



Technology, Real Estate, and the Innovation Economy

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**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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An appendix with the full case studies will be published on the ULI Europe website europe.uli.org

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Supported by:



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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Foreword

Dear Reader,

Urban Land Institute (ULI) Europe and Oslo Metropolitan Area (OMA) are delighted to bring you this ground-breaking study of Technology, Real Estate, and the Innovation Economy.

Through this partnership we wanted to address a critically important issue: how the real estate industry must adapt and meet the demands of the new normal – sustainable spaces in which to create innovation through knowledge, science, culture, and creativity whilst enhancing quality of life.

We know that this requires a subtle mix of dynamic relationships between entrepreneurs, established businesses, capital providers, knowledge institutions, and government. They must work together to foster an eco-system in which companies can start-up, grow, and succeed; and where clusters of collaborating firms can emerge and support each other whilst synchronising capital investment with growing trade and competitive talent.

So in this report we want to demonstrate how the real estate community is starting to play an active role in these eco-systems and what more it needs to do going forward. Real estate can make space fertile for invention and meet the changing needs of new enterprises as they grow and change rapidly from their origins to becoming major players – an evolution which is becoming increasingly shorter in terms of business life cycles.

This means a radically different set of roles for real estate providers from the more traditional corporate economy, where it hosts and services occupiers. For many, becoming a proactive agent in the enterprise or business growth process will be new. We therefore need to adapt quickly. This report shows through its many case studies how real estate providers are starting to do so – some are managing social networks and clubs, some are providing digital and virtual platforms, some act as investors, some refit buildings and retrofit spaces much more regularly and stop thinking only about the rent!

To put it very simply, real estate providers must become part of the innovation economy if they want to serve it: they must become part of the emerging norms, disciplines and culture of its occupiers.

This is also critical for a city like Oslo. Norway has grown very prosperous on gas and oil, but these are finite resources that will run out in due course. It is essential for Norway that Oslo becomes a successful pole of innovation, as technology and creative clusters offer the clearest opportunity for Norway to diversify its economic structure and create future prosperity and jobs. So, Norway's success requires that Oslo's real estate industry becomes a fully active part of the innovation economy. There is no other choice available.

We hope you enjoy reading this report and the associated case studies. We have met many inspiring people throughout this project who are boldly creating and developing exciting new initiatives in this area. We thank them for their input.

Our partnership on this work was made possible through a ULI Urban Innovation Grant and through the introductions made by **Professor Greg Clark**, who we would like to thank along with **Dr Tim Moonen**, who worked together on writing and researching this report.

Lisette van Doorn
CEO, ULI Europe

Erling Fossen
MD, Oslo Metropolitan Area

Executive Summary

The innovation economy – where ideas and IP are king – is evolving, growing, and urbanising exponentially. The world's 1,000 biggest spending firms on research and development (R&D) now spend over €1 billion a day to gain an innovation edge, and many of them are moving to the inner city, to maximise their scale and reach.¹ At the same time, disruptive technologies including mobile connectivity, the internet of things, and 3D printing are attracting trillions of dollars of investment and increasing the power of agile small companies to hit the big time.²

Mega disruptors are feeding the growth of this new economy. Big data, digitisation, the sharing economy, and the global war for talent, are all transforming how people and companies work and think. This disruption is driving more variety, volume, and quality, unsettling old business models, and forcing down barriers to entrepreneurship. Critically, they are also changing the patterns of demand for workplaces, buildings, urban districts, and even for cities themselves.

In this report, we explore and explain how all of this creates a new normal for real estate.

The business cycles of innovation sectors mean they need flexible leases, operate under different revenue models, and need access to grow-on space. They also need fully customised workspaces, reliable utility systems, and often a lively mix of retail, performance and event space built in. These specific and bespoke demands mean that any 'one size fits all' approach is destined to fail. What is more, these new requirements are no longer solely the demands of innovators. The influence of innovation is stretching to traditional sectors and tenants, rapidly transforming the real estate landscape.

The lessons from some of the world's ground-breaking innovation spaces and districts suggest that **real estate needs to revolutionise its modus operandi if it is to effectively service and profit from the innovation economy.** It can no longer rely just on bricks and mortar; these changing patterns add up to a fundamental change to the business model for real estate.

The demand for short-term flexibility is not being matched by supply, which continues to involve cost-intensive construction with long development times, leading to owners seeking long-term security. The supply of assets alone is no longer enough to quench the thirst for services, networks, and business support. Finding a new equilibrium that solves this deficit is the next big challenge for real estate.

To survive in the shorter term, the real estate sector must deliver a complete and integrated, and yet profoundly agile, product offering. Real estate providers must optimise the way assets are used to meet the needs of tenants, and expand their access to investment capital, mentorship, collaboration, incubation, IT protection, and sponsorship.

This report makes clear that innovative firms have complex space needs, and it is impossible to predict what kind of space is most likely to be favoured in five or 10 years' time. Therefore, in order to make construction sustainable, it is important to ensure new buildings can adapt to any kind of innovative industries. Instead of constructing immovable concrete structures, innovation is also urgently needed in this area of the real estate business; lighter weight and lower-cost modular structures need to be developed that are adaptable to future trends and products.

In this new era of innovation-led growth, the real estate sector has not yet grasped its own innovation imperative.

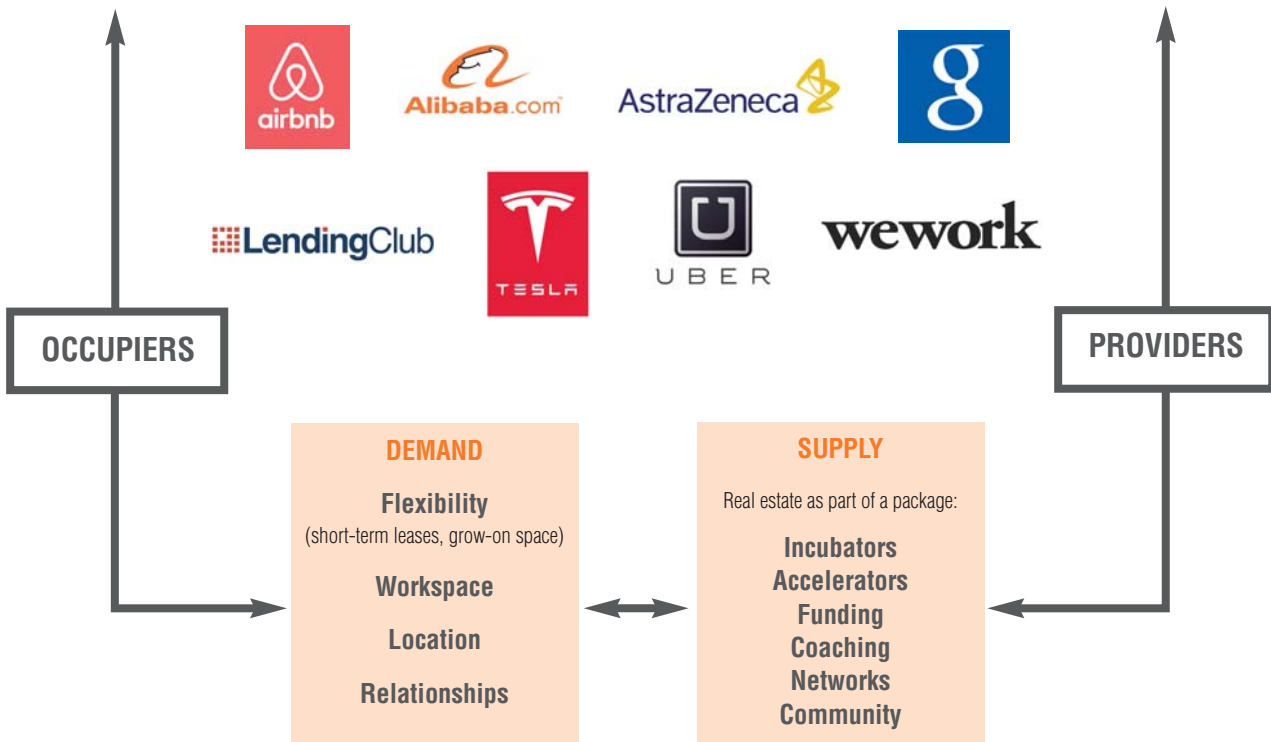
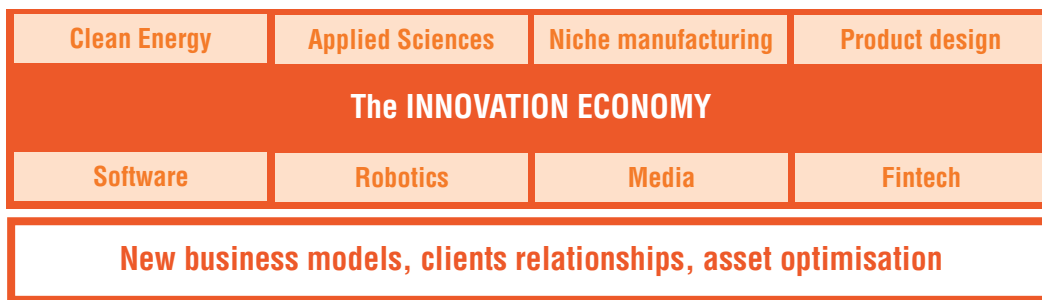
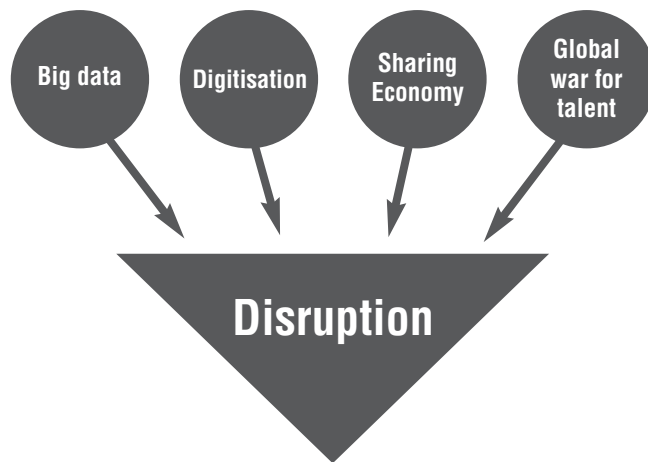
Nearly all industry observers feel that it has been slow to respond to the challenges of the innovation economy, often viewing it as a threat rather than an opportunity. But the innovation economy is real estate's new reality. It is here to stay. How well and how quickly investors, owners, designers, and developers now adapt will become either a competitive advantage or disadvantage, both for themselves and for innovation systems in the world's cities in which they operate.

The real estate industry needs to adapt in four key ways:

- **Adopt a 'service provider' mindset.** Real estate needs to become a service industry rather than an asset industry. If it is to generate returns in future, real estate operators have to offer a range of other services including funding, coaching, networking, and supplies. If they don't start doing so, others will and many already do.
- **Be prepared for continuous adaptation, feedback and complexity.** Real estate providers need to design careful tailor-made solutions when it comes to access, location, workplace, building layout, and rental terms. A new business model is essential.
- **Align interests and build transparency** between owners and occupiers. Landlords might work with their tenants to build a compelling story around a development, or even become a venture capital partner with a direct stake in the success of their businesses. Real estate must become a collaborating partner.
- **Provide hands-on stewardship** to address the broader framework for innovation. This means not only managing relationships between big companies and start-ups, but also exploring opportunities to provide accommodation or social infrastructure. It also means engaging with the innovation eco-system to address gaps: be they skills, capital, affordability or density. Real estate must actively help grow its tenants.

Summary of effects on real estate supply and demand

Globalisation | Urbanisation



Introduction

The innovation economy is here, but most buildings in European cities were designed for the industrial or corporate economy. They were constructed, owned, and managed with older business models in mind. Technology, the innovation economy and their spin offs, such as the sharing economy, co-working, and the digital economy, are major disruptors for the real estate industry. Real estate developers and investors now have to respond quickly to meet the needs of firms in innovative sectors such as digital media, IT, life sciences, clean tech, and others. As others outside the sector have responded much more quickly in offering new services and creating technologies for the innovation economy, real estate itself has to react and become more innovative.

This report seeks to answer the following questions:

- What are the different needs of small and growing businesses in the innovation economy?
- How can the needs of the innovation economy be met and served by innovative real estate providers?
- What are the factors of success at the level of buildings, districts and larger spaces?
- What are the implications for the business models of developers and investors?

The sections that follow assess how real estate can and must adapt to the innovation economy and to its trendsetting demands for new technologies, ownership patterns, revenue models, smarter buildings, and digital platforms. It draws on the experiences of 12 case study buildings and districts in Europe and North America and on the lessons shared at a ULI workshop hosted by the Oslo Metropolitan Area in May 2015.

Results of the vote at the Oslo workshop in May 2015:

How innovative is the real estate industry in its response so far to the innovation economy?

Very innovative	0%
Somewhat innovative	50%
Not very innovative	50%

The case study innovation sites are:

Amsterdam: The Edge

Amsterdam: VU Campus

22@Barcelona district

Berlin: Moritz Gruppe THE:SQUARE³

Berlin: SoundCloud

Hilversum: Media Park Netherlands

London: Tech City

New York Applied Sciences Campus

Oslo Cancer Cluster Innovation Park

Oslo: MESH Norway

Stockholm: SUP46

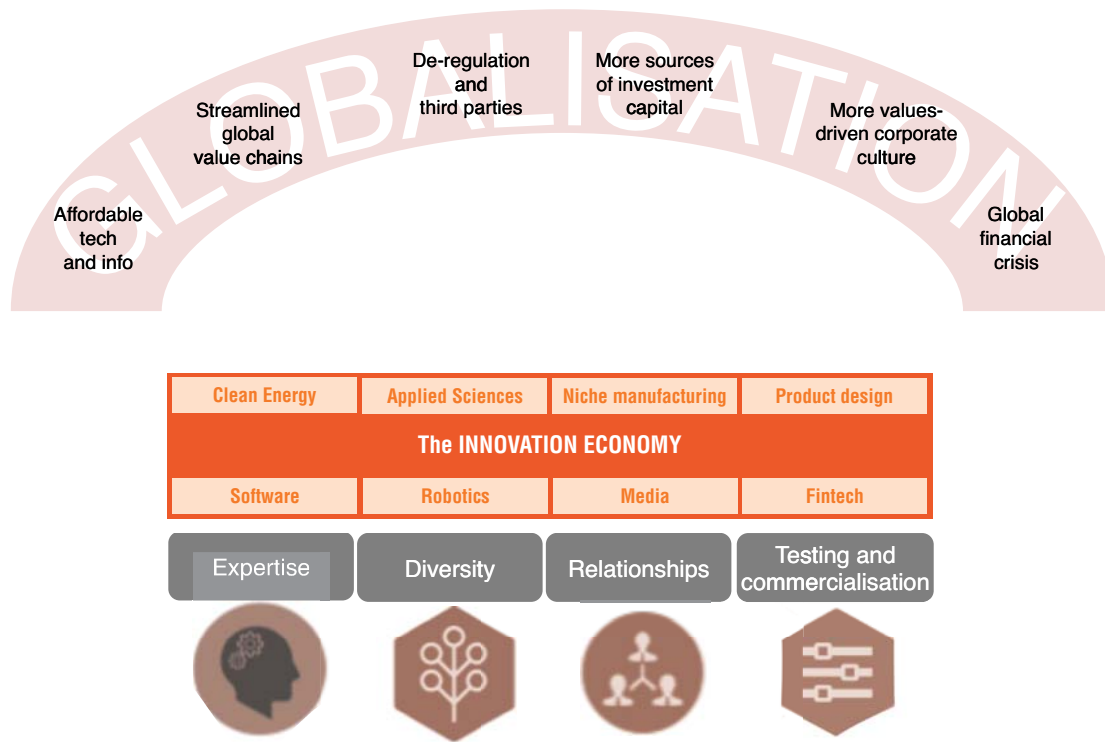
Toronto: MaRS

ULI held its workshop in Oslo because innovation sectors are vital to the future of the Norwegian economy. Technology clusters offer the clearest opportunity for Norway to diversify its economic structure and create future prosperity and jobs. One concern for Norway at the national level is the lack of capacity to innovate, but Oslo itself places an impressive 32nd out of over 400 cities in the 2014 *Innovation Cities Global Index*.³

The ULI/Oslo Innovation Economy workshop found a strong consensus that real estate has to adapt. In a series of votes, there was near unanimous agreement that the innovation economy has different real estate needs to the corporate economy and that innovation clusters need mixed uses, co-working space, sleep-on-site options, support for families, and investment in the whole community.

The real estate pioneers and best practices in this new cycle offer many important lessons for others. Oslo's own two case studies in this report are among 12 which highlight the different ways in which the city's real estate owners in both established and emerging clusters are seizing the initiative on the opportunities of innovation.

1. The Innovation Economy



The innovation imperative is upon us, and it is emerging as an urban phenomenon. Previous cycles of globalisation were dominated by the production of physical goods, or by the role of large corporate headquarters and management functions. The latest cycle of globalisation is based on a new era of innovation, characterised by deep specialisation, low barriers to entry, increased transparency, and more sources of capital investment. The innovation cycle is driving economic and real estate change in cities worldwide.

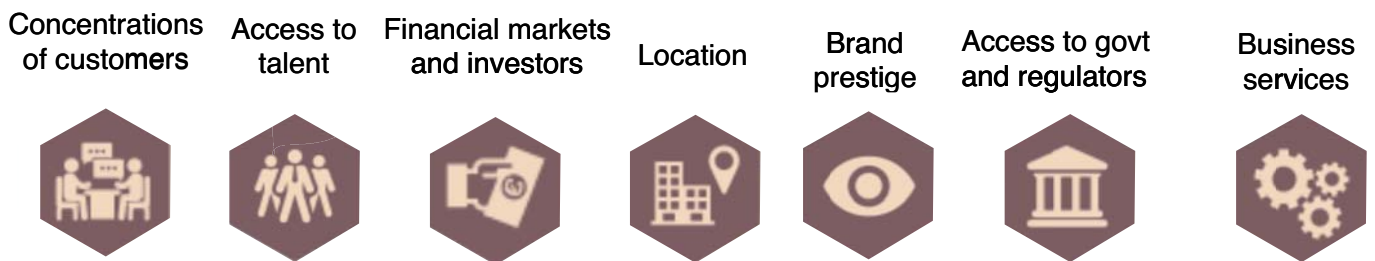
More players, more opportunities, and lower barriers to entry are creating the impulse to innovate in emerging and established sectors and are increasing the power and leverage of agile small companies with high-impact and high-growth potential. How cities and real estate owners adjust to this step change is now a key component of their competitive success.

The rise of high-tech, innovation-led industries is a disruptor across the spectrum of spatial scales.

- At the macro-scale, the innovation economy is fuelling the demand to locate in cities. Cities are the 21st century 'petri dishes' for commercial innovation and cross-fertilisation.⁴ They bring together a wide range of sectors, deep international networks, customer and client opportunities, and cultural and artistic quality.
- At the meso-scale, areas or neighbourhoods are being re-built to serve innovation as part of a broader process of re-urbanisation and re-densification. The management and design of real estate have therefore become key ingredients to support and leverage this process for shared benefit.⁵
- And at the micro-scale, many of the existing buildings in cities need to be re-purposed to fit the needs of new occupiers.⁶ For the innovation economy, workplace is a key enabler of organisational success, talent attraction and company brand.

The innovation sector spans advanced manufacturing, digital media, software, life sciences, medical devices, robotics, clean energy, nanotechnology, social enterprise and others – industries where new products and ideas generate big breakthroughs in productivity, value and quality of life.

WHY IS INNOVATION MOVING BACK TO THE CITY?



Source: Global Cities Business Alliance (2015)

1.1 The urbanisation of innovation

Innovation used to be the preserve of non-urban and suburban business and science parks. Silicon Valley was the most famous, but many other out-of-town developments grew across Europe in the 1980s and 1990s. These included the M4 Corridor outside London, the Erasmus Research Park outside Brussels, and the Softwarepark Hagenberg near Linz.

The quantum shift towards an 'on-demand' economy – triggered by era-defining disruptors such as big data and the sharing economy – is driving people and innovative companies back into cities. Innovation prefers cities because people are more closely connected, and because

of the access cities give to markets, finance and other enablers. Many industries now also know they must reach customers with rapid speed and service, with standards set high by the likes of Uber and Amazon, and being located in cities is a pre-requisite to achieve this.

Innovation activity in major cities is now often heavily concentrated in inner-city areas, near established business, financial and creative industry districts. Evidence from cities such as London also suggests a strong clustering of innovation activity around areas with very good public transport.⁷ This process is also bringing forward new approaches to density in inner-city areas in order to manage re-urbanisation in the most efficient and productive way.

1.2 Innovation clusters

A key spatial form of the innovation economy is the ‘**innovation district**’, where companies of different sizes cluster and connect with other start-ups, incubators and accelerators. These districts have emerged in at least 50 cities globally over the past two decades – leading examples are found in Barcelona, Berlin, Boston, London, Seoul and Stockholm. Some are heavily planned and scripted, others have emerged organically.

Innovation districts today play a key role in the economic development of cities in Europe and beyond. They attract mid- and high-income jobs, and offer opportunities for more efficient land use, movement patterns, and for better liveability and environmental outcomes. Although there are some overlaps between high-tech sector environments and traditional urban industrial and office developments, they also have many distinct needs which real estate and urban development have to respond to.

Innovation clusters take many different forms. Some are large designated districts that benefit from government policy and investment programmes, and are designed to achieve success in one specific sector. Others are campuses or complexes built at the edge of cities or along transport routes, benefiting from good access and links to universities. And recently, innovation buildings or districts have grown more organically in or near city centres, and have now emerged as petri dishes for larger scale innovation communities.

“ *Innovation is now a city-based phenomenon.* ”

– 2thinknow Consulting, Melbourne

In terms of companies and locations, Bruce Katz and Julie Wagner identify at least three kinds of district⁸:

- **Anchor plus** – those that grow up around an ‘anchor’ institution such as a teaching hospital or media headquarters, and have become dedicated to commercialising innovation.
- **Re-imagined urban areas** – looser collectives of opportunist small businesses and sometimes larger companies, either in de-industrialising waterfronts or low-to-medium-cost inner-city areas.
- **Urbanising science parks** in suburban or out-of-town areas, through enhanced density, housing, transport links and new amenities.

Our 12 case studies feature all three types, and a fourth model visible in Scandinavian cities:

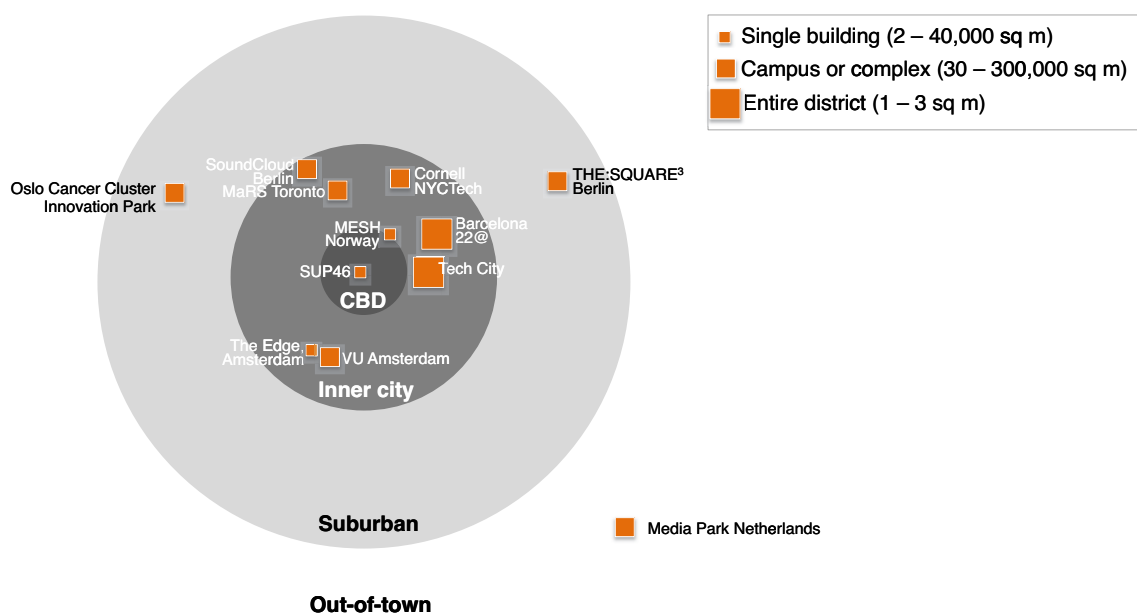
- **Downtown start-up hubs** – individual sites established in the city centre and which function as demonstrators for a wider platform of innovation.

Each of these platforms for innovation presents distinct challenges for real estate around occupier needs, infrastructure requirements, cost dilemmas and wider neighbourhood development. High-tech innovation economy workplaces where people create, design and build their products and services become important drivers of spatial and real estate change. The new requirements of innovator occupiers are totally different from those of traditional corporates or industrial occupiers and are well evidenced by our 12 case studies. These twelve innovation hubs cover a wide range of innovation sector specialisms and vary in size from a single building to an entire district (see following table).

Characteristics of the 12 case studies

	Location	Year established	Type of innovation site	Size	Sectors
The Edge	Zuidas, Amsterdam	2014	Re-imagined urban area	40,000 sq m	Professional services
VU Campus	Zuidas, Amsterdam	2013	Anchor +	240,000 sq m	Higher education applied sciences
Barcelona 22@	Poblenou, Barcelona	2004	Re-imagined urban area	3.0 sq m	Energy, medtech, IT, design, media
THE:SQUARE³	Alt-Hohenschönhausen, Berlin	Under construction (since 2014)	Re-imagined urban area	62,000 sq m	Mixed-use sport, retail and residential
SoundCloud Berlin	Mitte, Berlin	2014	Re-imagined urban area	4,000 sq m (16,000 sq m campus)	Digital
Media Park Netherlands	Hilversum (between Amsterdam and Utrecht)	1960	Urbanising science park	250,000 sq m	Media and broadcasting
London Tech City	Shoreditch, London	Gradual, officially since 2010	Re-imagined urban area	1,600,000 sq m	Digital, media and technology
Cornell NYC Tech Campus	Roosevelt Island, New York City	2017	Anchor +	195,000 sq m	Science and engineering
Oslo Cancer Cluster Innovation Park	Ullern District, Oslo	2015	Anchor +	36,000 sq m	Medical (oncology)
MESH Norway	Sentrum, Oslo	2012	Downtown start-up hub	3,100 sq m	Digital
SUP46	Norrmalm, Stockholm	2013	Downtown start-up hub	2,000 sq m	Internet, mobile, media, gaming
MaRS Discovery District	Downtown, Toronto	2000	Anchor +	140,000 sq m	Health, cleantech, ICT

Relative size and locations of the case studies in their cities



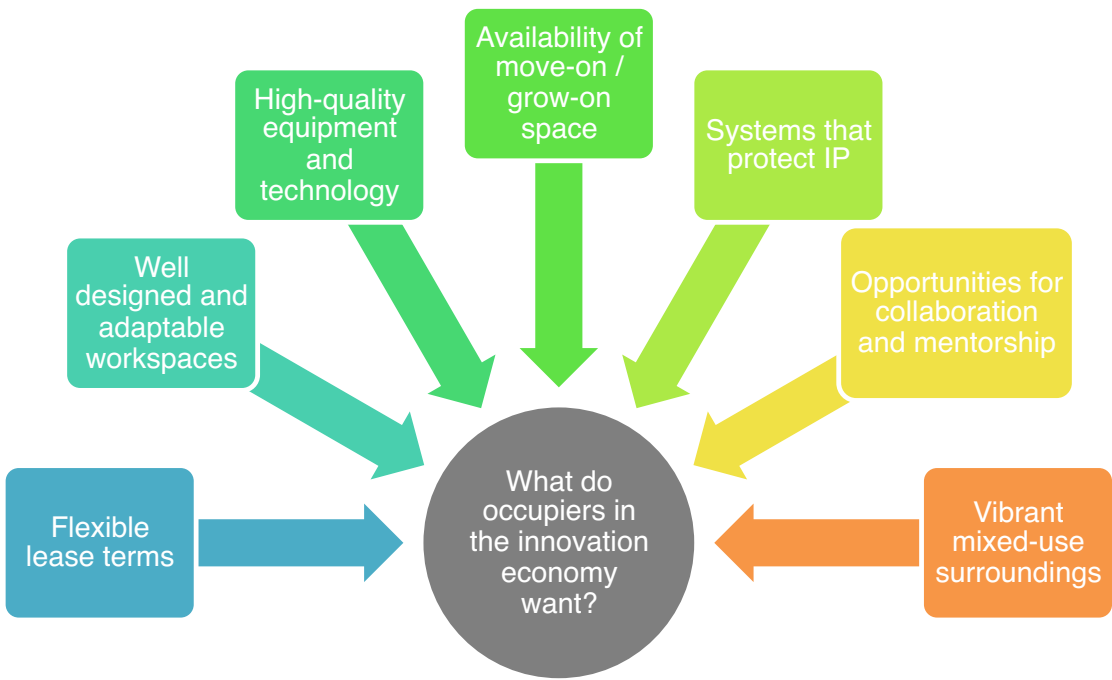
2. Demand and supply in the innovation economy

The specialised demands of innovation economy occupiers are often closely linked to the fledgling nature of their businesses. Start-ups in the volatile early stages of their business cycles require flexible space and contract terms and room to grow both their teams and their ideas. The importance of ideas to innovative firms means that shared and collaborative space are imperatives and occupiers look for office design that stimulates creativity and fresh thinking.

Of course innovators in particular sectors may have specific real estate requirements. In pharmaceutical and biotech, for example, the rise of independent research and development (R&D) providers means there is demand for wet and dry lab

space. Almost all occupiers will have exacting technology requirements, including high-quality fibre broadband connectivity and power systems.

What is increasingly clear is that these new requirements are no longer solely the demands of innovators. While the innovation economy has pioneered new ways of working, its influence is now stretching to even the most traditional of occupiers. Law firms and financial services firms are shifting their operations to open plan offices. Sharing desks, activity based working and 'relaxed' meeting space are becoming the norm.⁹ The innovation economy has kick-started a revolution in real estate demand.



SUP46 fulfils the need for affordable networking space and visibility for the start-up community in Stockholm. The hub provides dedicated working spaces for more than 50 companies in the city centre, as well as hot-desking, hang-out and equipped event spaces for meet-ups between entrepreneurs and investors. Supported by national business incubator STING and established venture capital funds in the city, a vibrant events roster and rigorous membership admission policy has raised its profile as the vanguard of Sweden's start-up community.



The effect of the big disruptors on real estate

The new innovation cycle is being driven and accelerated by a number of major disruptors to the global economy, each of which has big implications for how real estate must work and adapt in the future (see diagram). Big data analytics are transforming health, science and security sectors, among many others, and are also enabling transparency much better decision-making. Digitisation is not just changing

how we consume and behave, but also means companies prioritise spending on digital systems ahead of conventional infrastructure. The newly global battle for scarce talent means employers must compete not just on pay packets but also on the wider environment. And the sharing economy brings direct competitors to real estate and also brings other revenue models onto the horizon.

The big disruptors



BIG DATA

- ◆ Products and objects generate data to yield numerous commercialisable insights.
- ◆ Customisation, competitive premium on efficiency and quality.
- ◆ Greater transparency. Improved decision-making.

WHAT?

HOW?

IMPACT ON REAL ESTATE



DIGITISATION

- ◆ Broadband, mobile wireless, e-commerce, cloud computing, social media, sensors
- ◆ Changing how we work, play, buy, interact. Transforming finance, ICT, media, retail, manufacturing
- ◆ Less firm spend on infrastructure, more on automation and digital systems.



GLOBAL WAR FOR TALENT

- ◆ Internationalisation of labour markets.
- ◆ Deficits in talent pool = corporate competition
- ◆ More emphasis on physical location, mix of uses and employee lifestyle.

WHAT?

HOW?

IMPACT ON REAL ESTATE



SHARING ECONOMY

- ◆ Flexible renting and swapping: new era of micro-entrepreneurship – making money from assets and skills.
- ◆ Disrupting rental sectors – cars, equipment, accommodation, music, video, finance, staffing.
- ◆ Affects company location choices and preferred business climate. Rise of airbnb, wework. Decoupling of the ownership and use of the asset for revenue models.

The real estate response

Meeting the new demands of the innovation economy (and increasingly of other sectors which are following its lead) presents challenges for the business models of real estate owners and landlords. The real estate industry – developers, investors, owners and planners – has overall been slow to respond to the new shape of the economy and the adjustments that are required to re-think spatial form and business models.

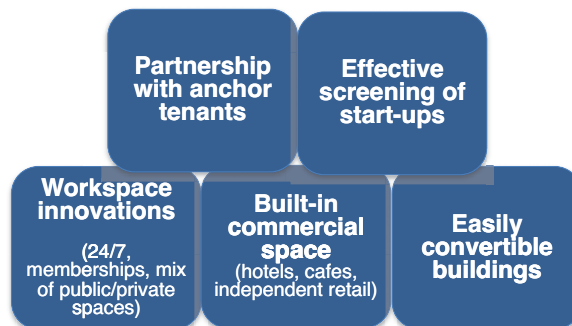
As the 12 case studies, and many other examples in other cities show, there exists real creativity and initiative to re-purpose properties and to support the macro framework that fosters innovation. This initiative is found across all aspects of the property and wider environment. Below, we explore the visible improvements seen both at the ‘micro’ level of the individual property and project, as well as the ‘macro’ level of district and city ecosystem.

“ 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... we've succeeded by being very flexible and having short-term and long-term spaces for their individual stages. ”

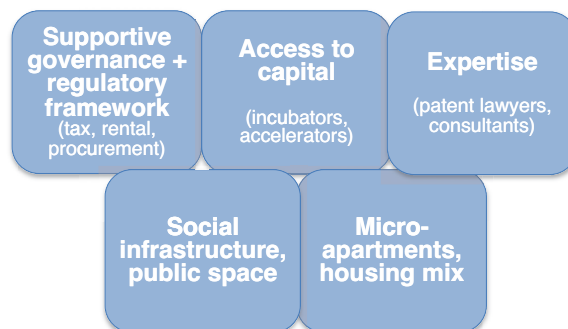
– **Simon Schaefer**, co-founder and investor, Factory Campus

- **Micro** conditions relate to the property or project itself, the kinds of space fit required and the practical adaptations needed to attract talent and optimise output in innovation firms.
- **Macro** conditions are those at the wider city or district level, which enhance the location's overall attraction for innovative firms. As people are the ‘raw material’ for innovation and with the increasing merger between working and private life, innovation spaces need to offer attractive places to arrive, to work, to grow their ventures, and to live.

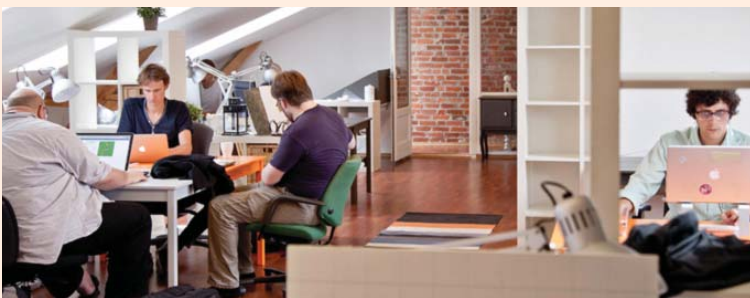
Project and property factors



Macro factors



MESH Norway illustrates a paradigm shift in Oslo, providing the interactive space and infrastructure fit for the internet generation. Its emphasis is on convening the networks that can accelerate the start-up scene in Norway. A single five storey-space that is home to around 150 companies, MESH's model charges a range of membership fees for access into its network, which has become the gathering place for the digital tech industry. It sustains a balance of around 70% occupancy by early stage start-ups and 30% by individuals in creative sectors such as digital and graphic arts. Desks are, in effect, rented out more than once at any given time. In expensive cities like Oslo, this model of co-working space and flexible use of real estate can be critical to lowering the setup and entry costs for entrepreneurs.



© MESH Norway¹⁰

MESH shows how real estate can broaden its role to include the attentive management of a community through hospitality, workshops and events. The space has become secondary to the importance of curating a vibrant network. For MESH, the fees generate the income that makes the business model viable.

2.1 Improving micro conditions

Property owners can make a variety of project and property adaptations to enhance the attractiveness and utility of their real estate asset to innovation firms.

- **Workspace innovations.** Many owners and developers have successfully revamped older industrial spaces by leveraging their large spaces, high ceilings, natural light and comparatively low rent, and mixed-use land. Some have reconverted and rehabilitated these spaces ahead of the curve, for example in 22@Barcelona. Successful developer-led programmes of improvement have retained the original architecture and mix of uses in order to foster the social interactions that underpin innovative practices. One challenge for real estate is to ensure its office space caters for personal work projects, collaboration with colleagues, group work and break-out sessions. Innovation buildings now often open up the space 24/7 and offer co-working, and private and flexible membership space. Amsterdam's VU Campus is a good example of anticipating future working styles and it has combined a mix of lounges, study zones, and shared research equipment to encourage collective work and share costs.
- **Creating new kinds of commercial space,** including hotels, cafes and restaurants is a key task for real estate in bohemian innovation districts. There has been a big trend towards facilitating independent and pop-up retail to retain the informal values and identity of the place. In London's Tech City, for example, the city's transport authority TfL launched seven new pop-up shops in Old Street station in 2014 in response to demand for a more innovative retail offer.¹¹
- **Adaptable buildings.** Adaptability of usage is a key theme in the innovation economy. Real estate owners may initially only have permission for single uses, but in some cases have successfully engaged planning authorities to agree an additional or alternative use. This process occurred at the Berlin SoundCloud site, where development on the disused brewery was initially slated for residential purposes but was eventually changed to offices. This pattern of so-called 'guerrilla development' is often key to the successful re-purposing of buildings to meet the needs of the innovation economy.

London's **Tech City** has emerged into one of the most vibrant digital technology and media hubs in Europe, employing over 150,000 people. For the past five years it has received active planning support and investment from national government and City Hall. The district effectively combines artist studios, co-working space, SME space, larger 'move on' spaces and Grade A corporate office space. Developers have responded to demand by adapting an aging building stock and ensuring retail and entertainment amenities sustain the area's appeal as the cluster begins to spread across East London. Access to pools of talent, and proximity to London's financial and legal hub are major advantages for the district, although challenges have appeared in relation to broadband quality, oversupply of serviced office space, and the affordability of space for small and medium enterprises (SMEs).



Innovative firms have complex space needs, and it is impossible to predict what kind of space is most likely to be favoured in five or 10 years' time. Therefore, in order to make construction sustainable, it is important to ensure new buildings can adapt to any kind of innovative industries. Instead of constructing immovable concrete structures, lighter weight modular structures are being developed that can be moved around to respond to future trends.¹² Cornell's new facilities in New York are designed exactly around this principle. It has deliberately not yet made a choice on what technology to install, as when the building is complete new products will already have emerged.

- **Attracting anchor tenants.** Agreements with anchor tenants are an important ingredient of a successful and sustainable innovation hub. Anchor tenants can be public institutions or private companies. Public institutions include medical hospitals, national broadcasters, economic institutes and university departments offering specific educational programmes. The popularity of MaRS' Phase 2 development has been underpinned by the Public Health Ontario's decision to build its Toronto laboratory as an anchor there.



SoundCloud's new global headquarters in Berlin is a former warehouse brewery near to the Berlin Wall. Most recently, the floors had been an office campus for early-stage technology start-ups, and has been converted into mostly open plan office space for 200 employees in multiple roles.

SoundCloud is the anchor tenant for a five-building, 16,000 sq m factory campus which houses over 20 start-ups and mature technology companies. The campus, an initial €22 million investment from investors with management experience in entrepreneurship, community and event management, features a range of workspaces as well as an auditorium, fitness room, basketball court and art gallery. With two-thirds of the companies at the angel or seed stage, the investors' intention is to create a space over the long term which can oversee the progress of dynamic companies.

Anchor tenants are attractive to both landlords and prospective tenants. Anchor tenants offer landlords longer term deals with less flexibility. Their size can safeguard jobs and leverage opportunities for immediate growth. The international profile and prestige of an anchor can be attractive to other tenants. In MediaPark Netherlands, NOB a public broadcast company, also the main occupier of the park, signed a 10-year lease contract for the main portion of the park. This assured the continuity of the media function of the park and helped attract other tenants including UBF, MAX, Sony and Talpa. Meanwhile Berlin's Factory Campus has been able to attract some of the most promising companies in the digital sector because of the draw of SoundCloud, which moved its headquarters there in 2014.

As well as attracting other smaller firms, anchor tenants offer opportunities for local firms and entrepreneurs to share resources and ideas, collaborate on projects, and translate projects into commercial applications. Collaborating with universities and research centres is a key strategy companies use to benefit from their infrastructure and lab facilities, taking advantage of collective skills and expertise.¹³ Anchor tenants can also cultivate an ethos of competition within a cluster, which is critical to improving productivity and expanding the total market.

Larger anchor companies are also well placed to lead on academic partnerships, and co-finance workforce development programmes, demonstration centres and apprenticeship opportunities. Experienced and successful business executives in anchor companies may be well placed to take on mentorship roles for younger start-ups and help build an ecosystem community. One example is **Telefónica Digital's** role as anchor in the 22@Barcelona district which has added momentum to the R&D capability of the cluster. Its new tower building, which brings together 1,200 highly-qualified professionals, reflects the maturity of public-private collaboration in Barcelona. The company has established Wayra, a project which aims to identify ICT talent, by selecting innovative start-ups for financial support.¹⁴

The Edge, Amsterdam

The Edge is a new office building at the 'Zuidas', Amsterdam that reflects the new demand for office environments that is spreading from the innovation economy to the traditional corporate economy. As a highly sustainable office building, it boasts the flagship tenant of Deloitte, the global professional services firm, with whom it was designed in close collaboration. The Edge provides high levels of comfort and amenity, including climate ceilings that provide radiant heat, personalised temperature and lighting around desks, and huge 2,300 sq m U-shaped floor areas for interaction. It also has distinctive sustainability adaptations to maximise sunlight and energy storage. Developer OVG designed The Edge in partnership with Deloitte to ensure its evolving needs would continue to be met. The building's credentials have attracted other tenants from across business services and digital sectors, with space offered with or without a fit out.



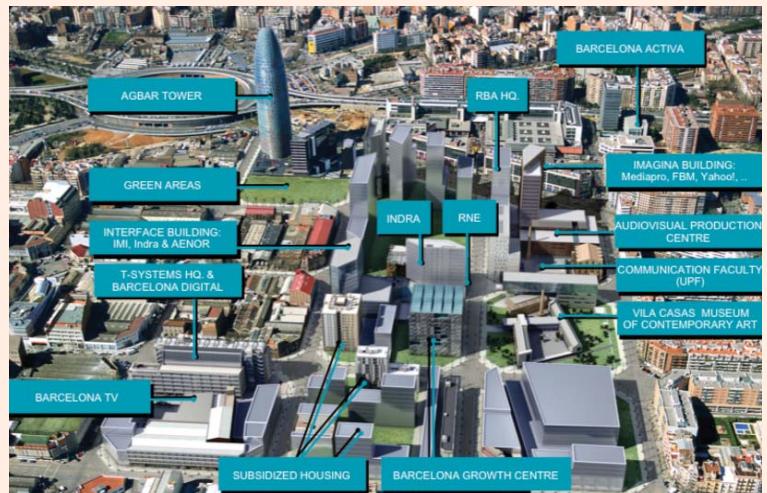
- **More effective screening of (and support for) start-ups.** Many innovation hubs – such as SUP46 and the MaRS district – are encouraging rigorous competition among the candidates for membership, which excludes unreliable businesses at early stages. There is also a broader effort to offer free expert advice, networking opportunities, seminars, workshops and market research to support companies.

2.2 Improving macro conditions

As part of real estate's shift towards providing stewardship, management and services in addition to the raw asset, there are many factors that shape the broader ecosystem which real estate ought now provide for, cultivate and influence. The 12 cases highlight the actions that many owners have taken to improve the competitive prospects of their tenants and hence to boost their own projects' long-term success.

- **More supportive operating framework for innovation.** Innovative industries need a favourable policy framework designed to support their growth. They need support through specific tax exemptions, intelligent procurement, and dedicated local governance with a strong understanding of business and entrepreneur needs. The real estate industry itself also needs a flexible governance framework to allow owners to quickly convert buildings, speed up construction times and make development plans more adaptable.

One important factor for stewardship is managing the balance of relationship between big companies and smaller or start-up firms. The innovation process is often highly distributed across organisations, with a shift from vertical relations of sub-contracting to more integrated and open forms of collaboration. This has to be managed through regulation to ensure the business system operates successfully. Large firms often have more experience of regulatory systems, financing and distribution channels, and innovation hubs need big companies to work within the regulation framework to encourage rather than stifle start-ups.¹⁵



One of the first innovation districts purposely developed in Europe, **Barcelona's 22@ district** in Poble Nou was an unprecedented project to accelerate Barcelona's international knowledge economy. Initially led by government, over the last decade private sector development has been encouraged in exchange for funding for green space, social housing and technology centres. Today the district houses over 8,000 ICT, legal, services and industrial firms, each of which can access buildings designed for their specific needs. The district has benefited from strong stewardship, improved rail and road connections, investment in high quality utility systems, and subsidised housing to create a truly liveable district.

More broadly, many successful sites of the innovation economy have turned their districts into an urban lab, to enable companies to test products and learn locally before marketing products more widely. For 22@Barcelona, there has been a clear strategy to invite innovators and entrepreneurs to build and test new products.

MaRS Discovery District has been an important research and innovation hub for the last decade in Toronto, having nurtured and catalysed many of the city's high growth medical and ICT companies. Phase 1 of development was designed to support high-load capacities, combining offices, co-working, meeting rooms and wet labs. The business model relies strongly on Ontario province grants and partner grants to supplement real estate rents of C\$10-11 million (€ 7-7.5 million) annually.¹⁶



With Phase 2 now oversubscribed, MaRS has over 100 tenants of different size and maturity, employing over 3,500 people. An initial investment of C\$600 million (€400 million) has created C\$3 billion (€2 billion) in economic value, aided by a strong system of mentorship and entrepreneurship education, and proximity to nine hospitals and three universities in Central Toronto.

- Improving finance and access to capital.** Innovation sectors need access to an international investment community (business angels, venture capitalists, seed investors) that is prepared to show confidence in smaller firms. Many of the most innovative firms are start-ups and SMEs and these tend to be financially constrained. Options to leverage funds for SMEs are usually available in the form of public, semi-public or private support, however sums will vary from city to city, the state of local public finances and the accessibility of private finance.

Often devised from outside the real estate sector, business incubators and accelerators provide financial support to innovative start-ups, usually by giving access to venture capital, angel investors or traditional bank loans. Being part of an incubator is usually a good signal for investors to support a start-up. Incubators also provide most of the services start-ups might need, considering their scarce financial and human resources. This includes business and marketing advice and training, help in accountability management, intellectual property support, and networking activities. As such, incubators and accelerators often provide real estate as just one part of a much broader mix of services, and have a very different revenue model.

- Enhancing city/district-wide attractiveness.** Real estate in the innovation economy has recognised it needs to promote the whole community rather than individual firms. The capacity of an innovation centre to attract talent also depends on the broader attractiveness of the city to talent. Enhancing attractiveness may involve actively managing:
 - Housing.** Innovation economy firms generate significant demand for smaller, 20-35 sq m apartments, either on-site or nearby, that offer diversity and density. These apartments often function as a live-work space, offering flexible storage, and access to conference room space, and co-working tables for meetings. Boston Redevelopment Authority has approved developers' plans to build a large number of micro-units in its Innovation District in the last two years. Larger sites have begun to provide a balanced combination of single family and multi-family units. Berlin's factory campus provides on-site accommodation to programmers and designers for up to six months at a time, while New York City's Applied Sciences Campus is also set to provide a large stock of student housing.

What are incubators and accelerators?

Accelerators and incubators are critical spaces in the innovation economy, but neither involve traditional landlord and occupier relationships. In different ways, they both offer entrepreneurs help in specific markets to quickly grow their business and attract venture capital firms to invest in their start-ups. The real estate they supply is a part of a much wider offer.

Incubators are all about supporting innovation. They offer a specific location to develop disruptive ideas with the aim of building out a business model and company. On no fixed schedule, and on short-term flexible leases, they provide dedicated and co-working space, equipment and mentoring to new businesses and early stage, pre-revenue companies. They offer access to market expertise, product knowledge and a path to capital from angel investors, governments, economic development agencies, and other investors. Their managers or their partners provide support to up to 50 businesses at any one time, sometimes for as long as five years, in return for a share in profit or minor equity stake. Rental levels are often linked to economic performance, and the successful businesses will be expected to migrate to more traditional real estate. The low rents system means that the revenue model is quite unlike traditional real estate.

Accelerators jumpstart and scale promising businesses with obvious growth potential. With a stronger focus on private office space rather than co-working space, their help is truncated into an intensive set timeframe, usually two to six months, after which start-ups 'graduate.' Their large mentor networks and hands-on involvement from accelerator managers (not necessarily the providers of the space) are highly prized. Like incubators, managers often take single-digit chunks of equity in return for space, capital and mentorship. At the end of the programme, start-ups may pitch at a demonstration day in front of investors and media. If successful, they will move on from the accelerator into 'move on' or 'grow on' space.

Demand for business incubators and accelerators in major cities is very high. In North America alone, there are now more than 1,000 incubators, compared to just 12 in 1980.¹ Accelerators are an even more recent phenomenon linked to the rise of the digital tech sector. Established incubators and accelerators are very selective, with typical acceptance rates of 1% to 5%, while others work only with trusted partners. As the ecosystem evolves, many are developing specialisations and big companies themselves are also starting programmes in order to build the next generation of clients and acquisitions.

Cornell Tech Applied Sciences Campus is a forthcoming innovation centre on Roosevelt Island, New York City, which benefits from the use of city land and financial assistance. Its aim is to create a new kind of space in a highly-connected part of the inner-city that brings together innovators, academics, and investors under one roof to produce and commercialise innovations and well as to expedite tech innovation activity more broadly across New York.

*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*



The \$2 billion (€1.8 billion) campus, with over 180,000 sq m of planned workspace, has received \$100 million (€90 million) in infrastructure assistance from New York City Economic Development Corporation, and a 99 year lease. It has also benefited from a large donation from former Mayor Bloomberg's philanthropic investments. The site replaces traditional classrooms with open 'office zones' and workstations, and the building is designed to be re-purposed as technology evolves. Student housing for 2,000 students in the first passive house high-rise residential building in the world, and a privately funded Executive Education Centre, are core parts of the new development.



Oslo Cancer Cluster Innovation Park is a genuine national asset because it aggregates all national cancer treatment data in order to identify and accelerate drug solutions for the future. The new 36,000 sq m park is unique in bringing together the full cancer cluster value chain, and its concentration of functions in one space allows unprecedented interaction between institutions, patients and businesses. Its mix of functions – including a hospital, school, incubators, biobanks, and institutes – allows it to tap into Norway's globally recognised biomedical industry and attract overseas talent in immuno oncology, radio-pharmaceuticals and big data. Managed by an experienced property development team, the park's non-profit status offers a platform for cross-party collaboration, and money made from the buildings is re-invested into additional office space and lab facilities to support firms' on-site expansion.

- **Social infrastructure**, such as kindergartens and schools, because these are critical factors affecting the decisions of innovators about where to live. Partnerships with schools can help embed an ecosystem of collaboration that supports skills development in particular industries. Daycare centres have also become important attractors of middle-aged professionals.
- **Civic and public space.** Attempts at mixing land use to improve the lifestyle offer are visible in successful innovation sites, especially in the case of relatively detached innovation clusters which have been populated with greater retail and cultural amenities to improve their appeal. The importance of well-connected districts also often requires the replacement of fences, walls and barriers with bike paths, pedestrianised streets and high-quality public spaces.
- **Prohibitive tax rates and restrictions on rental leases** for newcomers make it difficult for local entrepreneurs to expand their businesses by attracting employees from abroad. Advocacy and reform to tax policy is sometimes important to attract international entrepreneurs and companies to join a cluster.

Real estate owners cannot rely any more on their assets alone. Bricks and mortar are no longer sufficient either to attract firms in an innovation-based economy or to operate effectively in a fast changing industry. Innovation economy tenants are looking for properties which are actively managed, which adapt to their changing needs and which offer them opportunities to grow, collaborate and be inspired. Property owners must take a much more active role to manage their buildings and districts if they are to be competitive. This represents a major step change for real estate, which is becoming a service industry.

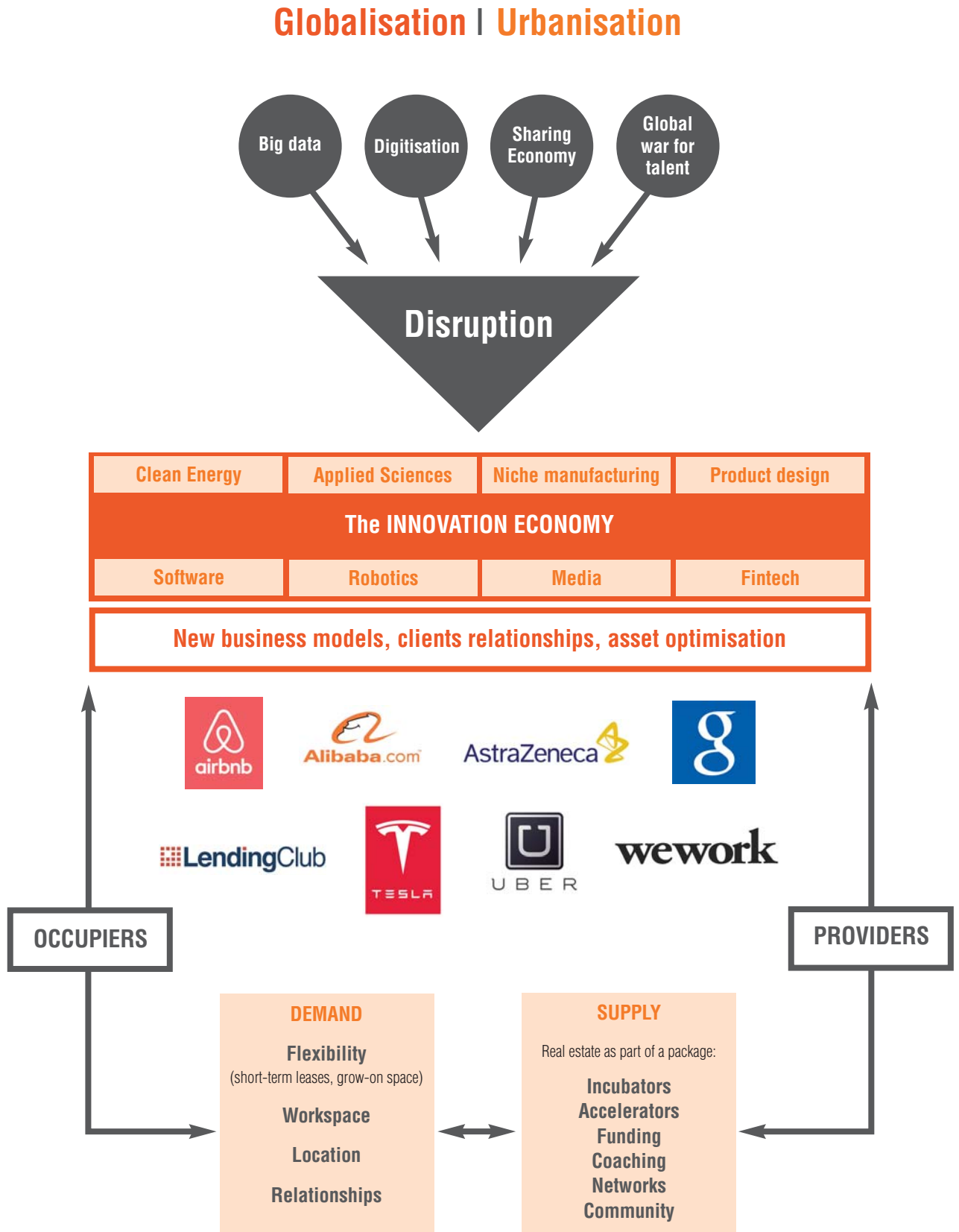
Learning lessons and adjusting to change

The adjustment to macro and micro conditions illustrated by these case studies highlight both the variation in scale that the innovation economy now takes, and also the way real estate expectations change over time in different cycles of innovation (see timeline). Media Park Netherlands is the longest established cluster, first developed back in 1960, and has been in a process of reinvention over the past decade in response to a new cycle of demand. In the early 2000s, it was one of a group of new projects – including 22@Barcelona and MaRS in Toronto – pioneering a new set of spaces for media, digital and science sectors.

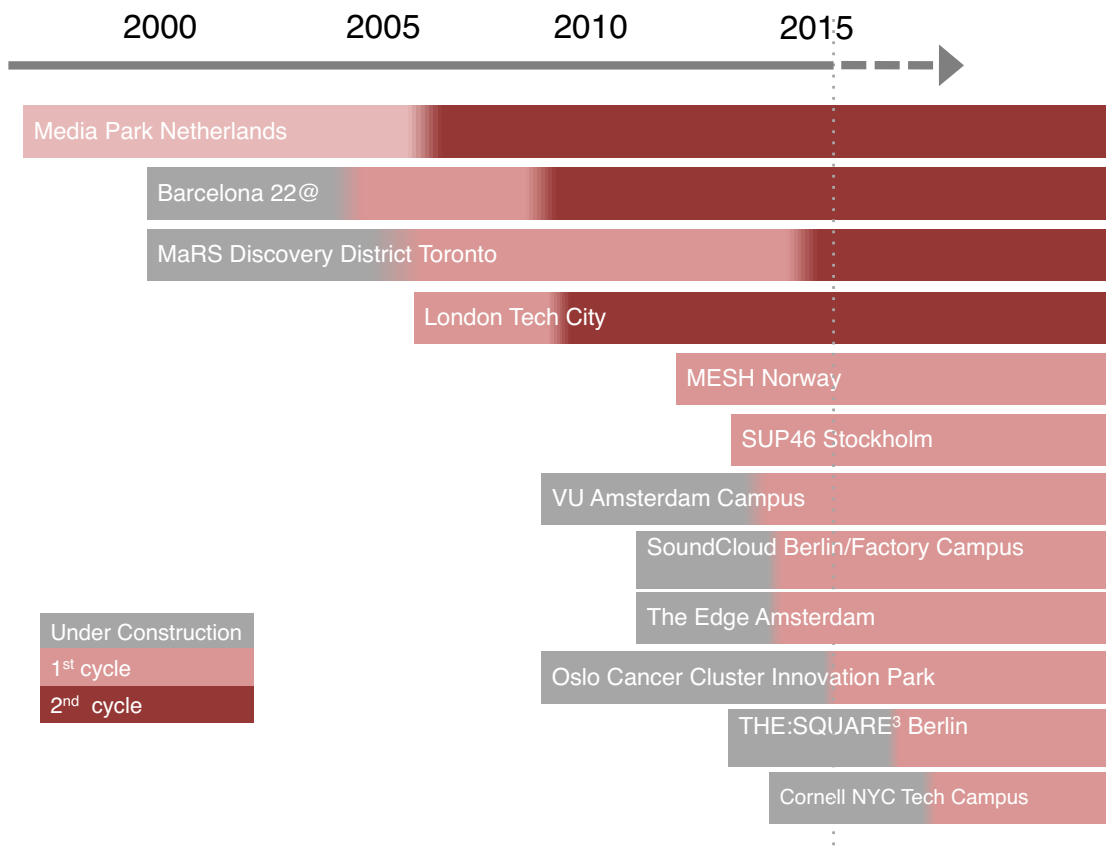
These more mature clusters, including Tech City in London, have now entered a second and even third cycle of adjustment to meet innovator needs, including specialised equipment, housing, supply systems, and affordable SME space. The experience of these sites shows the rest how real estate is now only part of the total offer, which also has to include funding, coaching and management.

The implications of changing patterns of supply and demand add up to a fundamental change to the business model for real estate. Although these case studies show what is possible, there is clearly a mismatch between supply and demand in the industry as a whole. The demand for short-term flexibility is not being matched by supply, which continues to involve time-consuming and expensive construction of immovable structures. The supply of assets is no longer enough to meet the demand for services, networks and business support. Finding a new equilibrium to solve this mismatch is the next big challenge for real estate.

Summary of effects on real estate supply and demand



Timeline of real estate adaptation in innovation clusters to respond to changing demands



3. What are the imperatives for real estate success?

Global best practice clearly shows how far most of the real estate industry has to go to respond to the disruption caused by the new cycle of innovation. Innovation economies are complex and so are their factors that make them thrive and grow. There is great variety of needs and sectors and so a 'one size fits all' approach will definitely fail. Nonetheless, a number of common ingredients to the success of innovation buildings and districts are visible:



VU Campus, Amsterdam

The modernisation of VU (Vrije Universiteit) campus is responding to the demand to bring previously siloed disciplines together to forge innovation and drive down costs. With the support of European Investment Bank funds, the redevelopment scheme is creating a new 'city within the city' by turning the area into a 24 hour mixed-use district. The new O12 lab building is unusual for accommodating a specialised convergence research cluster that brings together numerous science disciplines under one roof to carry out collective research inquiries and to share equipment 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. Part of the building also acts as a 'Lab Hotel' for research partners or commercial parties to rent space for a short time. The new campus invests in LED and acoustics technology to improve the sociability of its meeting spaces. New student apartments, shops, hotels and restaurants are being built in to bring the district to life. All labs are being future-proofed to prepare for changes in medical research practices, and some buildings are shared with business to multiply innovation potential.

In light of the disruption caused by the innovation economy, this review identifies **seven habits of highly successful real estate**:

- **Ensure a robust technology platform.** Fully equipped dedicated workspaces, underpinned by reliable digital and power systems, high quality event facilities and IP protection are widely viewed as essential to gain and maintain the confidence of companies that depend on rapid and seamless connectivity. They also offer efficiency advantages to tenants whose survival and success landlords have a stake in. Owners and developers that have had success in this area have been vigilant in lobbying market providers and investing to install up-to-date fibre optics and lab facilities, as London's Tech City has succeeded in doing.
- **Multiply routes to capital.** To support the aspirations of growing firms, but also to ensure the right supply and balance of residential, industrial and commercial real estate. Districts require access to capital markets, tax and training incentives, seed and venture finance, and debt finance. Hubs such as Stockholm's SUP46 benefit from public support from venture capitalists, accelerator partners and government authorities.
- **Collaborate with mature institutions** – business, universities and the public sector in particular – to optimise the design, delivery, marketing and management of the innovation hub. This will generate opportunities for mentorship, incubation and sponsorship with nearby centres of excellence. Consultation and leadership from entrepreneurs is also important to ensuring spaces provide what is wanted by the target market. Spaces like MaRS in Toronto show the value of engaging leadership from diverse sectors and diverse business sizes to help real estate owners understand what is needed across the whole market.

Negotiation with local and city councils is often essential to getting projects geared around the innovation sector off the ground. Planning and urban development officials may only approve certain uses or a certain volume of space dedicated to a specific use. For example, Moritz Gruppe has been very effective at gaining political support for THE:SQUARE³ project in Berlin by demonstrating the economic, housing stock, talent and amenity benefits to the area and the wider city.

- **Create a multi-stage vision for growth** that identifies and leverages company growth stages, sector anchors, spatial location and the brand and cultural identity of the area. Innovative firms need practical and flexible tenancy leases, and real estate must offer fee models not indexed to square metre space that can adjust to start-up business cycles and future needs for build-out space.

Innovation hubs also benefit from incremental storytelling that can convince people that they are at the leading edge of change. This is especially important for centres that are not in or around city centres and which were once characterised as unattractive, boring or suburban – which was a challenge for the Media Park Netherlands. The task for real estate developers is to build a concept of use that will optimise the innovation potential of the site while also conforming to local planning, design and land-use requirements.

- **Find the balance between confidentiality and transparency.** Transparency in innovation spaces is appealing because it increases accountability and collaboration, but in practice openness presents risks as well as advantages. Real estate owners and landlords can observe the need to demarcate private spaces where teams can work together without interruption or scrutiny. Oslo Cancer Cluster's new Innovation Park provides a very strong example of this balance, devised in collaboration with users.
- **Show hands-on leadership to grow value.** Many developers and asset owners identify the major challenge as taking place after the end of construction or re-development, when the task is to grow value over time through involved property management. At the end of an initial cycle they need to address the broader challenges of skills, capital, cost and density that enable the long-term success of the cluster. They must be vigilant that upgrades keep the area affordable for small growth-stage companies that larger companies want to move close to, and that the policy, regulation and financial framework protects small firms and embeds a local entrepreneurial culture.



Building a brand around a project

The importance of real estate managers creating a compelling concept for new developments is illustrated by **Moritz Gruppe's THE:SQUARE³** project in north-east Berlin. The superscript number 3 symbolises the three themes of life, nature and sport, and also stands for three plots and three towers, which resemble a sports podium of gold, silver and bronze. The three-pronged theme highlights the fully self-contained and multi-functional character of the urban plan for residents, commuters and visitors, as well as the enhanced quality of living and the access to sport and medical facilities.

THE:SQUARE³ has successfully built and publicised its powerful vision for its site. Using a slogan "How do you want to live?", it has focused on gaining industry and public interest by advertising in trade magazines, daily newspapers and sports magazines nationally and abroad, as well as through citizens forums and presentations to the local council.

The talent and experience of owners and landlords is essential to maintain the financial viability and sustainability of innovation clusters, while improving standards of living and architecture in the surrounding area. Social infrastructure – kindergartens, schools, clinics and civic space – is key to preserving the vitality of a project over time. The Media Park Netherlands illustrates the importance of patient long-term stewardship to improve road connectivity, public spaces, culture and support services to attract a critical mass of commercial media companies. A 12-person management team was invested in the project of creating value over time, by re-engineering the site to host the combination of functions that could prove appealing to the changing demand of innovative firms.

The **Media Park Netherlands** is a former public sector television cluster located 30km south east of Amsterdam, which has been managed by developer TCN for the last decade. Public broadcast activities continue to underpin the Park, but the strategic challenge has been to make it more attractive for a broader range of media companies. The park's managers have invested significantly in improving its lifestyle appeal, road connectivity and broader profile. Mixed-use land occupation was introduced to support health facilities, kindergartens, restaurants, bars and cinemas. In order to improve its status, a new museum for Sound and Vision was built on the campus and public space was re-designed to make the park more open, while NOB, UBF, MAX, Sony and Talpa were among the important anchors it has attracted.



- Include and engage the community.** The value of openness is at the heart of the innovation economy. Innovation hubs are successful when they facilitate professionals and neighbours to be part of the transformation. Larger innovation districts succeed when they invest in their evolution as a piece of the city that engages with surrounding areas, including low-income and high unemployment areas, and which offers pathways for opportunities to participate in the dividend of innovation. 22@Barcelona exemplifies the importance of inclusiveness, as its subsidised housing programme and social regeneration policies have ensured that the project remains true to its origins nearly 15 years on.

Real estate should everything to ensure the right talent can stay. Real estate owners and investors must take account of the deep challenges of SME space and housing affordability, and the wider offer, to enable people to live, work and access amenities near to the workplace. Real estate must cater for the blurring and even merging of work and private life, with viable solutions around on-site housing, independent retail and authentic entertainment and performance. This is something that more mature spaces such as 22@Barcelona, Media Park Netherlands, and Tech City have begun to address with more purpose.

4. Conclusions and key messages

The re-urbanisation of innovation is a major shift for the economy and for real estate. During the last cycle we thought of innovation as something that only happened in small university towns, at innovation districts and incubators, and on science and media parks. The decisive shift to the big city environment for innovation provides an opportunity to increase both the scale and productivity of innovative sectors, and to accelerate innovation in established sectors. It therefore requires a much larger adaptation of existing buildings, centres, and cities to a new economy. This is largely an organic, incremental, and messy process. It is one where the market takes a lead and planning authorities and development agencies must rush to catch up.

In this context, the flexibility and adaptability of local real estate sectors become either a competitive advantage or disadvantage to these innovation systems. The ability of real estate owners, planners, engineers, and utilities providers to respond to the need of the innovation economy will, in part, determine how much of it the city gets.

The real estate industry needs to adapt in four key ways:

- **Adopt a ‘service provider’ mindset.** Real estate needs to become a service industry rather than an asset industry. If it is to generate returns in future, real estate operators have to offer a range of other services including funding, coaching, networking, and supplies. If they don't start doing so, others will and many already do.
- **Be prepared for continuous adaptation, feedback and complexity.** Real estate providers need to design careful tailor-made solutions when it comes to access, location, workplace, building layout and rental terms. A new business model is essential.
- **Align interests and build transparency** between owners and occupiers. Landlords might work with their tenants to build a compelling story around a development, or even become a venture capital partner with a direct stake in the success of their businesses. Real estate must become a collaborating partner.
- **Provide hands-on stewardship** to address the broader framework for innovation. This means not only managing relationships between big companies and start-ups, but also exploring opportunities to provide accommodation or social infrastructure. It also means

engaging with the innovation eco-system to address gaps: be they skills, capital, affordability or density. Real estate must actively help grow its tenants.

Where next for Oslo's innovation economy? New hubs are appearing such as MESH, 657, StartupLab, MashUP, Bitraf and House of Nerds. Oslo-founded firms are also making big waves internationally across different sectors, from Xeneta (global container freight), Kahoot (education), WeVideo (video editing), Nimber (delivery) and Unacast (advertising). Its more mature sectors – whether oncology, healthcare or systems engineering – are also rising to the challenge.

Oslo's challenge is to increase the scale of adjustment to innovation. Because it has such a successful and inclusive economy, it is harder to convince residents of the need to accommodate innovation-led growth. The city has the highest share of residents in Europe (70%) that consider it ‘easy to find a job’, which makes the case for change tricky.¹⁷ The following strategic adjustments may be necessary:

- **Oslo's cultural offer can be leveraged in order to grow the innovation economy.** Its opera house, concert halls and many museums are very popular locally but international assessments identify culture as an area of improvement for the city.¹⁸ One challenge is to raise the profile of Oslo's quality of art and architecture, range of musical performances, advanced coffee culture and attractive work-life balance.
- **Oslo can use its densification strategy to retrofit spaces for the innovation economy.** The city population is expected to grow by nearly a third to over 800,000 by 2030, partly because of demand and partly because Oslo is not currently very dense compared to other European cities. There is a lot of potential to grow, especially around its T-bane subway network.¹⁹ Greater density is both desirable and necessary and will need to be tied to a more innovation-oriented economy.
- **Oslo needs a more diverse and differentiated mix of physical spaces** to help serendipity to occur. The city's existing office development models are mostly very similar, and the ethos of business networking and partnership is fairly new. Oslo can learn from other cities where large scale waterfront redevelopments and strong stewardship of media and life sciences clusters can facilitate productive innovation at scale.

Notes

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¹⁶ www.marsdd.com/wp-content/uploads/2014/10/MDD-Audited-Financials-March-2014.pdf

¹⁷ http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/survey2013_en.pdf

¹⁸ Culture and environment' is the weakest measure for Oslo in the EIU's annual liveability survey, rated outside the top 30 and on a par with cities such as Perth and Lyon.; http://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/urban/survey2013_en.pdf

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