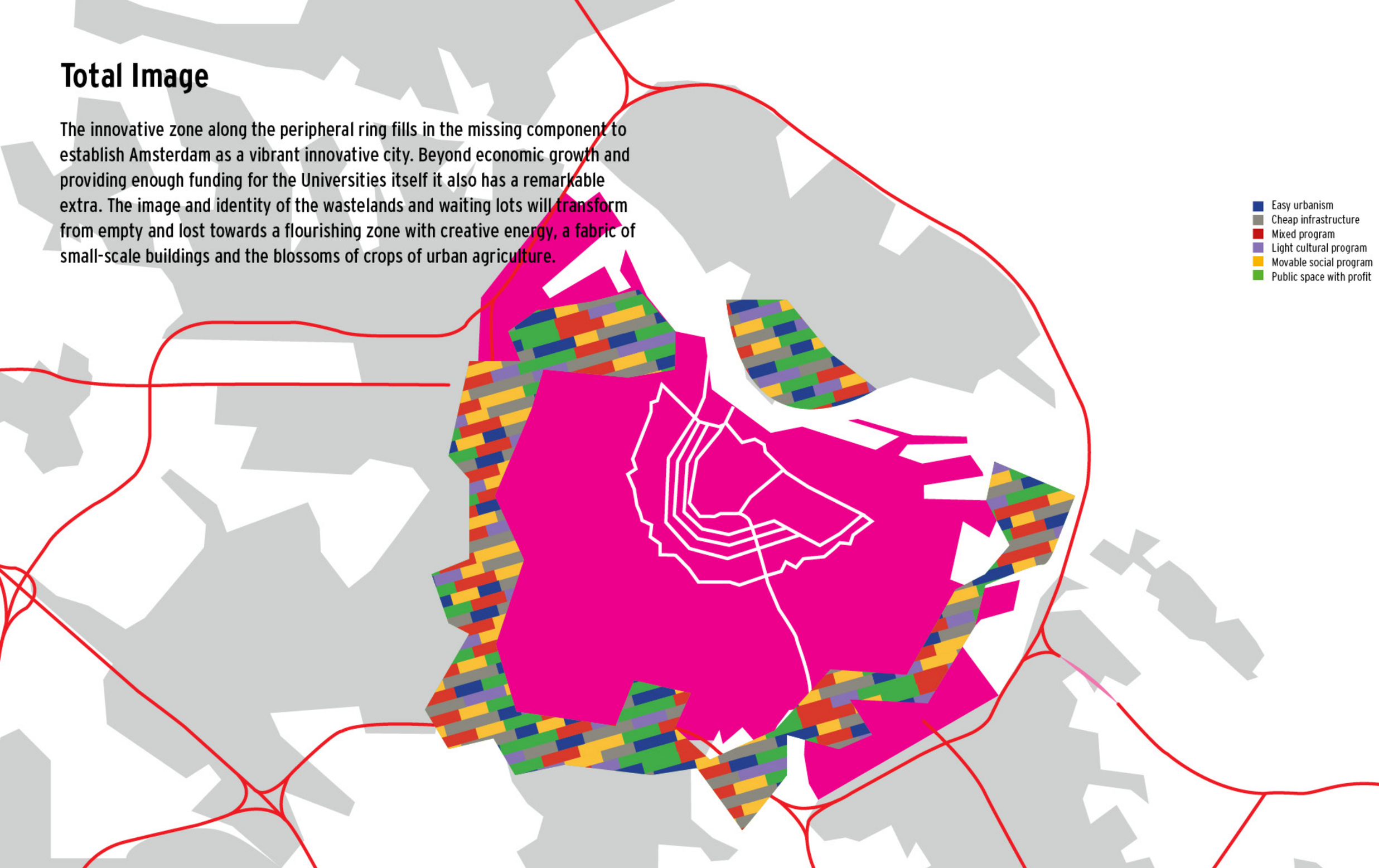
Green roofs with water retention and experimental grasses.

Wetlands for purification of the rainwater and park.

Biological restaurant with products from the market and wooden boardwalk connects office building with park.

# Total Image

The innovative zone along the peripheral ring fills in the missing component to establish Amsterdam as a vibrant innovative city. Beyond economic growth and providing enough funding for the Universities itself it also has a remarkable extra. The image and identity of the wastelands and waiting lots will transform from empty and lost towards a flourishing zone with creative energy, a fabric of small-scale buildings and the blossoms of crops of urban agriculture.





Pilot Project 3

# What happens if Students were the new shareholders of their campus?

Project by **Studio Makkink & Bey**: Jurgen Bey, Chanida Lumthaweepaisal, Oscar de Bakker, Emeline Cosijnse and Vissarion Naoum

# City of One Hundred Students: Student entrepreneurs as shareholders in their own campus economy

## What if students invest directly in a self-regulated loan system?

Although costs of higher education are rising, financial figures show that there is a considerable study market to explore. The (growing) education market provides a scope for innovative development and empowerment of student enterprise. Studio Makkink & Bey investigated into the organization of knowledge and studying, and worked out a 5 year investment plan and speculative design of a modular campus. A 5-year membership of a campus that centres around one research subject, provides students with a return on capital in the form of affordable basic needs and a start-up business. This plan explores various spatial, social and financial structures that correspond with changing realities.

## What kind of conditions best prepare the enterprising class for a creative economy?

An education system that is balanced with real life economy and a campus model that is ingrained with new urban, social and economic realities, produces forward thinking students who have learned to cross-breed ideas. If professional life starts during the years of study and integrates entrepreneurship across different disciplines, you can tap into their ingenuity while they move back and forth between working and learning. Flexibility, spatial efficiency and linkage are essential to facilitate entrepreneurial networks, talent harvesting, innovative start-ups, use of existing resources and a rewardable investment plan, along with a well equipped campus program. After five years, a graduated group of anticipative thinkers who produce innovative ideas is ready to enter the real world with their graduation start-ups.

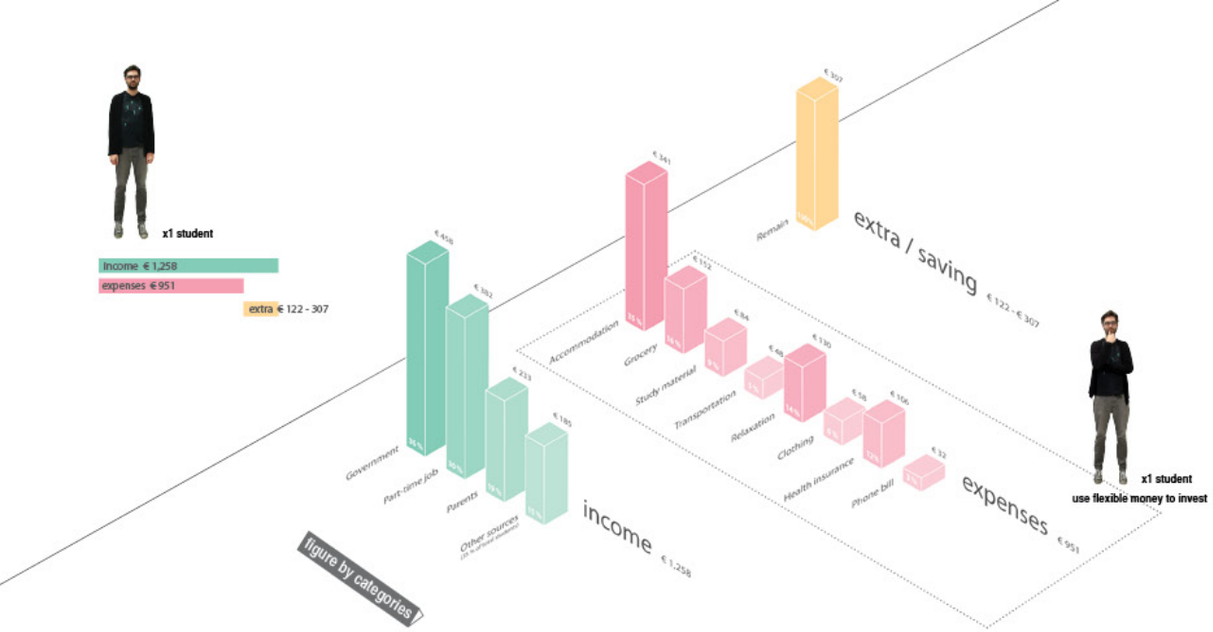
A scan of a students' monthly budget shows an opportunity to invest part of their expenses into a 5 year collective investment plan for and by students. They can opt for the regular student loan from the government, or, they can choose to deposit what they would normally spend on accommodation plus ancillary costs into a campus investment pool, together with student associates. Over a 5 year period and based on 100 students, the pool is expected to amount to about 4,086,000 Euros. Money is managed at the start when a student enrolls, while the bank finances a credit line.

The plan is projected on the international knowledge and business area of Amsterdam: the Zuidas. Some patches of land in the Zuidas remain undesignated for short periods, which holds an opportunity to reclaim the vacant fundaments for our campus site. Existing structures, infrastructures like foundations, building fragments, still serviceable facilities, green spaces are reallocated as frameworks for affordable and functional spaces. On top of this, equipment and reclaimed building materials are added to make use of resources such as collected natural (rain) water, household waste and the local circulation of other usable means and supplies.

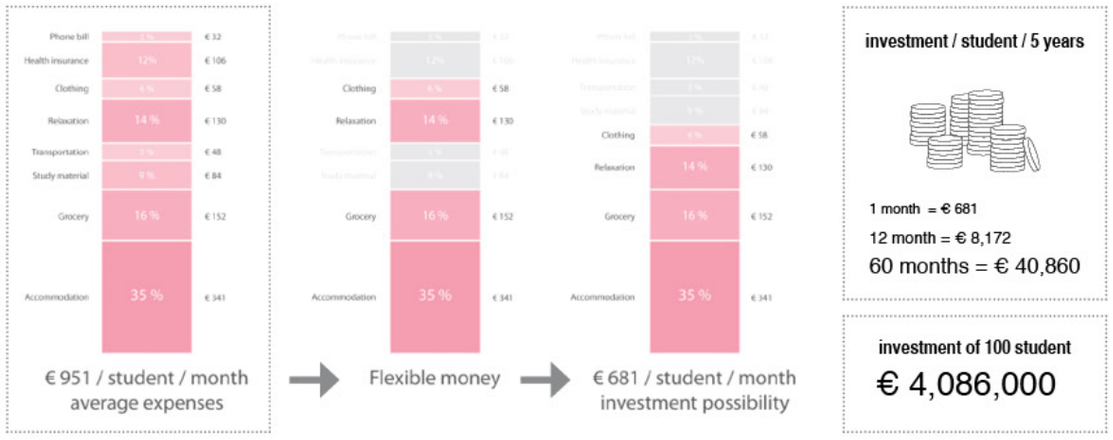
Students from different academic backgrounds live in learning-working units and initiate their own start-ups. They form a miniature society of people from art, science, technical disciplines and other branches of knowledge who pioneer with innovative ideas and take part in the professional marketplace. Cross-disciplinary activity is important, e.g. nanotechnology didn't start out as one sector, but required experts with different backgrounds. Higher education establishments should integrate entrepreneurship across different disciplines (e.g. technical and scientific studies, humanities and creative studies), as it may add value to the development of a field or business.

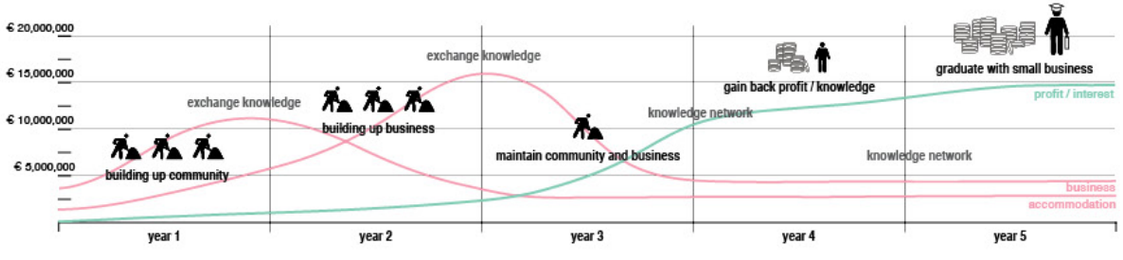
What is studied, ties the associated students together. In this case study, water is the comprehensive subject and point of departure of campus activities, production and development: in its spatial design and in its output. Student entrepreneurs explore water related issues in their multidisciplinary practices.

The learning-working units are modular structures made from Tetris-like modules, which are built up from cubes. These are stacked in one spinal column of same-function cubes, in this case the toilet, which adds to the potential of the total structure. A spinal organization of functions up scales the buildings' water system to industrial proportions. Public utilities, such as grey water purifying, a swimming pool or fish pond to farm fish for consumption, can now be added. Even small factories like breweries or a textile dyeing mills are imaginable.




Studentenonderzoek 2011-2012
Information from Nationaal Instituut voor Budgetvoorlichting



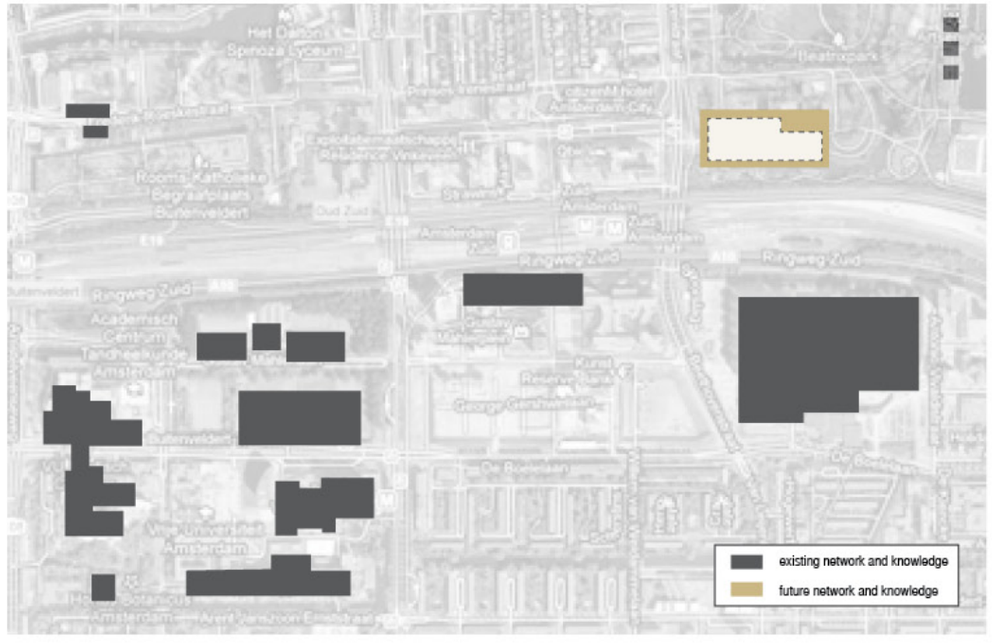






## ECONOMY

The financial flows of students were looked at as an opportunity to invest a share of their budget in a restructured closed cycle value system of money and basic needs. A share of disposable income and living expenses is deposited into a community fund that supports student shareholders who've invested to set up their own campus businesses. In order to have freedom of operation, the campus cooperation does not rely directly on state funds for capital. Instead, it relies on its associated bank with student shares as well as their own start-up economy. The campus projects are privately conceived, creating a closed micro economy with cheapened labor and production. Successful start-ups can be further developed with businesses in broader corporate networks. Students become independent shareholders in their own livelihood and enterprise, while they study in university and work out startup ideas that correspond to their study. Their shares partly consist of benefits in kind and a coverage of remaining regular expenditures.

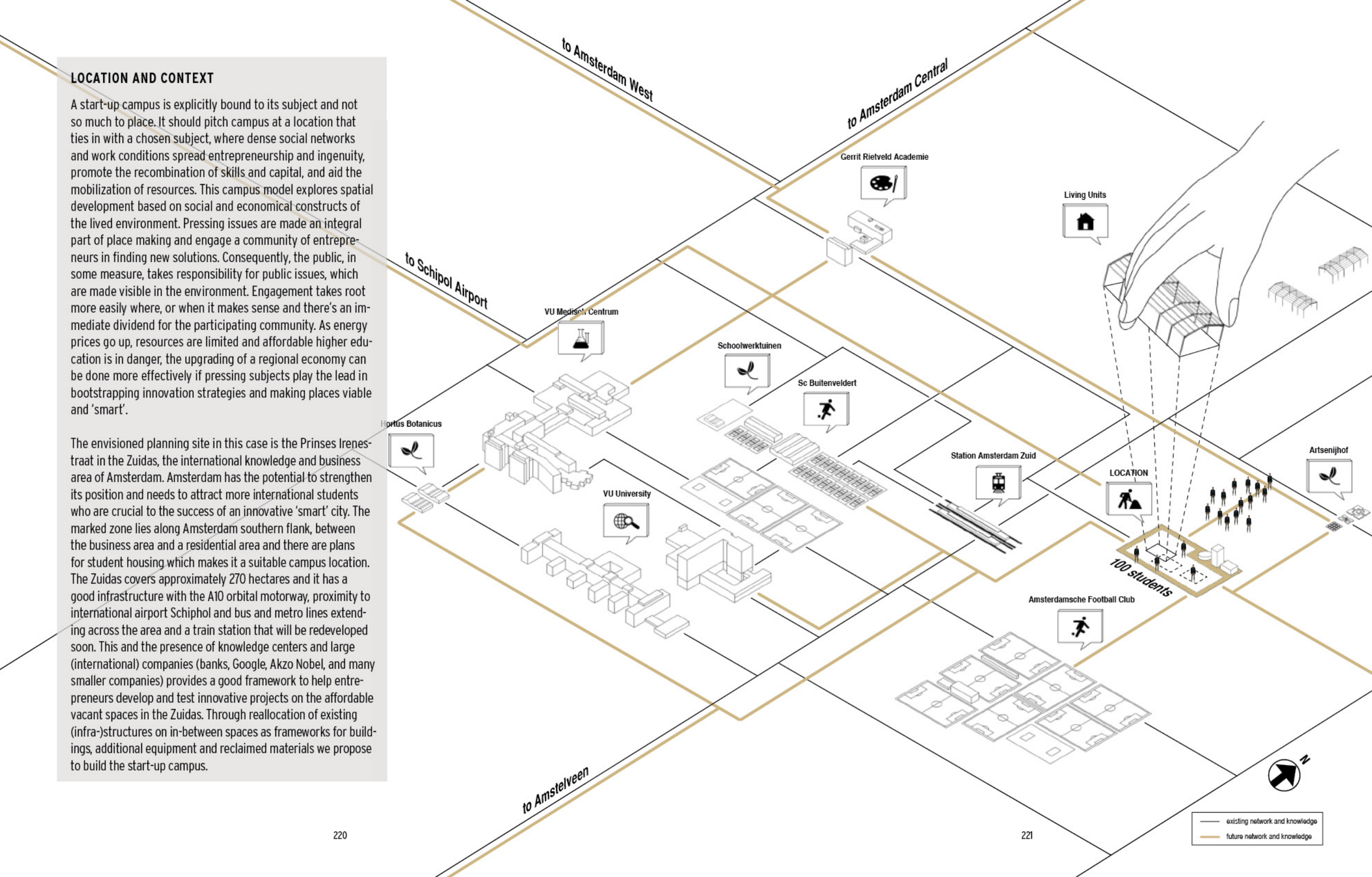
Students who choose to join the campus comply to a 5 year membership and are entitled to make use of the benefits of being part of the campus community. Benefits in kind are constructive corporate experiences and receiving basic physical needs (such as housing, etc), which leaves a substantially smaller amount of money needed for living. Still between two worlds, they can visualize what seems far off and impose innovative ideas on the real world in a place where trial and error is allowed. Instead of having an insignificant temp job, students are in charge of their professional maturity and ensure their investment in education is worthwhile. A more integral study-work path produces new employees who are anticipative thinkers instead of a work force of followers. An inclusive value system should also leverage the skills and knowledge of the future workforce.

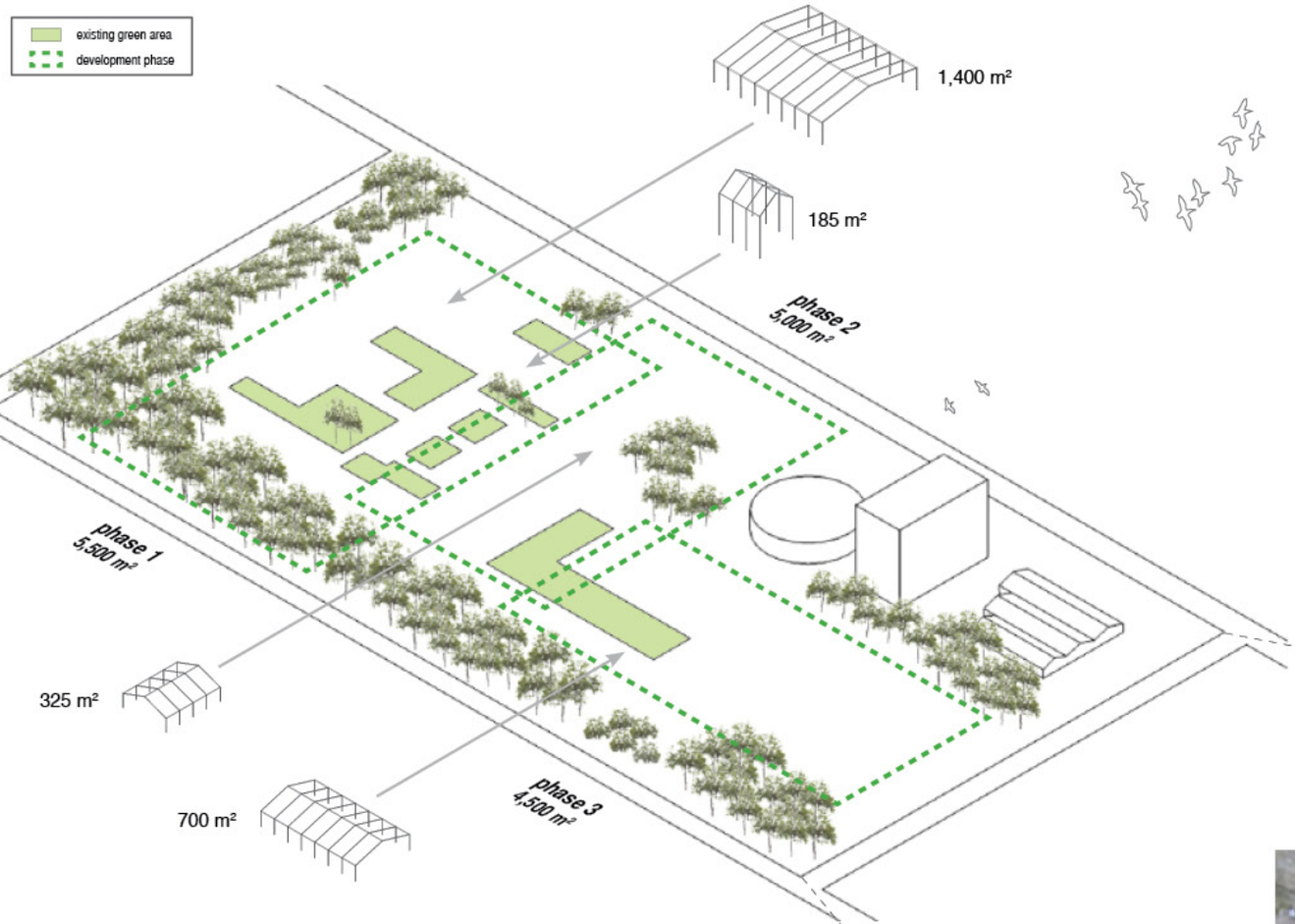


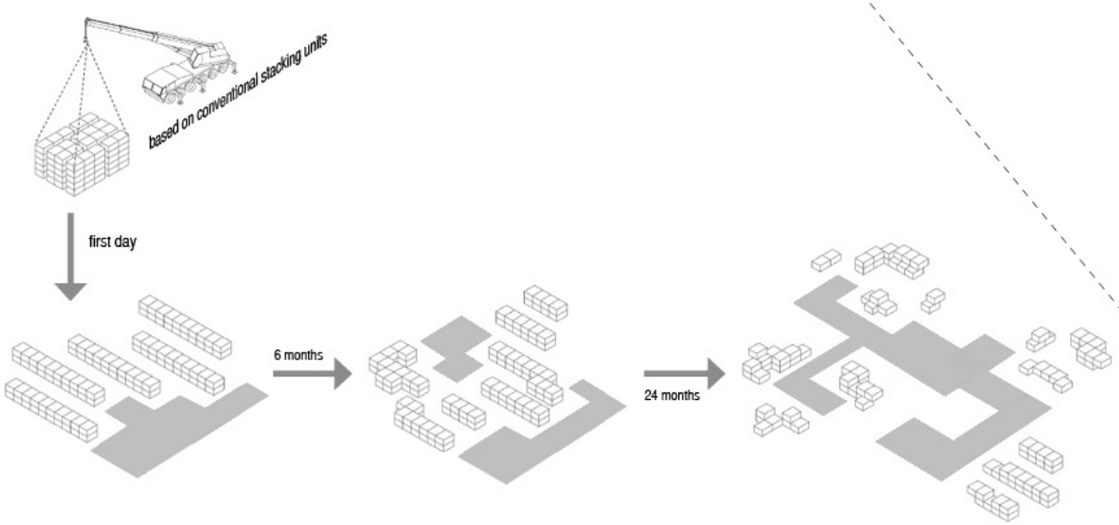
## LOCATION AND CONTEXT

A start-up campus is explicitly bound to its subject and not so much to place. It should pitch campus at a location that ties in with a chosen subject, where dense social networks and work conditions spread entrepreneurship and ingenuity, promote the recombination of skills and capital, and aid the mobilization of resources. This campus model explores spatial development based on social and economical constructs of the lived environment. Pressing issues are made an integral part of place making and engage a community of entrepreneurs in finding new solutions. Consequently, the public, in some measure, takes responsibility for public issues, which are made visible in the environment. Engagement takes root more easily where, or when it makes sense and there's an immediate dividend for the participating community. As energy prices go up, resources are limited and affordable higher education is in danger, the upgrading of a regional economy can be done more effectively if pressing subjects play the lead in bootstrapping innovation strategies and making places viable and 'smart'.

The envisioned planning site in this case is the Prinses Irenestraat in the Zuidas, the international knowledge and business area of Amsterdam. Amsterdam has the potential to strengthen its position and needs to attract more international students who are crucial to the success of an innovative 'smart' city. The marked zone lies along Amsterdam southern flank, between the business area and a residential area and there are plans for student housing which makes it a suitable campus location. The Zuidas covers approximately 270 hectares and it has a good infrastructure with the A10 orbital motorway, proximity to international airport Schiphol and bus and metro lines extending across the area and a train station that will be redeveloped soon. This and the presence of knowledge centers and large (international) companies (banks, Google, Akzo Nobel, and many smaller companies) provides a good framework to help entrepreneurs develop and test innovative projects on the affordable vacant spaces in the Zuidas. Through reallocation of existing (infra-)structures on in-between spaces as frameworks for buildings, additional equipment and reclaimed materials we propose to build the start-up campus.





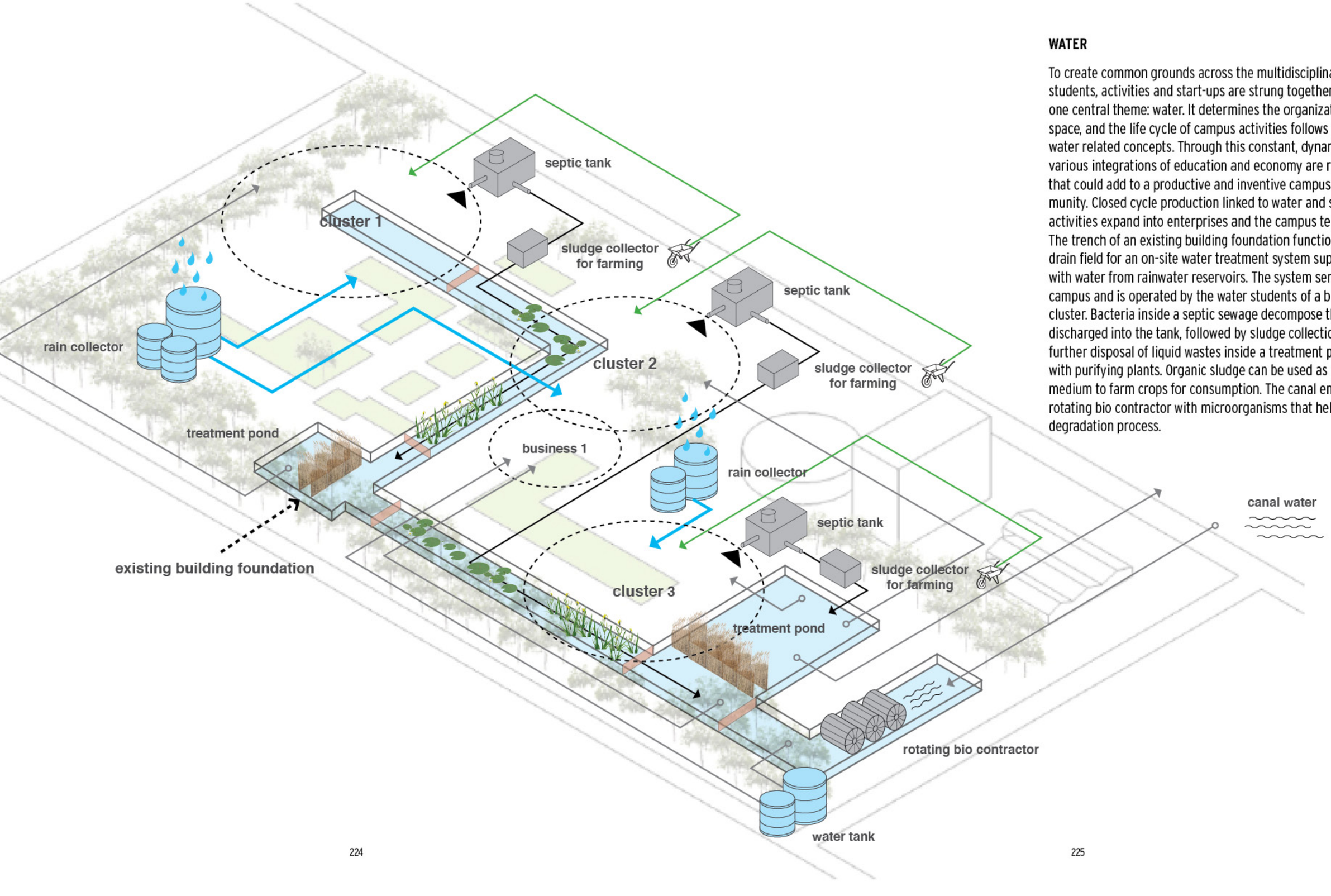






## SPATIAL DEVELOPMENT

Infrastructures of moving people, information and businesses create a distinct rhythm of use in metropolitan districts. This can be traced in the physical construction and functions of a place. Building remains, affordable vacant spaces, and proximity of business activities in the urban ribbon between the city center and Amsterdam outskirts provide excellent conditions for campus life. The municipality has a contract of up to five years to exploit fallow plots in the Zuidas, but struggles with the temporal status of the sites.

On the marked location in our plan, we used the remnants of an old premises as a framework for a modular set of facilities of a fragmented campus for 100 students. Foundations, building fragments, still serviceable facilities, green spaces are used for construction, but also for water farming. On a leasehold basis, the property is occupied during a 5 year period and developed in three stages for three different clusters (of flat mates sharing a business). In this period, the student associates build up their knowledge community, establish their business, harvest profit, skills and knowledge, after which they graduate with a profitable start-up. In the initial development stage, existing structures like green spaces and volumes are prepared for use. Modular building frames of different dimensions are placed along with living-working modules in the first part of the site, followed by the two other sections. After this, the modules will be arranged in a lay out for communal spaces that fits the rhythm of use on campus over time until the full potential of combined building functions for start-ups is reached.




## WATER

To create common grounds across the multidisciplinary students, activities and start-ups are strung together along one central theme: water. It determines the organization of space, and the life cycle of campus activities follows from water related concepts. Through this constant, dynamics in various integrations of education and economy are revealed that could add to a productive and inventive campus community. Closed cycle production linked to water and spin-off activities expand into enterprises and the campus terrain. The trench of an existing building foundation functions as a drain field for an on-site water treatment system supplied with water from rainwater reservoirs. The system serves the campus and is operated by the water students of a business cluster. Bacteria inside a septic sewage decompose the waste discharged into the tank, followed by sludge collection and further disposal of liquid wastes inside a treatment pond with purifying plants. Organic sludge can be used as growing medium to farm crops for consumption. The canal ends at a rotating bio contractor with microorganisms that help the degradation process.

## ARCHITECTURE

The organization of space is crucial to the way space is experienced and used. On all spatial scales, it dictates movements, posture, accessibility, light, sound, temperature, potential activities, and functions. Spatial interaction tells us how flows of people, material and information navigate between locations in spaces, and how objects are handled. With this and our objectives in mind, we identified relationships along which we designed the architecture of the planning site and the structures in it. By entering variables such as low-cost, variability, sharing, applied to working-studying-living, water, we arrived at a prefab construction kit with a series of standardized cubic modules. These basic accommodation units, which can slide into prefab building frames, have a minimum size for one person based on the 2.4 meter standard height of a room. Each cube has a designated function, and can be joined with a same function cube or a different function cube to proportion space precisely to use. Function combinations up scale facilities for shared use, shared utility systems, or even for large scale public use. Vertical function correspondence makes it possible to connect pipes into a circulation system aided by gravity, while horizontal expansion extends the building's visual lines and room to move.

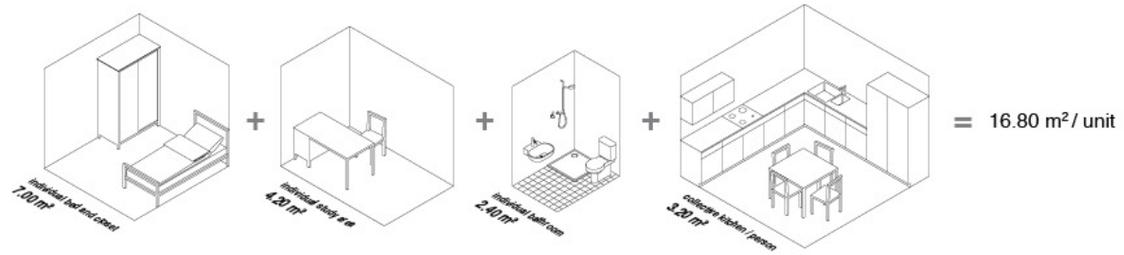
"Redneck Mansion" Theater het Amsterdam Bos, Catherina Scholten, 2005, Amsterdam

Ferembal House, Jean Prouvé, 1948, Nancy

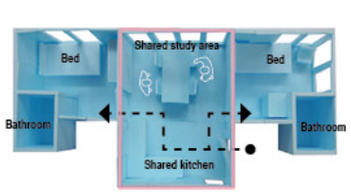
Case Study House no.8, Charles and Ray Eames, 1949, Los Angeles

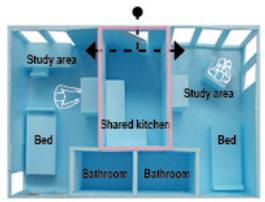
Mobile Home for Kröller-Müller, Joep van Lieshout, 1995, Otterlo

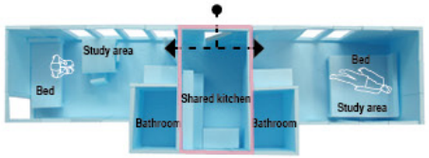





Average size of student room in Amsterdam
Information from www.sum.nl

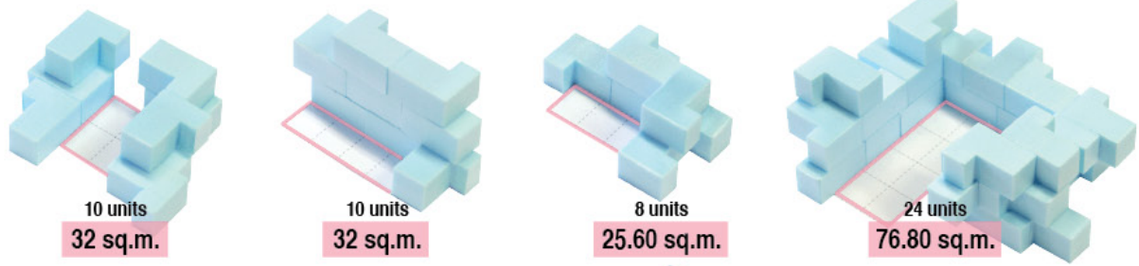


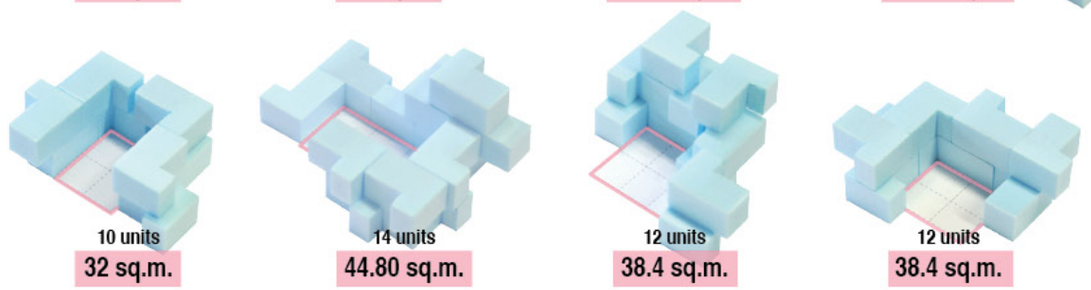




**basic living units + shared kitchen**

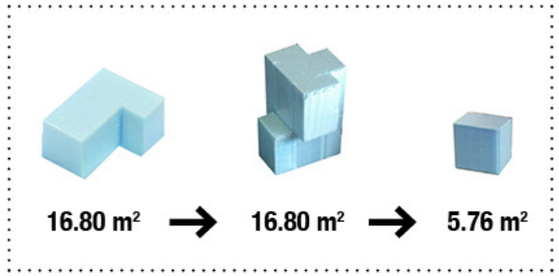
knowledge



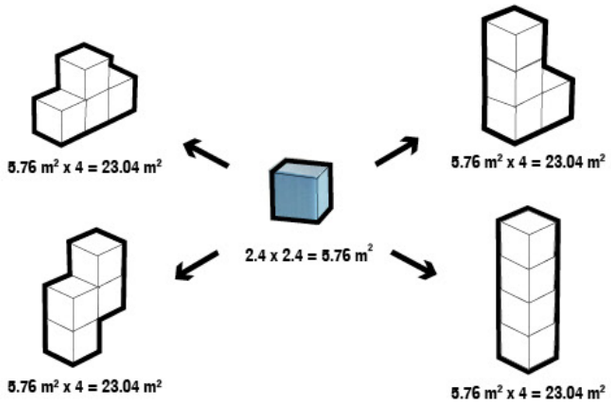



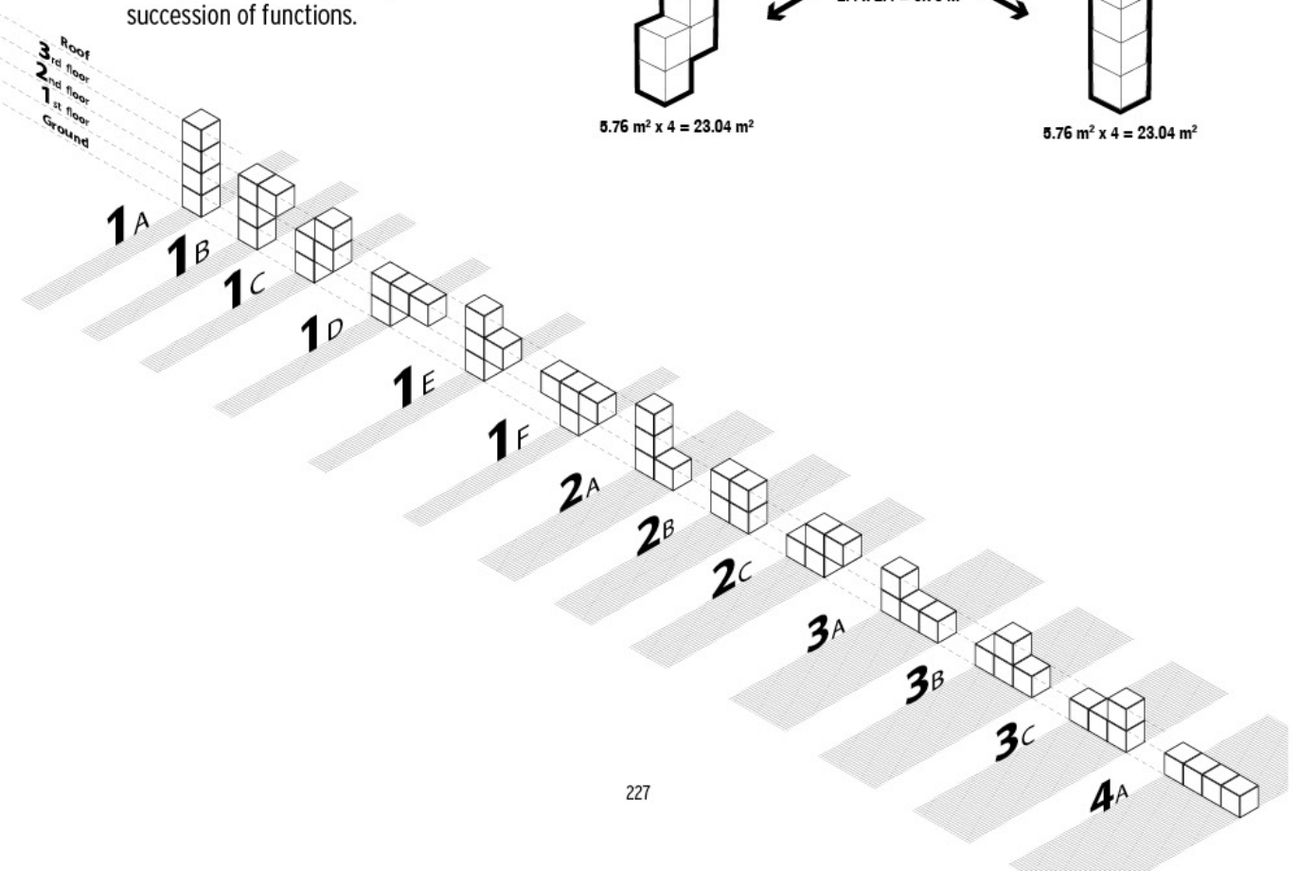
## UNIT CLASSIFICATION

The variety of Tetris-like formations shows where an annex adds to a spatial function of the learning-working cluster. The specific position of the annex magnifies the scope of how a formation functions. A vertical column separates the units in a highly partitioned building, a chain of top floors creates long rooftops, units that hover above the ground double as canopies. In a smart configuration of functions and shape, units connect where combinations make sense to ensure that there is no excess and serves a collective interest. After plotting a sequence of activities to take place in the clustered building, units can be strung along this activity sequence by a calculated positioning of extensions, rows, facilities and succession of functions.

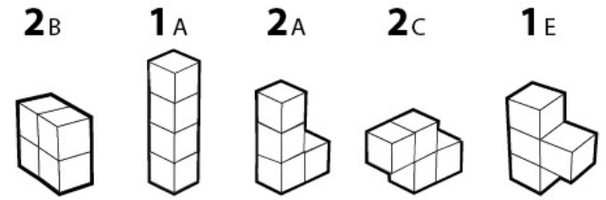



evolution of the unit

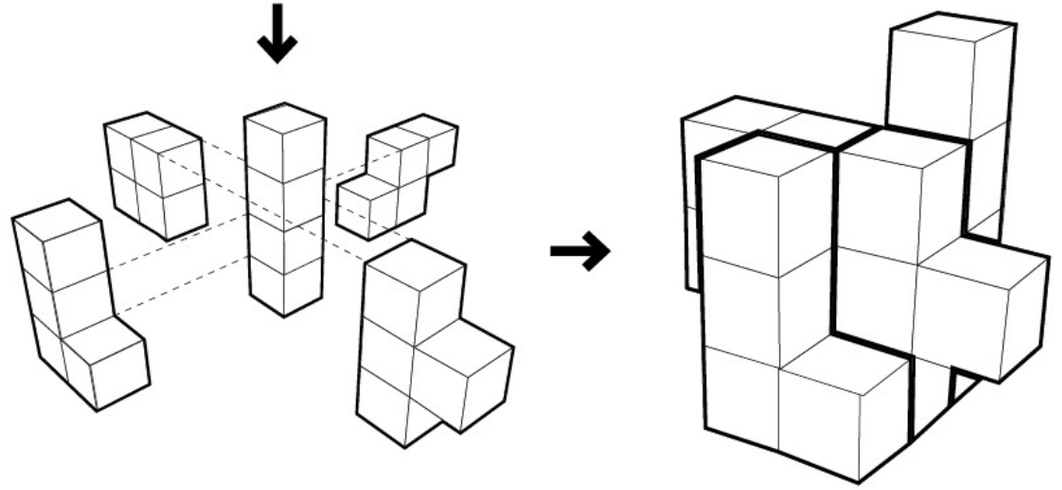




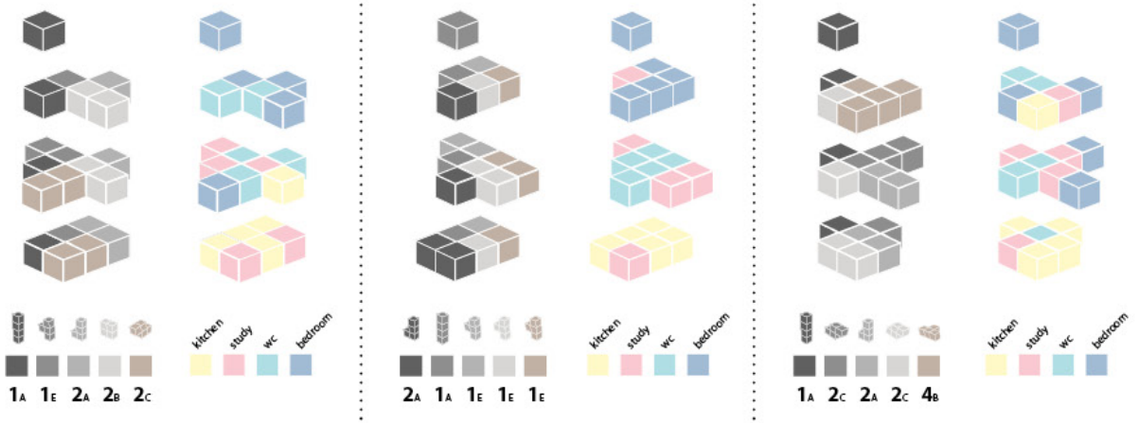



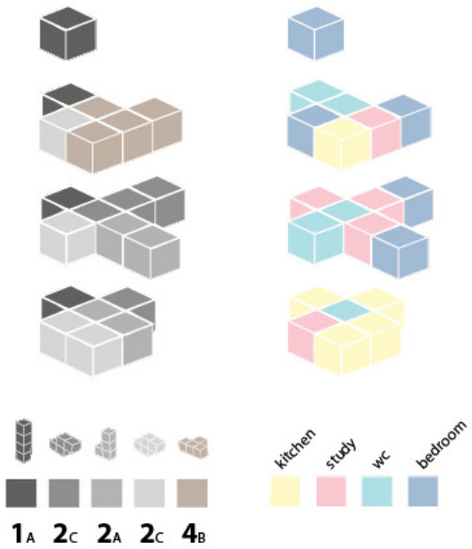

**Example of a configuration**
This cluster consists of TYPE 2B / 1A / 2A / 2C / 1E



## CONFIGURATIONS

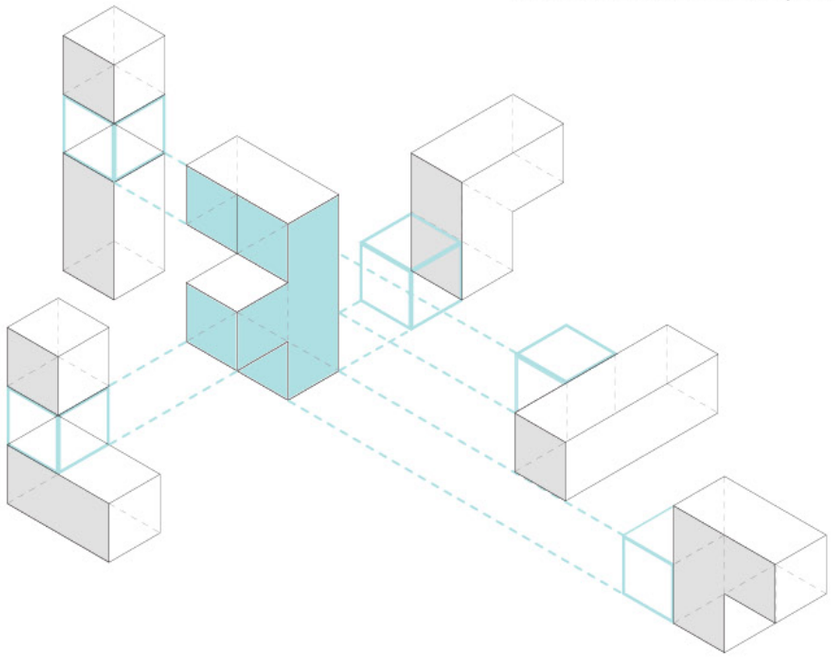
The diagram below shows a building of a set of Tetris-like shapes containing different facility units in each configuration. Each floor level houses another collection of facility units, some collections are diverse some are uniform. The same applies to vertical columns.






## INDEPENDENT TO DEPENDENT

This means that adjacent same function units could easily maximize their function as one utility, coupled facilities, or give private units of different owners around one unit equal access to it. A system of coupled functions per floor level, or in a spine of same function units, or in the core of a building where function units link up, offers the potential to capitalize on function clusters. It could service a student community of like minded entrepreneurs and turn their building into a factory of connected production. Spaces of work in particular can be broken down into sections of progressing production, as a whole they resemble a production line. Analysis of links within the student network plus core activities will show where operations intersect and what infrastructure their building should have to facilitate their enterprises.





## HOUSE OF PRODUCTION

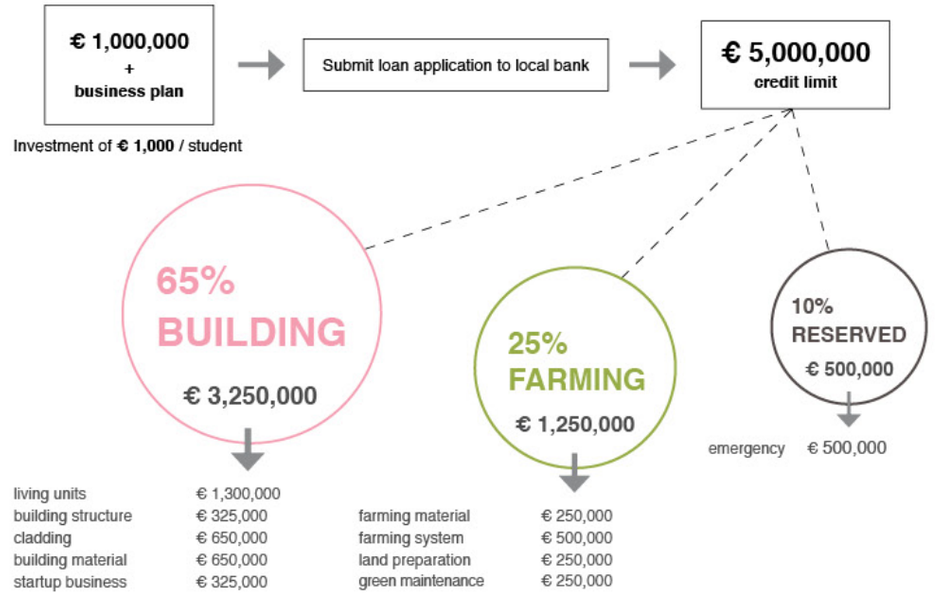
Intersections of common start-up activities institute the infrastructure of a student's production house and determine the sequences of production. Manufacturing systems are integrated in the architecture and fittings of a production house, similar to a water mill that generates power by a waterwheel and has a home integrated in the building. In pre-industrial times, small separate companies used to work side by side like a single factory, in between the houses. Today, living and working mesh again and the dual use of functions is on the rise, which will strongly influence architecture. The new class of anticipative enterprisers should establish production sequences that reveal understanding of production processes, use of resources and smart use of rhythms and flows (of people, material or information). Multidisciplinary expertise cumulates this to responsible full cycle production that is closely knit with its context.

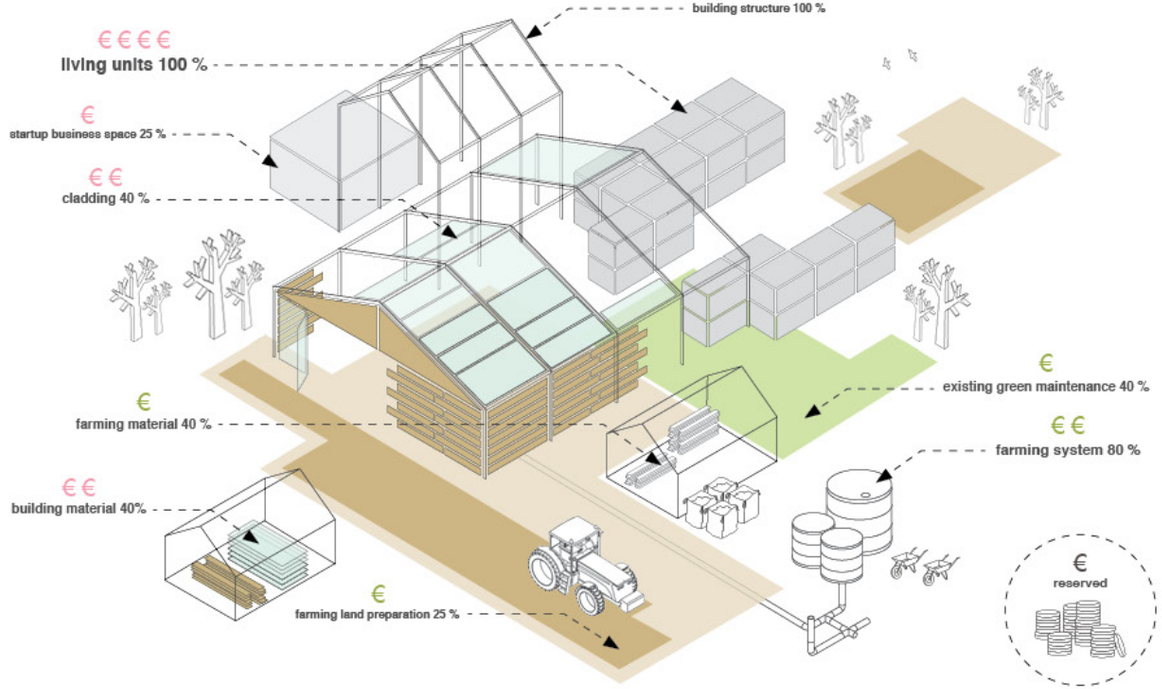
## THE COMMUNITY

During their 5 years on the modular campus, students develop a vision on a professional level, they have the opportunity to impose innovative ideas on the real world, from a place where trial and error is allowed. Still between two worlds, they can visualize what seems far off and find new inroads. Students in the water campus attend classes like any other student, but also work as trainee developers and form collaboration networks to establish their start-ups. Cross cutting areas typically provide a fertile grounds for valuable innovations and this requires a diverse network of experts. Social networks underlie the economic structure of many prosperous regions. The campus plan includes common grounds to form a closely knit community. The common focus is on water and communal meeting spaces promote the sharing of knowledge and ideas. Informal communications, collaborative projects, and common ties to research associations, companies and universities whip up the productivity rate and the institutionalization of collaborating. Central to a network economy is the concept of equilibrium in the system so that ties and exchanges between students remain beneficial to them. A set of requirements and regulations optimizes the community's cohesion:

All students are required to meet set requirements of aspired abilities and knowledge.
All students are required to sign a contract in which the student commits to a 5 year membership.
All students are required to invest the same amount in the campus bank.
All students are required to comply with the common agreement.
All students are required to work for the communal objective.
All students are required to help to build up the community and campus using existing resources.
All students are required to share their expertise.
All students are required to share information.
All students are required to share contacts.
All students are required to share ideas.
All students are required to partake in collaborative activities, on a professional and personal level.
All students are required to take initiative in connecting with other partners and allies.
All students are required to take initiative in making business plans and participative productivity.
All students are required to take initiative in communicating their progress in community presentations.
All students are required to safeguard the cohesion of the community.





## EXAMPLES OF APPLIED RESOURCES

Raw Textiles_Edwin Pelser

Raw Textiles_Edwin Pelser

Dye-works_Claudy Jongstra

Symbiosis_Jelte van Abbema

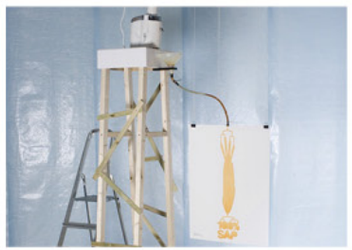
Grondvormen_Sander Boeijink, Nienke Sybrandy and Jeroen Wand

Sterk Water_Nienke Sybrandy

Sand_Atelier NL

Extrusion Bench_Studio Makkink & Bey

Drawn from Clay_Atelier NL



100% SAP_ Daniera ter Haar & Christoph Brach

Liquid Palette_Atelier NL, Christien Meindertsma, Lex Pott, Maarten Kolk and Guus Kusters

Autarky_Studio Formafantasma

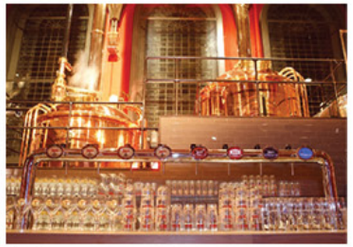

Coffee Grind Mushroom_Mediamatic

Urban Buds_Gionata Gatto

Unsustainable_Greetje van Helmond



## EXAMPLES OF WORK SPACES



Brewery

Pig farm

Grain farm

Aquaponics farm

Mushroom farm

Helpdesk

Laundry

Bike repair shop

Dining

Knowledge library

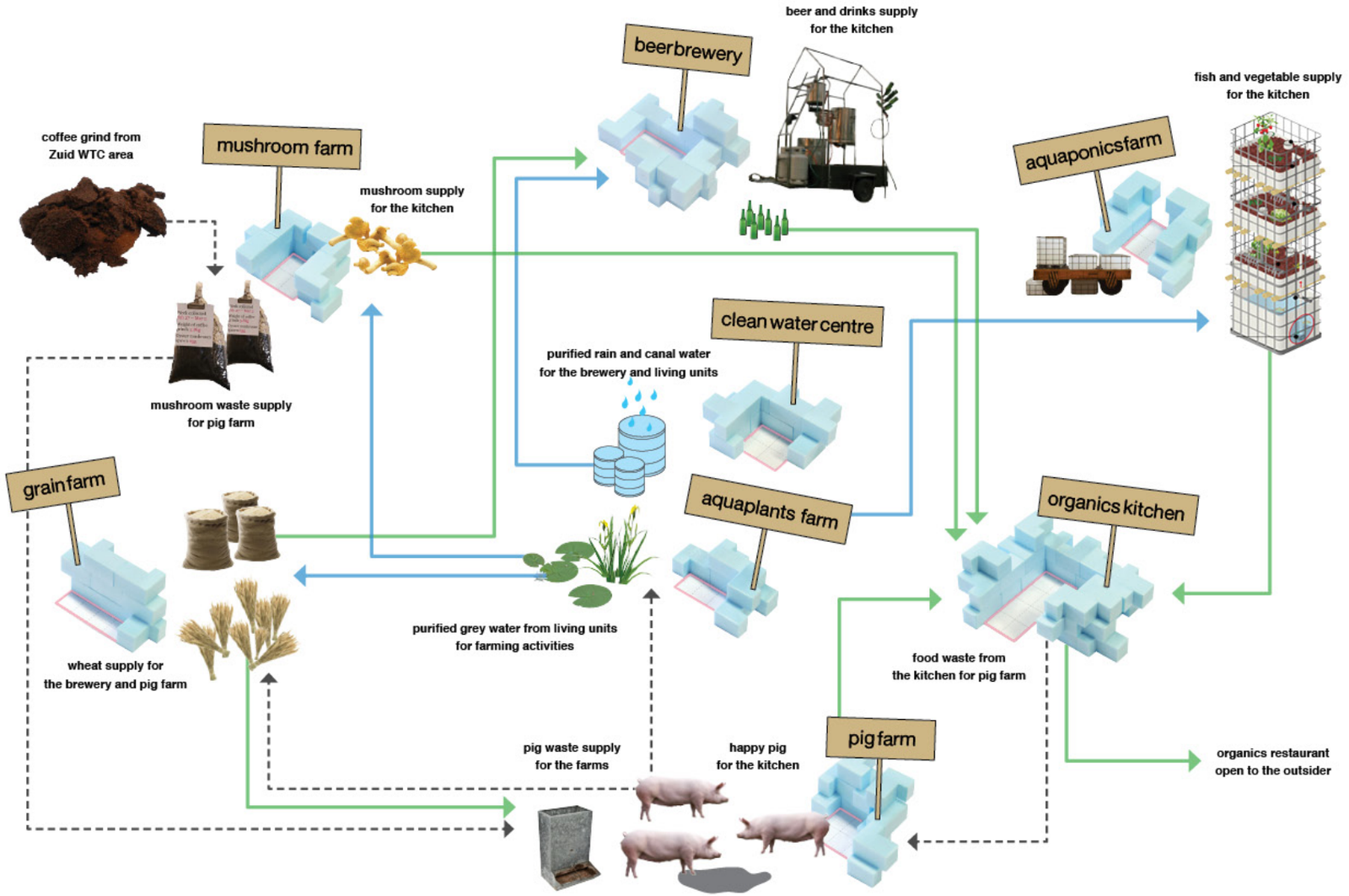
Study room

Textile lab

Pottery

3D printing

Wood workshop



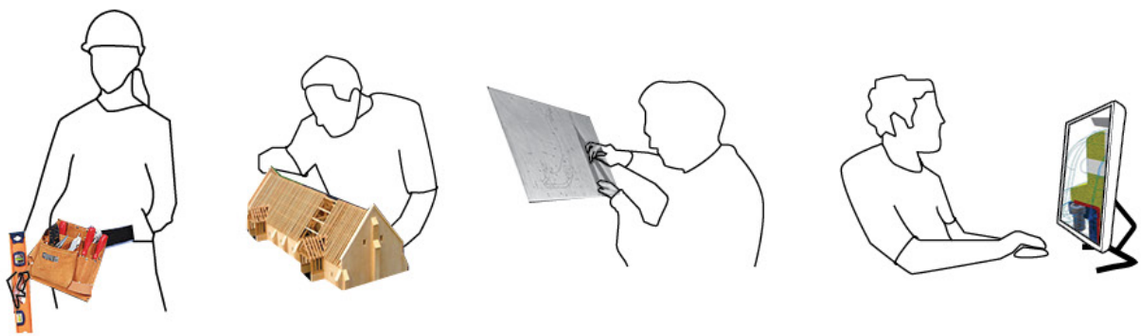

## PRODUCTIVE SEQUENCE

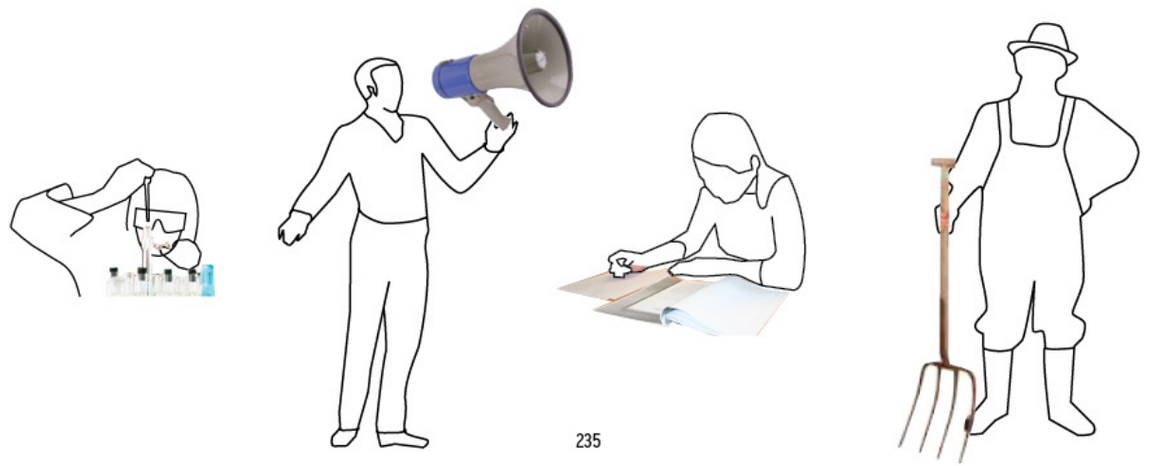
Full cycle production with a strong basis in the context of water corresponds with the urgent need for living within our means. Integrating living and producing into the campus architecture should dovetail well with a symbiosis between the production activities of the start-ups. Resources and facilities are linked to range a of production sequences, which in turn consist of parts that share common requirements in the production line. Linkage and interdependency enlarges the magnitude of one function from an individual facility, to a shared system that can grow into a public service. To give an example of three ascending degrees of functionality:

First degree: a toilet is a water utility - private use
Second degree: the water system connects to other spaces with its shared piping circuit, sewage, containers - shared use
Third degree: adds functions to the water system's facilities

A rooftop reservoir becomes a food production system and grey water purifier by placing plants, micro-organisms, snails and fish inside. Sludge is collected for farming activities and people can use the basin as a self-cleansing swimming pool. By brewing beer, an early purifying process, swimmers can enjoy a home brew beer and eat fish from an eatery with a focus on closed loop production - public use.

The same ascending degrees can be applied to the other utilities. A kitchen - sharing kitchen food, preparation, cleaning and waste - a public restaurant, take away - food industry. A bedroom - sharing bedding, laundry, bedtime stories - a hotel, camp site - leisure industry. A work space or study room - sharing knowledge, skills, information, collaborate - a library, school, science center, open workshop, lecture hall - knowledge industry.





## CONCLUSION

The start-up clusters may have many components, but their system of links give the campus enough equilibrium to restructure itself. Wether it is an aqua farming, a hydrogen power plant or an entire life cycle of the fashion industry, the sequence of activities starts at a main subject from which they fan out. Entrepreneurial activities qualify for selection if they link to important public issues, are innovative, contribute to the campus's valuable output and if they can be embedded in the campus projects. The examples show many art projects, because the arts are often overlooked as a sector that can add value to an innovation based economy. It's time to let the arts speak and deploy the innovation qualities of the creative industry. In their micro economy, students can fulfill an important role as pioneers who are not yet confined to restrictive business codes, which gives innovation the leeway it needs. Closely integrating student life with self-governed enterprises has the potential to encompass a vast range of benefits: from innovation, shaping an entrepreneurial mindset in students, development of a region, forming professional networks, cheapening labor and education, avoiding high student loan debts and exploring the education market. But these things can only gather momentum in spaces that are well defined.

# FIN

This project was made possible through the financial assistance from:

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