



Building the Innovation Economy

City-Level Strategies for Planning, Placemaking and Promotion

October 2016

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Urban Land
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Front cover image: Rotterdam waterfront

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Photos, ULI Workshop, Rotterdam



Executive summary

The innovation economy is proving to be a huge disruptor and opportunity for cities, businesses and the real estate sector.

Cities around the world are seeking to accommodate the needs of a new generation of technology powered industries and firms, whose innovation model depends on proximity and whose talent pool explicitly prefer urban locations and lifestyles. Such cities are motivated to host a larger slice of this innovation economy in order to grow a new base of jobs, adjust to the process of industrial change, or to leverage technology for the big challenges of sustainability, resilience, and social cohesion. Many are trying to raise their innovation profile by focusing investment and promotion on new 'innovation districts', locations within their city where the innovation economy might cluster and concentrate.

Rotterdam is a city for whom the innovation economy is essential to the creation of additional jobs, to enhance its international visibility, and to encourage innovation in city management. Like many other cities around the world, Rotterdam is trying to raise its profile by focusing investment and promotion on new 'innovation districts', locations within the city where the innovation economy might develop and expand.

To explore its longer-term strategy to establish the city as a centre for innovation, it partnered with ULI to organise a one-day workshop that brought together an international group of practitioners with expertise working on urban innovation districts.

The workshop looked at issues such as:

- the ingredients of a long-term strategy for a city to build its innovation capacity,
- the roles of government and market factors,
- the links between innovation districts, placemaking and land use and

- how cities can build an innovation identity and visibility.

This report further explores these topics inspired by the experience and examples of Munich, San Diego and Tel Aviv, as well as offering a number of recommendations to support Rotterdam's strategy for its innovation ecosystem and its key districts. Munich is a city in a third cycle as a city of innovation, San Diego is into a second cycle, and Tel Aviv is enjoying a first full cycle. This allows different kinds of lessons to be learned from their experience.

Key findings

The report shows that an innovative city economies are facilitated through ecosystems that operate at a whole-city, whole-region or even larger geography. Within cities, districts concentrate some of these elements where close proximity is needed, and give these activities a shared identity and visibility. But innovation districts cannot develop or thrive without the ecosystems operating around them, and an innovation district on its own does not create an innovation ecosystem.

Innovation clusters tend to emerge most strongly in cities where there is a combination of well-established growth sectors, dynamic population growth, access to capital, connectivity to growth markets, knowledge rich institutions, a conducive regulatory environment, and a collaborative and entrepreneurial working culture. Some cities and regions have nurtured these factors over several decades. They cannot usually be constructed quickly.

Where districts emerge depends less upon public policy and planning than it does on market forces (especially the clustering of sectors, space costs, availability and physical proximity) and the preferences of workers and entrepreneurs. Given the strength of market forces in this process, designating 'innovation districts' can be a risky business for public

authorities. While scholars and researchers have observed the rise of innovation districts, they suggest districts remain flexible, with no hard boundaries, given the extent to which these areas change and grow. Instead, it is important to observe and encourage districts that emerge naturally, and seek to ensure that they have the capacity and qualities needed to develop. As districts mature, and prices rise, additional locations and capacity should be encouraged. A successful innovation city will usually have several districts at different stages of maturity, supported by a shared and deepening ecosystem.

Building a strategy for the innovation economy

For cities to build their innovation economy, they need to adopt a multi-stage strategic approach: first fostering the demand side drivers and ecosystem conditions, then, observing the opportunities in different locations, and catalysing development in one or more, and later sustaining the demand and environment for innovation as the district matures.

Investors, landowners, developers and policies can all play a catalytic role in enabling an innovation district to achieve scale and critical mass. Cities also have to be prepared for the externalities and unintended consequences of growth in particular districts and the wider ecosystem.

For placemaking, innovation districts often begin in low cost/under-utilised locations but such districts emerge and flourish when there is an authentic environs and improving quality of place, amenities, social diversity and connectivity in the wider city. Aspiring innovation districts also have to bring forward a very distinctive offer of networks and cluster brands, with workspaces, amenities, density, regulations and public environments to generate the buzz and the 'stickiness' for real interaction.

It is also important that public planning mechanisms improve confidence and flexibility and are choreographed with placemaking and real estate innovation, if districts are to stimulate talent loyalty and private sector demand. Real estate has a critical leadership role to play in retaining the right buildings, partnering with innovative firms to achieve shared goals, and testing the market.

Marketing and promotion is also essential to drive an innovation economy and support the whole innovation ecosystem. By co-ordinating a clear message across multiple channels and markets, and by leveraging their distinct DNA, cities such as Tel Aviv and Munich have managed to scale up their offer to venture capital investors, create the appeal for talent, and the visibility to innovative companies across a range of sectors. Mostly they have done this by promoting a city wide or region-wide innovation story and have combined this with cultivating several neighbourhoods with authentic character, rich diversity and high quality of public space, some of which then emerge as centres of innovation.

When an innovation district develops some of the core innovation assets needed, lead district actors have to reach out both to potential occupiers, customers, residents, landowners and local leaders. A district may have to adopt a range of innovative and disruptive tactics in order to build demand and communicate the story of change effectively. The experience of San Diego highlights the value of regularly testing the appetite of the market through short-term experiments, of using 'tactical urbanism' and local art and culture to communicate values and ambition.

Figure 1: Key success factors for innovation district development



These findings hold a number of lessons for the city of Rotterdam, related to the three main themes of the report:

Principles of a long-term strategy for Rotterdam

- Recognise the strong innovation context in the Netherlands, be part of it, and leverage it. Rotterdam is already part of a major innovation economy.
- Balance the focus on specific locations with clear attention to city and region wide ecosystem development. Capture more attention from the existing ecosystem within Rotterdam.
- Grow and support the innovation activity and growth companies that Rotterdam already has. Build up demand for innovation amongst Rotterdam's existing businesses and institutions.

Optimise land use and placemaking in Rotterdam

- Continue to support Rotterdam Innovation District, but add to its offer the flexibility and market choice that investors and growing firms might want, promoting multiple locations

- Use Rotterdam's urban infrastructure and land as a platform for experimentation.
- Prioritise placemaking in the districts to achieve critical mass, and help RID to acquire a distinctive identity and appeal.

Build Rotterdam's innovation brand

- Leverage Rotterdam Port's DNA in promoting wider innovation agendas, building upon its success.
- Develop the city's innovation brand as a broad identity, reputation, and narrative.
- Invite others to 'feel' and 'experience' Rotterdam's innovation culture as well to 'buy' its products.

These recommendations can form the building blocks of a multi-cycle strategy for Rotterdam's innovation ecosystem, before a more targeted approach to build a critical mass of innovation activity in order to sustain street life and retail demand.

Section 1: Introduction

This report is informed by a collaboration between ULI and the City of Rotterdam, which is seeking to foster an innovation ecosystem as part of the modernisation of its economy and the re-development of the central station area and the port lands. As Rotterdam seeks to develop a longer term strategy to establish the city as a centre for innovation, and ensure that its plans are fully tested and challenged, it partnered with ULI to organise a one-day workshop that brought together an international group of practitioners with expertise working on urban innovation districts. This workshop tackled important under-pinning questions:

- What are the ingredients of a long-term strategy for a city to build its innovation capacity and to play a bigger role in the wider innovation ecosystem?
- What role is there for city government and market actors in activating and sustaining an innovation district?
- What are the links between innovation districts, placemaking and land use?
- How can cities communicate and promote their innovation focus to build identity and visibility, and how can an innovation district be leveraged to this effect?

These are pressing questions for many cities, including the city of Rotterdam as it seeks to scale its innovation districts and position itself as a city that is open and ready for innovation. This summary report draws on this workshop's findings, desk research, and the different approaches taken in three other cities (Munich, San Diego and Tel Aviv) which are featured, along with Rotterdam, in separate case studies published online. The report outlines the process and the ingredients that are required for cities that seek to accommodate more of the innovation economy, with a distinctive focus on the roles of land use, placemaking and promotion.

The Rotterdam case study

Rotterdam is still the largest seaport in Europe and the second largest city in the Netherlands, with a young and diverse population and strong air and rail connectivity. Rotterdam is part of a wider region that hosts world class research and development, and higher education institutions, and enjoys superb physical and digital connectivity.

But the city experiences low growth and high unemployment, as well as a shortage of skilled workers in emerging industries. The city's port and logistics functions are also a cause of high pollution and congestion. Rotterdam therefore has an urgent imperative to transition towards a more resilient economic and social model, evolving from a 'port-out city-in' development model towards a more joint development approach between the city and Port Authority.

Figure 2: Rotterdam waterfront



In November 2015, the city and Port of Rotterdam jointly launched Rotterdam Innovation District (RID), just west of the city centre. The RID and the Rotterdam Central District (RCD), the city's central business area, have been designated as strategic locations to explore the opportunities of the next economy (see Figure 3). RID is home to the RDM Rotterdam campus and Merwe-Vierhavens, a hub of port-related industry and small creative businesses, while the Cambridge Innovation Center (CIC) has recently relocated to the RCD. The city is now exploring how to optimise its innovation assets and strengthen the wider ecosystem.

The international experience

This report draws substantially on the experience of three case study cities that are all medium-sized, internationally-oriented, and possess important technology and innovation assets (see Table 1). All three cities – Munich, San Diego and Tel Aviv – are ranked in the top 80 of the 2thinknow Innovation Cities Index,² and rank in the top 10 in their continent for venture capital investment.³ Although these three cities all have distinctive economic, social and place assets, their cultivation of a robust innovation ecosystem whose activities have partly become concentrated in certain key districts, offers important lessons for others.

Munich is a city in a third cycle as a city of innovation, San Diego is into a second cycle, and Tel Aviv is enjoying a first full cycle. This allows different kinds of lessons to be learned from their experience. Inspired by the experience and examples of these three cities, this report seeks to help Rotterdam and other cities understand the key roles of land use, placemaking, investment and promotion in the process of getting an innovation district off the ground, and in enabling a district to serve a wider strategy of urban growth, liveability and competitiveness.

Figure 3: Rotterdam's inner-city innovation locations¹,

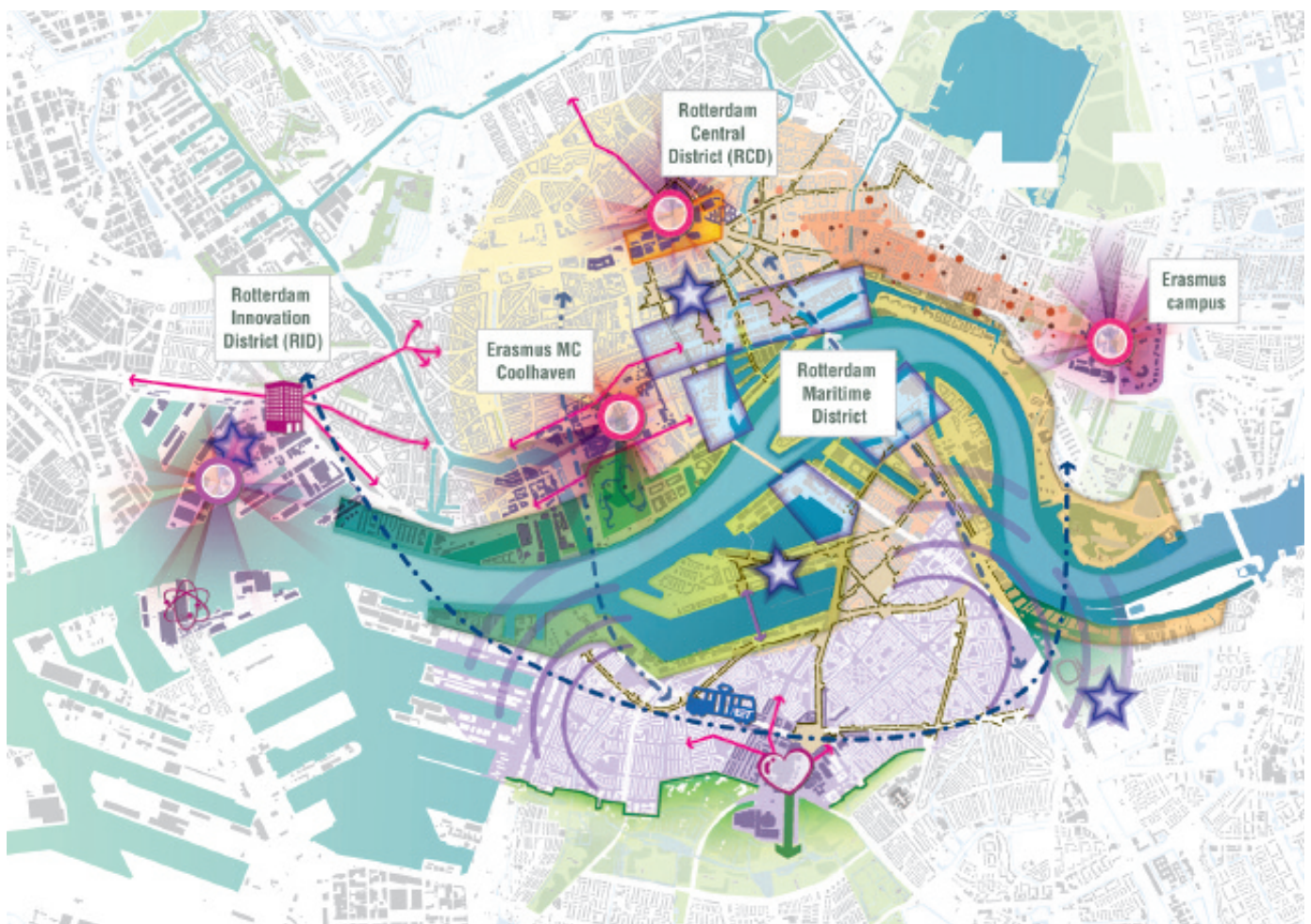


Table 1: Innovation sectors, assets and ecosystems in the four cities

	Innovation sectors	Innovation assets
Munich	<ul style="list-style-type: none"> Advanced manufacturing (automotive, aerospace) Biotechnology/ life sciences IT – software, e-commerce Media – advertising, digital media, TV and publishing 	<ul style="list-style-type: none"> 'Munich mix' of sectors and companies Bavaria state government programmes in innovation and technology Large network of research facilities, start up centres, university spin offs
Rotterdam	<ul style="list-style-type: none"> Maritime and offshore Cleantech (energy transition, climate adaptation, delta security). Food Medical 	<ul style="list-style-type: none"> Chain of innovation hubs linked by East-West metro line Cambridge Innovation Center (CIC), co-working spaces RDM Campus - Rotterdam University of Applied Sciences and the Makerspace Erasmus Centre for Entrepreneurship Strategic land freed up in inner city by Port relocation Port focus on and investment in innovation (with SmartPort)
San Diego	<ul style="list-style-type: none"> IT/telecoms/cyber security Maritime – US Navy Life sciences – oncology Action sports 	<ul style="list-style-type: none"> Collaborative network of businesses, researchers, philanthropists, entrepreneurs San Diego State University, UC San Diego, 80 research institutes e.g Sanford Consortium, Scripps Hospital and Metabolic Institute, Salk Institute for biological studies. Innovation support hubs, Economic Development Corporation (EDC)
Tel Aviv	<ul style="list-style-type: none"> Internet/software Computer security Telecommunications Smart technology and energy 	<ul style="list-style-type: none"> Strong presence of global technology firms Highly supportive VC network Mature incubator and accelerator programmes Climate, open-ness and lifestyle appeal

Report overview

Section 2 identifies the drivers of the new innovation economy and its needs and preferences for certain kinds of locations, through a review of the existing literature and indices. It explains the links between an innovation district and an innovation ecosystem, and emphasises the pre-conditions for any innovation concentration to emerge or become established.

In Section 3, we explain the different stages that cities go through in first fostering an innovation ecosystem, and then activating and sustaining one or more innovation districts. We review the pre-conditions in the wider ecosystem that are necessary for a spatial concentration of innovation to emerge, and we highlight the roles of catalyst investors, landowners,

developers, and policies in enabling an innovation district to achieve scale and critical mass. We also look at the tactics that mature and established innovation districts pursue to ensure diversity, inclusiveness, resident buy-in, and growth capacity.

In Section 4, we turn to the role of land use, real estate and placemaking in fostering innovation at the ecosystem and district level. The section highlights the mix of local and external place factors that are needed in order to kick-start a startup and innovation culture, and the ways that different cities pursue this given the assets and constraints they have. The need for planning to be choreographed with placemaking, support for entrepreneurship and real estate innovation is emphasised if districts are to stimulate private sector demand.

In Section 5, the power of a compelling city identity and district promotion is explored through the experience of different cities. We identify some of the benefits that accrue to cities that understand and leverage their DNA to tell a story that attracts innovative talent. We then examine some of the tactics to raise interest and galvanise local communities in emerging innovation districts.

In the conclusion, we review the lessons from the previous sections for cities seeking to accommodate a larger share of the innovation economy. We make a number of high level recommendations for Rotterdam to support the city's strategy for its innovation economy, ecosystem, and its key districts.

Section 2: The rise of cities and the innovation economy

The innovation economy is emerging rapidly, and is becoming a huge disruptor and opportunity for cities and business alike.

The imperative for real estate owners and landlords to adapt their business models in response to this new phenomenon was captured in the 2015 ULI Europe report *Technology, Real Estate, and the Innovation Economy*. In this report, we examine the spatial and location requirements of innovation by taking a closer look at the relationship between innovation ecosystems and innovation districts.

In the aftermath of the financial crisis of 2008, diversification beyond finance and corporate services and the fostering of a new jobs, talent and tax revenue base became an urgent imperative for cities all around the world. At the same time, many cities are in various stages of transformation from an industrial based economy to one built around services and innovation, while technologically-enabled products and services are also making rapid gains in addressing sustainability and individual well-being. All of these factors are driving interest by cities in the requirements and locations of the new innovation economy.

Cities seek to provide for, and accommodate, the needs of advanced industries and firms fuelled by a new generation of technologies that embrace materials, production, IT, virtual reality, robotics, big data, life sciences, energy, waste, water, logistics and distribution, transport, construction, and smart infrastructure systems. A wide range of new and emerging industrial sectors are developing and using these technologies. Their tendency to cluster in specific locations and increasingly to prefer urban environments is a major alternative source of productivity and jobs in cities.⁴ In particular, the opportunities and implications surrounding 'innovation districts' have become the subject of major strategic attention for cities and for the real estate industry.

There is a growing knowledge base about the many kinds of innovation districts that are established and emerging in the world's cities. But not all cities are either well-endowed or ready to host innovation districts. Understanding how innovation processes work, what their ecosystems and platform requirements are, and whether they can attract and retain the talent and capital needed for innovation to flourish are logical pre-conditions for any innovation district, campus, quarter, zone, park, cluster, corridor, or triangle to emerge or become established.

The multiple scales of the innovation economy: cities, ecosystems and districts

Innovation districts have been observed since the late 1990s. Although there is no exact qualifying definition of an innovation district, and many cities give neighbourhoods an 'innovation district' label in advance of reality, there are now dozens of functioning districts worldwide.

In a ground-breaking study of more than 25 districts in North America and beyond, Brookings scholars Bruce Katz and Julie Wagner found that what makes an innovation district really stand out is the level which anchor institutions and companies *connect* and *collaborate* with a larger set of economic actors including start ups, incubators and accelerators. Underneath this observation, then is the power of its 'networking assets' that generate positive relationships between these diverse actors. Districts enable and facilitate relationships that are part of the co-operation required for innovation.

Subsequent research, including by the World Bank and Centre for London, highlights the variety of forms and 'types' these districts can take: some are organically embedded in urban neighbourhoods, others have evolved out of a more detached campus or science park format, while some emerge from nearby firms and institutions sharing assets, facilities and 'traffic'.⁵ The existence and influence of anchor firms or institutions in these districts is common but by no means universal. Districts host the anchors and core assets that produce innovative content.

In all cases, companies in innovation sectors see the benefits of 'agglomeration', where the proximity and density of firms, people, research or knowledge institutions, make it easier for productive collisions to take place between firms, people, capital, and ideas. They are also explicitly responding to the urban lifestyle preferences of a highly-skilled younger workforce. Districts concentrate the impacts of interaction with 'super-proximity'.

Ecosystems drive demand for districts -and districts enhance ecosystems

Innovation economies often produce specific kinds of localised clusters and associated land uses because many innovation sectors benefit from proximity between firms, institutions, investors, and infrastructures. Innovation districts are distinct from other spatial formats of innovation, such as science parks, technology zones, industrial corridors, or one-off buildings, that are dominated by single land uses and specialised sector functions.⁶ They are larger multi-purpose areas that draw together scientific, creative and business space with other functions such as civic and cultural institutions, universities and hospitals, connectivity, amenities, retail, residential, and public space.

Figure 4: Vila Olímpica, the backdrop for Barcelona's most mature innovation district, 22@



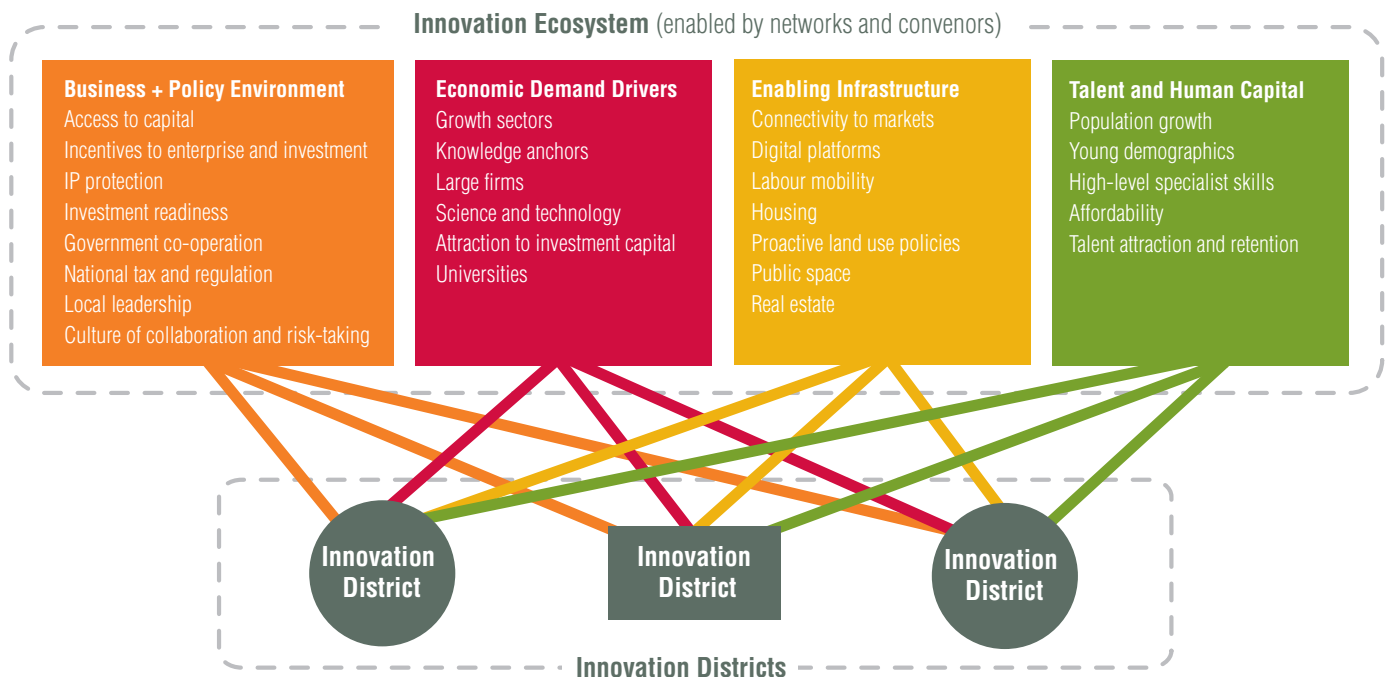
Photo by Till Niermann, CC by SA 2.0

Measuring innovation in cities and districts

This re-urbanisation of innovation can be observed through many lenses, not least the flow of venture capital investment towards firms in inner city or urban locations. It is also tracked by new indices that have been developed to measure urban innovation. Among the leading examples are:

- UK-based public-private initiative CITIE measures how well prepared more than 40 city governments and systems are to host and support entrepreneurship. One of its nine dimensions is “How does the city use space to create opportunities for high-growth companies?”, where the proximity, infrastructure and space variety provided by districts plays a key role.
- Australian firm 2thinknow’s Innovation Program series measures cities based on their framework conditions for innovation, their soft and hard infrastructure, and their cultural assets that generate ideas.
- San Francisco-based software company Compass ranks the world’s 20 leading Start Up Ecosystems based on the size and value of the ecosystem, market reach, funding, talent and mentors.

Innovation is becoming more measurable and revealing the role that districts play.

Figure 5: The relationship between innovation ecosystems and innovation districts

Districts host key parts of a wider 'ecosystem' of innovation, which spans all of the actors and relationships whose goal is to enable technology development, enterprise, and innovation.⁷ Such ecosystems have a much wider geography than a single district, often operating at a whole of city, whole of a region, or even a national or transnational level. Responsibility for co-ordinating these ecosystems may be shared by many organisations, firms and tiers of government. The districts concentrate some of the activities so that they share an identity, and become visible and accessible to those not located within the district.

- **An ecosystem** includes the immediate customer communities, infrastructures, supply chains, labour markets, and investment systems that operate at wider metropolitan and regional scales. These include the enabling infrastructure, the skills and human capital base, the policy framework and the economic demand drivers (See Figure 5). The degree of strength of an ecosystem refers to its level of proven ability to sequence these factors in favour of business formation, capitalisation, and growth. Strong ecosystems produce a large number of start ups and a substantial range of high-growth companies.
- **An innovation economy** is an economy at a local, regional, or national level where the proportion of jobs, firms, and GDP produced relies increasingly on sectors that: adopt and optimise new technologies; experiment with new products, processes, channels and transactions; and disrupt existing sectors and business models with new firms and entrants.
- **A district**, by contrast, is the very local place where the processes of enterprise formation and business growth that the ecosystem enables occur. Knowledge sharing in a number of sectors increasingly takes place at a neighbourhood level, where companies and individuals are located within a '10-minute walk' of each other. These local districts are in symbiosis with the wider ecosystem, as they cannot thrive in isolation from the city's wider economic, infrastructure, social and political systems.⁸

However, amid all the current buzz around innovation districts, there is a need to understand the differences between aspirations and reality. Successful innovation districts are driven by larger trends than site availability, and are products of dynamic innovation ecosystems. Districts are not the drivers of such ecosystems. Even though they can be catalysts for such ecosystems to expand and deepen, a city does not become an innovation hub simply by promoting the establishment of an innovation district.

For many cities, including Rotterdam, the first priority is to assess the real potential of its innovation economy and review the exact needs of the innovation ecosystem. This involves understanding the niches the city has to offer and the conditions that support high growth of smaller firms in order to be able to foster them. This then informs subsequent decisions about whether and how to apply an innovation district approach, citywide, or in particular locations. So in the following sections we review the roles of public and private sector actors in fostering the ecosystem and then activating and sustaining specific district locations.

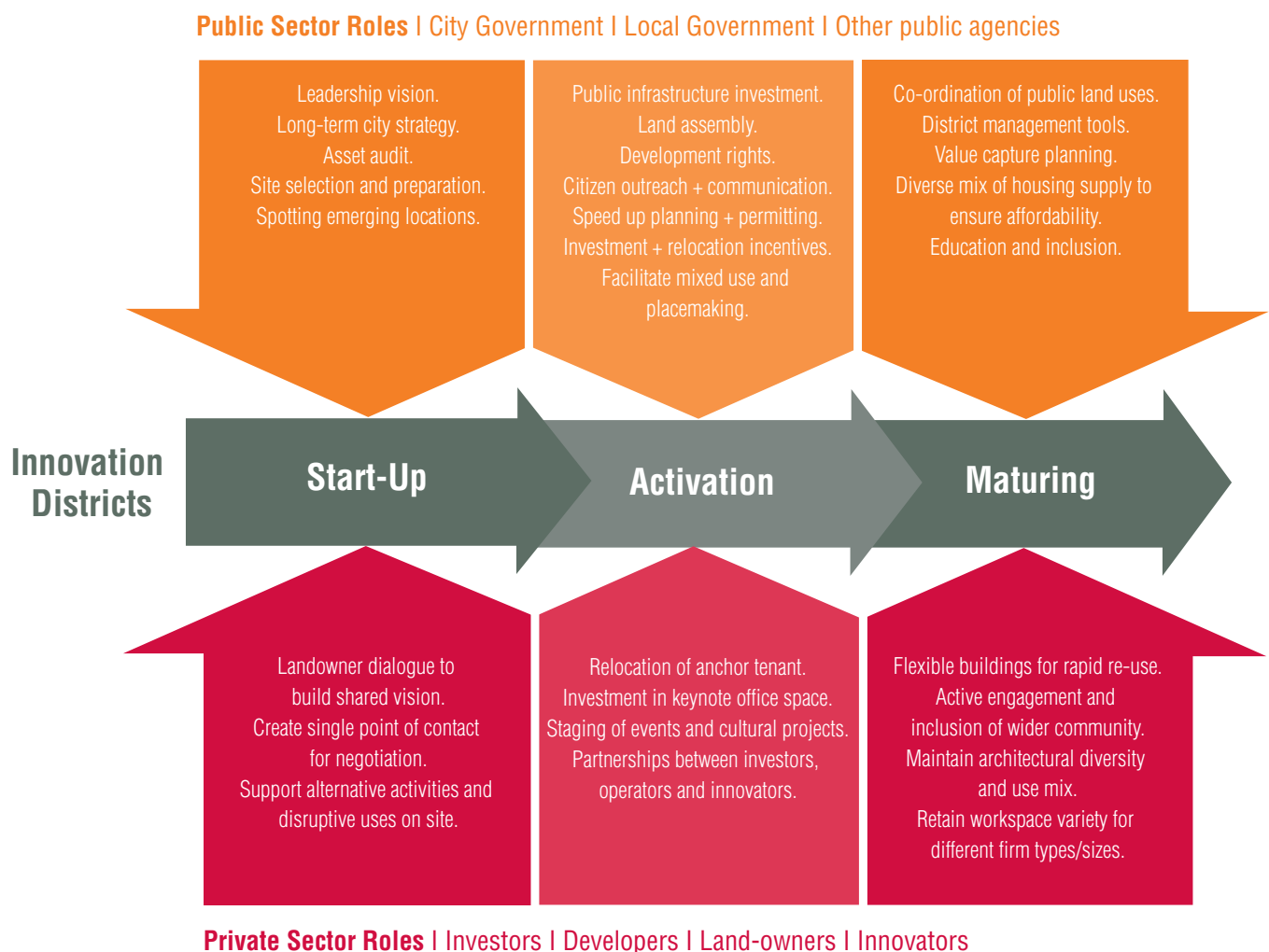
Section 3: **Fostering an innovation ecosystem and district through the cycle: the role of investors, developers and city governments**

In dozens of cities across Europe and hundreds of cities around the world, city and local governments, or large land-holding partners, are earmarking specific locations as potential urban innovation districts (or 'innovation zones' or 'innovation parks').

But districts do not evolve and succeed just because city governments or landowners wish to have them. They require careful interventions at different points in their development, first to

spot promising locations with embryonic, if not already strong, clusters and create the initial conditions, then to catalyse their growth, and later to sustain their momentum. In the vast majority of cases, these districts are not building from scratch but building from an important set of starting assets that can be leveraged. This section identifies the different roles of governments and market actors at each stage, summarised in Figure 6.

Figure 6: Summary of roles of public sector and private sector actors in different stages of innovation district development



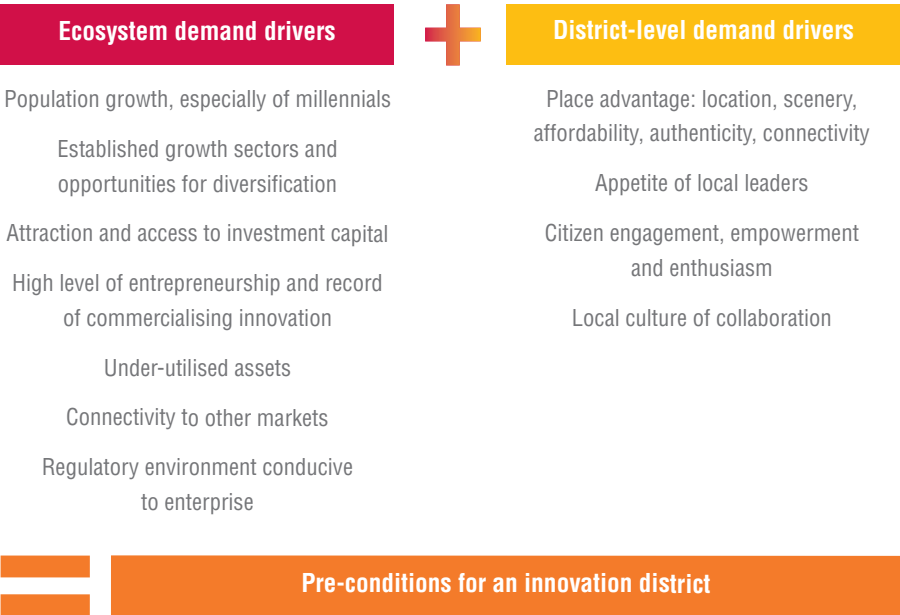
Ecosystem pre-conditions

The conditions for the emergence of spatially concentrated clusters of innovative companies need to be understood to include demand drivers at the macro and local level, as well as local assets (Figure 7). Based on analysis of leading cities and districts that have an established innovation ecosystem,⁹ as well as on workshop findings, it is apparent that innovation economies tend to emerge most strongly in cities where there is a combination of some of the following factors:

- a regulatory environment that respects intellectual property and also encourages appropriate enterprise risk taking
- well-established growth sectors with competitive pressures to innovate
- population growth and labour mobility
- connectivity to growth markets and sources of capital
- knowledge and technology intensive institutions and sectors
- high levels of entrepreneurship and an ethos of collaboration
- under-utilised assets
- a shared long-term vision for the city and its economic development
- rationalised land uses and a high quality of place that facilitates mixed use

Most large and successful cities have these ingredients within their borders or close at hand, and so too do many smaller specialised cities, and some medium sized cities in the process of transition. Rotterdam has many of these features within its wider region, and the key task is to enable Rotterdam to host more of the activity that is now developing at the regional level.

Figure 7: Drivers of market demand at ecosystem and district level



Fostering an innovation ecosystem in San Diego, California

San Diego’s careful cultivation of a regional civic and entrepreneurship culture has been essential to the formation of its innovation ecosystem. Having become a centre for military and medical research, for over 50 years the city’s business, education, civic and philanthropic communities have pooled their knowledge and resources to achieve shared economic goals, helping to build a critical mass of scientists and venture capital firms in the innovation system.

San Diego has gradually deepened its knowledge sharing system across different disciplines through technology commercialisation schemes, entrepreneurship education, and technology transfer offices. Over the last 30 years the Chamber of Commerce, Economic Development Corporation (EDC) and startup accelerator CONNECT have been dedicated to increasing business interaction and collaboration. This circulation of ideas has helped the city to adjust to and commercialise new economic opportunities in each new economic and federal spending cycle.

Today San Diego has major strengths in IT, life sciences, maritime, cyber-security and aerospace, supported by two international universities and 80 research institutes. The city’s economic diversity and innovation focus has created the demand to densify Downtown and provide vibrant city centre living from a younger workforce. The ecosystem pre-conditions have given visionary developers in the I.D.E.A District the confidence to facilitate the re-urbanisation of San Diego’s innovation economy.

Where these pre-conditions are in place innovation ecosystems may emerge. They are driven by the demands of established sectors that need to innovate, or by institutions that need to commercialise, or by talented people that want to try new ways to discover solutions to problems or respond to specific opportunities. As an innovation ecosystem emerges, specific districts may then become key locations for the new activities.

Startup: from the ecosystem to the district locations

The role of city government during the early stages of innovation district development can vary considerably. In empowered and well-resourced cities, the city government or a government corporation may be the lead agent in the process of change. In others, it plays the role of background co-ordinator, operating as an interface between development and the public, and engaging with the key infrastructure providers – e.g. transport, hospital, utilities, communications. In cities with limited capacity and experience at redevelopment, the role of city government may be characterised by inertia or risk aversion, leaving others to fill the void.

At the very early stages, city governments can be most supportive by developing a coherent long-term city strategy, supported by city leaders, that provides a clear framework for growth, specialisation, population change and infrastructure needs. Research of innovation districts for this report indicates that this can be backed up by:

- **Auditing of assets.** City governments are often best placed to carry out a full audit of assets across the city, so as to identify suitable locations and to understand certain areas' local competitive strengths, which can often go 'under the radar'. By learning what the real competitive advantages are, a city can then make more informed choices about what activity to attract that will create the critical mass that can drive growth and investment.
- **Legislation to change development priorities.** The elimination or reduction of noisy or polluting activities is often a basic prerequisite for a district to attract innovative firms. In Munich, the transformation of Werksviertel was made possible by a city law to re-locate polluting industries outside the city limits, while similar policies can be seen in Tel Aviv and elsewhere.
- **Site selection and preparation.** Selecting the first site or list of sites for potential employment densification (based on existing assets, transport links and economic needs), and co-ordinating the preparation of these sites, is an important enabler of redevelopment and densification. As the experience of London and Seoul shows, the concentration of spatial development within named 'opportunity areas' is an important enabler of redevelopment and densification, not least in reducing the complexity of policies, plans, and regulations.

Although this stage is often where the public sector makes many of the most important enabling interventions, international experience suggests that the private sector also plays a number of important roles. One of the most important initiatives district developers can take is to **lead the market and build a shared vision**. In San Diego's I.D.E.A. District, the I.D.E.A. Partners team engaged in highly effective outreach and communication with civic leaders, local businesses, residents, and potential tenants in order to develop consensus around planning principles.

In complex sites, owners and developers may also accelerate progress of development by re-organising internally. One way they may do so is to **combine and create a single point of contact**. In Werksviertel Munich, the nine landowners agreed to appoint an external project manager to represent them and facilitate negotiation and dialogue. This can have the effect of simplifying and speeding up the planning and regulation process.

Herzliya: Proactive local government leadership in the Tel Aviv region

In Tel Aviv's metropolitan area, local governments have been successful in concentrating the activities of the innovation ecosystem within district locations. One of its key locations is Herzliya, where the municipal government has been an active facilitator for over 25 years. In the first cycle, the Mayor and Deputy Mayor of Herzliya recognised the potential of the district, encouraged real estate entrepreneurs, and offered building rights and property tax breaks to encourage tenants to locate and stay. In the case of one of the key corporate tenants, Scitex, the municipality permitted demolition of the single-storey building to construct a seven-storey replacement leased to the company, as well as accelerating the approval process.

Later, zoning laws were modified to increase its density and declare it 'hazard free' to incentivise high-tech relocations. The district's access to main road arteries, and the high quality of workspace and facilities, were viewed as the key advantages to its growth. In the new cycle of the district's development, the municipality has developed its own accelerator focused on urban innovation and open data – the Herzliya Accelerator Center – and endorsed a new zoning plan to make the district more flexible and mixed-use.

Figure 8: Microsoft building in Herzliya Pituach



Photo by Guy Pakeman, CC by SA 2.0

Activating innovation districts

In many innovation districts, particular catalysts are also observable that accelerate the pace and scale of activity. They include market led, institutional and policy initiatives.

Which catalysts are most effective will depend on the existing land, place and institutional assets in a given district, and the capacity of different stakeholders to act. Some innovation districts are quite centrally planned and managed by city governments. Others are more bottom-up in orientation, perhaps beginning with the organic activity of local innovators, or involving a coalition of developers, investors and local agencies. Here we highlight the roles that investors, strategic landowner/developers,

and city governments can all play to enable an innovation district to grow and succeed.

Catalytic investment and developer leadership

Without substantial public financing, many innovation districts are stuck in a 'catch-22' of struggling to attract tenants to sign up, which prevents lenders from being prepared to pay for construction, and results in delays that have short and long-term costs. High rents and a lack of financial incentives to target innovative companies and sectors can often be a challenge for districts in desirable central locations.

Therefore, catalytic investment, demonstration projects and developer leadership are all important.

It is often the case that innovation districts are in locations where **long-term landowners** (e.g. port companies, family companies) seek to build value through patient investment, beginning with a catalytic project. In Rotterdam, the Port has been the main financer and developer so far, investing more than €100 million in the RDM Rotterdam campus and Makerspace with a patient approach to return. This is in order to encourage businesses that can enable the port to innovate and become more sustainable, supplying equipment in wood, metalworking and 3D printing. And in Munich, four out of the nine investors in Werskviertel are family-owned businesses (see Box).

Developers can also make catalytic investments to demonstrate a new model of placemaking can be possible. In San Diego the mixed-use IDEA1 development is a six-storey joint venture development across a whole city block that offers entrepreneur-focused housing with co-working and social spaces, the first wave of retail and restaurants, and a large public courtyard. IDEA1 not only showcases placemaking possibilities but also is intended to anticipate future market demand and act as a catalyst to attract further investment and new tenants to a Downtown neighbourhood not used to innovation economy activity.

In other cases, external investment from anchor organisations are vital in catalysing a critical mass of companies, innovators and support mechanisms to take shape:

- **Investment from a large or highly innovative anchor firm** can kick-start an innovation ecosystem between small and large firms and universities, and/or attract international capital and trading links. Many districts have been established in the vicinity of blue chip corporate tenants who regularly develop patents, because of these firms' observed R&D output. This catalyst is visible in the case of Herzliya Tel Aviv, where the companies of Digital and Scitex were the first-movers to the district and around which a culture of entrepreneurship and internationalisation grew. Other examples of transformative anchors include Telefonica's role in growing the digital cluster in Barcelona 22@.
- **Investment from a university or innovation hub** often provides a different kind of underpinning for a wider ecosystem dedicated to innovation and expertise. They are typically a source of steady cash flow for landlords, and their students or users are a steady supply of consumers as well as the next generation of innovators. In Tel Aviv, the founding of the Interdisciplinary Center in Herzliya in 1994 on a disused military site helped establish the district's reputation for non-hierarchical co-working and partnerships with students, as well as the future talent supply in the district. Rotterdam's attraction of the Cambridge Innovation Centre's (CIC) to the Groothandelsgebouw, and the RDM Rotterdam campus adjacent to a dynamic makerspace, are also intended to have this effect.

Werksviertel, Munich: Long-term value creation

In Werksviertel, the four landowners that are family businesses have strong incentives to retain the land and the buildings on it, and build long-term value, rather than seek a quick exit.

One of these family businesses, and the largest landowner, Werner Eckhart and Otec GmbH played an important galvanising role at the start of the process of redevelopment. Despite a five-year delay in obtaining rights to convert the land from industrial to mixed-use, Otec actively supported the cultural and artistic activity on the site. Otec and three other land owners prepared a revised masterplan which was accepted by the city's planning department, and encouraged the five other landowners to join the development.

Meanwhile Rohde & Schwarz – the anchor employer on the site – made a key €40m investment in 2005 with Technology Centre 1 (see Figure 9). This 16,000m² building sought to create a different type of working environment and an architectural attraction in its own right. In 2016 it invested a further €35m in Technology Centre 2.

Figure 9: Technology Centre 1, Werksviertel



© Rohde & Schwarz

Figure 10: RDM Makerspace

© Softwalks

Operators and developers can also catalyse the re-imagining of a district as a more vibrant location through the **strategic use of events**. By inviting and attracting both existing residents and the next generation of potential innovators, designed events and cultural projects can re-activate and re-purpose obsolete land, and strengthen social bonds.

Catalytic interventions from city government

At the activation stage, in many districts the private sector increasingly takes the lead, but city governments or municipal corporations can make a number of important interventions:

- **Overcoming physical barriers.** Often the latent potential of an innovation district is constrained by a physical barrier such as a motorway or waterway. A city government decision to build over or remove the barrier can be a catalyst to increase the scale, proximity and desirability of a district.

- **Experimental land uses and/or formal re-zoning.** A new zoning plan may provide clear guidelines about the size and use of future development, which gives confidence to developers and investors that the district will have a cohesive image and identity. Innovation districts often rely on re-zoning so that both small and larger firms can be accommodated, or so that industrial uses can be re-fitted for innovation economy purposes, or to allow for new amenities and retail that create the necessary vibrancy. Re-zoning can also provide a model for district densification and intensification, which is often critical to make development projects financially viable.

The catalytic effect of a new zoning plan is clear in Werksviertel, Munich. The city set up a system of development rights in the district whereby it offered the land owners the right to increase the floor area ratio (FAR), in return for applying a special

instrument for 'socially equitable land use' (SoBoN) that issues a maximum 30% charge on the profit that is recycled into social infrastructure such as roads, parks, kindergartens and schools.

- **Financial tools and incentives.** Where judiciously used, investment incentives can be important in encouraging strategic tenants to locate, as Tel Aviv has used to good effect. There are examples where the creation or re-instatement of a tax-increment financing mechanism is often vital to underwrite public and private investment.
- **Streamlined approvals and permissions process.** Reduced time for buildings approvals can be critical to allow projects to move forward at the right point in the cycle, and city governments often look to accelerate the process if the district has become part of its strategy. These improvements are visible in the case of San Diego I.D.E.A. District.

- **High profile launch and promotion** can provide an important signal to the market about the intentions for the district, and the ongoing support and facilitation it will receive from the public sector.

In Rotterdam, the shifting location and modernisation of the Port coupled with the extensive urban regeneration activities provides the opportunity for active positioning of locations for innovation activity. The transformation of how public and private actors organise for innovation is another catalyst to activate the specific districts of RDM Campus and M4H, for example, with the Port and Rotterdam University of Applied Sciences (RUAS) already innovating to become stewards of urban development. The arrival of CIC is one important catalyst, and in the next period overcoming physical barriers and adopting an experimental approach to land use and planning may also be necessary to activate one or more districts.

Maturing innovation districts

As innovation districts become mature, built-out locations, new tactical and strategic challenges arise.

The innovation economy tends to create highly-skilled, highly-paid jobs, and this creates knock on effects on living costs and the supply of amenities in the neighbourhoods where innovation is concentrated. Where the gaps between those 'inside' and 'outside' the innovation economy are stark, resident opposition to further development can grow. Other unforeseen and unintended consequences may also appear including stretched infrastructure, congestion, and demand for new types of location.

To remain diverse and inclusive locations, innovation districts have to devise ways to include a wider range of residents in the innovation economy, and to play a role in driving broader transformations in a city and its communities. Among the factors that are important include:

- **Participative planning** through face-to-face meetings and online platforms that encourage all demographics to put forward their perspectives and shape future development choices.
- **Utilise tactical urbanism** approaches that encourage citizens to get involved actively in localised place making, through experiments with public space, under-utilised assets and festivals/celebrations.
- **Creative housing solutions.** Innovation districts often have to find new ways to meet housing demand to maintain affordable access to talent. This is often a wider challenge for the ecosystem that requires local and city governments to innovate financially and operationally. Co-housing, where residents share kitchen and leisure spaces, is one increasingly popular mechanism to increase housing supply, skills-sharing and social capital.
- **Open and accessible community spaces** where a mix of people can meet and share ideas. Open access spaces and open days are used to invite participation and understanding of the innovation economy, with examples such as Tel Aviv's Old Library and Boston's Venture Café Foundation. In Rotterdam, the price to use the Makerspace is very low, the entrance is open and inviting, and support is given through

classes and equipment. CIC Rotterdam also provides open days to startups to reflect the idea that anyone can be part of the innovation ecosystem.

- **Combine education with innovation.** It is imperative to provide both local residents and future workforce with pathways to participating in the innovation economy. Often this requires bridging the gap of high-level technical skills and softer skills required in emerging sectors. At RDM Rotterdam, students receive technical education and training at vocational and higher levels. There is a track record of companies forming active collaborations with students in so-called 'Communities of Practice'.
- **Building 'inclusive DNA' in innovation businesses.** Innovation districts benefit from the presence of companies that are well aware of their social responsibilities and that look for creative ways for their business engagement to benefit the wider community.
- **Ensure an inclusive innovation economy** through actions that address employability of local workers in innovative SMEs and clusters and strategies for supply chain development that include a wider mix of firms and other suppliers.

Tel Aviv: Re-use of a library to create affordable work and event space

Given growing rental costs, in 2011 the City of Tel Aviv converted an old under-used municipal library in Shalom Tower into a co-working space in the heart of the city's business cluster. The City invested over €80,000 to create a space for work tables and bean-bag chairs. Up to 12 startups pay around €60 a month for work and meeting space, which has been a very popular and affordable alternative.¹⁰

This initiative kick-started demand for more community services in the city centre, and wider market provision of affordable space. Throughout this process, the municipality has provided tax breaks and incentives for companies at different stages of maturity, and actively markets Tel Aviv's open, liberal and lifestyle credentials worldwide.

Figure 11: Shalom Tower, home to a library for startups



Photo by Avishai Teicher, CC by SA 2.0

Summary

For cities to build their innovation economy they need to adopt a multi-stage strategic approach: first, fostering the ecosystem conditions, then catalysing development in a specific location, and later sustaining the environment for innovation as the district matures. Cities also have to be prepared for the externalities and unintended consequences of growth in particular districts and the wider ecosystem (e.g. rising housing prices, infrastructure stress, congestion). The interventions of public policy and market actors are different in every city, and change over time as the private sector takes on wider responsibilities.

Section 4: The roles of land use, real estate and placemaking for innovation districts

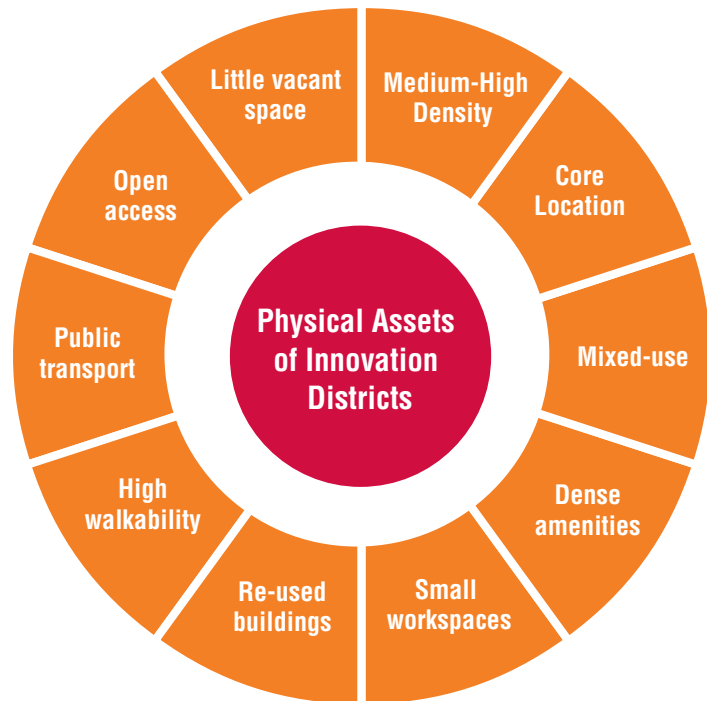
Innovation land use and place making have a fundamental role in the evolution of innovation districts from idea to reality. Innovative firms and their customers, venture capital investors, and knowledge workers are sensitive to local environmental conditions. Places need to meet the preferences of these actors if they are to succeed as innovation districts. Different sectors have distinctive spatial preferences as the ULI Europe report *Technology, Real Estate and the Innovation Economy* showed, but innovation districts have to be enjoyable places in which to walk, interact and spend time. For example Rotterdam must meet needs of smart logistics, cleantech, bio-based chemicals, water, creative 'maker' industries and the different requirements of larger firms and institutions, small enterprises, and technology workers.

Place factors in the wider ecosystem

Innovation districts firstly need external place factors in order to succeed. They rely on the city to offer proximity, connectivity, quality of place, and access to wider factors of success and agglomeration, especially in terms of access to talent and affordable housing. There are many examples of cities where the curation of magnetic urbanism in multiple neighbourhoods, and the provision of amenities like restaurants, independent retail and nightclubs – or more prosaic infrastructure such as housing and education – has kick-started the arrival of startups and an innovation culture.

Innovation districts also need local, internal features. They need the right balance of workspace, amenities, quality public space, transport, housing, inclusion, character, rules and by-laws that support and sustain innovative sectors. When they are in under-used areas of the urban fabric, they rely especially on physical activation to generate ground floor foot

Figure 12: Common physical assets of innovation districts¹¹



traffic and a centre of gravity that offers enough incentives for people to stick around in the area. Some of the physical assets they usually require are highlighted in Figure 12.

Placemaking and land use challenges faced by innovation districts

The formation of innovation districts with these kind of physical assets often comes up against immediate challenges in relation to land use and placemaking. These include:

- A lack of physical access to a site that means there is not enough traffic or collision between people to create an atmosphere conducive to ideas-sharing.
- Landowner complexity (e.g. Munich, San Diego) can make it difficult to reach legal agreements about land pooling and the creation of shared public spaces.
- A lack of perceived 'authenticity' in the existing real estate, or a lack of provision of either large floor plates or smaller spaces, can reduce the attraction and appeal of a new innovation district to target residents and workforces (e.g. San Diego, Tel Aviv).
- Insufficient land use diversity means that some districts can struggle to gain the 18-hour or 24-hour vibrancy to host innovation.

“Make a great city and people will come.”

David Malmuth, I.D.E.A. Partners,
ULI workshop, Rotterdam

Munich: Investing in the underlying conditions for innovation

The foundation to Munich's under-stated approach to the innovation economy is a strong culture of planning, urban renewal, and targeted development, which has created the building blocks for a tolerant and open-minded city that is conducive to innovation.

Since the 1945 Meitinger Plan, Munich's innovation system has been guided by a planning framework committed to modernisation, a high quality physical and social infrastructure, and support for both large firms and small and medium enterprises (SMEs). The state of Bavaria implemented a long-term R&D and innovation policy based around adjusting for future technologies. Public funding was directed towards the growth of university and vocational education, and investments in high speed rail, airports and quality of life. A second and third cycle of investment not only grew the network of research facilities and enhanced the digital infrastructure platform. They also safeguarded Munich's quality of place and fostered the city's reputation as attractive to talent, business and venture capital.

Today, Munich's context is a severe shortage of developable land, combined with a rising population, many of which are young and of an immigrant background. The city's long-term response is to create the atmosphere for innovation by investing in affordability, education and social provision. The city's key tool – the SoBoN – requires beneficiaries from land value increases to share the costs of building roads, public spaces, schools and other social infrastructure, and creates a culture of collaboration between public and private sectors.

In the emerging innovation district of Werksviertel there is a significant housing component, an average 20 percent of which is social welfare housing and a further 10 percent affordable family housing. Elsewhere, Munich is also pursuing densification in ex-industrial or ex-military sites such as Bayernkaserne, and re-engagement with the river in Isar. The aim is to build co-operation and citizen engagement, and ultimately provide young people with enough space, meaningful placemaking, and social support networks to let education and innovation flourish.

Figure 13: Marienplatz, Munich



Photo by David Iliff. License: CC by SA 3.0

Planning mechanisms are usually critical for innovation districts to achieve scale and coherence, and to eventually become established locations of development and employment. Among the most important tools include:

- **Land use powers.** A clear delegation of land use powers is important to encourage a strategic approach to the use of economic land, and encourage and incentivise investors to redevelop brownfield sites, as Munich has done. An agile infrastructure framework that supports long-term development, can support flexible development planning techniques that accept inevitable changes in use over a 20-30 year development cycle.
- **Land parcel assembly.** Land assembly and land acquisition can be important tools in the process of curating a new kind of district, depending on whether there is sufficient political will and/or capital to undertake extensive reclamation. This may be carried out by the public or private sector. As the experience of Herzliya shows in Tel Aviv, innovation district projects benefit from large and flexible development parcels that can adapt to the market cycle, and future trends of amalgamation, sub-division and phasing as market needs evolve.
- **Development/densification rights.** Innovation districts often benefit from the ability to sell development rights (air rights) that permit an increase in density in order to finance projects and the creation of wider social infrastructure. This has been used effectively in Munich but also in many other cities.

Figure 14: Snowflake Baking Co, at the heart of the IDEA District, San Diego



Photo by I.D.E.A. Partners LLC

- **Value capture planning.** The curation of an innovation district may require a shift in mindset from a short-term, project-based approach to development, towards a circular process-based approach that seeks to capture the value of development and recycle the value back into the innovation ecosystem. One of the most important examples of this process is at Barcelona 22@ district, where in exchange for planning permits the City Council charges a development levy per square metre of land, and demands rights to 30 percent of the total land area of the proposed development or the equivalent monetary value.

These charges and contributions have been reinvested in full to construct social housing, incubators and student accommodation and to fund a long-term infrastructure plan.¹²

Across many city examples, the alignment of planning across all levels of government, and across all departments, appears to be an advantage for the wider innovation ecosystem and also for nominated districts to achieve critical mass. A lack of accountability, meso-scale planning or local enforcement capability can all hinder growth.¹³

“In talking with real estate investors and developers, we have learned that a relatively dense area needs a minimum of 1 to 1.5 million square feet of innovative activity to create critical mass. At that scale, activities start to occur outside buildings such as in streets and public spaces. This is where people, across various firms, across various sectors start to mix and network, creating the ‘buzz’ and all the idea sharing that comes with that.”

Julie Wagner, Nonresident Senior Fellow, Brookings, ULI workshop Rotterdam

These planning tools are necessary and welcome, but not usually sufficient to create new groundswells of demand. Leaders in innovation districts benefit from the ability not just to access these tools but also to choreograph them in tandem with placemaking and support for entrepreneurship. Without other kinds of non-planning tools and incentives, and access to public redevelopment finance, well-planned innovation districts may find it hard to stimulate private sector demand.

The implications for real estate owners and operators

The rise of innovation districts presents a number of implications and imperatives for real estate. On the one hand, because startup companies have to focus on their business, they rarely have the financial spare capacity or the risk appetite to build or refit their own building, and so real estate has to become a more active service provider. On the other hand, the research undertaken for this report highlights the fact that real estate has to adopt a 'total place' agenda and become active participants and stewards of the whole process of innovation district development. Further implications and imperatives are detailed in the 2015 ULI Europe report *Technology, Real Estate, and the Innovation Economy*.

The experience of innovation districts reveals ways in which real estate can support the process of providing the right kinds of space to attract and sustain the innovation economy:

1. Retain and re-use heritage buildings

Historic buildings, sometimes including those of limited aesthetic appeal, are often a signal of authenticity that is attractive to innovative companies and talent. Wherever possible these should be creatively restored and re-fitted, as part of a broader embrace of architectural innovation and diversification, and a commitment to placemaking.

“Many cities are brought up on a diet of heavy-handed planning. Instead planning should be all about nurturing, fostering, removing the barriers, curating, creating places that offer the blank canvas. This different kind of planning is smarter, strategic and more orchestrated.”

ULI workshop participant, Rotterdam, September 2016

2. Move with speed and agility

Optimising available space in a district that is undergoing rapid change is necessary to support the needs of startup firms. Sometimes when buildings are scheduled for demolition, real estate owners can enable startups to use such buildings as an interim arrangement, and to do so they may look to salvage, design and fit them out in as little as 60–90 days. In this way, real estate can serve the demands of innovation when traditional planning and permitting processes are too slow or rigid. In order to do so, real estate will need to show flexibility in terms of contracts, services and size and uses of the spaces it owns and manages.

3. Partner with innovation leaders

Rather than try and create the perfect product by themselves, real estate owners may actively team up with those organisations whose role it is to support innovation in the district – especially local innovation centres.

4. Become community organisers and alliance-builders

In many innovation districts, it is incumbent on real estate owners to show humility about the needs and aspirations of local residents and other stakeholders, and to become actively involved in the organisation process of developing a shared vision and agreeing shared planning principles.

5. Experiment to test local appetite

The speed of change in the innovation economy places a premium on acting swiftly. Rather than wait for long-term planning outcomes, real estate owners may find it effective to hold events to test demand, gauge local perceptions, and build interest and enthusiasm over time. This approach is sometime described as 'tactical urbanism'.

6. Accommodate a creative mix of firms and uses

A dynamic mix of uses is essential to placemaking dimension of innovation districts. Many districts around the world agree on land use plans with an even mix of commercial and residential use, including affordable housing, as well as space for retail, hospitality and community uses.

Despite the potential for higher and more stable income from larger firms, many districts benefit from the ongoing support provided to smaller companies. For example, one of the key new buildings in Werksviertel is a large 200-tenant commercial building for small crafts and workshops. But real estate has to be able also to accommodate the potentially rapid growth from a startup to 'adolescence' and ultimately to a global business.

Buildings themselves also have to be adaptive to allow for a changing balance of uses. For example, life sciences companies increasingly require data storage space rather than lab space, while financial technology firms feature a changing balance of traders and programmers.

Figure 15: Old and new uses in Werksviertel, Munich



© Rohde & Schwarz

Often the balance also needs to be struck between co-working and private spaces, not least to ensure IP protection. The provision of housing is also becoming increasingly essential to formerly single use innovation districts.

7. Invest in and advocate for the wider quality of place

Real estate owners may have to take the lead to ensure that deterrents to innovation – noise, pollution, heavy road use – are designed out and disincentivised through legislation and effective planning. In some cases, real estate providers may also become responsible for the district's walkability and the provision of substantial green space. In Rotterdam, this implies that the journey towards becoming an innovation economy will require a much focussed stewardship of the 'total place' experience. This requires both enabling experiments in placemaking and place-management, and a wider system response which is responsive to how clusters and districts develop.

Summary

Innovation districts ultimately depend on a high quality of life and place in the wider city, and the city's ability to supply the amenities, connectivity and variety that serve those that participate in local clusters of innovation. Cities with many magnetic public spaces and high quality public services are often crucibles of startup culture.

Aspiring innovation districts also have to bring forward a very distinctive offer of workspaces, amenities, density, regulations and public environments to generate the buzz and the stickiness for real interaction. This is often a challenge in districts that are remote, under complex ownership, or lack the right real estate product. Although public planning can help improve certainty, flexibility and opportunities to achieve scale, real estate has a critical leadership role to play in retaining the right buildings, partnering with innovative firms to achieve shared goals, testing the market, and adopting a 'total place' agenda.

Section 5: Marketing and promoting an innovation district

Over the last 20 years, many cities have learned that having a balanced global story, identity and reputation can help to make them a candidate for more of the opportunities and assets that are internationally contested (e.g. talent, investment, R&D, students, events).¹⁴

A city brand is a “network of associations that people hold with the city that helps them make sense of the city and what it means.”¹⁵ For this meaning to be clear, cities often try to develop a unified story that speaks to all of the opportunities that they seek rather than maintain separate stories in different markets.

Having a clear global story to tell appears to bring distinct advantages to certain cities. It creates differentiation, visibility, name recognition, third party endorsement, and ‘benefit of the doubt’. For small and medium-sized cities, the risks of not having a clear story are unrecognised assets and distorted messages. Therefore, many cities are learning to tell their story more clearly, reviewing their DNA, building a narrative alliance across different markets, and developing internal pride and confidence.

Storytelling and innovation

Promotion is an important ingredient that supports a city’s innovation ecosystem and also its main innovation districts. Companies and talent increasingly wish to be associated with cities that are perceived to embrace innovation and be at the leading edge of change. This demands a strong and coherent message about the role of innovation in both the city as a whole but also in its pioneer districts.

Successful cities develop this message by tuning in to the DNA of their city and the district, taking account of the industries and assets that are already established, and leveraging these to tell a story about the city’s past and the future.

In this section, we explore the implementation of effective communication and messaging approaches to market the city as a centre of innovation, and also to promote the achievements and benefits of a new innovation district.

Leveraging a city’s DNA for innovation

It is often important to communicate an innovation district as part of a narrative of city change, adjustment and reform. However, many districts have to overcome the limitations of their dominant city brand. Some cities like San Diego are associated principally with lifestyle, climate, scenery and tourism, rather than with breakthrough innovations. Others, like Munich, may have a ‘clean’ or ‘hygienic’ brand and are

associated with insurance, big science or manufacturing, rather than with ‘edgy’ or ‘gritty’ extra-institutional environments perceived as conducive to innovation.

The challenge at the city level is to promote innovation in a way that is authentic to the city’s DNA. The history of most cities provides a distinctive story and a unique set of advantages or ‘skillsets’ which act as a foundation for the future innovation economy. These may be embedded in the city’s quality of place (e.g. its climate, public realm, vibrancy), its economic assets (anchor institutions, financial know-how), or its social traditions (diversity, affordability, belonging). Whichever assets a city has, these need to be at the heart of a story that everyone in the city can tell. Cities such as Sydney, Singapore, Barcelona, and London have been successful at establishing a global brand that is also a ‘glue’ that unifies its people and institutions, and which helps to manage processes of change with confidence.

For cities that are moving into the innovation economy, three key insights about city branding are important. First, cities must understand how the world sees them now. This means that they should benchmark and review themselves against other cities. Second, they must consider how the larger spaces they are part of inform their reputation and identity. This usually means the reputation of their wider region or nation. Third, they must consider how they can build and leverage an innovation story across the different realms of a territorial brand, such as the resident lifestyle, the visitor experience, the business/investor offer, and the leader/innovator dimension.

Tel Aviv: Leveraging a city's magnetism to stimulate innovation

Tel Aviv is a powerful example of how a city can leverage its DNA of risk-taking, openness, commerce and lifestyle to drive its innovation economy.

Over the past 30 years, venture capital firms, startup companies set up by ex-Intel employees, and senior mentors, have combined to make Tel Aviv a major exporter of tech innovation – but most innovation activity took place well outside the city centre. Since 1989, Tel Aviv has marketed itself as the ‘non-stop city’ to highlight its lifestyle edge and its tolerance to young talented workers and innovative firms. City leaders also reclaimed Tel Aviv’s Bauhaus architecture and the city became known as the ‘White City’, and given world heritage status by UNESCO. The ‘non-stop city’ was both a promise and an active policy to promote its urban vibe.

In 2010 Tel Aviv set up ‘Tel Aviv Global’ to promote the city to the world, co-ordinate its branding efforts, promote investment and tourism, and attract key entrepreneurs and startups in target sectors. The initiative supports the wider regional innovation ecosystem by aligning wider economic development objectives with the city’s promises to be non-stop, smart and entrepreneurial.

By 2012, Tel Aviv decided to complement its brand with marketing campaigns around ‘startup city’ and ‘smart city’, supported by initiatives such as the Digital Life Design (DLD) event, a city-wide forum to facilitate networking between entrepreneurs and venture capital. These initiatives position Tel Aviv as a leader in the application of smart technologies to urban life, and underline the city’s commitment to converting its brand promises into tangible outcomes. In Tel Aviv the number of startups has been growing exponentially since 2013 and now exceeds 1,500. With the support of 70 accelerators, the city achieved a record \$5.4bn of exits in 2015, indicating the high international demand for startups that have emerged from the Tel Aviv innovation ecosystem.

Figure 16: Tel Aviv feature in *TimeOut* magazine, 2013



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District marketing and promotion

At the same time, the promotion story for an innovation district must simultaneously reach out to a number of key audiences:

- Anchor institutions and firms
- Entrepreneurs and small firms
- Customers of innovative sectors
- Knowledge workers
- Venture capitalists
- Existing land owners
- Real estate investors
- Public policy leaders
- Utility and amenity providers (e.g. energy, IT, telecommunications, and transport authorities)
- Citizens
- Other stakeholders within 'the district'

The communication story has to be credible and appealing to all of these audiences if the district is to develop a strong identity, garner support, and overcome difficulties and setbacks that arise. In particular, international experience suggests that districts rely on authenticity, scale, real placemaking and character, before they can be promoted as centres of innovation. However, it is not uncommon for key players involved in innovation districts to be relatively inexperienced at 'selling' their project to partners, local customers and to wider audiences as part of an integrated approach.

Aspiring innovation districts use many different tactics in order to build a story, an authentic sense of place, and associated demand, before then communicating the innovation story to other partners. These tactics include:

- **Cultivation of a nightlife scene.** Landowners in Werksviertel have done this successfully by supporting Kultfabrik over many years which established the area's reputation for entertainment and culture.

- **Urban design competitions** are a common way for innovation districts to invite architectural innovation, get the attention of anchor firms, make the area interesting for talent, and get local citizens behind the project.
- **Attraction of a keynote cultural asset** to the district is often a powerful way of communicating the changing cultural geography of a city, and showing potential investors and companies that the district's transition is real and permanent.
- **Naming or renaming streets** to reflect the heritage of the neighbourhood is an approach that builds the identity of the district.

The experience of San Diego (see Box) has particular resonance for Rotterdam, and especially the M4H area, where the governance system is very open and new bottom-up structures of collaboration have emerged. In this 'maker' location, it may be possible to pursue tactical urbanism approaches to test appetite of existing users for different kinds of public space, without large upfront investments. This may require a shift from focusing on physical assets and planning towards supporting the people and relationships that underpin the ecosystem. In other locations, Rotterdam may seek a more conventional placemaking approach to meet the preferences of science and manufacturing activities.

More broadly for Rotterdam, the fostering of the innovation brand has some important ingredients. Firstly, reflecting on the three key issues raised above:

- Rotterdam does not yet feature highly in global reviews and benchmarks of innovation, enterprise, technology, and science, but its wider region does. So leveraging the assets of the region and giving them a special role in the city is essential.
- The Netherlands in general and its major cities in particular have a high reputation for innovation and enterprise, so this is an asset for Rotterdam and can be developed as part of the story.
- Rotterdam has a strong reputation as a place to live, but it does not yet have such strengths as place to visit or invest. These have to be addressed in both positioning and through practical interventions. At the same time Rotterdam does have a leadership and innovation story associated with the port, urban regeneration, social diversity and city government. It needs to leverage these into the innovation economy story that it seeks to develop.

Rotterdam should develop a brand alliance to build its overall innovation story and there are useful lessons from San Diego and Tel Aviv in how to do this. Creating a powerful city wide partnership to build and tell a combined story is the key first imperative.

“The people in the area are the people who are the pioneers already. The system should be open, then try to frame it into a story.”

ULI workshop participant, Rotterdam, September 2016

San Diego's I.D.E.A. District: Tactical urbanism as a communication tool

In some cities, the biggest communication challenge is to re-shape local perceptions to show that city centres can be places of creativity and vitality. Real estate planners and developers have adopted highly innovative practices in the I.D.E.A. District to facilitate and promote re-urbanisation in one of the last pieces of undeveloped land in Downtown San Diego.

After an initial attempt in 2011 to activate and 'liberate' a park at East Village Green struggled to catalyse change, the I.D.E.A. Partners and SLP Planning chose to adopt a different style of communication with the local community – an organic approach called tactical urbanism.

In 2013 the partners synchronised a new masterplan with social media, a movie story, and the artistic transformation of a warehouse in order to create a real sense of disruption in the district. Local attendance and interest in the pop-up art show was surprisingly high, and across a diverse demographic. This was followed by the transformation of a dis-used car repair site into an explicitly temporary art venue called SILO (see Figure 17). The activation of the public realm, supported by the smart use of video marketing, helped create new buzz and new belonging in the district.

Subsequently, graduate students repurposed shipping containers to develop a parking lot into a temporary beer garden and community space called Quartyard (see Figure 18), which showcases local musical talent and cultural events. This sequence of projects has together created the appetite for the first office projects in the District to come forward, with interest from Downtown and suburban firms.

The premise of the tactical urbanism approach in San Diego, which holds lessons for others, is that:

- The testing of new ideas is the best way to understand what different 'customers' want from an innovation district.
- Short-term promotional and showcasing initiatives, made possible by streamlining or even circumventing planning processes, can create long-term change for a district.
- The power of art can be leveraged powerfully to communicate the character and aspiration of a new district.
- Well maintained and vibrant public space will create the platform for real estate and quality of life to succeed.

Figure 17: SILO, Makers Quarter, San Diego, Tel Aviv feature in TimeOut magazine, 2013



© Makers Quarter

Figure 18: Quartyard, IDEA District, San Diego



Photo by I.D.E.A. Partners LLC

Summary

Marketing and promotion are important ingredients to support the whole innovation ecosystem in a city. Innovation is the process through which cities renew their economy and physical fabric. Ensuring that the processes and changes are visible and understood is key to generating confidence and momentum and recruiting more participants. By co-ordinating a clear message across multiple channels and markets, and by leveraging their distinct DNA, cities such as Tel Aviv and Munich, as well as others such as Barcelona and London, have managed to create the appeal for talent and innovative companies in a range of sectors to locate in their city. Mostly they have done this by cultivating neighbourhoods with distinctive names and authentic character (e.g. Tech City, 22@), rich diversity and high quality of public space, some of which then emerge as centres of innovation.

When an innovation district develops, some of the core assets become credibly promoted as part of the city's innovation story, it has to reach out both to potential occupiers, customers, residents, landowners and local leaders. A district may have to adopt a range of innovative and disruptive tactics in order to build demand and communicate the story of change effectively. The ecosystem must develop a reputation as a great environment for enterprise and investment, and the districts need brands that make them visible and appealing.

The experience of San Diego highlights the value of regularly testing the appetite of the market through short-term experiments, of using local art and culture to communicate values and ambition.

Section 6: Conclusions and recommendations for Rotterdam

The promotion of innovation by cities is an important imperative in the current cycle. Cities must adapt to changing economic, demographic, technological and environmental circumstances. A key part of that adaptation is the ability to innovate within city government, and to host innovating activities within the city. Experimentation and the willingness to make changes or allow them to happen, is an important part of adaptability and urban resilience.

The attempt by cities to host more of the innovation economy is a big part of this process of adaptation. Given the exponential nature of new technologies and the hyper-mobility of talented people and investment capital, the fostering of an innovation ecosystem or innovation district is never complete. Ecosystems and districts are in a process of constant evolution, due to many kinds of internal and external drivers, all summarised above.

This means that cities aiming to foster an innovation ecosystem, and districts seeking to 'become' the next big centre of innovation, have to be mindful of their own starting points, the long-term opportunities and externalities of innovation-led growth, as well as wider demographic, economic, infrastructure, and ecosystem conditions.

Such an assessment forms the first step for a long-term strategy for developing an innovation economy. A long-term strategy is then complemented by a series of 'tactics' around mixed-use placemaking, the creation of critical mass in strategic locations, and leveraging of the city's DNA to promote innovation and create a unifying communication story. This combination of strategy and tactics is captured in Figure 19.

Figure 19: Key success factors for innovation district development



Observations and recommendations for Rotterdam

Rotterdam's history of innovation is deep and long. Its historic roles as a leading port, gateway, entrepôt, and mercantile city all speak to its leadership in previous cycles. And, Rotterdam's story is one of continued leadership in trade, freight, energy and logistics. Due to technological and geographical changes in those industries and to Rotterdam's wider demography and aspirations, another cycle of innovation is beginning. This cycle specifically involves:

- Utilising land released by the changing geography of ports and freight.
- Increasing the technology innovation in energy and logistics.
- Fostering new urban innovation nodes.
- Deepening the urban economy with new sectors and activities.

For Rotterdam, the innovation economy is essential to the creation of additional jobs, to enhance its international visibility, and to encourage innovation in Rotterdam's own city management. The city's innovation ambitions also serve a wider development strategy to create a liveable waterfront, a desirable working environment, and a new visitor economy in the stretch between the central city and the historic port land.

As Rotterdam develops its approach to its innovation ecosystem and districts, the city may need to be mindful of some existing constraints. The innovation asset base in Rotterdam is currently very dispersed, and cannot benefit from organic and spontaneous collaboration because of the large distances and physical barriers of water. This means that Rotterdam's designated Innovation District does not currently host the economic assets, anchors or critical mass that easily attract catalytic investment, or that can form the centrepiece for an economic strategy. Many of the most innovative activities oriented around the port or the central city are not located in the district that is being promoted as the primary centre of innovation.

This means that Rotterdam will need to prioritise and sequence its actions in the following order:

- i. Develop a strategy to promote innovation, growth, and modernisation across the city as whole, to support and foster the deepening of the wider innovation ecosystem, and to adapt continuously through multiple cycles and manage unintended consequences as they appear.
- ii. Flexibly assist the development of all districts where the hosting of key functions and clustering is possible, through placemaking and the achievement of critical mass.
- iii. Build and promote Rotterdam's innovation brand by leveraging the whole city's port and industrial DNA, retained expertise and diverse communities.

Based on the workshop findings and the comparative case study analysis, these produced a number of recommendations for Rotterdam:

Develop a strategy for Rotterdam as a city of innovation

- **Recognise the innovation context in the Netherlands and leverage it.** The Netherlands and its core cities are already some of the most innovative in Europe, especially in the sectors of water, life sciences, bio-based, high tech, energy, logistics and creative industries. Rotterdam has superb connectivity and complementarity with the higher education, research, and startup scenes in The Hague, Utrecht, Amsterdam, Delft, Eindhoven and beyond. Rotterdam also has the capacity to host a substantial portion of the Dutch innovation economy. A focus on connections, complementarities, and collaboration is a key part of the Rotterdam innovation challenge, in order to help more small firms survive, scale and overcome the so-called 'valley of death', and so for the city to play a bigger role in the wider ecosystem.

Other cities have shown the way: Munich successfully observed and leveraged the innovation context in Bavaria over multiple cycles, bringing forward highly specific programmes to supplying its life sciences, ICT and mechatronics strengths with bespoke R&D, training and infrastructure. Meanwhile, Tel Aviv also identified Israel's innovation strengths as an exporter of scientific, military and energy knowledge, and has sought to leverage this by combining public research infrastructure with corporate R&D in inter-disciplinary consortia, with a clear focus on the framework conditions and intellectual property protection. Rotterdam might be able to take current public-private research initiatives – like SmartPort – to this level. The recent establishment of the Metropolitan region Rotterdam The Hague (MRDH), an approved policy framework for European cooperation of 23 local authorities in the southern part of Zuid-Holland, in addition to Innovation Quarter, the regional investment agency for Zuid-Holland, should foster such an approach.

- **Balance the focus on specific locations with prioritised attention to city wide ecosystem development.**

Fostering the ecosystem of business demand, liveability, talent attraction, startups, growth companies, business investment, spin-outs, spin-offs, spin-ins, corporate ventures, real estate and tenant services, and encouraging networking between the key players is critical to the ecosystem that will make any innovation district in Rotterdam sustainable.

San Diego is a powerful example of a city whose leadership institutions focused systematically on building interactions through community intermediaries, technology commercialisation initiatives, entrepreneurship education, and technology transfer offices. By cultivating these flows of knowledge over more than 20 years, San Diego has allowed the development and commercialisation of new ideas to flourish, eventually creating the groundswell of demand for innovation to re-urbanise in the specific location of the East Village. This experience, and others, suggests that Rotterdam should move forward developing and strengthening a local and regional network of innovators and supporters, through a diverse set of actions on various levels. This may include arranging for the location of incubators, accelerators and co-working spaces, like CIC and Venture Café, hosting roundtables for entrepreneurs in Merwe-Vierhavens, and participating in SmartPort and other innovation networks.

- **Grow and support the innovation activity and growth companies that Rotterdam already has.** A full audit of firms, assets, networks and partnerships should inform Rotterdam's investment and policy approach so that it is targeted in the right areas to support the interactions that already flourish. A multi-partner strategy for innovation, working in collaboration between several sectors within local government, should make the city of Rotterdam an



essential part of the innovation ecosystem, together with other institutions, such as the Erasmus University and the Rotterdam University of Applied Sciences, and many other more formal and informal institutions.

Optimise land use and placemaking in Rotterdam

- **Continue to support Rotterdam Innovation District, but add flexibility and market choice that investors and growing firms might want, promoting multiple locations.** The RID is an inspiring project that can become an important new node in Rotterdam's economy. But it will succeed when it complements other districts and is flexible to market preferences and choices. So, it might be expected that multiple distinctive locations will emerge in Rotterdam and the

RID will be one of them. The RID will also need an authentic character and identity that is tied to the history of the area. Clear choices have to be made as to which parts of the development of RID are dependent on developments elsewhere, such as the success of CIC creating spin-offs in industrial production in the area, and which are more autonomous and might even result in spin-offs elsewhere in the city.

- **Use Rotterdam's urban infrastructure and land as a platform for experimentation.** Rotterdam's industrial heritage means it is a city of great variety in terms of uses and infrastructures. These should be used as a basis for experimentation in new urban solutions. By inviting and permitting creative experiments, the city can observe which activities blossom and build a strategy

around them. The labs, industrial warehouses and public realm in and around M4H and RDM offer the potential to co-locate the 'idea' and 'production' elements of innovation, and turn the district into 'a place where ideas get to work.' Such an approach may result in not only developing the innovation economy, but actually incorporating innovation in the urban development process. Parts of RID might be approached as living labs. The project 'lab on the street', experimenting with different pavement solutions, is already setting an example.

- **Prioritise placemaking in the districts to achieve critical mass** and help RID to acquire a distinctive identity and appeal. Rotterdam's innovation capacity will grow if several of the city's districts can attain critical mass of real estate and commercial activity, with an authentic sense of place, so that it gains a real identity and character. Rotterdam cannot know in advance which areas will ultimately host a large scale of innovative firm formation and clustering, so the city should flexibly promote the character and quality of multiple locations, and ensure adequate supply of affordable housing in the right strategic locations, just as cities such as Munich have done. Improving connections, both in public transport and in walkability, will help to achieve critical mass sooner. A regular connection between RDM Rotterdam Campus and Merwe-Vierhavens would be one improvement that would make an immediate difference.

The placemaking needed to boost Rotterdam's innovation platform may require a change in mindset among public and private actors. The redevelopment of M4H, for example, can act as a stimulus to organisational innovation where public and private partners co-create, experiment and test new products and services. The challenge for RID is to further explore the potential of this 'double loop' model of learning. Actually incorporating the urban development process in the innovation system, rather than simply viewing real estate as a facilitator, opens up a new perspective on the role of the innovation district. The Port of Rotterdam and the Rotterdam University of Applied Sciences are already innovating by becoming involved in integrated urban development and learning new skills of area marketing, and ongoing innovation in approach will be required.

Build Rotterdam's innovation brand

- **Leverage Rotterdam Port's DNA in promoting wider innovation agendas, building upon its success.** Rotterdam is a city of unique port know-how which should be explicitly promoted. One area which Rotterdam should emphasise is its expertise at taming the water in terms of providing solutions for future water challenges in cities and for water life as a whole.

Rotterdam is part of the Rockefeller 100 Resilient Cities movement and has appointed a Chief Resilience Officer. The Rotterdam University of Applied Sciences runs several education and research programme's in water management and marine technology. Recent urban projects have shown the potential of applying innovative solutions in its own city, like combining water storage facilities with underground parking and urban squares and testing all sorts of driving objects, from houses, to a hotel and even a farm. These projects should become part of a clear narrative that promotes Rotterdam's unique expertise in addressing and solving one of the 21st century's biggest resilience challenges.

- **Develop Rotterdam's innovation brand as a broad identity, reputation and narrative.** Currently the city of Rotterdam, the Port of Rotterdam and other stakeholders are using the slogan 'Rotterdam: Make It Happen' to refer to the entrepreneurial mentality and the smart manufacturing potential within the city. The collective attempt to tell the 'story of Rotterdam' is in its early stages, drawing on success stories such as offshore access firm Ampelmann Operations. Going forward, the innovation story of Rotterdam should be told boldly and proactively. It should not be substantially or solely linked to the RID project, but should be seen as the context for it and the driver of

other improvements. Tel Aviv has shown how a consistent city brand can infuse all of its positioning activities, spanning not just its innovation brand but also its citizen, investor and visitor brands, so that real actions and initiatives in the city continually strengthen this integrated identity.

Other cities that have moved successfully into the innovation economy have worked hard to understand how the world sees them, how the larger region or nation shapes their reputation, and how they can build an innovation story that aligns with its resident lifestyle, visitor experience and business offer. Rotterdam can undertake initiatives in all of these areas. One way other cities such as San Diego and Tel Aviv have done this is to develop a brand alliance, a powerful city wide partnership to create and communicate a combined story.

- **Invite others to feel and experience Rotterdam's innovation culture** as well to 'buy' its products. Rotterdam has the assets not just to export its innovation but to bring people closer to its source. This requires a clearer story that is understood and shared by all parts of the city – tourism, business, universities, and citizens. This culture also extends into the wider region, with port related activities extending as far as The Hague where several (regional) headquarters of petrochemical firms and traders are located. The partnership between these cities towards a future-proof region can help to build this story further.

These initial high-level recommendations can form the building blocks of a long-term, multi-cycle strategy for Rotterdam's innovation ecosystem, before a more targeted approach to build a critical mass of innovation activity in order to sustain street life and retail demand.



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