Technology, Real Estate and the Innovation Economy

Appendix

Case studies

Urban Land Institute

About ULI

The Urban Land Institute (ULI) is a non-profit research and education organisation supported by its members. Founded in Chicago in 1936, the Institute now has over 35,000 members in 75 countries worldwide, representing the entire spectrum of land use and real estate development disciplines, working in private enterprise and public service.

ULI has been active in Europe since the early 1990s and today has over 2,200 members across 27 countries. It has a particularly strong presence in the major European real estate markets of the UK, Germany, France and the Netherlands but is also active in emerging markets such as Turkey and Poland.

ULI's mission is to provide leadership in the responsible use of land and in creating and sustaining thriving communities worldwide. The Institute is committed to:

- Bringing together leaders from across the fields of real estate and land use policy to exchange best practices and serve community needs;
- Fostering collaboration within and beyond ULI's membership through mentoring, dialogue, and problem solving;
- Exploring issues of urbanisation, conservation, regeneration, land use, capital formation, and sustainable development;
- Advancing land use policies and design practices that respect the uniqueness of both the built and natural environments;
- Sharing knowledge through education, applied research, publishing, and electronic media; and
- Sustaining a diverse global network of local practice and advisory efforts that address current and future challenges.

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Urban Land Institute

Front cover image: Oslo Cancer Cluster Innovation Park. Photo credit: Thomas Ekström

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Contents

About This Report

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OMA

Oslo Metropolitan Area (OMA) is a non-profit organisation owned by the biggest developers in Norway, and receives the support of public authorities in the region. Its objective is to promote the Oslo region as the most attractive region in the Nordics for global investors and companies.

Authors

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Appendix Case studies

Amsterdam: The Edge

Location	Zuidas, Amsterdam
Size	40,000 sq m
Sector	Professional services
Completed	2014

Photo: Franklin Heijnen – available on a Creative Commons license.

Background

The Edge is a 40,000 sq m, 15 storey office building in Zuidas, the key corporate and business zone in Amsterdam. Completed in 2014, the building is now multi tenanted. The flagship lessee is the professional services firm Deloitte, who have moved their Dutch headquarters to the building. The Edge has recently been proclaimed the most sustainable office building in the world – having been awarded a BREEAM score of 98.36% and 'Outstanding' certification. The Edge was designed by PLP Architecture and developed by OVG.

What real estate do its innovative firms need?

The Edge's principal occupier, Deloitte, was looking for an office environment which would stimulate and bring the best out of its employees. As part of its Corporate Responsibility strategy, the firm is pursuing greener ways of working and moving branches around the world into greener workspaces. The new Netherlands Headquarters needed to adhere to this policy.

Peter Bommel, the CEO of Deloitte Netherlands explained:

"When it came to identifying our new headquarters in Amsterdam, we wanted to ensure that our building not only had the right sustainability credentials but was also a really innovative and inspiring place to work for our employees."

The firm wanted its new offices to prioritise the comfort and health of its workforce, believing that this was a crucial factor in creating a productive working environment.

As a global corporate, Deloitte also required a building which reflected its sector leading status – a piece of architecture befitting of a global company's national headquarters. As the CEO of OVG explained *"Deloitte always strives for the best and the building we developed for them reflects this."*

How do real estate providers make it work?

These providers focused on creating a building that is a world leader in terms of both sustainability credentials and the working environment created:

Innovative Working Environment

The Edge provides very high levels of comfort and amenity for the workers within it. Climate ceilings provide radiant heat (the equivalent of underfloor heating) – an adaptation which has been shown to decrease the amount of sickness leave taken by employees. Cutting edge technology enables employees to tailor their working environment to suit their individual preferences: temperature and lighting around an employee's desk can be regulated using an app on their smartphone.

The layout of the building is designed to encourage interaction and collaboration. The entire building has a transparent layout with floors of over 2.300sq m each. These large floor areas are laid out in a U-shape around a large central atrium in order to stimulate communication and to contribute to creating as many natural meeting points as possible.

Finally, the Edge is not purely an office space, but has the scale and amenities to create a working ecosystem. The facilities within the building include a coffee bar, restaurant, grand café (which is open to the public) and fitness centre.

The building is also highly accessible for employees – there is parking availability in the underground garage, 500 bike spaces, and a free shuttle to a separate parking garage. Train and metro stations are only a 400 metre walk away.

Sustainability

OVG, developers of the Edge, used innovative smart technology to create a highly sustainable office building. The Edge is energy neutral and is one of the only office buildings of its size to achieve BREEAM's Outstanding certification. Significant sustainability adaptations included orienting the building to the path of the sun in order to maximise natural light and heating, the fitting of solar panels on all south facing surfaces other than windows, and the use of aquifer thermal energy storage (130 metres below ground) to generate all energy required for heating and cooling the building. Rainwater is collected for flushing the building's toilets and the green areas which surround the building.

Lighting systems within the building are paired with sensors in order to detect movement, light and temperature and adapt artificial light use accordingly. This innovative technology not only saves money on energy costs (an estimated 30% reduction in the building's total energy use), but serves as a means of providing information and data about how the building is running to drive overall efficiency.

What are the factors of success?

Several factors contribute to making The Edge an attractive building for a variety of tenants in the traditional corporate and more innovation-oriented economy.

- **Collaborative design and build**
  OVG developed The Edge in close collaboration with Deloitte, the building's primary occupier, working together from the outset in order to ensure that the tenant's requirements were met. The developer also partnered with specialists in order to develop cutting edge energy efficiencies and a quality working environment. For example, OVG worked in collaboration with Phillips on the building's innovative lighting system. The CEO of OVG credits this collaborative approach as the reason for the building receiving its high BREEAM rating.

- **Thinking outside the building's boundaries**
  The Edge's is relatively unusual in that it utilises space outside of its own land parcel in order to maximise energy generation. OVG worked with the University of Amsterdam and the Amsterdam University of Applied Sciences in an agreement which saw an area of 4,100 square metres (44,132 sq ft) on the school's rooftops fitted with solar panels, in order to generate energy for the building.

- **Commitment to sustainability**
  OVG, the developer, demonstrates a firm commitment to sustainability, and in the words of its CEO Coen van Oostrom, is passionate about *"the role it can play in creating improved living and working conditions"*. The firm invested more than $1 billion in sustainable real estate development between 2007 and 2011, and in 2011 made a commitment to invest the same amount again. Deloitte, as primary occupier has also displayed a consistent focus on sustainability through its Corporate Responsibility policy and its delivery.

- **Flexibility of Space**
  The Edge is a multi-let office building, with tenants operating in a wide range of sectors. Besides Deloitte, other tenants include AKD (law), Henkel (consumer goods), Sandvik (mining), Salesforce (CRM software), and Edelman (PR). The flexibility of the office space provided plays a role in the attractiveness of the building to a wide range of tenants. Space can be let open plan, or with cellular offices fitted, and can be offered with or without a fit out. The Edge's proximity to Schiphol international airport has also proven an attraction to the building's international tenants.

Amsterdam: The VU Campus

Location	Zuidas, Amsterdam
Size	500,000 sq m
Sector	Higher education, medical/life sciences
Completed	Up to 2018

VU VRIJE UNIVERSITEIT AMSTERDAM

Background

Founded in 1880, the VU (Vrije Universiteit) is one of two publicly funded universities in Amsterdam. The University has an urban campus setting, covering around 0.5 square km on the edge of the Zuidas business district. It is attended by around 25,000 students and has developed into a research-intensive institution. The VU has strong links with local and international business and civil society.

VU's existing campus is currently being developed, modernised and upgraded in order to meet the needs of a modern day academic institution. The project size is 500,000 sq m, nearly half of which is for the university, and the rest used for housing, hotels, offices and other urban development. With the support of European Investment Bank funds, the largest ever loan by the Bank to a university, the redevelopment scheme is a cornerstone of VU's Vision 2025. Work is expected to be complete by 2018, forming a new *"city within the city"*.[2]

What real estate do its innovative firms need?

In order to remain an internationally competitive educational and research institution, the VU needs to attract students (both domestic and international), top quality teachers, and businesses. Cutting edge research, teaching equipment and infrastructure is key to its competitive offer. The university looks for concentration, digitisation, diverse study areas, and the creation of spaces that facilitate meeting and innovation.

The University also recognises that students want to spend time on campus outside of their teaching time. It is therefore providing a sport, leisure, cultural and retail offer on site. Meeting places, public space and communal areas are being re-designed to be lively, inviting and attractive places in which people wish to linger, aided by a new supply of 1,200 student housing units nearby.

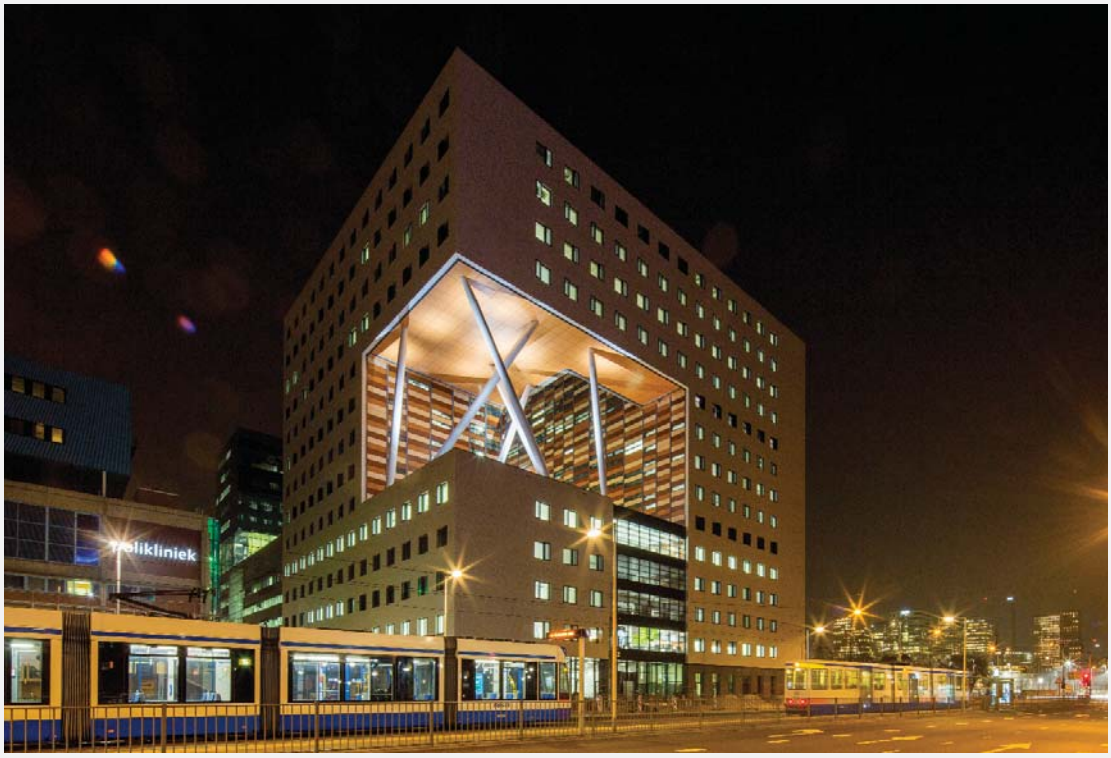


Image of the new O|2 lab building[1]

> *New teaching and working styles are taking shape now and in the future in the foyers, open-plan offices and coffee corners. With the arrival of on-campus student housing and an extensive sports and cultural programme, the campus is becoming a city within the city.*
>
> **– VU university**

How do real estate providers make it work?

The University is improving the quality and competitiveness of its campus in a number of ways. The VU's vision of the new campus (which will be double the size of the former site) is of *"a car-free urban environment with green roofs, inviting squares, underground car and bicycle parks and open buildings."*

Key improvements include:

- **Integration of medical research activity.** Designed as a cube with a atrium to fill the space with light, the Campus's new 33,000 sq m **OI2 lab building** is one of the first in the Netherlands to accommodate a specialised convergence research cluster. The aim to scale innovation in applied scientific-medical research conducted by chemists, molecular biologists, analysts, biophysicists and bioinformaticians from two universities and preclinical researchers from VUmc. The building is accommodating up to 750 employees where high-end research equipment is shared to encourage collective inquiries and to share costs. Bringing together biochemical labs, synthesis labs, a radionuclide lab and a lab for non-fatal diseases under one roof is a highly innovative practice, and part of the building acts as a 'Lab Hotel' for research partners or commercial parties to rent space for a short time.[3]
- **Priority given to social spaces.** The Main Building is intended to be a key hub for students, teachers and researchers to exchange ideas, and is undergoing a major facelift to make better use of the existing space. A more accessible and welcoming entrance and lobby, a broader range of study and lounge spaces, pleasant LED lighting and improved acoustics are all in train. Outdoors, the new Campus Square (Campusplein) will be completely pedestrianised and serve as a green meeting place.
- **Increased mix of uses.** New student apartments, shops, hotels and restaurants are intended to bring the district to life, making the campus the centre of activity for Amsterdam's whole Zuidas district. The Campusplein will be the heart of the University, and will have a full programme of sporting events, film screenings and productions. Individual buildings on the campus are diversifying their uses: the Main Building will have a new espresso bar and VU Café, and the ground floor of the OI2 lab will function as an urban plaza with restaurants, an information centre, a conference hall, meeting rooms and a bicycle parking area.
- **Redevelopment or construction of attractive and modern buildings.** Inspirational new buildings being built on campus include the new Academic Centre for Dentistry Amsterdam, and a spectacular new OI2 laboratory which will house state of the art and unique research infrastructure for the Human Health and Life Sciences sector.
  Both new construction and renovation of existing buildings have a focus on using natural light, with the guiding principle of enabling those indoors to see what's going on outdoors.
- **New flexible facilities.** Academic buildings will be used for cultural and leisure events – the Main Building already hosts an annual Film Festival on the building's roof, which will be continued with the renovated structure. The new OI2 building will contain flexibly designed lecture theatres that can be used to show movies and stage theatrical productions. It will also deliberately 'future-proof' the labs to prepare for changes in medical research practices. Some buildings will also be shared with business – for example several partners of the university will be given new office space within the Main Building.

- **Sustainable sources of energy and water** are an important part of the projects. Pooling is achieved using water from a nearby lake and other energy needs are met by the University Energy Centre. The OI2 building has a sedum green roof to absorb water and provide insulation. The building's structure lets in plenty of daylight, saving on the cost of artificial lighting.

What are the factors of success?

The unique factors which seem poised to make a positive difference to the site include:

- **Academia / private sector collaboration:** Partnership is an essential theme of the redevelopment of VU campus, and collaboration with the private sector is a key strategy to build commercial innovation. The project itself is being co-managed by the VU University and the VU University Medical Centre, who are also working with the City of Amsterdam, and private sector partners as part of the Hello Zuidas organisation.

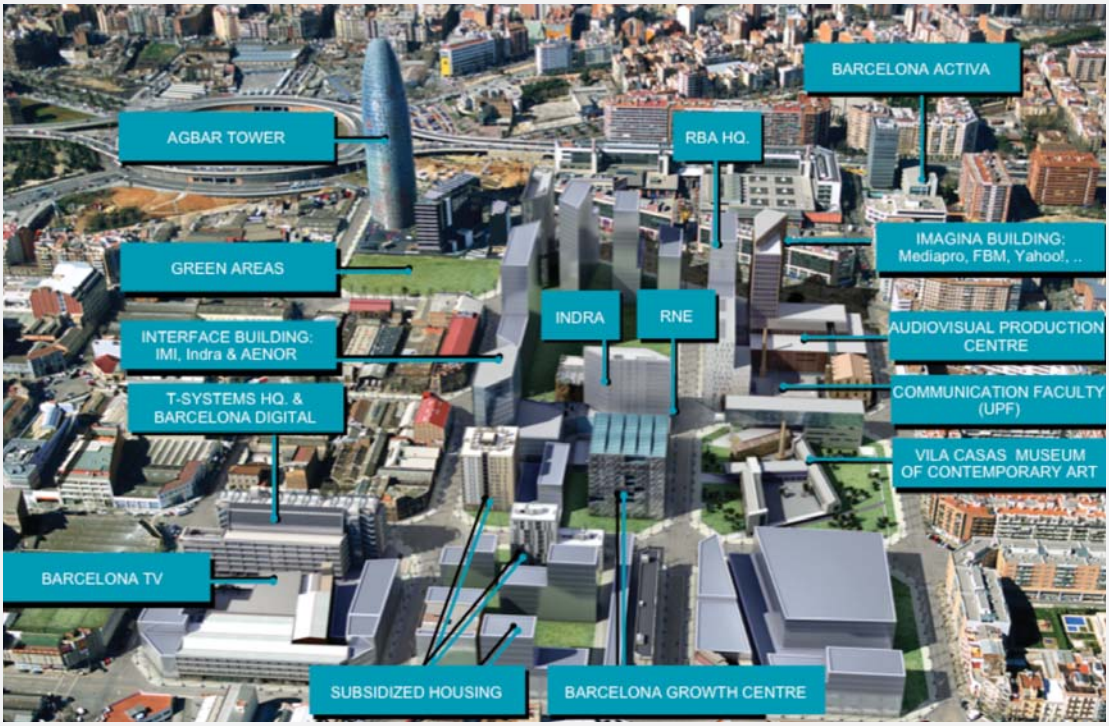
  The development is of interest to local (Zuidas based) businesses because of the opportunities it presents for knowledge sharing, innovation and talent development. The new buildings will also provide flexible space which can be hired or leased by businesses for a specific time. Companies with a link to the research at the lab will also be able to lease new buildings which will be built on nearby land.

- **Life 'after hours':** VU is investing in a lively area which will be a 24/7 district. Residents, businesses, culture lovers, hotel and restaurant guests can visit and linger in the district, creating a great offer outside of office and teaching hours. The campus is designed as a "city in a city" with the vibrancy of a small town. This mixed use and daytime / night time offering will be essential in attracting students (as well as researchers and lecturers) to study and live in the district.

- **Phased Redevelopment:** VU Amsterdam is redeveloping the campus step-by-step so that it can continue functioning properly during the process of modernisation. This incremental approach has built in flexibility to respond to changing needs.

22@Barcelona

Location	Barcelona, Poblenou
Size	3.0 sq m
Sector	ICT, energy, medical, design, media
Completed	2020



Map of 22@Barcelona: © Josep Miquel Piqué

Background

Once a flourishing industrial neighbourhood, Barcelona's south eastern area faced a long period of decay from the 1960s onward. Yet Barcelona City Council recognised the potential of the district with its opportunities for large-scale development and easy access to the city centre. In 2000 it launched an inclusive regeneration plan to transform the old industrial district of Poblenou into Barcelona's innovation district 22@. The scale of the project was unprecedented in Barcelona, with a floor space of 3,000,000 sq m across 115 city blocks.[4]

The district aims to attract knowledge-intensive industries. It is divided into five clusters within the area: information and communication technologies (ICT), energy, medical technologies, design, and media. Along with the general urban regeneration plan, Barcelona's municipality had to find a way to attract those highly innovative industries in the district by providing them with the services and infrastructure they needed.

Initially the government-led initiative had limited success, but in 2004 the private sector became more involved and led the effort to attract companies across the city to re-locate. Rather than offer subsidies, the Council decided to loosen regulations in the area and offer more freedom for private building owners to build at higher ratios in exchange for returning 30% of the land to the city to build green space, social housing and shared technology centres. Total public investment has exceed €180 million.

Ten years after its first tenants, 22@ plays a critical role in the city's real estate offer. In 2014, 80,000 sq m of new space was let on the site, equal to 28% of total city demand. ICT companies occupy 28%, followed by the legal sector (22%), general services (18%) and the industrial sector (12%). Having attracted office investment of more than €1.6 billion in recent years, the vacancy rate in the district is lower than the Barcelona average. At the current rate of absorption, office space in the 22@ district may only be available to meet demand up to 2016, and further construction may be required.[5]

What real estate do its innovative firms need?

The 22@ district had to provide innovative firms with a dense ecosystem capable of generating cross-fertilisation and proximity spillovers from scratch. The area started as a low-density, mono-functional zone. In its original form, the layout, density and connectivity was not conducive to knowledge sharing between diverse sectors. Because the site lacked leisure, retail and aesthetic amenities, 22@ needed to be organised as an innovation cluster from scratch. This meant deliberate planning from the start to ensure a continuous mixed-use development policy with a diverse and attractive offer for tenants.

The ICT sector was the primary focus and required a variety of real estate:

- **A Technology Transfer centre** to act as an anchor point for innovation with companies as the main shareholders.
- **Spaces for shows and exhibitions:** e.g. ICT House, an ICT Dissemination and Experimentation Centre, in the MediaTIC building.
- **Small and medium enterprises (SME) office space:** the MediaTIC Building and the 22@Interface Building, both equipped with specific services.
- **Living Lab:** part of a network of urban laboratories operated by public and private sectors.

The MediaTIC building was renamed the Mediatic Barcelona Growth Centre in 2014 as a public-private base for the city's innovation incubation activities. The ground floor has become home to a municipal agency, the first floor features a training centre, and on the second floor an incubator called Mobile Startup Barcelona accommodates a number of innovative projects related to mobile technology. Other floors feature more incubators, public brand agencies and research centres related to e-learning.[6]

The landmark building in 22@'s biomedical sector is the 55,000 sq m Biomedical Research park. This site's organisational model is cooperative with common spaces that facilitate interaction between the centres and which share advanced scientific and technical services.

The real estate demands of innovative firms have been complemented by research and training centres, housing and green space.

How do real estate providers make it work?

- **Enhanced locational proximity**
  The first important structural element has been to turn the traditionally low-density industrial layout into a denser and compact neighbourhood. Although several historical buildings have been renovated and turned into new spaces, the project has also strongly encouraged new real estate investments by allowing the construction of new spaces adapted to the different industries and activities.

- **Enhanced collaboration through real estate development**
  The unique selling proposition of 22@ is that it gathers — in a very close perimeter — five clusters of related industries, with high knowledge-sharing potential. Each of the clusters includes companies, university departments, technological centres and incubators, creating an efficient innovation ecosystem and strengthening the networks between researchers and industries. By providing common facilities and dedicated networking spaces, 22@ aims to enhance this knowledge-sharing potential. Additionally, such concentration of actors implies a more efficient use of specialised infrastructures.

  The district also plans to develop inter-cluster spaces, such as the Media-ICT building. This building will offer shared space, hosting university research centres, training centres, communal services and communication spaces, with the goal to increase relations between media and ICT professionals and researchers. Such inter-industry cooperation will help develop innovative behaviours by mixing different (yet relatively close) skills and knowledge backgrounds.

  Furthermore 22@ offers flexible spaces rented by the week or the month to adapt to early stage start-up needs. Indeed, knowledge workers, particularly in the fields of ICT or media industries, are usually geographically and temporally flexible and might only need a dedicated working space for a short period of time.

- **Infrastructure offer adapted to firms' activities** New buildings have been designed to adapt to each industry's specificities. For example, the TecMed cluster features scientific laboratories accessible to enterprises and institutions. Collaboration is also strongly emphasised with dedicated spaces to foster knowledge sharing and communication. An example of this is the Barcelona Media Park, which is under construction, and will act as a central point for meeting, innovation and research for the media cluster.

What are the factors of success?

By 2010, 22@ district had become home to more than 7,000 companies with 90,000 employees. Its success derives from the combined effects of hard infrastructure, soft innovation factors, public-private governance, talent development, and corporate attraction:

- **Integrated regeneration plan.** By combining economic as well as social policies, the project encouraged the creation of a diverse environment, with various industries, shops, green spaces and housing. Such an ecosystem is not only beneficial to the city's development, but also meets the amenity demands of innovative firms.

- **Understanding of innovation practices.** The district development took account of workplace organisation and knowledge-sharing practices of the new economy. Flexible spaces and collaboration are fostered through the working space offer. The public sector, particularly through the development agency Barcelona Activa, has been eager to support entrepreneurs through financial products and business support.

- **Transport connections.** The municipality invested in enhanced infrastructure connectivity around 22@. This included a ring road to connect the district to the airport and the rest of metropolitan area while heavy and light rail upgrades are also under way.

- **Housing provision.** The municipality allocated part of the land to be turned into subsidised housing in order to create a truly liveable district throughout the day. Some of the existing buildings have been regenerated while 4,000 new social housing units have been constructed.

- **High-quality public space and infrastructure.** The creators of 22@ designed the district not only to aggregate international companies but to create vibrant and exciting urban spaces. Around 114,000 sq m of new green zones were included, while several flagship buildings were developed such as Herzog & de Meuron's *Edificio Forum,* which hosts a large auditorium, and Jean Nouvel's Torre Agbar. These buildings have been important to reverse the negative image of the neighbourhood, highlight the changes under way, and attract new firms to the area.

Integrated supply systems. While the industry clusters are separated into distinct clusters within 22@, they share centralised heating and air-conditioning, electricity distribution, waste disposal, telecoms infrastructure, and smart traffic management system.

Berlin: Moritz Gruppe THE:SQUARE³

Location	Berlin Alt-Hohenschönhausen
Size	62,000 sq m
Sector	Mixed-use sport, retail and residential
Completed	Under construction (since 2014)

THE:SQUARE³ is a new complex developed by Moritz Gruppe GmbH in Berlin. The three-tower building will occupy a 62,000 sq m site in Berlin's Alt-Hohenschönhausen area, an eastern district well set for regeneration. The area is currently quite run down, with a former sports conference centre lying derelict. The planned site consists of a 118-metre skyscraper, two smaller towers (66 and 48 metres), other residential and office buildings, and a quarter of retail, gastronomy and leisure venues. The project, which represents a €450 million investment, will offer 146,000 sq m of gross floor space and is due to be completed 2019.[8] Its scope is set to help rejuvenate the district into a more multi-functional area and increase the number of (future) residents by around 13%.

THE:SQUARE³ draws on its local environment to propose a mixed-used complex revolving around three themes: sport, nature and life. Sport is the core unifying theme of the complex. The site is located right next to Berlin's Sportforum, Germany's largest Olympic training centre of excellence, which spreads over a 45 hectare site and offers infrastructure suitable for 16 Olympic sports.[9] It will provide several amenities adapted to the sport industry, and its relation to the Olympics will even be reflected in the three towers' design, which will feature gold, silver and bronze tints.

Nature is also a central element: multiple courtyards, green rooftops, hanging gardens and vertical green walls are included in the project. Finally, the mixed-used character of the development aims to promote a diverse and high-quality lifestyle.[10] The complex takes into account the current need for sustainable and low-energy infrastructure. The three towers are oriented in such a way to maximise sunlight, and a natural cross-ventilation system further allows to reduce energy consumption and costs. Solar energy will be absorbed through photovoltaic cells included in the building's outer skin, and rainwater will be collected and reused throughout the complex.[11]

THE:SQUARE³ Office: © Moritz Gruppe GmbH[7]

THE:SQUARE³ Street View: © Moritz Gruppe GmbH

What real estate do its innovative firms need?

About 100,000 sq m will be dedicated to offices and retail.[12] Office spaces are expected to be occupied by sport-related industries and businesses, and retail facilities — including a specialised shopping mall— will mostly be dedicated to sports. The complex will also feature a medical and research centre, a sport hotel and a sport entertainment area.

The residential part of the complex comprises 1,000 apartments as well as several social and education facilities, including a kindergarten and a school. Some infrastructure has already come online. In 2013 a daycare centre opened with more than 200 places, while over 200 smaller apartments have already been constructed, out of a planned total of 1,000.[13]

The project's space allocation features a rich mix of office, retail, recreation, family friendly housing and civic space. In addition to 25,000 sq m of offices, the site features 300 units of single-family housing and 650 multi-family units. A 12,000 sq m plot was sold in 2012, and a further plot of 38,500 sq m was recently sold in 2015. The remaining plot is planned for sale in 2015. This means there is a rather swift return of investment and significant cash flow. The town planning process will be finalised after just 39 months.

How do real estate providers make it work?

- **Negotiation with the city council** is an important step to getting the project off the ground. The retail sector is set to occupy the lower floors of the towers. But the planned retail area of 8,500 sq m was recently deemed too large by City Councillors for Urban Development, with approval only granted so far for 5,000 sq m, partly due to concerns about a partly occupied shopping centre (Hohenschönhauser Tor) opposite the site.[14] Gaining political support by building a broader long-term vision about the housing and amenity benefits to the city has been an important task for the developer.[15]

- **Marketing and Press:** The Group's press strategy is aimed at ensuring broad and long term coverage of the project THE:SQUARE^3, and its unifying themes, under the slogan "How do you want to live?". The strategy concentrates on trade magazines from the real estate industry and the architectural community, as well as dailies, arts journals and sports magazines at both national and international levels. The different media events serve as "hooks" to keep industry experts and the general public informed about the project, establish the brand THE:SQUARE^3, and raise and maintain public interest in both the project's potential and its marketing. Presentations to Lichtenberg District Council, news of the project SECRET GARDEN, a promotional film, several citizens' forums, and other marketing elements were all implemented according to the Group's marketing plan. Moritz Gruppe accompanies the project from day one with extensive informative events, innovative marketing activities, direct contact and dialogue with residents, all political parties, local clubs and the press. The building has won several awards already including winner of the ICONIC Award for architecture and concept in Germany 2013, a nomination for the final in MIPIM 2013 in the category 'Best Future Project', increasing the acceptance and regard for the project.

What are the factors of success?

THE:SQUARE^3 is still under construction so it remains to be seen how the project will work in practice. So far, a couple of important ingredients have helped the development to gain momentum.

- **Developer experience.** Moritz Gruppe was the first developer to discover the potential of the area from 2009 onwards when it revitalised a former confectionery plant and developed the successful residential project 'Schokostücke' and 'Zuckerwarenfabrik' on the same Konrad-Wolf-Straße.[16] This laid the foundation to continue on their positive path with the project since the summer of 2012. Both sites had been eyed up in the past by developers, but for many years nobody found a workable solution. The Group's preference and ambition is to create a model of liveability and architecture that sets the standards for the rest of the area.

- **A compelling concept.** The project name THE:SQUARE^3 tries to capture the character of the place and the location. The superscript number 3 refers to the three topics life, nature and sport, and the fact that the projects has 3 plots and 3 towers. The three topics life, nature and sport are mirrored through the architecture with the three towers resembling a sports podium of gold, silver and bronze.

  - LIFE: Through the multifunctional urban plan, revitalisation of the neighbourhood to suit multiple tastes is a key task.
  - NATURE: Green roofs, courtyards and playing fields provide access to nature and are important to the quality of life offer.
  - SPORT: Offices for sports companies and clubs, apartments, a medical and research centre, sports education facilities, a sports hotel (for athletes) and a sports focused shopping mall at ground level, aims to provide an atmosphere of health and work-life balance.

Location	Berlin Mitte
Size	4,000 sq m (16,000 sq m wider campus)
Sector	Digital
Completed	2014 (begun 2011)

Berlin SoundCloud

Map and image of Factory Campus Berlin[17]

In 2014 SoundCloud moved into its new global headquarters in Berlin. The site is three floors and 4,000 sq m of a former warehouse brewery in the district of Mitte, close to the Berlin Wall. The floors had previously been an office campus for early stage technology start-ups, and had been converted into mostly open plan office space. The site had retained its industrial interior – with concrete columns, exposed concrete floor and rough brick walls.

SoundCloud Berlin is home to over 200 employees working in multiple roles including product, engineering, design, community, finance, brand, legal and HR. The interior has been designed from scratch by KINZO to create a collaborative and knowledge-sharing space.

SoundCloud was the first agreed tenant in the Factory, a five building 16,000 sq m campus for start-ups and mature technology companies formed in 2011 within a growing cluster in the district. The campus features 23 companies occupying anything from 200 sq m units to more than 1,000 sq m, with employee size varying from 2 to 220, all with an average age of 30. This flexibility allows small start-ups to work on the same campus as more established tech firms and learn from their experience. The start-ups are in varying segments of the digital industry, from consumer internet (32%) to social (28%), fashion (8%), health (6%) and cleantech (3%). Currently, 85% of all workers are employees and the remainder are freelancers.[18]

What real estate do its innovative firms need?
The SoundCloud space required a number of distinctive technologies and installations: high-quality audio visual equipment, a recording studio, meeting space, and space for non-employees to take part in hackathons, talks and conferences. The company has access to a 400-capacity auditorium to host events. As SoundCloud is growing rapidly, the site also had to be able to absorb expansion and to potentially accommodate up to 350 desks.

Across the wider Factory campus, two new storeys were added, and in addition to the workspaces there is a fitness room, basketball court, restaurant, coffee shop and art gallery.

How do real estate providers make it work?
Angel and seed financing company JMES Investments and Berlin property company s+p Real Estate led efforts to establish the Factory in 2011.[19] The campus is a €22 million investment brought together by five individuals. Although more money could have been made from turning the site into residential apartments, the investors' intention was to create somewhere to locate for the next 10 years, where they could oversee the creation of dynamic companies. Some JMES portfolio companies are existing tenants.

More than two-thirds of the companies are at the angel or seed stage. The founders of the campus do not attach themselves to a particular model of incubator or accelerator – they are "stage agnostic" so welcome fully-established companies, later-stage companies or up-and-coming firms. Factory has launched a €100m fund to bridge the gap between late-seed and early-series A funding, which many start-ups in Berlin find hard to cross.

Co-founder and investor Simon Schaefer has observed the difficulties of creating a profitable concept around start-ups: *"If you look at real estate as a business, start-ups are probably your worst clients. Because if it works really well, they outgrow the space quickly. And if it doesn't work at all, you'll hear from them when there's a lot of rent left to be paid."* [20]

What are the factors of success?

- The flexibility to have both short-term and long-term spaces for their individual stages.
- A combination of **management experience** in entrepreneurship, community management and event management.
- Identifying the importance of a **network of founders and enablers** in accelerating the Factory ecosystem.
- **On-site accommodation** - programmers and designers can apply for free on-campus accommodation for up to six months at a time.[21]

Hilversum: Media Park Netherlands

Location	Hilversum (between Amsterdam and Utrecht)
Size	250,000 sq m
Sector	Media and broadcasting
Completed	1960

The Media Park was a public sector project offering facilities for the main public television activities in the Netherlands, founded in 1960. TCN acquired the Media Park in 2003 for around €100 million, at a time when Amsterdam was beginning to bring competition to the media sector.[23] Public broadcast company NOB was the main occupier and it signed a 10-year lease contract which assured the continuity of the media function of the park.

The company's objective was to make the facility attractive for a broader range of media companies, both public and private, and revitalise the park into a high-end media hub. This has involved complementing the concentration of large corporate and public broadcasters with a more diverse ecosystem of related industries and more SMEs, to form a 'cross-media' cluster. In a 10 year period the park has become one of the leading concentrations of media companies in Europe.

What real estate do its innovative firms need?

The recent response has attempted to provide more facilities for SMEs in the cluster, enhancing its lifestyle appeal, improving its connectivity and branding the whole municipality as an integrated media city. The media hub concept was a vision of a multi-media village using the facilities such as studios, data connections, independent energy systems, security and suppliers to the media industry. Together, the effect of this upgrade was to create a unique cluster with international appeal.

The original plans for the 2007-20 period identified scope for an extra 135,000 sq m of space to include smaller and more affordable venues which were necessary to attract start-ups. In addition, mixed-use land occupation was introduced with the development of health facilities and kindergartens, and a longer-term objective to open up restaurants, bars and cinemas to diversify from the media park's single-occupier structure.[24]

A number of buildings have now been added to the site. These included a new data centre, supporting services such as a crèche, shops, café and information booth, and fully-refurbished studio facilities. In 2011 a zoning plan was approved that allowed another 70,000 sq m of building and supporting services.

How do real estate providers make it work?

A key part of the new vision was to open the park to the public. The Media Park is part of an 80-year long radio and television heritage with its own cultural dimensions. It is part of the Netherlands' collective memory and was therefore positioned as such. For the media companies, this offered potential to improve relations and outreach with their customers. TCN added a new museum for Sound and Vision on the campus and invested in the infrastructure around the park.

Accessibility was an absolute necessity for the success of the park. With this vision in mind, TCN executed the following projects:

- The fence around the park was demolished
- Names of famous TV personalities were given to the streets.
- Special public events were organised to make the park more attractive to visitors.
- More than 100,000 sq m of new multi-media companies was added to the park over a 10 year period.
- UBF, MAX, Sony, Talpa and other key tenants were brought to the park.

From 2004, local authorities authorised infrastructure investment around the park, to improve road, cycle, rail and bus connectivity.[25]

What are the factors of success?

- **Comprehensive management.** The management of the park has included security, energy, leasing, marketing, development, daily management and maintenance. Intensive and comprehensive management over more than 10 years has overseen the successful implementation of a multi-stage vision.
- **Long-term anchor.** The role of Dutch broadcaster NOB as the long-term anchor has been essential in attracting other local and international companies over the last decade.

Location	London, Shoreditch
Size	1.6 million sq m
Sector	Digital, media and technology
Completed	Organic growth since 1970s

Tech City London

London's Tech City emerged organically from the ex-manufacturing districts on the eastern fringe of the financial district. As factories and warehouses closed down throughout the 1970s, artist communities moved in to the large empty buildings with abundant natural light and high ceilings. Bohemian communities and young creative minds followed in their wake, bringing a mix of edgy boutiques, galleries, bars and restaurants, and fostered an entrepreneurial creative community.[27]

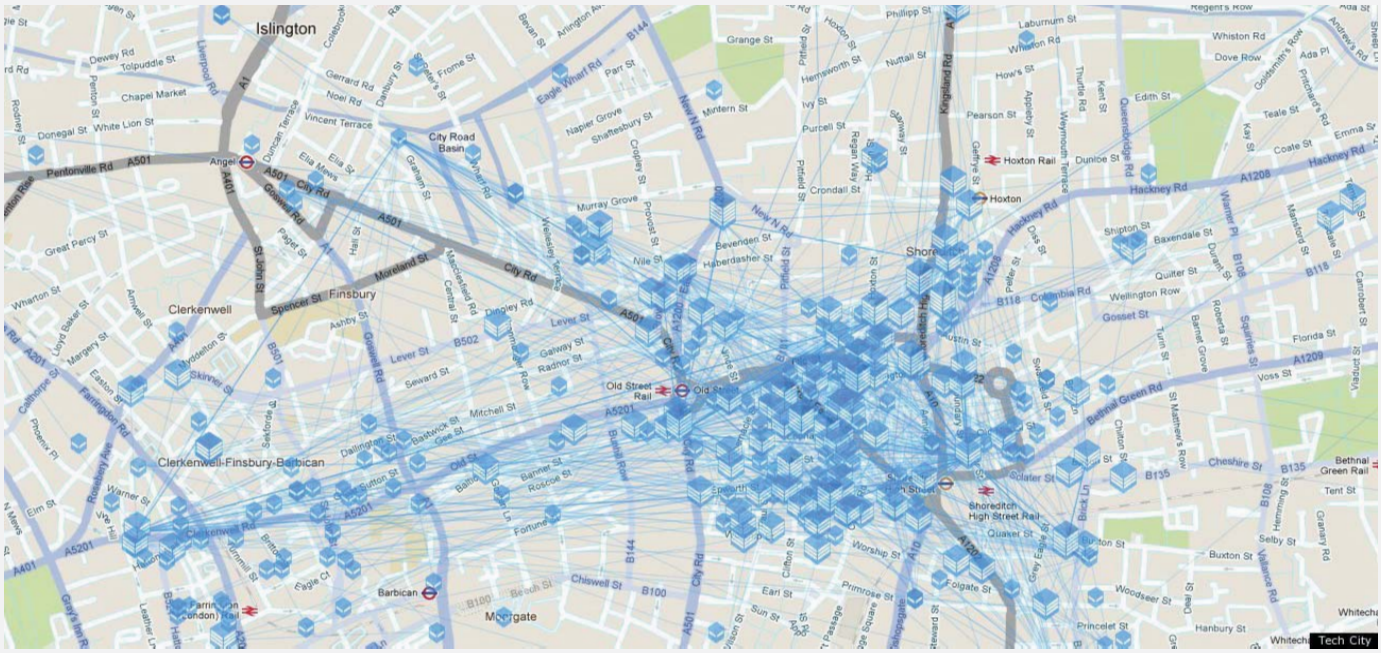
This mix has allowed the neighbourhoods north and east of the City to become one of the most vibrant tech hubs in Europe, home to diverse yet interrelated clusters feeding off each other's creativity, including media, advertising, fashion, architecture, engineering, and software.[28] Over 34,000 digital technology businesses operate there, employing over 150,000 people. The area boasts a little over 1.5 million sq m of office space in its core and periphery, and Technology, Media and Telecommunications (TMT) firms represent about a third of active requirements in the district. TMT firms used to represent approximately 7-9% of office take-up between 2004 and 2009, but this had risen to nearly 25% in 2013.[29] While initially a grassroots process, the cluster has attracted the attention of City Hall and the national government alike, who have set up a support and investment promotion agency, Tech City, and are adapting local planning guidelines.

What real estate do its innovative firms need?

There are five types of space most commonly sought after in Tech City:

- **Artist's studios,** typically under 1,000 sq ft (92 sq m) per unit but grouped together as a collection of studios in centrally managed larger buildings. Originally these often 'colonised' buildings lying vacant.
- **Co-working space,** typically up to 4,000 sq ft (371 sq m), as a key source of affordable space for start-ups and micro-businesses, and for which there is a very high level of demand.
- **Start-up and other SME space,** up to 4,000 sq ft (371 sq m), covers small individual business units that are neither artists' studios nor co-working space.

London's Tech City[26]



- **Grow on/move on space,** larger than start up space of 4,000 - 30,000 sq ft (371 – 2,787 sq m), housed in a diverse range of spaces.
- **Corporate office space** of 30,000+ sq ft (2,787+ sq m), the largest occupiers of office space, with large floorplates, flexible space, and Grade A quality.

Recently there has been an urgent need for affordable office space. Rents have risen rapidly, and short-term supply problems have compounded the issue with annual new building supply typically hovering around 5% of total stock.[30] Secondary commercial property supply is being eroded by frequent conversions to residential units.[31] Furthermore, some of the recent addition to office space has been skewed towards larger units (above 53,800 sq ft/5,000 sq m), whereas micro-businesses, start-ups and SMEs need smaller offices and flexible office-use arrangements.[32]

Businesses in Tech City demand high-speed broadband infrastructure, but there have been challenges ensuring this connectivity. Firms in the cluster are seeking action on connection speeds.

How do real estate providers make it work?

As Tech City grew organically, real estate providers did not initiate a deliberate growth policy, but instead responded positively to the needs of local firms. This has included:

- **Understanding the aesthetic and lifestyle aspirations of the workforce**
  As artists and entrepreneurs were initially drawn to the area's high-ceiling, bricked, aesthetically pleasing, 'non-mainstream' warehouses, developers have responded by both adapting this building stock to start-up needs, and by developing modern equivalents.[33] In addition, collaboration between developers and the Greater London Authority (GLA) has made clear that Tech City's present and future success depends on sustaining the independent retail and entertainment offer which made the area attractive in the first place. As a result, a commitment to pursuing mixed-used development is proving key to the area's continuing appeal.[34]

- **Embracing flexibility**
  Landlords and developers have progressively realised the need for flexible occupation and tenancy arrangements. As a result, 'co-working' spaces – first introduced in 2008 – have become increasingly popular in Tech City, with the Google Campus, The Tea Building and The Trampery as prominent examples. Such spaces are affordable for start-ups and micro enterprises as they are based on the short-term sharing of services and facilities based on membership fees rather than tenancies, and simultaneously provide the spaces to mix, meet and create with others.[35] Companies such as Google are happy to provide them as they seek to benefit from spill-overs these generate.

  In addition, shorter tenancy agreements for small firms in take-off stage have become more widespread in response to the short-term mobility needs of SMEs. Similarly, informal and ad-hoc arrangements are frequent, allowing firms to use the premises of a larger company as a starting point. Finally, large corporate entities have responded positively to the variety of needs from tech SMEs, by sponsoring them or subsidising facilities, hoping to either benefit from their innovative output or future collaboration.[36]

- **Responding to demand**
  Despite the short-term pressure on office space, the 2013-2018 period will see a 10 fold increase in floor-space coming on to the market compared to the previous five years, which will help relieve current pressures. By 2023 it is estimated than extra 5.18 million sq ft (481,000 sq m) of office space could be added.[37] The district will need to be vigilant to ensure there is not an oversupply of space.

What are the factors of success?

- **Inherited real estate and cluster strengths.** Run-down industrial units that first hosted artists and bohemians were relatively affordable and provided the platform for creative experimentation.
- **Pool of young, digitally literate workforce.**
- **Proximity to London's financial and legal hub** has generated clear benefits in terms of the flow of ideas and venture capital funding links.
- **Improvements to transport links** - including bus services and the London Overground, have helped ease congestion.[38]
- **City planning frameworks.** The Mayor's *City Fringe Opportunity Area Planning Framework,* recently submitted for consultation, is also playing a significant role in the cluster's future.[39] The framework is seeking consensus on optimised planning guidelines which will sustain the retail, cultural, residential and commercial mix of buildings that made the area appealing in the first place.

Cornell Tech Applied Sciences Campus

Location	Roosevelt Island, New York City
Size	2 million square feet
Sector	Tech, science and engineering
Completed	First phase to open 2017

260,000 people are employed in a tech-related job in New York City, and with the acquisition of 5 million square feet of office space in 2014, the tech sector was second only to the financial sector for take-up.[40] The city government, initially under Mayor Bloomberg and currently with enthusiastic support from Mayor de Blasio, has taken an active lead in providing the tech sector with land, office space and capital, initially through an incubator network launched in 2009, and more recently through its Applied Sciences NYC program.

Launched in 2010, Applied Sciences NYC invited academic institutions to submit proposals for new applied science campuses in the city, with the winners benefitting from the use of city land and financial assistance.[41] The aim was to create a world-class campus as a way to expedite growth of the City's tech sector and create a more diversified and competitive economy.

After having reviewed numerous applications for future campuses, the city government announced that the plans of Cornell University, with the Technion-Israel Institute of Technology as an academic partner, was the first to have been chosen.[42] Their plans for a new $2 billion, 2 million sq ft campus on Roosevelt Island are coming to fruition, with the first buildings due to be completed by summer 2017. The hope is that at full capacity, 2,000 graduate students will mix and innovate with academia and business. New York's Economic Development Corporation (NYCEDC) has offered $100 million in infrastructure assistance, the site of Roosevelt Island, a 99 year lease and administrative support.

Aerial View from Northwest. The Bridge, The Bloomberg Center, Residential Building, and Verizon Exec. Ed. Center (listed from left to right) - Credit Kilograph, Weiss Manfredi, Morphosis, and Handel Architects

CORNELL NYCTECH

What real estate do its innovative firms need?

Manhattan's popularity had produced sky-high rents and a shortage of office space, a situation which has spilled over into other boroughs such as Brooklyn.[43] Small tech start-ups find themselves in need of affordable space, while wishing to remain in vibrant communities.

The Applied Sciences NYC project is key to the city's response to the tech sector's land, lifestyle and agglomeration requirements. Plans for the campus underline the ethos of the project, supplying the physical space that breaks down the silos between academia, entrepreneurs and investor.[44] The campus rejects traditional classrooms, walls and offices, replacing them with open plans and collaborative workstations. The campus is designed to ensure that everything can be re-purposed as technology evolves – and as a result, no definite IT choices have been made since no one knows what classroom technologies will look like in the future. Furthermore, traditional infrastructure such as a university data centre are absent, with the gamble that cloud computing will be able to host the vast amounts of university data systems.

Since the launch of the first project, the NYCEDC has announced three new campus developments.

- the NYU Center for Urban Science and Progress, which will focus on urban challenges and technology.
- the Columbia University Institute for Data Sciences and Engineering dedicated to advanced data sciences, adding 44,000 ft2 of work and study space by 2016 with $15 million in financial support from the City.
- Carnegie Mellon's Integrative Media Program which will provide an extra 16,000 ft2 in Brooklyn, with a $3.5 million coming from City Hall, to focus on the overlaps between technology and the arts.[45]

The New York City government is supporting biotech clusters in other connected programs. NYCEDC is investing $13.4 million in the Alexandria Center for Life Sciences, which will provide 1 million sq ft of research and co-working space on the East-side of Manhattan, while running an Early Stage Life Sciences Funding initiative.[46] The latter is a PPP to raise funds for future research, with $10 million committed by the city, $40 million from corporate sponsors and the rest to be matched by future venture capital partnerships.

How do real estate providers make it work?

The first phase of the new campus of Cornell Tech, which is to be built on Roosevelt Island by summer 2017, will occupy 5 ha and will comprise:

- The Bloomberg Center, Cornell Tech's first academic building
- The Bridge, a place for companies to locate on campus
- A residential building for students and faculty
- Verizon Executive Education Center [47]

This reflects the trend of growing importance of universities as anchor innovation institutions with activity springing up around them. Cooperation between academic institutions and corporates has eased the talent recruitment process, boosted collaboration opportunities and generated substantial income for the universities.[48]

The Verizon Executive Education Center is funded with a $50 million gift by Verizon. Bloomberg Philanthropies announced a $100 million gift to fund construction of the first academic building, named The Bloomberg Center, which Cornell aspires to be among the largest net-zero energy buildings in the United States, with all of its power generated on campus. The residential building will be the first passive house high-rise in the world, and ensure there is 24/7 campus activity.

By attracting leading architects and master planning companies it is planned to create one of *"the most environmentally friendly and energy-efficient campuses in the world."* [49]

What are the factors of success?

- **Support from NYCEDC's incubator network.** The city funds affordable work spaces and collaborative environments – while offering access to corporate sponsors.[50] Such spaces include the Harlem Biospace focused on life sciences which provides wet labs, and the NYC Urban Future Lab, a community for entrepreneurs in clean tech and energy, with 10,000 sq ft of workspace to meet, collaborate and innovate. Over 1,000 start-ups have benefited from over 20 city-supported incubators, therefore responding to the need for affordable and equipped workspaces.
- **Public finance to support entrepreneurs.** The City recently agreed to help fund, build and lease 10,000 sq ft of flexible workspaces near Fulton Mall.[51] This was partly in response to the Downtown Brooklyn's Partnership call for a Master Lessee program to subsidise real estate upgrade costs for landlords willing to rent at below-market rates to start-ups.
- **At Cornell Tech, partnership between world leading universities** in computer science and engineering, an Ivy League Cornell University and a winner of Nobel prizes Technion-Israel Institute of Technology ensures a strong academic and research base for university-born innovations.
- **City authority support** with an initial 99-year lease of extremely valuable and sought after public land on Roosevelt Island, being developed by Cornell University.

Oslo Cancer Cluster Innovation Park[52]

Location	Oslo, Ullern District
Size	36,000 sq m
Sector	Medical
Completed	2015

Background

Oslo Cancer Cluster is an oncology research and industry cluster dedicated to accelerating the development of new cancer diagnostics and medicines. It is one of twelve internationally-oriented industrial clusters to receive technical and financial support from the Norwegian Ministry of Trade and Industry and the Ministry of Regional Development of Norway, and has the status of a Norwegian Centre of Excellence (NCE).

In August 2015, the Oslo Cancer Cluster opened an Innovation Park which aims to become Europe's major oncology education, research and industry hub. The park will become a centre for the development of new cancer treatments and therapeutics, and specifically aims to shorten the time it takes for laboratory ideas to reach cancer patients. The $200 million (€178.9 million), 36,000 sq m park is believed to be the largest investment of its kind in Europe.

The Cancer Cluster Innovation Park is located next to the Norwegian Radium Hospital and the Institute of Cancer Research at Oslo University Hospital in the western district of Ullern. As such, it aims to bring the whole value chain of oncology, from basic research to industry in one place.

The park will establish a Biotech incubator, which will house and support promising oncology SMEs which are looking to commercialise. Other tenants at the site will include the Norwegian Cancer Registry, Oslo University Hospital, and the Radium Hospital Research Foundation. Labs, offices, research departments and biobanks will all form part of the development.

Uniquely, the park will also integrate Ullern High School within its campus. The links between the high school and innovation park will be strong, with lectures given at the school by researchers and member companies, students getting the chance to do internships in research institutions and cluster companies, training camps for teachers run by the cluster, and collaboration on teaching methods with the University of Oslo.

What real estate do its innovative firms need?

The three main buildings on the innovation campus are designed to fit the specialised needs of both oncology research and development (R&D) and business development. Office space is available in cellular designs or in semi-open plan form. Within the incubator, researchers and start-ups may rent 'ready to use' office and/or lab space, with all practicalities taken care of. The floorplan below shows some of the space available to incubator companies, incorporating cold storage rooms, labs, social areas, and cellular offices.

Bespoke needs are also catered for – for example, Building A is occupied by Oslo University Hospital, and benefits from an upper storey connection between its own building and the adjacent Norwegian Radium Hospital, in order to make it possible to ship medication from the Hospital Pharmacy Production Unit to the clinic.

Additional facilities at the innovation park include:

- A canteen open to all tenants, as well as kitchenettes on several floors.
- A multi-purpose hall, which can be used by all tenants
- An auditorium which can be rented for lectures, seminars or conferences.
- 170 parking spaces
- Catering services
- Labs which can be used by leaseholders (as opposed to those for the use of incubator companies).

How do real estate providers make it work?

By building the innovation park immediately adjacent to the Norwegian Radium Hospital and the Institute of Cancer Research at Oslo University Hospital, the whole value chain from basic research to industry is brought together in one location. The site of the park was originally occupied by Ullern High School, but was obtained and developed under an innovative deal which saw the former High School demolished and re-housed on site.

The park is scheduled to be built in two phases, with the second phase of construction dependent upon a threshold level of pre-lets being reached. Once the desired demand from tenants is achieved, Phase 2 construction will begin on the development of a further seven-storey 8,000 sq m building.

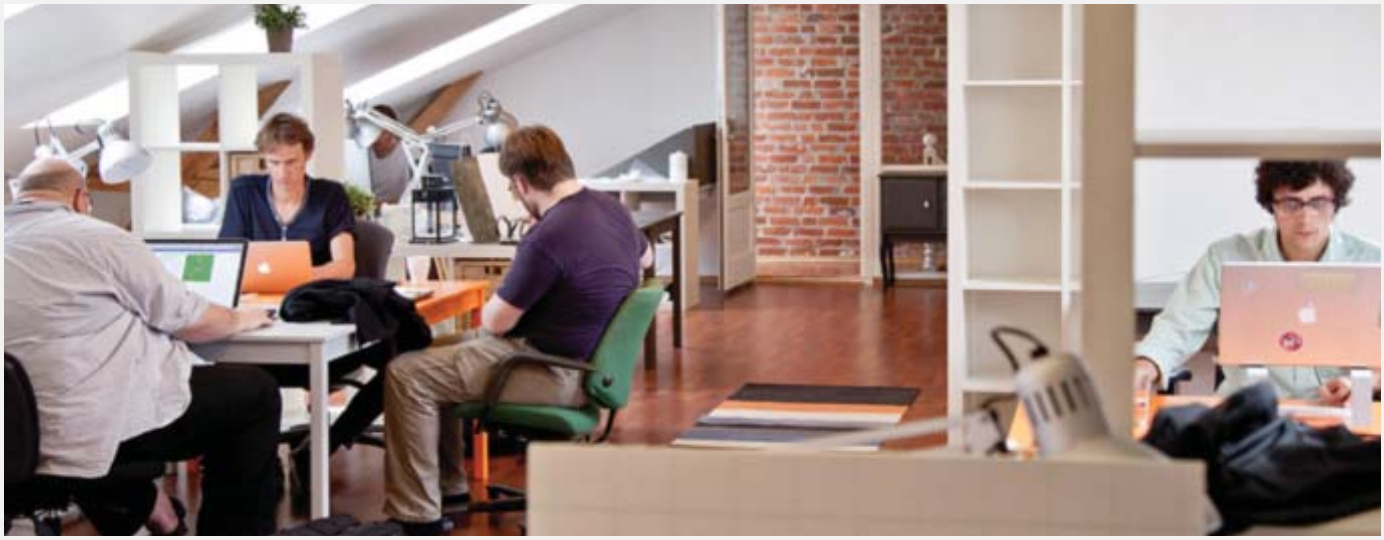
What are the factors of success?

Oslo Cancer Cluster Innovation Park has only just opened, and as such its success is not guaranteed. However, a number of factors set it apart from other science innovation parks and suggest that it has the potential to achieve its aims:

- **Niche focus:** the innovation park is purely focused on oncology and the establishment of an oncology incubator. It is thought that this focus on only one therapeutic area will help small biotech companies to attract attention early on from perspective partners.
- **'Under one roof' approach:** bringing together biotech, pharmaceutical and service companies alongside significant centres of excellence and world-class lab facilities is expected to bring about the highest levels of collaboration and connectivity.
- **Experienced team:** The park's board members and management team are comprised of representatives who have in-depth knowledge and extensive experience with property development and real estate, as well as in the oncology industry.
- **Clustering with world class institutions:** The adjacent Radium Hospital dates from 1932 and is well known as a field leader in cancer research and treatment. Norway has been recognised by a number of international evaluations as a world class centre for medical research.
- **Planning for the next generation:** Through the collaboration with Ullern High School, the innovation park aims to educate the researchers and entrepreneurs of tomorrow, and attract and develop top talent who can sustain the Oslo cancer cluster in the future.
- **Funding:** The Cancer Cluster Incubator receives financial support from the governmental agency Siva, the Industrial Development Corporation of Norway. The funding will be used to develop and implement a tailor made business development concept for the tenants of the Incubator.

Location	Oslo, City centre
Size	3,100 sq m
Sector	Digital
Completed	2012

Oslo MESH Norway[53]



Background

MESH is a 3,100 sq m innovation platform, co-working and event space in downtown Oslo which aims to connect and accelerate the start-up scene in Norway. Its goal is to make Oslo a vital hub on the European start-up scene and help to create more Norwegian start-ups with international impact.

MESH formed Oslo's first co-working space when it opened in February 2012, following trends for collaborative workspaces which sprung up elsewhere in Europe and the USA. Today, it hosts around 150 companies, freelancers and entrepreneurs mainly working in tech and design, and tries to maintain a balance of around 70% of occupants from early stage start-ups, and 30% creative individuals such as filmmakers, animation makers, and graphic designers. Some start-ups based within MESH include Holder de ord (Norwegian for "keeping their word"), which tracks politicians' promises; and Justcoin, a currency exchange for Bitcoin.

The space also hosts events for the tech and innovation industry, including TEDx events, meet-ups for Android and Apple, creative breakfasts and entrepreneurial workshops. In 2015, MESH will host the closing party for the Oslo Innovation Week - the largest innovation convention in Europe.

What real estate do its innovative firms need?

MESH seeks to meet every possible requirement of the innovative entrepreneur. The hub is based in a five-storey industrial-style space in central Oslo and comprises a series of flexible event spaces, meeting rooms, workspaces, a video studio, a makerspace / creative lab, photo lab, a nightclub and a coffee shop which is open to the public.

Desks are provided in both open plan spaces and in individual cubicles. Common areas are available for eating, socialising, or hosting parties, and table tennis or Playstations are available in communal areas for members. Other areas are suitable for more formal meetings, workshops and lectures. Members have access to complimentary internet, coffee and printing facilities (including 3D printers), and audio visual equipment. Meanwhile, there are event spaces which can be hired including a 'backyard' suitable for summer parties or concerts, a café which can be shared with public users in the daytime or rented wholly at night, and a nightclub.

How do real estate providers make it work?

Oslo is one of the most expensive cities in the world, and can be prohibitively costly for entrepreneurs looking to set up their own operations. The use of shared / co-working space, and flexible use of real estate – for example a public café which doubles up as a meeting room or networking space – can help to lower the setup costs for entrepreneurs.

What are the factors of success?

Opened in 2012, MESH has become Oslo's main hub for tech-oriented activities. It is now entirely self-funded thanks to high demand (having initially received government grants), and has even been shortlisted for the 2015 Nordic Startup Awards Best Office Space. Its success can be attributed to a number of factors:

- **Central location:** Located just behind Oslo's City Hall, MESH is ideally located for meetings and events. Although real estate in central Oslo is expensive, MESH's founders were able to take up land which traditional core area services such as did not want. This was thanks to the informality and flexibility of their user's requirements.
- **Creating an environment that fosters innovation:** MESH is not only a space for entrepreneurs to work in, it also organises and provides help and services to start-ups. It has even entered into partnerships with companies who provide pro-bono services to young entrepreneurs, such as legal services.
- **Flexible membership:** MESH members can, if accepted, join with full-time, part-time or night-time memberships.
- **Lead by innovators:** The founders of MESH, Anders Mjaset and Audun Ueland, are themselves young entrepreneurs, having founded a start-up business - PramPack, a luggage company - at the age of 21, which they later sold to private equity. Both still under 30, they have an inherent understanding of what young entrepreneurs want and need from their working environment. As they describe it, they have created an environment where entrepreneurs 'feel at home'.
- **A focus on the social:** MESH is distinguishable from other hubs because of the focus it places on networking and socialising as an essential part of innovation.

Location	Stockholm, city centre
Size	2,000 sq m
Sector	Digital (Internet, mobile, media and gaming)
Completed	2013

Stockholm SUP46

© SUP46:[54]

A start-up hub for Stockholm

Stockholm has a thriving innovation economy, with numerous examples of successful start-ups. Yet, until October 2013, the digital start-up sector did not have a place to gather together and network. SUP46 was born to fulfil the need of developing an influential start-up community in Stockholm. In a medium-sized city such as Stockholm, it acts as an intermediary for the entrepreneurial community, encouraging start-up development and networking.

The hub proposes dedicated working spaces in the centre of the city, and organises events and meet-ups with entrepreneurs and investors. It was set up to respond to the needs of local start-ups to find affordable space, benefit from the synergies of knowledge-sharing in co-working facilities, and to help local start-ups increase their visibility to partners and investors.

SUP46 has experienced rapid success, partly because of its strict membership admission policy, which quickly raised its level of recognition.[55] The project was developed with the help of the business incubator STING, which identified the need for a start-up hub in Stockholm, and is backed by several media companies, investors and government authorities.[56]

What real estate do its innovative firms need?

SUP46 offers 2,000 sq m of meeting and co-working space and accommodates about 54 companies. The conference rooms and event spaces are provided with all necessary equipment such as video conferencing systems and can accommodate up to 150 people. There is also a 'hangout space' with cafés and some entertainment facilities. Members of SUP46 enjoy the opportunities of workplaces and networking in the partnering start-up hubs in San Francisco, Berlin and Copenhagen.[57]

SUP46 holds meetings, events and conferences on a regular basis including meetings of major entrepreneurship communities such as Startup Weekend, which was the largest in the world in 2014.[58]

SUP46 is situated in the city centre but faces the challenges of general real estate issues in Stockholm characterised by the lack of housing supply. Fast technology sector development in the city has led to large inflow of people both from Sweden and other counties, whereas the expected housing construction rate does not exceed 10,000 new homes annually over the next 15 years.[59] Significant lack of apartments for rent, and especially of those for foreign tech workers due to the city's restrictions on lease for newcomers, makes it difficult for young entrepreneurs to live close to work and to expand their businesses by attracting employees from abroad.

How do real estate providers make it work?

SUP46 provides the typical facilities that digital start-ups prefer, offering both flexibility and diversity of spaces.

- **Flexibility:** SUP46 provides 2,000 sq m of space, open 24/7. Start-ups that have successfully been selected to be part of the community can opt for either a fixed membership, which includes a personal seat within the co-working space; a flex membership, in which the member has no dedicated seat and is instead hot-desking; or a private room. Therefore, membership offers are tailored to start-up needs and financial situations, while fostering an ethos of knowledge-sharing and networking.

- **Diversity of working spaces and services:** Co-working space is usually the main facility offered by a start-up hub or an incubator, and SUP46 is no exception. The hub also offers a 'hangout space', open to both members and non-members. The facility is dedicated to discussion or informal meetings, again in an attempt to favour informal linkages. Members also have access to conference rooms. Start-ups typically only need formal conference rooms sporadically, which makes it more profitable and useful for them to share such spaces with their peers.

- Finally, SUP46 regularly organises **events and conferences.** These may include other entrepreneurs, industries or financial investors. SUP46 is not an accelerator; it does not provide direct funding to the start-ups it hosts. Events with venture capitalists, firms and regional accelerators is a mechanism to give start-ups more exposure and help them to find financial support and business opportunities.[61]

What are the factors of success?

- **First-mover as an entrepreneurial co-working space** in a city which is rapidly growing as a start-up economy and has such success stories as Spotify and Skype.
- **Flexible and diverse** meeting and co-working spaces open 24/7 as well as access to partnering business hubs in different parts of the world for SUP46 members.
- **Proximity** to the city centre.
- **Support** from venture capitalists, accelerator partners and government authorities.
- **Regularly held workshops and events** including international entrepreneurial community meetings.
- **Rigorous competition** among the candidates for membership, which excludes unreliable businesses at early stages.

Location	Toronto, downtown
Size	140,000 sq m
Sector	Heath, cleantech, ICT
Completed	2000

MaRS discovery district

MaRS discovery district [61]

MaRS Discovery District is a non-profit research and innovation hub in Toronto. Launched in 2000 as a non- profit charity overseen by a private sector Board, MaRS opened in 2005, and has been a driving force for collaboration between science and technology innovators, entrepreneurs, business leaders, investors and policymakers in Toronto. Its physical infrastructure and business networks has helped bring important discoveries to market and launch a number of Canada's high growth companies.[62]

The innovation centre is part of the Discovery District, an urban cluster specialised in biotechnologies. The district incorporates nine hospitals, three universities, and over 30 medical and science research centres on a 2 sq m area in Central Toronto.[63]

The MaRS project was designed to provide support to innovative industries, specifically in their effort to finance and commercialise their technology. In relation to the Discovery District, MaRS services were primarily dedicated to "medical and related science" — from which the centre draws its name — before eventually opening up to information and communication technologies (ICT) and clean-tech industries. It will soon be complemented with a financial technology cluster, first of its kind in Canada.[64] So far, an initial investment of $600 million has already created $3 billion in economic value.[65]

Annual revenues at MaRS amount to approximately C$40m a year, although real estate rents only account for $10-11m. Other major sources of funding are a provincial operating grant of C$5m, restricted provincial grants of C$7-9m and partner grants of C$10-11m.[66]

Health	ICT	Cleantech
Digital health technologies	Education Technology	Cleantech
Remote health sensors	Financial Technology	Water
Novel diagnostic devices	Retail & Digital Commerce	Building technology
Health information management solutions	Media & Entertainment	Transportation
Targeted pharmaceuticals		Agriculture
Biologicals		Advanced materials
Novel therapeutic modalities		
Medical devices		
Assistive technologies		

What real estate do its innovative firms need?

MaRS has over 100 tenants of different size and maturity (startups, mid-size companies and multinationals, investors, researchers, community developers, professional service firms and retailers). These companies employ over 3,500 people. The sectors MaRS supports are principally health, information communication technologies (ICT) and cleantech:

The development of MaRS discovery district has been divided into two phases. Phase 1 gathered three buildings on a total working surface of 750,000 square-feet. The hospital building was originally intended to be residential, but the founders of MaRS decided that the strategically located property would be better used as an innovation centre. Two other buildings were developed during MaRS phase 1:

- the **South Tower,** which features more than 200,000 sq ft of laboratory space, including wet labs, and which has been designed to support high load capacities. An incubator for science and technology firms occupies the 2nd and 3rd floors of the Tower – it provides furnished offices, fully fitted laboratories and meeting rooms. Facilities include shared access to fridges, freezers, MilliQ, ice machine, centrifuge, autoclave, environmental rooms, meeting space, shared kitchen, fax and photocopier, IP phone, voice mail and Internet connection.

- the **Toronto Medical Discovery Tower,** also specifically arranged to host laboratory facilities.

Many of MaRS facilities are therefore strongly adapted to biomedical industries, although working spaces also include offices for ICT industries, co-working spaces, meeting rooms and other facilities dedicated to training and venture services.[67]

In 2014, the MaRS centre considerably expanded with the completion of the Phase 2 tower after a C$400m loan facility from the Province of Ontario. The new building offers 780,000 sq ft of laboratory and office spaces, doubling the centre's total footprint. The building is now over-subscribed.

How do real estate providers make it work?

The MaRS discovery district highlights both the opportunities and risks of real estate development in the innovation sector. Phase 1 has been very successful, because it features spaces that are adapted to biotechnology firms as well as ICT firms. Buildings have been designed to cater to their needs, and to offer long-term flexibility.

For Phase 2, the anchor tenants at the top of building is a provincial government initiative to bring a medical cluster tackling infectious disease to Toronto's downtown core, so that there would be a rapid response to a future emergency like the SARS crisis. The combination of lab space, tech space and institutional research has proven very attractive and popular.

What are the factors of success?

- **Wide range of free services for MaRS venture clients** including startups screening and expert advice, networking opportunities, seminars and workshops and provision of market research of the industry;
- **Collaborative environment:** companies from diverse sectors such as heath, clean technology, information and communication technology and financial technology and of various size (startups, SMEs and multinational companies) are united in one place;
- **Extensive entrepreneurship education programmes** with more than 50,000 people trained since 2009;
- **Beneficial location** close to the University of Toronto, Canada's largest university, to city's major academic hospitals as well as to the government and financial institutions;
- **Good transport connectivity** with the Greater Toronto Area by subway and GO Transit system.

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