In collaboration with Jacobs

WORLD ECONOMIC FORUM

Innovation Ecosystems: A Toolkit of Principles and Best Practice

INSIGHT REPORT

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Contents

Foreword

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Cities are living laboratories of human ambition. Within their boundaries, we witness the continuous interplay between tradition and transformation, between the communities we've built and the futures we imagine. Today, as urban populations surge towards 70% of humanity by 2050, innovation districts have emerged as critical catalysts for reimagining how cities generate prosperity, foster collaboration and create opportunity.

The rapid proliferation of innovation districts worldwide, from Singapore to São Paulo and Detroit to Dhahran, reflects an urgent search for new models of urban development. Yet amid this investment surge, a fundamental question persists: how do we ensure these districts deliver not just economic returns, but meaningful benefits for the communities they serve?

This challenge becomes more pressing as the pace of technological change accelerates. The average lifespan of companies has plummeted from 67 years to just 15 over recent decades, forcing organizations and cities to reimagine their approaches to innovation. Meanwhile, the climate crisis demands that we build differently, more sustainably, with the recognition that our urban environments account for 40% of global carbon emissions.

Innovation districts represent our best opportunity to prototype solutions to these interconnected challenges. When designed thoughtfully, they become crucibles where diverse talents converge, where established institutions collaborate with emerging start-ups, where global knowledge meets local wisdom. They offer the promise of economic transformation while addressing societal needs.

Innovation districts cannot succeed through technology or capital alone. They require principled approaches that balance multiple imperatives – economic vitality with environmental sustainability, global competitiveness with local inclusivity, technological advancement with human flourishing.

The path forward demands courage to move beyond conventional approaches and wisdom to learn from both successes and failures. It requires us to see innovation districts not as isolated developments but as integral parts of our urban fabric, accountable to the communities they serve and the planet we share.

By embracing the principles and practices outlined in this toolkit, we can create environments where innovation serves not as an end in itself, but as a means to address humanity's most pressing challenges. The choices we make today about how we design, govern and operate innovation districts will shape the cities our children inherit. Let us ensure those choices reflect our highest aspirations for human progress and collective prosperity.

Andrew Collinge
Director, Smart Places and
Digital Infrastructure, Jacobs

It has been a pleasure to work with the World Economic Forum on this report and with the creators of innovation districts around the world, who have been especially generous with their knowledge and experience. In a world where urban populations are projected to grow by 2.5 billion people by 2050, where more than one billion are estimated to be at risk from coastal climate hazards[1] and where over 300 exabytes of data are generated daily,[2] both the need and the opportunity to innovate are clear. These opportunities and challenges are at the heart of Jacobs' mission to reinvent the places of today for a better tomorrow, through the thoughtful and impactful design of resilient, future-oriented places.

There is an ever-growing body of research and inspiring examples of innovation districts globally. This report distils best practice and tangible lessons learned to uncover what truly works in practice – and what doesn't.

While governance has been widely discussed, it is reported as one of the core reasons why up to 50% of innovation districts fail.[3] With increasing global competition for talent and growing evidence of the importance of proximity for collaboration, imaginative placemaking and design are fundamental. Urban areas in the United Kingdom account for just 9% of land, while they generate 63% of GDP and host 73% of knowledge-based jobs.[4] Yet, translating these insights into actionable urban design remains a challenge.

Digital infrastructure, services and data are increasingly critical enablers of innovation. Today, IoT devices number nearly 19 billion and 94% of companies use cloud services.[5] A wider array of digital technologies is upending business models and driving dramatic change. Innovation districts need to plan how this digital infrastructure will feed innovation and emerging forms of value creation – future-proofing places, unlocking investment and testing technologies from the outset.

This toolkit is organized around three components – governance, placemaking and digital infrastructure. It defines best practice and actions to overcome common challenges. And it draws on case studies that testify to the tenacity of innovation districts: from DistritoTec's multifaceted approach to placemaking and sustainability, to Punggol Digital District's integration of infrastructure and testing spaces from inception.

The paper concludes with eight key actions that translate the World Economic Forum's eight guiding principles for responsible innovation into practical steps that innovation districts can adopt to scale up their impact – ensuring the benefits of innovation spill over into communities, while balancing the physical and social aspects of place and navigating differentiation in an ever-changing context.

Innovation districts are not just buildings and spaces – they need to be talent magnets in increasingly competitive and shifting labour markets. In a world of accelerating technological progress and disruption, they are catalysts for the next generation of game-changing innovations. Above all, innovation districts are engines for local social and economic rejuvenation – whether that means decarbonizing cities and supply chains, delivering transformational healthcare or creating widespread opportunity and prosperity through the responsible scaling-up of technology. Let's be sure to build them with purpose, resilience and ambition.

Executive summary

Innovation districts are experiencing an unprecedented surge in global investment and attention. With global venture capital investments reaching $369 billion in 2024[6] and government initiatives such as the US CHIPS and Science Act allocating over $1.4 trillion to boost technological innovation,[7] cities worldwide are racing to establish concentrated innovation environments as engines of economic transformation.

Yet beneath this enthusiasm lies a sobering reality: many innovation districts fail to deliver lasting impact beyond their initial funding periods. Too often, excitement around emerging technologies drives investment towards novelty rather than solutions that address real community needs. The result is a growing disconnect between innovation ambitions and societal outcomes.

Three critical challenges

Today's innovation districts must navigate three interconnected challenges:

Closing the innovation-impact gap: Previous generations of science parks often created islands of prosperity surrounded by unchanged neighbourhoods.[8] Today's districts must demonstrate that concentrated innovation can generate broadly shared benefits, including quality jobs for local residents, opportunities for diverse entrepreneurs and solutions to community challenges.

Building sustainably: With the built environment accounting for almost 40% of global carbon emissions and US office vacancy rates hitting 20.4% in 2024,[9] districts cannot justify traditional development approaches. They must model sustainable development through adaptive reuse, nature-based solutions and circular economy principles.

Adapting to digital transformation: Beyond traditional laboratory and office space, districts need sophisticated digital infrastructure supporting everything from autonomous vehicle testing to bioinformatics research, while ensuring this transformation does not exclude those without technical expertise or erode public trust.

Framework for action

The opening chapter introduces the World Economic Forum's framework for responsible innovation, which offers a path forward through eight guiding principles – **collaborative, sustainable, resilient, human-centric, efficient, transparent, accessible and scalable**.[10] These principles have emerged from extensive analysis of innovation districts worldwide; they identify patterns that distinguish transformative developments from mere real estate projects with innovation branding.

The toolkit then translates principles into practice, through chapters that address the following:

- **Collaborative governance and stakeholder engagement:** explores inclusive structures that balance diverse interests while maintaining operational effectiveness.
- **Human-centric design and sustainable places:** examines how physical environments catalyse innovation while prioritizing well-being and environmental responsibility.
- **Efficient and scalable digital infrastructure:** investigates building technological foundations that support cutting-edge innovation while ensuring community benefits.

Each chapter combines conceptual frameworks with practical tools such as assessment matrices, implementation checklists and decision trees guiding real-world application.

Path forward

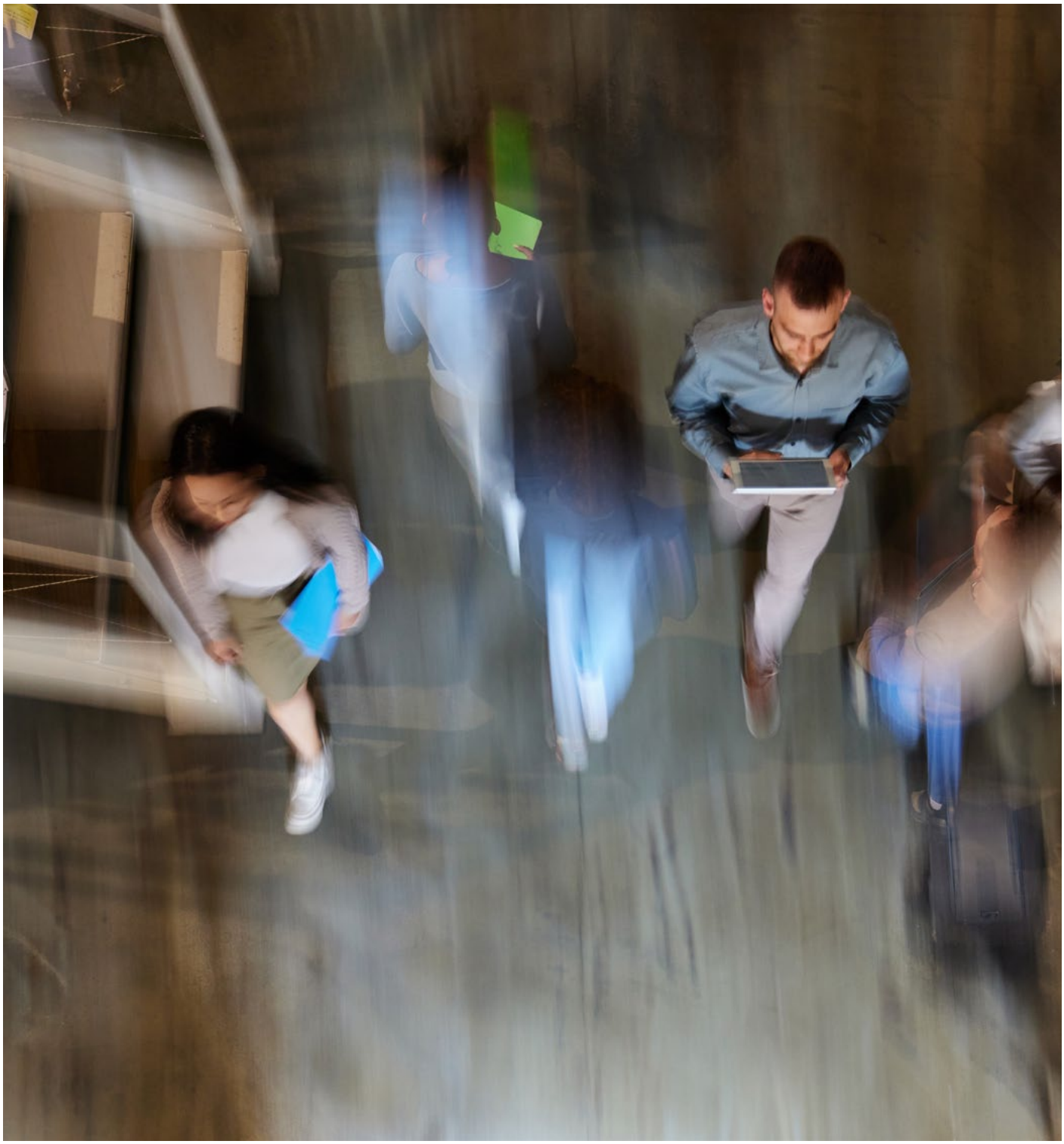
Innovation districts represent one of the most significant opportunities to reshape urban prosperity in the 21st century. They can demonstrate that innovation serves everyone, not just elites. They prove that economic dynamism and environmental stewardship can reinforce each other.

Realizing this potential requires moving beyond conventional approaches that simply cluster innovation assets and hope for spillover benefits. It demands intentional design, inclusive governance and sustained commitment to principles that may sometimes conflict with short-term interests.

This toolkit provides the framework and tools for that journey. By grounding decisions in shared principles while respecting local variation, cities can create innovation districts that truly serve as engines of inclusive prosperity.

1 Principle-based framework for responsible innovation

Eight guiding principles within a framework for responsible innovation can ensure that innovation districts generate inclusive prosperity and sustainable impact.



Innovation districts worldwide demonstrate remarkable diversity in their approaches, contexts and outcomes. Each represents a unique response to local challenges and opportunities, shaped by distinct governance models, funding structures and cultural contexts. Yet beneath this diversity lies a critical need for shared principles that can guide development towards meaningful, sustainable impact.

As cities and regions invest billions in innovation infrastructure, the difference between districts that transform communities and those that become isolated enclaves often comes down to the principles that guide their development. The rapid pace of technological change, combined with the complex stakeholder environments in which innovation districts operate, can easily lead to misaligned priorities and missed opportunities. Without a principled framework, districts risk becoming showcases of technological novelty rather than engines of inclusive prosperity.

Principled innovation

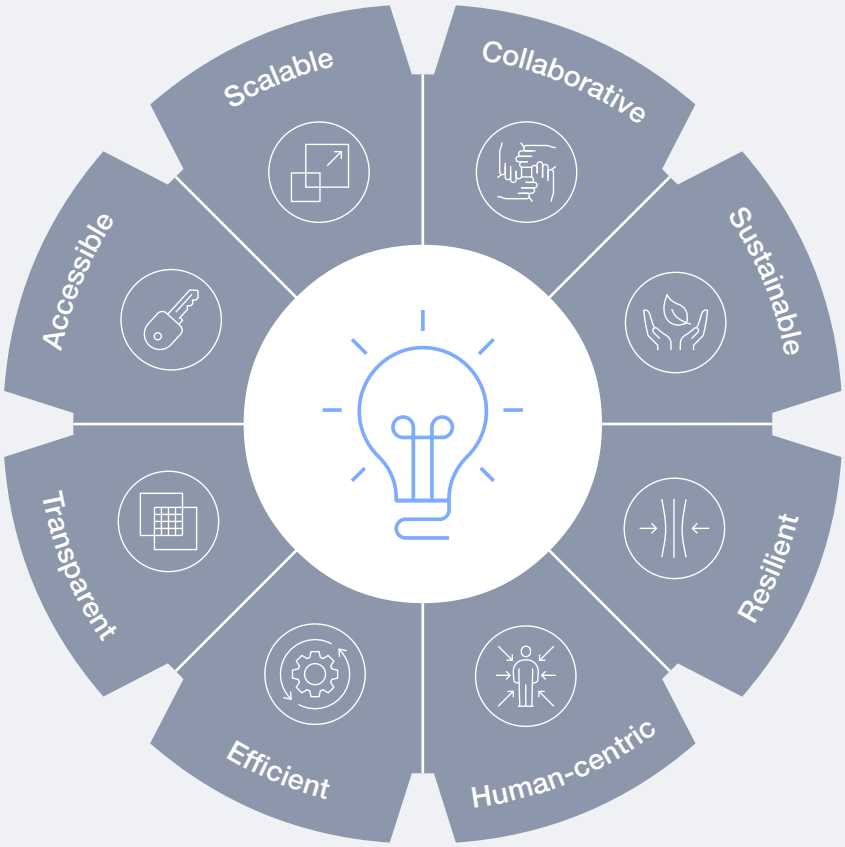
Innovation districts face unprecedented complexity. They must balance global competitiveness with local community needs, attract cutting-edge businesses while ensuring affordable space for start-ups, and foster breakthrough research while addressing immediate societal challenges. These tensions cannot be resolved through ad hoc decision-making or by copying successful models without adaptation.

A principles-based approach provides coherent guidance while allowing flexibility for local context. Rather than prescriptive rules that quickly become outdated, principles serve as navigational tools that help stakeholders make complex decisions about governance, infrastructure, programming and community engagement. They create a shared language for diverse stakeholders and establish common ground for evaluating success beyond traditional economic metrics.

Eight guiding principles

In its April 2025 insight report, *Shaping Tomorrow: Responsible Innovation for a Brighter Future*, the World Economic Forum presents a framework for responsible innovation that identifies eight interconnected principles to guide the development of innovation ecosystems towards sustainable, inclusive impact (see Figure 1). When applied to innovation districts, these principles help ensure that concentrated innovation activity benefits broader communities while maintaining economic viability and environmental responsibility.

FIGURE 1 **Eight guiding principles to guide responsible innovation**



Source: World Economic Forum.

PRINCIPLE 1

Collaborative

Innovation thrives when diverse perspectives come together. The collaborative principle recognizes that solving complex challenges requires partnerships between universities and industry, government and entrepreneurs, established corporations and start-ups. Real collaboration goes beyond networking events. It needs formal structures for ongoing engagement, shared decision-making and incentives that encourage knowledge-sharing over competition. When districts embrace collaboration, they create network effects where each new participant enhances opportunities for everyone else.

PRINCIPLE 2

Sustainable

Sustainability means balancing environmental protection, economic viability and social equity. Innovation districts must prove that growth and environmental responsibility work together. This includes using renewable energy, designing buildings that last and following circular economy principles where waste becomes resource. Economic sustainability requires diverse funding sources rather than dependence on single investors. Social sustainability means ensuring local communities benefit from development through affordable housing, local hiring and accessible programming.

PRINCIPLE 3

Resilient

Change is constant in innovation ecosystems. Technologies evolve, markets shift, funding cycles end and global disruptions test organizational capacity. Resilient districts build flexibility into everything they do. This means creating spaces that can adapt to different uses, governance structures that evolve with ecosystem maturity and diverse economic bases that reduce vulnerability to sector downturns. Resilience is about maintaining core functions while embracing experimentation and learning from failures without losing momentum.

PRINCIPLE 4

Human-centric

Innovation ultimately serves human needs. The human-centric principle ensures that technological advancement improves quality of life for all community members. This means designing spaces where people want to work and interact – not just functional buildings, but inspiring places that foster creativity. It requires programming that addresses real community needs and governance that includes diverse voices. Success should be measured by improvements in human well-being, not simply patents filed or capital raised.

> These principles are not rigid prescriptions but guiding lights that help navigate complexity while maintaining focus on what matters most.

PRINCIPLE 5

Efficient

Resources are limited and must be used wisely. The efficient principle optimizes resource use while minimizing waste. This includes energy-efficient buildings, streamlined permitting processes and technology that enhances productivity. However, efficiency must balance with effectiveness. Too much focus on efficiency can eliminate the creative redundancy that often leads to breakthroughs. Districts need thoughtful optimization that maintains flexibility for experimentation while eliminating unnecessary waste.

PRINCIPLE 6

Transparent

Trust forms the foundation of successful innovation ecosystems, and transparency builds trust. This principle requires openness about how districts operate, make decisions and use resources. It means sharing both successes and failures honestly, making data accessible and creating clear accountability mechanisms. Transparency includes explaining how public funds are spent, how development decisions affect communities and which data is collected in public spaces. Clear communication helps stakeholders make informed decisions and hold leaders accountable.

PRINCIPLE 7

Accessible

Innovation benefits should reach everyone, not just privileged elites. The accessible principle addresses barriers that prevent full participation. Physical spaces must accommodate people with different abilities. Programmes should be available in multiple languages and formats. Funding opportunities need to reach diverse entrepreneurs, not just those with existing connections. Workforce development programmes should prepare local residents for new jobs. Accessibility is a fundamental design principle that shapes everything from building entrances to application processes.

PRINCIPLE 8

Scalable

Successful innovations must grow beyond pilot projects to create widespread impact. The scalable principle ensures that what works can expand without losing effectiveness. For innovation districts, this means helping individual start-ups reach market scale, enabling successful programmes to serve more participants and allowing proven district models to replicate elsewhere. Scalability requires infrastructure that can handle growth and processes that remain manageable as complexity increases. It also means ensuring that community benefits grow alongside economic expansion.

Integration and application

These eight principles work together, reinforcing each other when properly integrated. Collaboration enhances resilience by distributing risk and resources. Transparency enables accessibility by making information available to all stakeholders. Efficiency supports sustainability by reducing resource consumption. Human-centric design promotes both accessibility and collaboration by ensuring everyone can participate meaningfully.

The principles also create productive tensions that require balance. Efficiency might conflict with accessibility if streamlined processes exclude certain groups. Scalability might challenge sustainability if growth exceeds environmental capacity. These tensions are features, not bugs. They promote thoughtful decision-making and prevent single-minded optimization that ignores broader impacts.

Living framework

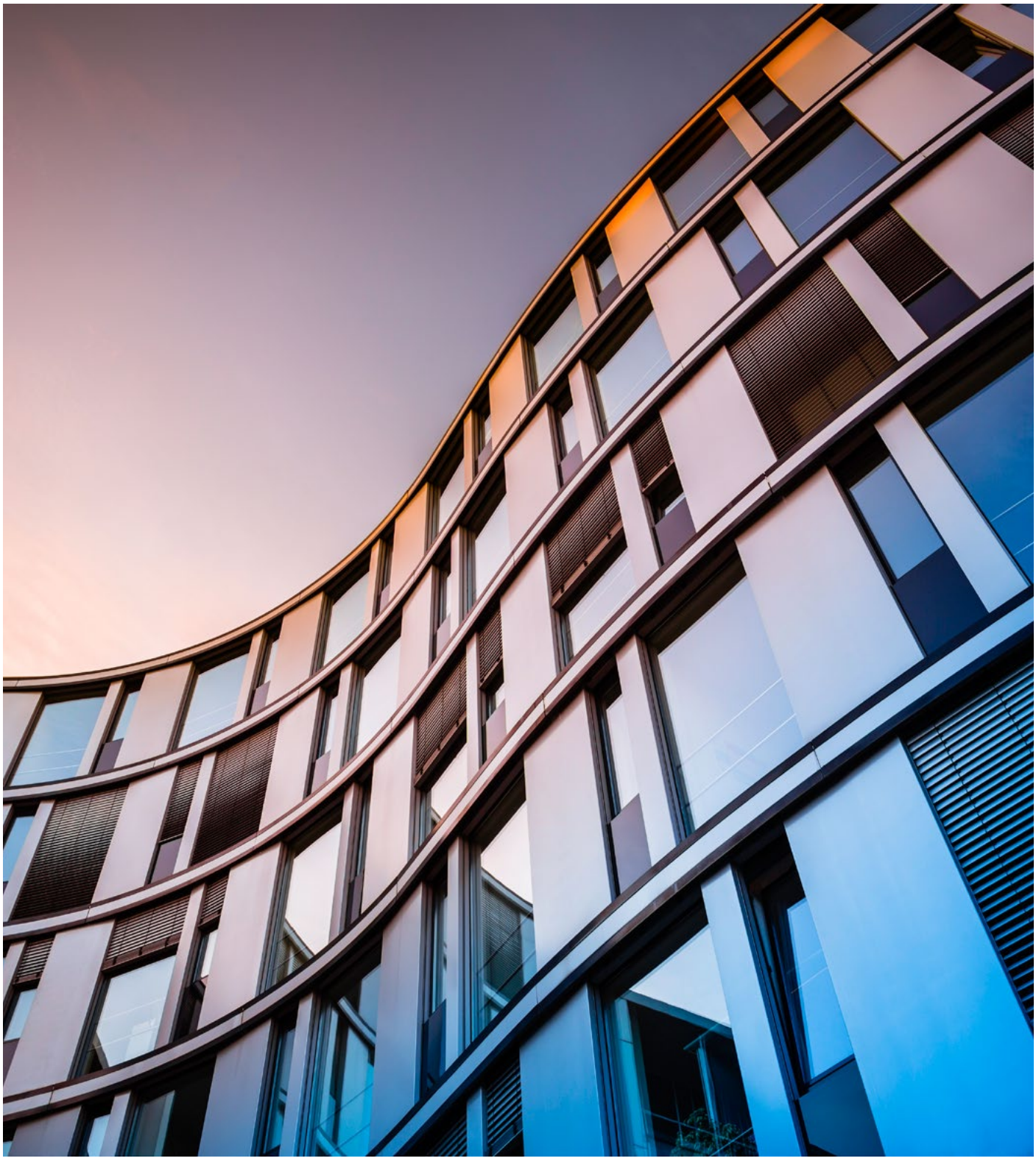
This framework evolves with experience and learning. As innovation districts worldwide experiment with different approaches, new insights emerge about how principles translate into practice. The framework provides structure for capturing and sharing these lessons, creating a global community of practice around responsible innovation district development.

The principles offer a foundation for assessment and continuous improvement. Districts can evaluate their current practices against these principles, identify gaps and opportunities, and develop targeted strategies for enhancement. They provide a common vocabulary for cross-district learning and a basis for constructive critique that advances the entire field.

Ultimately, these principles serve as a north star for innovation district development. They are not rigid prescriptions but guiding lights that help navigate complexity while maintaining focus on what matters most: creating innovation ecosystems that generate prosperity, opportunity and well-being for all members of society. The following chapters explore how these principles manifest in practice across governance, physical design and digital infrastructure, illustrated by case studies referred to as “Innovation District Spotlights”.

2 Collaborative governance and stakeholder engagement

This chapter explores inclusive governance structures that balance diverse interests while maintaining operational effectiveness.



There was a time when entrepreneurs prized secrecy, developing and patiently tending their wonders in isolation.

This is not the way we work now; technology changes too quickly. We no longer create from scratch; we draw on each other's talents. The most successful companies grow in "hotspots" that boast world-class research institutions, incredible scientists, engineers and businesspeople, skilled investors, supportive governmental bodies and ever-more-experienced entrepreneurs. It is in these hotspots that we are fixing the world through clever ideas.

The currency of today is 'being current'. Our currency is the ability to leverage the latest advances and know-how of others to make new things possible that, a year or two earlier, would have been unthinkable. Recent advances in AI, quantum computing and genetic engineering suggest that there will be no slowing of the flywheel of innovation.

In the shadow of MIT, my organization – the Cambridge Innovation Center – grew to be one of the world's largest innovation hubs; more recently we have been engaged as an advisor. Through work with half a dozen national governments around the world, we have distilled what we have learned about how to lead and govern this type of work and the organizations to partner with.

Tim Rowe
Founder and CEO, Cambridge Innovation Center

2.1 **Delivering on the principles:** collaboration across the three lifecycle stages of innovation districts

The governance of an innovation district and the way its diverse stakeholders collaborate will need to evolve as it develops through the following lifecycle phases:

- Set-up and early stage
- Growth and scaling-up
- Maturity

Each stage of the process must address distinct governance challenges, reflecting evolving needs and dynamics at each point. These stages embody some of the guiding principles of innovation:

Collaborative: e.g. in the set-up and early stage, where initial enthusiasm should be nurtured and translated into concrete commitments.

Resilient: e.g. in the growth and scaling-up phase, where momentum may wane but governance structures must remain robust and enduring.

Sustainable: e.g. in the maturity phase, where the funding model becomes self-sustaining and evidence of success outweighs the resource commitment.

Transparent: this is a principle to be embedded throughout every lifecycle phase, reflecting an open and inclusive approach to innovation and its evaluation.

Success should be measured not only by business growth, but also by the delivery of meaningful, tangible benefits to communities. While each stage involves varying challenges, inclusive governance is a critical theme to be considered throughout.

The case studies (Innovation District Spotlights) profiled in this chapter reflect a diverse range of approaches to the challenges of inclusive governance and collaborative stakeholder engagement:

INNOVATION DISTRICT SPOTLIGHT 1:
Michigan Central, Detroit, US – private sector-led PPP to engage communities by giving them decision-making power.

INNOVATION DISTRICT SPOTLIGHT 2:
T-Hub Foundation, Hyderabad, India – collaborative governance uniting state government, academia and industry to create India's leading innovation hub.

INNOVATION DISTRICT SPOTLIGHT 3:
Aramco Taleed, Saudi Arabia – empowering SMEs through the robust governance and support of a state-owned enterprise.

INNOVATION DISTRICT SPOTLIGHT 4:
DistritoTec, Monterrey, Mexico – university-led participatory governance to transform social cohesion through empowering neighbourhoods.

2.2 Set-up and early stage

While foundational governance will grow into more established forms over time, the most successful innovation districts are those that intrinsically understand their uniqueness and from the outset engage with a wide array of stakeholders.

Contextual awareness: anchoring innovation districts in relationships from the outset

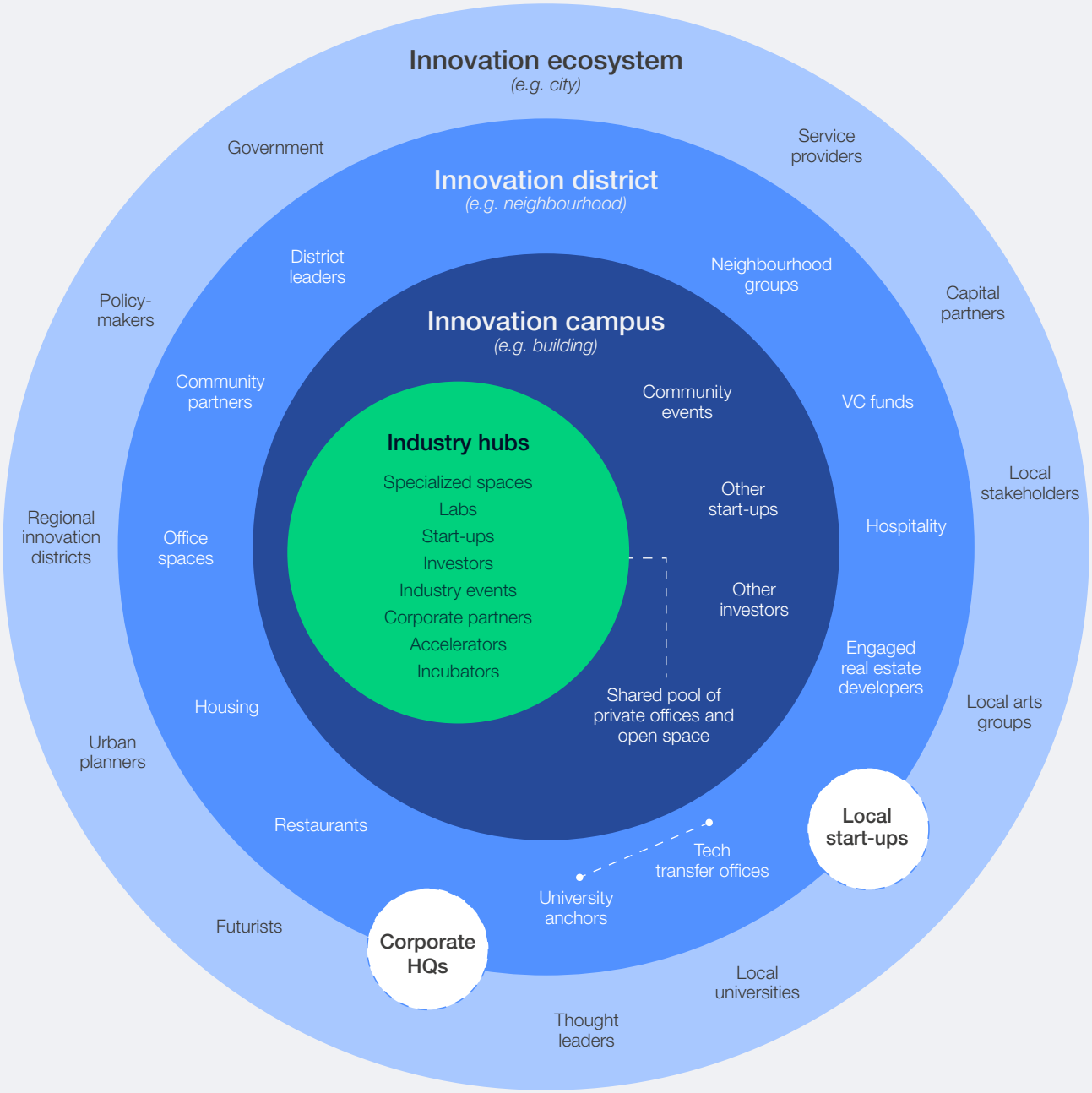
A city's or region's economic success is increasingly based on its ability to cultivate innovation, attract and concentrate successful start-ups, and support venture capital. The differentiating factor lies in the health of each city's innovation ecosystem and how effectively it channels energy and enthusiasm into collaborative structures – reflecting the **collaborative** principle outlined above.

The Cambridge Innovation Center emphasizes mapping-out complex networks of actors and collaborators in concentric circles of activity, as illustrated in Figure 2. Doing so helps operators move from geographic proximity towards connecting actors with common interests or complementary offers and starting to realize the potential of ecosystems.

This early-stage ecosystem dynamic creates a gravitational pull that draws in entrepreneurs, generating a beneficial cycle where the concentration of expertise and activity becomes self-reinforcing. Understanding the underlying relationship dynamics is crucial for effective governance, which must be flexible enough at the outset to nurture natural collaborative tendencies, while providing the structural support necessary for sustainable growth over the longer term.

> Effective governance must be flexible enough at the outset to nurture collaboration, while providing the structural support necessary for sustainable growth.

FIGURE 2 | **Innovation ecosystem and definitions**



Innovation ecosystem	Innovation district	Innovation campus	Industry hubs
Comprised of ideas, developments and partnerships between start-ups, accelerators, entrepreneurs, governments and institutions in close proximity to each other.	A physically compact, transit-accessible, tech-enabled geographic area with mixed-use amenities where leading-edge anchor institutions and companies cluster and connect with start-ups, business incubators and accelerators.	A building or campus of buildings that provides high-quality spaces and shared resources for innovators. The campus acts as a curated centre of gravity in the innovation district, concentrating diverse partners in a neutral, collaborative space.	**Innovation hubs:** provide specialized spaces and community resources for innovators focused on an industry (e.g. robotics) or common goal (e.g. better ageing for all). Industry hubs may include lab and prototyping spaces, dedicated staff and bespoke programming beyond typical innovation campus services. **Co-working:** provides dedicated or non-dedicated flexible workspace. It can be used by companies at any stage, but is most frequently associated with early-stage start-ups and solo entrepreneurs.

Source: Cambridge Innovation Center, Innovation Quarter, Brookings Institution.[11]

> Rather than pursuing generic technology development, innovation districts should focus on areas of genuine competitive advantage.

Strategic focus and differentiation

Smart entrepreneurs are mobile, meaning new innovation districts are vying with other ecosystems for their attention from the outset. This need to compete implies that governance frameworks should establish clear strategic focus areas that differentiate newer innovation districts from (often larger) competitors. Rather than pursuing generic technology development, districts should focus on areas of genuine competitive advantage.

The principle of strategic differentiation suggests that if an innovation district is intended to compete in, for example, robotics against an established hub such as Boston, it should focus on establishing a competitive edge in a specialized sub-field such as agricultural robotics. In Singapore, for example, the Punggol Digital District offers a district-scale living lab for test-bedding smart solutions related to asset and facilities management and efficiency. In bringing together a digitalized physical environment and an open digital platform, Punggol offers businesses and students the opportunity to perform simulations and rapid prototyping for new products and services, drawing on AI and robotics innovations. The district's aim is to bring down the cost of experimentation and time-to-market.

Building foundational governance structures and public-private partnerships

There is inherent complexity in aligning interests across the early stages of innovation district growth. The public-private partnership (PPP) structure is a common approach, favoured for the flexibility and resilience it affords. PPPs enable the innovation district operator to leverage the relative strengths of partners while mitigating individual limitations.

One of the central challenges in forming innovation hubs relates to the way in which real estate is typically financed. Start-ups tend to have no credit and very short planning horizons, often measured in months, making them "unbankable" as users of real estate. For this reason, the funding for innovation hubs is typically provided by public bodies interested in seeing innovation districts come into being. PPPs offer a governance structure able to access such public funding.

Clear lines of responsibility and accountability across multiple stakeholders can create complementary value streams: government provides stability, scale and resources; academia ensures research depth and talent pipeline; while industry partners offer market access, practical validation of products and a commercial focus. Models such as Michigan Central[12] (see Innovation District Spotlight 1) and Hyderabad's T-Hub[13] (see Innovation District Spotlight 2) operate as not-for-profit companies, balancing mission-driven objectives with commercial sustainability.

INNOVATION DISTRICT SPOTLIGHT 1

Michigan Central – from abandoned train station to innovation hub through community-centred governance

Overview

For three decades, Michigan Central Station stood as Detroit's most visible monument to decline – its broken windows and crumbling facade a symbol of the city's struggles. Yet in the past seven years, it has been transformed into a 30-acre tech and cultural hub, with a mission to attract a wide range of creative talent to advance technologies and programmes that address some of humanity's most critical challenges.

Community empowerment

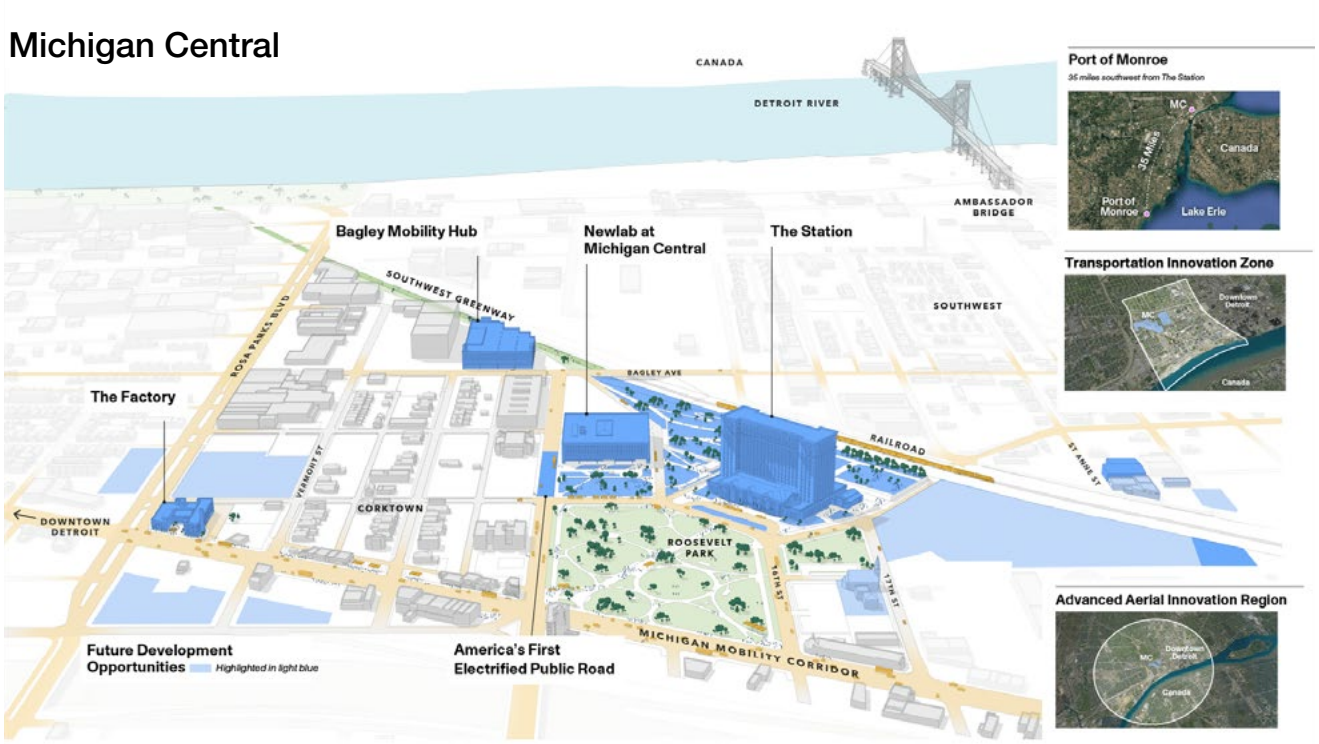
Ford Motor Company purchased the 18-story landmark in June 2018.[14] What happened next broke the mould of traditional corporate development. Rather than imposing a vision, Ford spent six months conducting community listening sessions with over 2,000 residents. The message was clear: no more development that pushed locals out.

In response, Ford established Michigan Central as an independent 501(c)(3) non-profit in 2020, creating an unprecedented public-private governance structure. The State of Michigan invested millions, the City of Detroit provided tax incentives, while Ford itself committed $950 million to the project. In addition, the 15-member board included three community representatives holding veto power over technology deployments that affect public spaces.[15]

Building trust

When the district began testing autonomous vehicles and smart city sensors, Michigan Central adopted the Digital Trust for Places and Routines (DTPR) framework[16] – the first innovation district globally to do so. Interactive kiosks in English, Spanish and Arabic explain every pilot project, while QR codes link to real-time data dashboards showing exactly what information is being collected and how it is used.[17]

The Michigan Central model demonstrates that when governance structures give communities real power, innovation districts can rebuild trust while accelerating technological progress.



Source: Michigan Central.[18]

INNOVATION DISTRICT SPOTLIGHT 2

Hyderabad's T-Hub, India – triple helix model of innovation

Overview

T-Hub Foundation in Hyderabad, capital of southern India's Telangana state, exemplifies collaborative governance through its innovative "triple helix" model uniting government, academia and industry. Operating from the world's largest start-up facility – a 572,000 ft² T-shaped building – T-Hub has created India's premier innovation hub, supporting over 2,000 start-ups while engaging with 200+ corporates, 100+ investors and 290+ mentors.[19]

Strategic foundation and partnership architecture

The ecosystem emerged from Telangana's recognition that institutionalizing start-up activity could position it as an alternative to India's traditional hubs in Bengaluru and the National Capital Region. The Government of Telangana anchors the model through infrastructure funding and policy frameworks. Academic partners – Indian School of Business, IIIT-Hyderabad and NALSAR University – provide business strategy, technical expertise and legal guidance. Industry leaders – including Tech Mahindra, Cyient and SRI Capital – contribute market insights and validation opportunities through board participation. This triple helix model creates complementary value streams: government provides stability and infrastructure, academia delivers research and talent development, and industry offers market access and commercial validation.

Governance architecture and decision-making

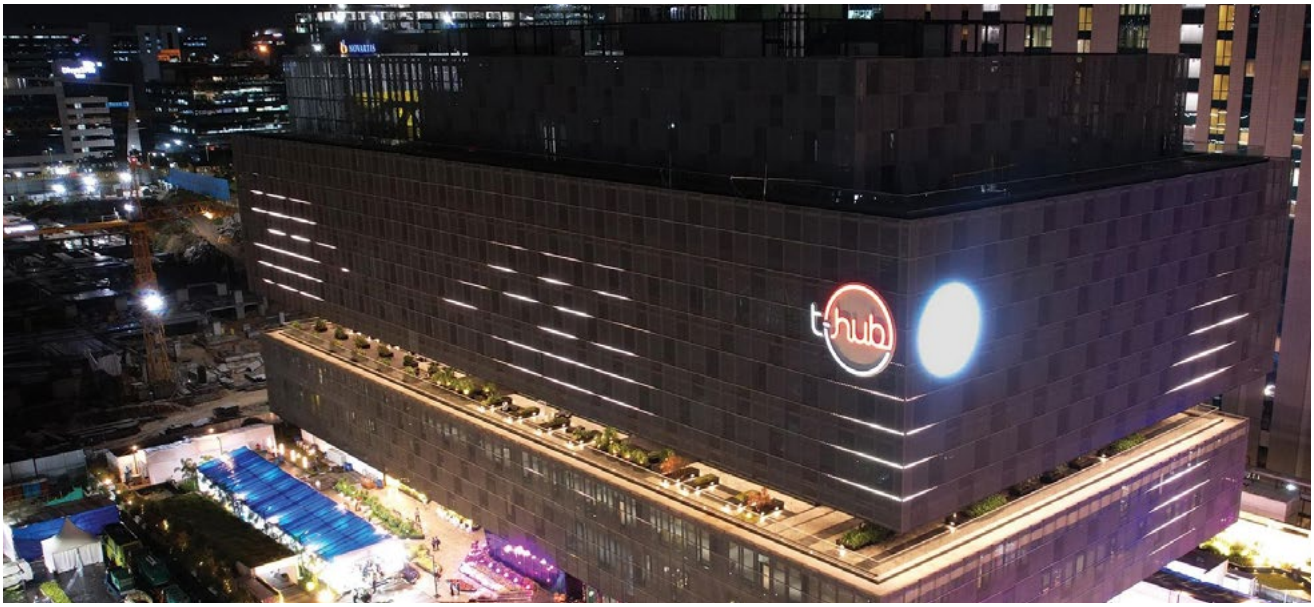
T-Hub operates through a three-tier framework balancing strategic oversight with operational agility. The CEO drives vision and execution, supported by leaders managing start-up programmes, corporate innovation, international partnerships and digital initiatives. The board, comprising representatives from all stakeholder groups, provides strategic direction, while an advisory committee reviews performance. Weekly leadership meetings handle operational decisions, with accountability maintained through systematic KPI monitoring of start-ups supported, funding raised and jobs created.

Comprehensive ecosystem engagement

T-Hub serves as an "incubator of incubators", hosting India's largest Atal Incubation Centre focused on healthcare, sustainability, spacetech, mobility and semiconductors. It houses MATH, India's largest AI centre of excellence supporting 180+ AI/ML start-ups, and serves as India's largest incubator for the defence platform iDEX, where start-ups have secured over $40 million in purchase orders. Corporate innovation programmes support enterprises through solution accelerators, innovation challenges and intrapreneurship programmes. T-Bridge – T-Hub's global arm with partnerships across 11 countries – facilitates international expansion through programmes such as IMAP for international start-ups entering India and Trestle for Indian start-ups going global. Proximity to T-Works, India's largest prototyping centre, provides seamless access to advanced manufacturing capabilities, creating an integrated ecosystem.

Impact and replication framework

Since 2015, T-Hub has strengthened Hyderabad's position as a major innovation hub, with alumni featured in Forbes 30 Under 30 and Shark Tank India. The model's emphasis on collaborative decision-making, transparent accountability and inclusive engagement provides a replicable framework for regions developing innovation ecosystems through multi-stakeholder partnerships.



Source: T-Hub Foundation.[20]

2.3 Growth and scaling-up

Uniqueness of offer counts and, complementing this, so does the need to focus on more than technology and infrastructure.

This chapter contains two case studies from leading innovation districts that could not be more different from one another – yet both demonstrate the power of effective, resilient governance models that are tailored to the specific context:

INNOVATION DISTRICT SPOTLIGHT 3:
Aramco Taleed, Saudi Arabia: demonstrates how a corporate-led initiative can develop an innovative ecosystem to empower SMEs through skills training and common KPIs.

INNOVATION DISTRICT SPOTLIGHT 4:
DistritoTec, Mexico: demonstrates how a university can put inclusive community engagement and human-centred design at the heart of urban innovation.

INNOVATION DISTRICT SPOTLIGHT 3:

Aramco Taleed, Saudi Arabia – corporate-led ecosystem development through SME empowerment

Overview

Aramco's Taleed programme demonstrates how major corporations can catalyse the development of innovation ecosystems through the strategic empowerment of small and medium-sized enterprises (SMEs). Launched in 2022, this corporate-led initiative has established 16 new businesses, supported over 2,500 SMEs, enabled approximately $800 million in capital investment and created 22,000 job opportunities, while advancing Saudi Arabia's Vision 2030 goals for economic diversification.

Strategic framework

Operating from Aramco's LEED Platinum-certified headquarters in Dhahran, Taleed targets four strategic sectors: sustainability, manufacturing, digital and industrial. The programme's name, meaning "rooted" in Arabic, reflects its mission to cultivate indigenous innovation capacity while supporting the Kingdom's goal of increasing SME contribution to GDP from 20% to 35% by 2030.

Core services

- **SME creation and localization**: developing business cases to establish and localize new SMEs.
- **Growth support**: via strategy, training and advisory initiatives to scale up SMEs.
- **Local capability building**: empowering Saudi talent through upskilling, training and mentorship for future industrial jobs.

Taleed has introduced a range of programmes tailored to support SMEs, including a "Carbon Net Zero Program" to help SMEs reduce emissions and energy costs through digital tools and frameworks, an "Operational Excellence Support Program" to share best business practices and an "Internal Controls Assessment Tool" to enhance governance and risk management, and to strengthen SMEs' overall efficiency and sustainability.

Collaborative ecosystem integration

Rather than creating isolated innovation spaces, Taleed integrates SMEs into Aramco's existing ecosystem, providing them unprecedented access to raw materials through Aramco downstream affiliates, technical expertise for piloting opportunities and connections to funding networks offering diverse financial solutions. This approach creates what Taleed Director Yousif Al-Ghamdi describes as "a collision of ideas and new investments" where SMEs transform concepts into viable solutions addressing specific industry challenges.

Governance and digital innovation

The programme leverages Aramco's robust governance framework while maintaining entrepreneurial agility through dedicated leadership structures. This model effectively manages a complex network of over 30 public and private partners, including funding providers and technology enablers, to provide comprehensive support to participating SMEs.

Digital transformation drives impact: an upcoming AI-powered platform will democratize e-learning, expert advice and offer discounted solutions. A fintech marketplace will cut funding approval to 48 hours, showing how corporate infrastructure removes SME barriers.

INNOVATION DISTRICT SPOTLIGHT 3:

Aramco Taleed, Saudi Arabia – corporate-led ecosystem development through SME empowerment (continued)

Programme offerings

- Business case development
- Subject matter expertise
- Raw material supply
- Partner connection
- Financial support
- Incentive facilitation
- Talent sourcing
- Training and consultation
- Market access
- Secure industrial lands

aramco Taleed

Programme services

- SME growth support
- New SME creation and localization
- Building local capabilities

KPIs

- Number of new SMEs established
- Number of SMEs supported
- Capital enabled
- Jobs created

Target sectors

- Sustainability
- Digital
- Manufacturing
- Industrial

Source: Aramco Taleed.[21]

INNOVATION DISTRICT SPOTLIGHT 4:

DistritoTec, Monterrey – Mexico's pioneer in neighbourhood-led innovation governance and placemaking

Overview

In the late 2000s and early 2010s, Monterrey – Mexico's third largest city – was, in the words of the WRI Ross Center, "a low-density, resource-inefficient metropolitan area plagued by congestion, as drug violence tore at the social fabric of the city". As a result, Tecnológico de Monterrey – a private research university known as "Tec" – considered moving campus. Instead, however, Tec launched DistritoTec in 2014, a 452-hectare regeneration initiative spanning 24 neighbourhoods with $200 million in seed funding.[22]

Governance innovation

DistritoTec pioneered participatory governance through Mexico's first district-level Neighbourhood Council. Starting with community engagement in 2014, the initiative encouraged the formation of 14 neighbourhood committees that gained representation within the larger council. In 2015, Monterrey approved DistritoTec as a special development zone. By 2018, the Neighbourhood Council received formal recognition in Municipal Law – a first in Mexico – and in 2019, a public trust was established allowing revenue capture for reinvestment in the district.[23]

Placemaking strategy driven by co-design and sustainability

DistritoTec's placemaking strategy integrates sustainable infrastructure and public spaces, such as "complete streets", "complete parks" and mixed-use development.[24] Public spaces are co-designed using project for public spaces (PPS) methodologies, which define a "great place" as one offering at least 10 distinct activities (e.g. dining, relaxing, exercising, socializing, learning, attending events) and 10 destinations within the district, prioritizing sociability, activities, comfort/image and connections. These principles are applied alongside citizen participation to shape inclusive, accessible cityscapes.

Sustainability features include endemic reforestation, conservation of native species and mobility-focused urban design, incorporating complete street networks and regeneration of urban parks. Mixed-use elements (e.g. housing, retail, amenities) have been planned both within the university campus and surrounding areas.

Measurable transformation (2014-2021)

This innovative governance model has delivered the following concrete results:[25]

- 16,900+ direct beneficiaries.
- 23% increase in registered businesses (3x city average).
- $500 million in new private investment attracted.
- 17,000 square metres of renovated public parks.
- 3 kilometres of complete streets for pedestrians and cyclists.
- Crime virtually eliminated in the district.

Image credit: Tecnológico de Monterrey.

INNOVATION DISTRICT SPOTLIGHT 4:

DistritoTec, Monterrey – Mexico's pioneer in neighbourhood-led innovation governance and placemaking (continued)

Community impact

Beyond infrastructure, DistritoTec has transformed social cohesion through cultural programming, cinema nights, concerts, local markets and art shows organized by neighbourhood committees. The area's population has increased by 56%, reducing empty dwellings by 69% between 2010 and 2020, according to official census data. The district has become a regional hub for thriving communities and urban innovation. The model now influences national complete streets guidelines and has inspired similar initiatives at other Tec campuses.[26]

Distrito de Innovación Monterrey

Building on this decade of positive progress, Tec de Monterrey initiated the Distrito de Innovación Monterrey, a dedicated innovation district within DistritoTec. At its core are two anchor buildings, designed specifically to concentrate R&D capabilities and generate innovative solutions that transform the realities of communities in Mexico and around the world:

- **Expedition FEMSA**: a dedicated building to catalyse innovation from applied research, aligning academic initiatives with industry needs. It hosts 32 programmes across disciplines, with 70% of operations funded by external partnerships. It features specialized labs, co-working spaces and three event spaces to support financial sustainability.[27]

- **Eduardo Garza T. Innovation and Entrepreneurship Hub**: this centre – due to launch in 2026 – aims to foster creativity, collaboration and entrepreneurship by connecting academia and business to accelerate prototypes and start-ups. It will feature bio-workshop labs, co-working spaces, 18 start-up garages, two hangars for tech development and three event venues across 8,300 m^2.[28]

International recognition

DistritoTec was named as a finalist for the 2020-2021 WRI Ross Prize for Cities (out of 262 global proposals), recognizing its demonstration of how universities can catalyse urban transformation through participatory governance. In 2024, it received the World Economic Forum-UN Habitat Award for Public-Private Collaboration.[29]

Source: WRI Ross Center, World Economic Forum.
Image credit: Expedition FEMSA, Distrito de Innovación Monterrey.

> Traditional corporate governance assumes aligned interests; innovation districts must govern despite misaligned interests.

Building specialism and uniqueness

Innovation districts must use governance to encourage closer connections between ecosystem stakeholders, to improve collaboration and knowledge-sharing. This includes creating advisory mechanisms for small businesses, establishing mentorship programmes and developing communication and engagement strategies that ensure appropriate information-sharing with different actors based on their specific needs and capabilities. To ensure resilience and long-term progress, these formalized structures are indispensable – they anchor efforts and preserve momentum beyond the enthusiasm of initial stages.

The goal is to create physical places that serve as "meccas" in chosen fields – these are the locations that global investors feel they must visit regularly and entrepreneurs recognize as the definitive gathering places for their industry. For example, the Graphene Engineering Innovation Centre[30] in Manchester, United Kingdom, exemplifies this approach, having assembled the expertise, specialized equipment and corporate partnerships necessary to become the global gathering place for those wanting to design, build and invest in the graphene products of the future.

Organizational structure and decision-making for innovation district operators

Governance models will need to fit the local context. Most aim to balance strategic oversight with operational agility. T-Hub in Hyderabad, for example, exemplifies this balanced decision-making framework through its triple helix governance model (see Innovation District Spotlight 2), where government, academia and industry representatives share board seats with equal voting rights, preventing any single stakeholder from dominating strategic decisions.

Innovation district-specific accountability challenges

Innovation districts face a unique governance challenge: unlike corporations with clear profit motives or universities with academic missions, they must satisfy diverse stakeholders with fundamentally different definitions of success.

The tension is real: property developers measure square footage leased, universities count research papers published, governments track job creation, while VCs focus on unicorns produced. Traditional corporate governance assumes aligned interests; innovation districts must govern despite misaligned interests.

Some districts are pioneering new approaches to make these tensions productive rather than destructive, for example by:

- Publishing multiple KPI sets showing how different stakeholders define success.
- Creating forums where conflicting priorities are explicitly negotiated.
- Developing composite metrics that force trade-offs to become visible.

Ecosystem engagement

As they build momentum, innovation districts can expand ecosystem engagement activities in a number of ways, to promote opportunities for capacity building, connecting and collaboration and to foster a broader innovation culture. A range of engagement approaches can be applied, including the following:

- **For start-ups**: Regular cohort check-ins or thematic clusters for founders to share insights and collaboration opportunities, demo days and mentorship clinics.
- **For corporates**: Co-design of innovation challenges, pilot programme management and structured review frameworks.
- **For academia**: Collaborative research and mentorship programmes.
- **For investors**: Organizing investor meet-ups, demo days and closed-door pitch sessions.
- **For government**: Continuous alignment with policies and public service challenges and reporting progress on key metrics.
- **For all stakeholders**: Community-building events to promote cross pollination and trust-building.

2.4 Maturity

Changing business models and the growing influence of technology in the wider economy underline the importance of inclusive governance to anticipate how future trends will affect innovation processes and business operations in innovation districts.

Future-orientated governance for scaling-up and evolution

Governance frameworks for mature innovation districts need to balance several tensions. They must remain true to meeting entrepreneurs' needs and encourage broad participation in decision-making, while achieving growth, which itself can erode a sense of agency as the number of players in the ecosystem grows. Also, the most ambitious must use governance to scale up for global recognition while maintaining local roots.

Governance frameworks should increasingly prioritize self-sustaining measures over time to reduce dependence on government intervention, while maintaining appropriate public sector oversight. This underscores the importance of horizon-scanning to stay alert to changing political priorities and funding landscapes. Crucially, they must demonstrate that the impact they achieve justifies the investment, thereby delivering on the **sustainable** guiding innovation principle.

Physical and organizational hubs to support governance

Within mature innovation districts, it is possible to create physical focal points or hubs that serve as common gathering places in which ecosystem participants regularly interact while maintaining neutrality.

CIC's facility in Cambridge, US, exemplifies this approach, housing dozens of large corporations, VCs and angel investors, multiple accelerator programmes and numerous service industry players, all working on a level playing field with no preferential access to business opportunity. Done right, hubs of this type can grow steadily over time, taking over space in neighbouring buildings, effectively becoming the "central business district" of the innovation ecosystem.

Governance for technology preparedness

Driven by accelerating technology trends, the digital infrastructure and information technology requirements of tenants are becoming increasingly central to the success of innovation districts. Governance frameworks must address the risk of obsolescence as technology markets change, while maintaining a focus on frontier innovation opportunities as they relate to the particular specialization of the innovation district.

Future councils or similar advisory bodies must take on the role of anticipating emerging trends – such as the arrival of 6G wireless network technology – and guide strategic planning processes to ensure that districts remain relevant as technological landscapes evolve and investment in the technology itself is both proportionate and adaptive.

3 Human-centric design and sustainable places

This chapter examines how physical environments catalyse innovation, creating spaces for collaboration and testing while prioritizing well-being and environmental responsibility.

From the Greek agora to the library of Alexandria to the Parisian coffee shops where French revolutionaries plotted, the gestation and sharing of ideas has been enabled by physical spaces where people gather.

Cities, over history, have functioned as a hotbed of innovation – creating synergies from a critical mass of people, ideas and economic buoyancy. Key factors have included:

- A mechanism for the rapid spread of ideas: press, guilds, town squares.
- A mechanism for the build-up of knowledge: libraries, universities, institutions.
- 24/7 animation: a hustle and bustle that endures across days, seasons, cycles.

In many cases, the innovative character of cities has emerged organically within a synergistic socio/economic/political context. In many more, it has been the result of strategic investments and policy. Scale and density have been their allies.

Innovation districts by contrast are typically smaller than a downtown. And the authorship is more distinct. Recent decades have seen the emergence of successful districts, super-charging an innovation-based economy.

The next few pages point towards worthwhile examples for us to analyse and be inspired by. Ultimately, every new place will need to embrace a bespoke approach, with vision, diligence and chutzpah.

Antonio Gómez-Palacio
CEO, DIALOG

3.1 **Delivering on the principles:** three components of good placemaking for innovation districts

The design of spaces matters – thoughtful design can foster the "collision of ideas" necessary for innovation, physical infrastructure can be optimized for testing and demonstration, and community spaces can be created to attract and retain diverse talent. To successfully do this, spaces must be planned from the start – setting out a compelling placemaking strategy to create a stimulating, collaborative environment, whilst also allowing for serendipity and the flexibility to evolve over time, whether to accommodate growth, macro or local sector and societal changes.

The following design components transform physical environments into dynamic innovation ecosystems:

- Designing spaces that drive innovation.
- Creating flexible infrastructure for testing and demonstration.
- Building vibrant community spaces.

These components deliver on some of the guiding principles for innovation by creating environments that are:

Human-centric by design.

Resilient through future-focused and adaptable infrastructure.

Accessible through the programming and allocation of community-building spaces.

There are many practical examples of innovation districts that have achieved this dynamic transformation around the world. The case studies profiled in this report show how placemaking is embedded in different geographical contexts, scales and stages of development – whether repurposing existing urban spaces, delivering ambitious new masterplans or working at a city scale to better integrate spaces both old and new. For example:

INNOVATION DISTRICT SPOTLIGHT 5:
Milan's Innovation District (MIND) shows how a legacy World Expo site can be transformed into the country's biggest innovation district, setting a blueprint for scale and replication elsewhere.[31]

INNOVATION DISTRICT SPOTLIGHT 6:
Saudi Arabia's Diriyah Company shows how human-centric placemaking is conceived from the start as part of a larger strategic masterplan to attract the high-value firms and people it wants.[32]

INNOVATION DISTRICT SPOTLIGHT 7:
Morocco's City of Agadir shows how placemaking at a city scale can support inclusive innovation and catalyse new ideas.[33]

3.2 Designing spaces that drive innovation

A successful placemaking strategy must balance both the "hard" physical infrastructure and the "soft" social and cultural dynamics of a place.

Design for diverse interactions

Physical spaces should support a spectrum of interactions – from deep focus to casual encounters. Third spaces (e.g. cafés, lounges, green areas) are crucial as they lower the perception of social risk, encouraging spontaneous conversations. These spaces must be intentionally scaled, curated and activated – not large, empty expanses.

> Researchers have found that open-plan offices can actually reduce face-to-face interaction by up to 70%, as people retreat into digital communication.

Scale and social norms

The scale of a space shapes behaviour. Environments that are vast and open can feel impersonal and discourage informal interaction. Researchers have found that open-plan offices can actually reduce face-to-face interaction by up to 70%, as people retreat into digital communication.[34] To codify these findings into the design of places, cities such as Boston have developed *Tactical Public Realm Guidelines*,[35] to foster interaction in public settings.

Density and connectivity

Innovation thrives on proximity and interaction. Communication frequency drops exponentially as physical distance increases, with findings that the Allen Curve principles hold true.[36] Moving beyond the isolated business park models of the 1990s, contemporary research suggests that dense, well-connected environments foster serendipitous encounters.

Singapore's Punggol Digital District shows how this thinking can be integrated into innovation district design (see Innovation District Spotlight 9).[37] The masterplan is designed to spark conversations and creativity by fully integrating business and commercial zones with the educational spaces of the Singapore Institute of Technology and the surrounding community.[38] An 800 metre-long Campus Boulevard and 2 km of covered bridges link all buildings in the district, while workers, students and nearby residents share a park, shopping mall, food court and childcare centres.

Green and natural spaces

Green spaces are not just aesthetic – they support well-being, informality and climate resilience. Milan's innovation district (MIND – see Innovation District Spotlight 5) is creating one of Europe's largest series of interconnecting green parks, integrating 3,500 trees and nature-based solutions to support biodiversity and social interaction.[39]

INNOVATION DISTRICT SPOTLIGHT 5

Milan Innovation District (MIND) – large-scale urban regeneration site for scaling-up innovation

Overview

The Milan Innovation District (MIND) is a large-scale urban regeneration project transforming the former Expo Milano 2015 site into a dynamic hub for science, technology, education, healthcare and social innovation. Spearheaded by Arexpo, MIND is envisioned as a "city of the future" where innovation and everyday life converge. It is designed to be a multifunctional, inclusive and sustainable district that fosters collaboration across sectors and disciplines. In doing so, it creates a blueprint for replication and scaling, with an aim to catalyse innovation ecosystems in other parts of Italy.

Location

MIND spans the municipalities of Milan and Rho, strategically located with direct access to high-speed rail, the A4 motorway, Malpensa Airport and Milan's metro line M1. It is just 12 km from Milan's historic centre with a developing public transport network, making it well-connected to the city centre and easy to access internationally.

Key statistics

- **Total area**: 1,000,000 m^2 (1 km^2).
- **Green spaces and public squares**: 440,000+ m^2.
- **Daily population**: ~60,000 people (researchers, students, professionals, residents).
- **Investment**: ~€4 billion.
- **Concession**: 99-year agreement with Lendlease.

Stakeholders involved

- **Arexpo** – public majority-owned company leading the regeneration.
- **Lendlease** – global property and infrastructure group.
- **Human Technopole** – Italy's life sciences research institute.
- **Galeazzi Hospital** – 16-storey medical centre for advanced healthcare.
- **University of Milan (Unimi)** – new science campus for 18,000 students.
- **Fondazione Triulza** – social innovation centre engaging the third sector.

Placemaking and urban design

Placemaking is central to MIND's identity. The district is designed as an "urban laboratory" where diverse functions – research, education, healthcare, housing, entertainment, event spaces and public services – are closely integrated. The sectors and innovations housed in these spaces are equally diverse – ranging from bio-tech start-ups to using robotics for architectural restoration. This mixed-use approach fosters a vibrant, inclusive community and supports innovation through everyday interactions.

The master plan prioritizes human-centric design, with widespread green areas, vertical gardens and pedestrian-friendly infrastructure. Public spaces are conceived not just as amenities but as catalysts for well-being, creativity and collaboration. MIND's masterplan emphasizes street-level permeability through its "common ground" design strategy, which fosters social interaction, mixed-use functionality and spontaneous collaboration among researchers, residents and visitors. The emphasis on sustainable mobility, including driverless transport and cycling infrastructure, reinforces MIND's commitment to environmental resilience.

MIND's placemaking strategy includes cultural and social programming, ensuring that the district remains animated and engaging. The legacy of Expo 2015 is preserved and reimagined, turning temporary exhibition grounds into permanent spaces for innovation and community life.

INNOVATION DISTRICT SPOTLIGHT 5

Milan Innovation District (MIND) – large-scale urban regeneration site for scaling-up innovation (continued)

Success factors and lessons learnt

- **Designing for interaction, not just function**: Early designs focused heavily on infrastructure and innovation facilities. Later phases emphasized placemaking as a catalyst for community and creativity, leading to the common ground strategy.
- **Balancing global ambitions with local needs**: MIND's international profile and success risked alienating nearby communities. Placemaking efforts such as open parks and inclusive programming helped bridge the gap between global innovation and local relevance.
- **Green space as a strategic asset**: Rather than treating green areas as aesthetic add-ons, MIND embedded them as functional, programmable spaces – supporting health, mobility and biodiversity.
- **Flexibility in use and identity**: Spaces such as MIND Village evolved to accommodate changing tenant needs, from start-ups to large firms, requiring adaptive architecture and modular public spaces. In other areas, MIND builds on its local heritage, using a historic farmhouse from Expo 2015 as a social innovation hub to embed civic functions into the district's core.
- **Transit and accessibility as placemaking enablers**: Proximity to metro and rail lines was leveraged to make MIND a gateway to Milan, reinforcing its role as a regional connector and not just a standalone campus.

Source: MIND.[40]
Image credit: MIND

Programming to incentivize interactions

Physical space alone is not enough. Activation through programming (e.g. events, talks, workshops) brings spaces to life. The Venture Café at Boston's Cambridge Innovation Center runs weekly gatherings that connect thousands of innovators through curated sessions.[41]

Similarly, Tec de Monterrey's DistritoTec integrates community engagement into the Distrito de Innovación Monterrey and its research and entrepreneurial capability to turn ideas into real-world solutions, strengthening the district's innovation ecosystem (see Innovation District Spotlight 4).[42] Academic institutions are particularly well placed for activation programmes and play a convening role.

Consider the role of the public sector in space activation

Local authorities can convene, advocate and enable, acting as "gardeners" of innovation ecosystems. In London, Hammersmith and Fulham Council's model of "entrepreneurial municipal government" team culture exemplifies this, embedding innovation into local strategy and governance.[43]

Both the design and activation of physical spaces play a critical role in enabling "curated self-selection" – allowing the intended audience to recognize the space as one that resonates with them, avoiding the sense of anonymity or feeling overwhelmed that can result from excessively large or poorly curated environments. This process of self-selection is essential to fostering an environment that is inclusive yet intentionally curated to be socially comfortable and aligned with a clear sense of purpose.

3.3 Creating flexible infrastructure for testing and demonstration

Innovation districts need to consider how to create infrastructure that can allow innovation to be tested, demonstrated and scaled up. These spaces must be flexible enough to evolve and adapt, but also sufficiently tailored to local and industry sector requirements.

The ability both to test and to showcase innovation is essential

The space to showcase innovations is often a core commercial driver for companies when deciding on locations. Meanwhile, sandbox environments help with testing and scaling-up new ideas to accelerate product commercialization. The format and specifics of these are often driven by the sector. For example, innovations in transportation require large-scale, "real-world" testing in urban environments, as can be seen in Tokyo's Toyota Woven City.[44] Conversely, innovation districts for life sciences and materials science rely on very controlled interior environments, such as the Materials Innovation Factory in Liverpool, United Kingdom.[45]

A key challenge is justifying the initial investment required

Public-private partnerships can help alleviate the initial financial burden by enabling shared investment – where private capital contributes to upfront development costs and drives momentum, while public funding often supports enabling infrastructure and long-term value creation. This approach aligns commercial interests with public benefit, allowing for a broader, longer-term view of return on investment that includes economic, social and environmental outcomes. The value of partnerships for co-investment can be seen in Michigan Central (see Innovation District Spotlight 1)[46] and Gratiot Innovation District,[47] both located in Detroit, US, drawing in major investments from Bedrock and Ford Motor Company.

Keep spaces adaptable to respond to the testing needs of companies

Having a deep understanding of companies' needs for modular versus static elements – and how the relevant sector market may evolve – helps to create an environment that is both useful now and adaptable in the long term. The permeability, both visual and physical, of an innovation district that is testing new ideas supports its desirability for companies as well as enhancing the trust of the wider community in the innovations being tested. NTT East's approach to market creation for private 5G through its testbed NTTe-City Labo in Japan demonstrates this adaptability across a breadth of sector use cases, from agriculture to mobility (see Innovation District Spotlight 10).[48]

Demonstrating a proof-of-concept model

Demonstrating proof-of-concept in tandem with strong public-sector advocacy is key to overcoming a risk-averse mindset and accelerating project development. The success of innovations from sandbox environments should be showcased alongside public sector enabling policies, so that innovations can be scaled up. Leaders often have low risk appetites and want closely matched precedents, which makes innovation difficult. Education and storytelling are crucial to reduce this perceived risk.

3.4 Building vibrant community spaces

Innovation districts must avoid placing too narrow a focus on employees they want to attract. The wider social fabric and quality of life that an innovation district creates is essential to get right, in order to retain talent and stimulate local economic growth.

Community-building is critical for long-term desirability

Quality of life is a key factor in attracting the best talent and innovation districts must adapt to shifting mindsets that value this. Innovation districts alone are not sufficient to attract the talent they want to grow. Consideration of wider communities and networks that surround the talent that innovations are looking to attract is essential. Housing, community infrastructure and impacts on affordability for local communities should not be considered separately, as community-building is a critical component for longer term desirability and retention. The 22@Barcelona district in Spain exemplifies this, where development areas are designed to increase the share of affordable housing and green infrastructure.[49]

Innovation districts should drive local economic growth by design

Key to this is the inclusive programming of spaces, including aspects such as reskilling programmes to build purpose-led innovation districts. The Cleveland Health-Tech Corridor (HTC) offers training programmes for local residents to access to jobs in healthcare and biotech.[50] Furthermore, building public trust, for instance, by linking taxes to visible local improvements is important to consider. Programming aspects should be a core part of the business case and the operating costs integrated into planning.

Balance specialized innovation spaces with inclusive public areas

Innovation districts must go beyond aesthetics to build cohesive and inclusive neighbourhoods, inspired by the activation and vibrancy of placemaking beyond the workplace. If innovation districts fall silent at night, they risk becoming isolated and unwelcoming. Integration into the surrounding city fabric is essential for vibrancy and building long-term value, as can be seen in successful developments such as The Knowledge Quarter in Kings Cross, London.[51]

In Saudi Arabia, Diriyah's emerging innovation district demonstrates the value of embedding innovation within a broader masterplan – ensuring seamless integration into the wider urban fabric. Designed to blend creative, residential and entertainment uses while prioritizing walkability, the district aims to foster continuous interaction and a dynamic atmosphere throughout the day (see Innovation District Spotlight 6).

INNOVATION DISTRICT SPOTLIGHT 6

Diriyah, Saudi Arabia: human-centric masterplan for catalysing innovation

Overview

Diriyah Company – a key part of Saudi Arabia's Vision 2030 – is catalysing innovation through thoughtful placemaking and design. The company's overall masterplan aims to transform Riyadh's historic Diriyah area – a UNESCO World Heritage Site – into a diverse cultural, residential and commercial hub.

Smart and sustainable

Diriyah's masterplan aims to improve walkability, by combining traditional urban layouts with smart systems to improve pedestrian comfort. The plan embraces the latest innovations in mobility and parking management to enhance operational delivery and digital transformation, positioning Diriyah as a premier global destination.

Public, nature-based spaces

The first phase of physical infrastructure prioritizes active travel and convenience, with fully pedestrianized areas above ground and modern infrastructure below. Public spaces are central to Diriyah's approach, improving mental health, reducing stress and elevating creative thinking – all key to inspiring innovation. These spaces are enhanced by natural elements, especially the restored Wadi Hanifah, a water channel which runs through the development, supporting green public parks and other accessible landscaped areas.

Supporting creativity

Diriyah's land use supports creativity and innovation, with zones dedicated to arts, media, education, technology, music and culture. The media and innovation district will host labs and sector-specific creative spaces, while proximity to King Saud University will encourage collaboration across academia, NGOs and industry. In the northern district, creative zones will integrate residential areas to cultivate dynamic, mixed-use neighbourhoods that inspire creativity by blending everyday living with cultural and entertainment experiences.

Through its physical infrastructure, Diriyah aims to achieve a balance between Saudi Arabia's rich traditional culture and contemporary lifestyle and placemaking. In doing so with a human-centric approach, Diriyah Company believes innovation will come naturally.

Source: Diriyah Company.[52]

Image credit: Diriyah Company.

Innovation districts must be socially sustainable

Social infrastructure, often overlooked, is becoming investable, but still needs support from governments. Greater fiscal autonomy can help cities invest directly in innovation. In Japan, for example, local governments have a good degree of fiscal autonomy, including more control over local tax revenues, compared to other more centralized systems such as the United Kingdom.[53] Involving local stakeholder organizations in the master-planning of innovation districts, including communities, businesses and academic institutions, is key to their success.

Embed these principles through context-specific planning

As demonstrated through the case studies, while the core components of innovation districts are broadly applicable, their implementation must be sensitive to local context and scale. For example, the City of Agadir's approach to urban innovation exemplifies a distributed model – developing specialized clusters across the city and leveraging its coastal location to focus on the ocean economy and agritech. At the same time, innovation is integrated city-wide, to address pressing challenges such as water scarcity and urban heat effects. (see Innovation District Spotlight 7).

Allied to this context-specific approach is the need for a clear, long-term vision – essential to avoid ad hoc development and to ensure a balanced alignment between public and private interests. Equally important is thinking beyond the physical boundaries of the district itself – echoing earlier points on governance – to consider wider urban systems and broader impacts on communities.

Although innovation is a key driver of successful districts, it cannot operate in isolation. It must be supported by integrated planning, policy and governance frameworks that provide stewardship and active management of the spaces created.

INNOVATION DISTRICT SPOTLIGHT 7

City of Agadir, Morocco – heritage-informed innovation for blue-green resilience

Overview

Agadir, Morocco's leading blue-green hub, demonstrates how historical governance principles can inform modern innovation ecosystems. The city's name, meaning "fortified community granary" in Amazigh, reflects centuries-old traditions of shared stewardship and collective risk management that now shape its approach to innovation.

Multiple clusters support ocean economy and agritech

As the anchor of Morocco's southern industrial corridor, Agadir leverages its coastal position to integrate an ocean economy with agricultural innovation. The ecosystem spans multiple specialized clusters:

- Technopark and Innovation City for start-ups.
- Regional centre of the National Institute of Fisheries Research (INRH) for fisheries science.
- Haliopole for seafood processing.
- Agrotech for agricultural innovation, supported by Ibn Zohr University's deep talent pipeline.

Innovation saves energy and water while boosting taxes

The city's centralized digital platform integrates real-time data across mobility, lighting, water and waste systems, enabling evidence-based decision-making. This systematic approach yields measurable impacts:

- 50% reduction in street-lighting energy use while doubling coverage.
- 60% greywater reuse saving 12 million cubic metres annually.
- 70% growth in local tax revenues reinvested in services and SME support.

Blue-green strategy embraces sustainability and growth

Agadir's blue-green strategy[54] addresses water scarcity through large-scale desalination for households and agriculture, while treated greywater irrigates urban green corridors. This integration of traditional governance wisdom with modern technology creates a replicable model for coastal cities facing climate challenges while pursuing innovation-led growth.

Source: City of Agadir.[55]
Image credit: City of Agadir.

4 Efficient and scalable digital infrastructure

This chapter investigates building technological foundations that support cutting-edge innovation while ensuring communities benefit.

Digital is no longer optional. The increasing ubiquity of digital services fundamentally changes how we navigate and experience places, how we collaborate and how we participate in the economy. Digital infrastructure is a critical element for innovation districts if they are to spearhead the breakthroughs that shape tomorrow.

Digital innovation is happening at pace. Same-day delivery is growing at a staggering 36% annually.[56] At industry level, the global delivery robotics market is set to increase from $500 million to nearly $5 billion by 2032,[57] while spending on edge computing is expected to reach $378 billion by 2028.[58] Digital innovation is also reflected in the job market, where the tech sector is creating jobs at six times the rate of the global economy. These are not distant projections – they are rapidly emerging market realities that are set to increase.

Innovation districts must capitalize on these transformations as they seek to attract businesses and talent that require the digital connectivity, data and services necessary to accelerate their innovation potential. Digital infrastructure is no longer a supporting amenity, but a critical enabler of entrepreneurship and technology testing. Whether supporting advanced manufacturing, providing mobility testbeds or simply offering digital platforms that help founders and entrepreneurs meet, districts must plan their digital foundations with the same rigour they apply to physical planning.

We must also recognize that the value of digital infrastructure and services ultimately depends on how people use them. A user-centred, long-term approach matters more than chasing the latest tech trends in the short-term.

Katie Adnams
Associate Director, Smart Places and Digital Infrastructure, Jacobs

4.1 **Delivering on the principles:** three components of digital infrastructure

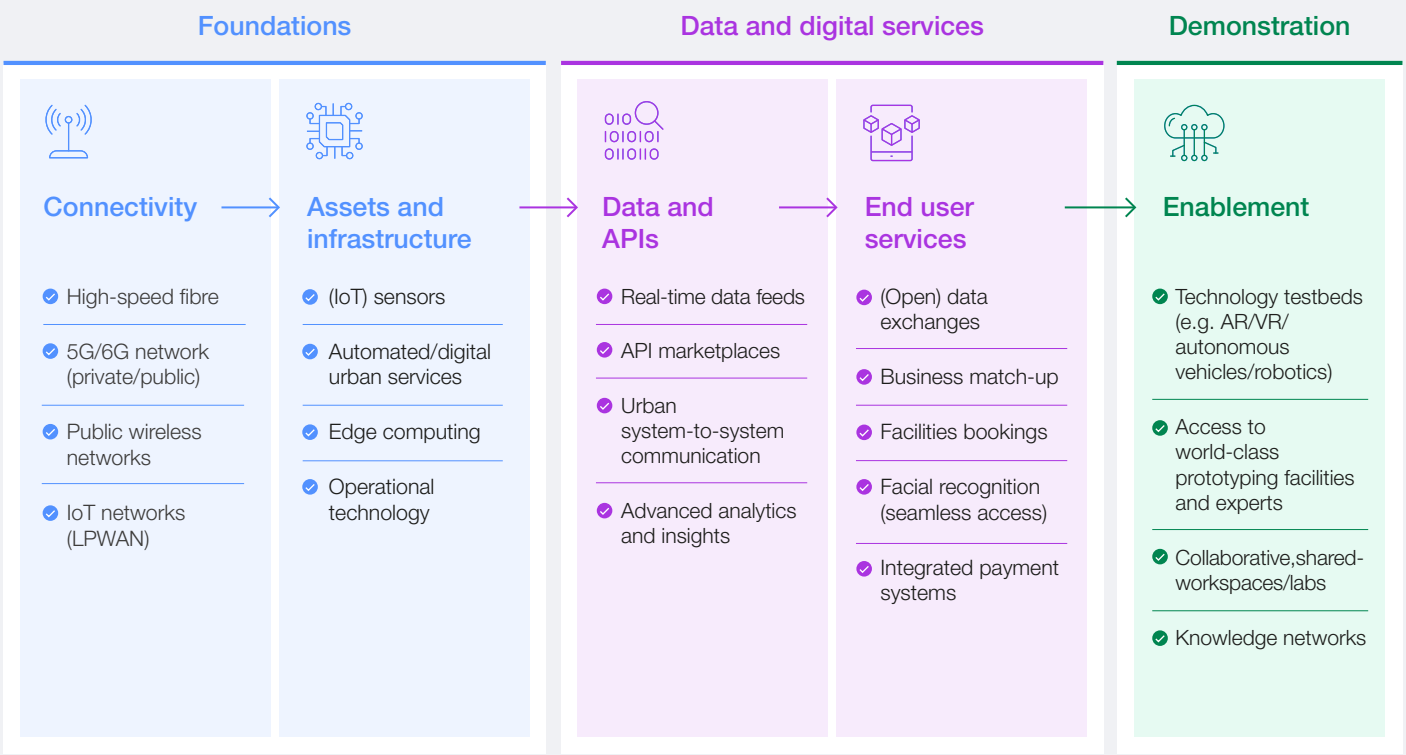
Innovation districts are living labs for technology testing, homes to smart city initiatives, hotbeds of collaboration and knowledge exchange for young companies testing robotic, AI and advanced engineering applications. They are also increasingly places offering enhanced liveability and services for discerning talent and local communities. These factors make digital infrastructure central to their vision, design and operation.

The challenge for innovation districts is to develop a baseline digital infrastructure that can flex and expand around both user needs and changes in requirement, based on shifting and accelerating technology trends. Crucially though, this must be linked to identity and purpose, as well as making economic and commercial sense. A decision to focus, for example, on advanced manufacturing heightens the need to plan digital infrastructure around low-latency[59] applications requiring real-time processing capabilities and access to high computational requirements, such as augmented and virtual reality and autonomous vehicles and robotics.

To make sense of digital technologies and the way in which they relate to other components of the ecosystem, as well as to the physical environment, digital infrastructure can be broken down into three main components (see Figure 3):

- Foundations.
- Data and digital services.
- Demonstration.

FIGURE 3 | **Innovation district digital infrastructure components**



Note: IoT = internet of things; LPWAN = low-power wide-area network, a type of wireless communication designed for IoT; API = application programming interface; AR/VR = augmented reality/virtual reality.

Source: Jacobs.

These components relate to areas of ecosystem activity that support and enable collaboration, such as effective governance structures and agreements to share data. The components also need to consider technology drivers, such as AI workloads and its "demand for compute" power, some of which will form part of the digital infrastructure offer within innovation districts.

These components embody some of the guiding principles of innovation by ensuring that digital foundations are:

Scalable, to support future growth.

Resilient, capable of adapting to evolving industry and societal demand.

Transparent in their design and operation of data and digital services.

Efficient through their creation of a future-proof digital environment – one that encourages experimentation and enables the innovations of tomorrow.

The following sections explore digital infrastructure foundations, data and digital services and demonstration in more detail, with reference to case studies including:

INNOVATION DISTRICT SPOTLIGHT 8:
Knowledge Quarter Liverpool, United Kingdom, demonstrates how public-private partnerships can deliver super-fast connectivity for tenants, while addressing the digital divide.

INNOVATION DISTRICT SPOTLIGHT 9:
Singapore's Punggol Digital District shows how digital infrastructure can be integrated into the design from the outset, to create a cutting-edge environment for testing innovation and optimising services.

INNOVATION DISTRICT SPOTLIGHT 10:
NTT East e-City Labo in Tokyo illustrates how emerging technologies powered by 5G can be effectively scaled and commercialised through a structured testbed approach. It covers four phases: proof of concept, commercial showcase, production testing, and business model development.

4.2 Foundations: connectivity, assets and infrastructure

Innovation districts must establish a foundational level of digital infrastructure, such as high-speed fibre and wireless networks, to support their users.

High-speed fibre

High-speed fibre is the backbone of modern digital infrastructure and a core element in the innovation district value proposition, enabling rapid data transmission essential for cloud computing, real-time collaboration and industry 4.0 applications. It supports the significant bandwidth requirements of emerging technologies and ensures reliable connectivity for businesses and tenants.

Wireless networks

Similarly, 5G networks provide the low latency and high-speed data transmission that can serve as the communications infrastructure for a dense network of smart city and IoT applications. When 6G arrives[60] (in 2030 at the earliest, for the United Kingdom) it will offer data rates reaching terabits per second – at least 100 times faster than 5G. This ultra-low latency, high-bandwidth environment will further boost the development and uptake of AI applications, while bringing down costs and increasing energy efficiency.

Given the substantial capital expenditure in digital infrastructure, along with ongoing operational expenses and the need to integrate with existing assets, innovation districts should consider the following:

- The possibility of securing private sector investment for enhanced security and control.
- Designing for significant, scaled-up IoT and deployment of edge computing,[61] to capitalize on low-latency benefits.
- How to establish robust cybersecurity frameworks.
- How to co-ordinate with municipal planning to speed-up permitting and share infrastructure.

Digital connectivity investment models

There are significant upfront infrastructure investments associated with digital connectivity, given the physical infrastructure maintenance and regulatory hurdles to consider. As such, the prevailing investment model for digital connectivity combines multiple partners and factors:

- Public sector for planning and regulatory support.
- Integration of connectivity into real estate developments.
- Private sector capital and expertise.
- Academic institutions providing research and development capacity.

The promoters of CENTRAL TECH, a 27,000 ft^2 innovation hub in Liverpool's Knowledge Quarter, understood the draw of unrivalled digital connectivity and internet infrastructure (see Innovation District Spotlight 8). They signed up to a long-term partnership with LCR Connect (a joint venture between the Liverpool City Region Combined Authority and the private sector ITS Technology Group) to create a public-private model capable of delivering affordable world-class connectivity. Doing so delivers gigabit-capable fibre network to tenants working in digital and engineering sectors, while enabling LCR Connect to expand the network to 345 km^2, helping to address the region's digital divide.

INNOVATION DISTRICT SPOTLIGHT 8

Knowledge Quarter Liverpool, United Kingdom – partnership-driven digital connectivity

Overview

Knowledge Quarter Liverpool (KQ Liverpool) demonstrates how strategic partnerships can transform digital infrastructure into a competitive advantage for innovation districts. Spanning more than half of Liverpool's city centre, this triple-helix partnership between universities, public sector and private industry has created one of the United Kingdom's foremost innovation districts through collaborative infrastructure development and deployment.

Stakeholders involved

Sciontec is the commercial spin-out development company of KQ Liverpool and its model is innovative. Bruntwood SciTech's investment into Sciontec in 2020 – alongside the University of Liverpool, Liverpool John Moores University and Liverpool City Council – catalysed the district's development company with the transformation of Liverpool Science Park, the progression of HEMISPHERE One and Two lab developments and the recently opened CENTRAL TECH building – all innovation hubs located across KQ Liverpool.

Public-private partnership shares costs and benefits of connectivity

Central to Sciontec's digital strategy is its partnership with LCR Connect, a joint venture between the Liverpool City Region Combined Authority and ITS Technology Group. This collaboration delivers gigabit-capable fibre networks to the district's digital and engineering-focused tenants at CENTRAL TECH. The partnership model splits ownership equally between public and private sectors, ensuring both commercial viability and public benefit. Rather than requiring massive upfront public investment, the partnership structure allows infrastructure costs to be shared while generating sustainable revenue streams.

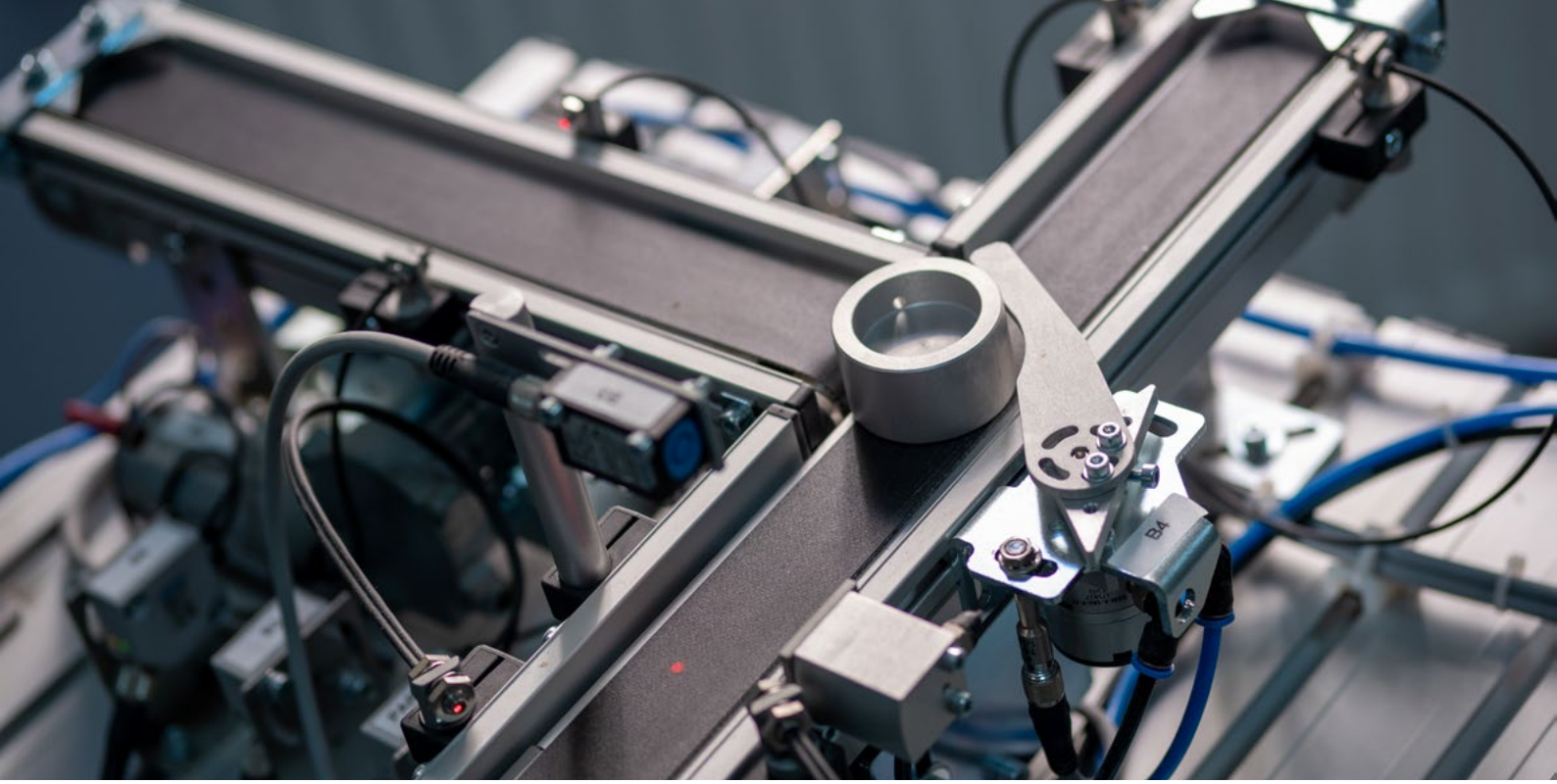
Addressing the region's digital divide

The approach extends beyond serving innovation district tenants. By anchoring demand through innovation districts such as KQ Liverpool, LCR Connect has expanded its network to cover 345 km^2 across the Liverpool City Region, directly addressing the digital divide that often accompanies innovation district development. This demonstrates how innovation districts can catalyse broader digital infrastructure improvements rather than creating isolated pockets of connectivity.

Offering local students a future in digital innovation

KQ Liverpool's inclusive innovation programmes further leverage this digital foundation. The KQ Futures initiative uses digital platforms as one way to engage over 1,400 local students annually, from aged 5-18 years, opening the way to careers in innovation. Virtual programming capabilities enable greater participation as well as breaking down barriers to see behind the closed doors of world-leading innovation hubs such as KQ Liverpool's Digital Innovation Facility. The KQ Futures programme is part-funded by the Liverpool City Region Combined Authority Innovation Zone, demonstrating the scale of the partnership with city authorities as well as the integration of policy-making, inclusive growth, and investment in infrastructure and economic development.

Source: Knowledge Quarter Liverpool.[62]
Image credit: Knowledge Quarter Liverpool.



IoT sensors

The extent to which innovation districts consider IoT sensor technology depends on the character, purpose and types of innovation clusters they seek to attract. Sensors enable data collection at a scale and granularity to enable smart city and smart building technologies, such as predictive maintenance and automated decision-making. Considerations for selecting an IoT sensor-supporting network include range, sensor power consumption, data rates and volumes (for low bandwidth), as well as computer vision, video applications and data security (for high bandwidth). As the planning stage provides only a partial view of IoT requirements for tenants, digital master planning approaches often have to estimate fixed connectivity requirements that will later accommodate these needs.

Edge computing

New autonomous, ultra time-sensitive urban service models, industrial automation, and applications in activities such as healthcare are increasingly reliant on ultra-low-latency data transmission. Edge computing helps maintain security and privacy by reducing the amount of data carried over networks and reducing bandwidth requirements. Distributed infrastructure can also enhance user experience in latency-sensitive smart city applications.

Operational technology

Broader operational technology is a foundational element for innovation districts, bridging the gap between information technology and industrial systems. A mix of hardware and software, operational technology is used to monitor and control physical systems from energy and transport systems to a host of IoT applications. It therefore plays a pivotal role in encouraging secure collaboration between ecosystem partners and enabling the piloting of new products and services. The degree to which an innovation district considers edge computing and operational technology will depend on its proposed activities and required return on investment for distributed computing infrastructure.

Collaborative ecosystem approach

Michigan Central (see Innovation District Spotlight 1) amply demonstrates the power of a collaborative ecosystem approach. One of North America's most comprehensive urban mobility testbeds, Michigan Central draws on Detroit's automotive heritage to advance the next generation of technologies that will shape the future of mobility and transportation. The 30-acre innovation hub features a Transportation Innovation Zone for mobility testing and a three-mile Advanced Aerial Innovation Region for air technology testing.

In addition, Michigan Central's venture platform and key ecosystem partner, NewLab, offers sophisticated, collaborative innovation environments with world-class prototyping and fabrication facilities. Newlab also provides a team of experts to help bring products and technologies to life.

This ecosystem approach is particularly effective in Detroit's mobility-focused innovation landscape, where automotive expertise is converging with autonomy and connectivity technologies.

4.3 Data sharing and digital services

Innovation districts must consider data sharing (from both a technical and governance perspective), as well as the right mix of digital services to provide to users.

Data sharing

Data sharing has the potential to enable collaboration and drive value through the convergence of data-hungry and data-generating digital technologies. As such, innovation districts must consider how they can target data-sharing initiatives and support their success through governance and data-sharing infrastructure and services.

Data sharing brings with it both technical and governance considerations. On the technical side, standards for interoperability, quality and real-time data feeds can consume time and budgets. On governance, innovation districts need clear data-sharing agreements to ensure responsible data sharing and use. These agreements must strike the right balance between protecting intellectual property, while enabling collaborative research and development between start-ups and established companies.

There are few better examples of data sharing impact than Open Banking, which has adoption rates reaching 12-15% of households across the United Kingdom, Brazil and the US.[63] Of relevance to innovation districts is how the early and intense focus on a regulatory and governance initiative created a thriving ecosystem driving innovation and consumer choice in financial services.

Singapore's Punggol Digital District (see Innovation District Spotlight 9) exemplifies the tangible benefits of data sharing for an innovation district. Its digital infrastructure is built around an Open Data Platform, which plays a central role in optimizing services and enhancing system performance by integrating and managing energy data across the district. Supported by digital twin and simulation technologies, the district is a testbed that facilitates real-world experimentation.

INNOVATION DISTRICT SPOTLIGHT 9

Punggol Digital District, Singapore

Overview

Punggol Digital District (PDD) is Singapore's first smart, sustainable innovation district.[64] The 50-hectare district is developed for key tech sectors such as cybersecurity, artificial intelligence, robotics, fintech and smart city solutions. With the Open Digital Platform (ODP) as its digital backbone, the district serves as a living lab for smart solutions.[65]

When fully developed, PDD will be a collaboration and innovation hub for 28,000 knowledge workers, 12,000 students from the Singapore Institute of Technology and more than 500 faculty and professional officers. By integrating businesses, academia and spaces for the community into one seamless ecosystem, it is a model for future innovation districts.

Key statistics

- **Size**: 50 hectares
- **Projected job creation**: 28,000 jobs
- **Students and faculty**: 12,000 students, 500+ faculty
- **Occupancy rate:** 65% (as of 2025)
- **Landscape replacement area**: 100%
- **Energy efficiency gains**: 30%
- **Smart grid output**: expected to produce up to 3,000 MWh/year when fully deployed, potential 20% energy savings through artificial intelligence and machine learning.

Stakeholders

- **Lead developer**: JTC, the Singapore Government's industrial master planner and developer.
- **Government agencies**: Cyber Security Agency of Singapore, Early Childhood Development Agency, Enterprise Singapore, Government Technology Agency of Singapore, Infocomm Media Development Authority, Land Transport Authority, National Environment Agency, National Parks Board, People's Association.
- **Academic partner**: Singapore Institute of Technology.
- **Industry partners**: Association of Information Security Professionals, dConstruct Robotics, OCBC Bank, Panasonic, United Overseas Bank, Wanxiang Singapore.

Digital infrastructure

Punggol Digital District's digital infrastructure is anchored by the ODP, which integrates real-time data from systems such as cooling, waste and energy to optimize operations and enable predictive and preventive analytics. The district features Singapore's first smart energy grid, combining solar panels and battery storage, managed via the ODP.[66] A district cooling system reduces energy consumption by 30%, while a pneumatic waste conveyance network streamlines refuse disposal.[67] Digital twin and simulation tools support rapid prototyping and real-world testing, making PDD a dynamic testbed for start-ups and researchers. Together, these technologies create a smart, efficient and innovation-ready urban environment.

Key success factors and lessons learned

- **Integrated planning**: co-location of academia and industry fosters real-time collaboration and talent development.
- **Flexible governance**: enterprise district model allows dynamic land use and planning.
- **Digital-physical synergy**: embedding digital infrastructure from the outset ensures seamless operations and innovation.
- **Community-centric design**: walkable, green and inclusive spaces enhance liveability and engagement.
- **Challenges addressed**: multi-agency coordination, cybersecurity and futureproofing digital systems were tackled through modular architecture and stakeholder engagement.

Source: JTC, Singapore, 2025.

Digital services

The everyday experience of an innovation district can be optimized through the integration of digital services. The cumulative effect of these services can encourage collaboration and connection, while ensuring security where it is needed. Below is a shortlist of digital service applications for innovation districts:

Community and collaboration

- Member/tenant management platforms create digital communities where members showcase skills and expertise. Like professional social networks, they enable skill searching, collaboration requests and partner discovery.
- Business matchmaking services use AI algorithms to analyse profiles and suggest relevant connections, matching start-ups with investors or connecting companies with service providers.
- Event management systems handle complete event lifecycles from planning to follow-up, including registration, invitations, attendance tracking and feedback collection.

Operations and commerce

- Integrated payment processing handles all district transactions through unified platforms supporting memberships, bookings and services.
- Digital access control replaces key cards with smartphone-based access, logging attempts and managing permissions remotely while integrating with visitor management systems.
- Communication and notification platforms serve as central communication hubs with push notifications, discussion forums and announcement boards segmented by user roles and interests.
- Analytics and reporting dashboards aggregate data from all systems to track utilization, engagement, revenue and costs, providing predictive analytics for demand forecasting and resource optimization.

Space and resource management

- Equipment and asset reservation manages shared tools such as 3D printers and fabrication equipment, while handling bookings, training certifications, maintenance schedules and usage instructions.
- Facility booking systems provide real-time scheduling for meeting rooms, labs and specialized equipment through web and mobile interfaces.

4.4 Demonstration and enablement

Testbeds are critically important to the success of young businesses seeking to innovate with advanced technologies, as they bridge the workbench, laboratory and real-world deployment.

Regulatory approvals

Innovation districts that streamline regulatory approvals and permissions can significantly accelerate the testing and eventual deployment of technologies. By working with relevant stakeholders and authorities, innovation districts can create conditions to allow companies to more easily test and prototype.

Facilities

Providing the facilities and infrastructure to test relevant technologies is an absolute requirement for innovation districts. The specific infrastructure required is dependent on the innovation district, but as an example, Michigan Central's urban mobility testbed has unique and highly valuable platform elements. These include physical assets supporting wired and wireless electric vehicle charging product development, as well as shared digital and physical infrastructure to support safe, scaled flight of small drones beyond visual line of sight.

Collaboration and knowledge networks

A collaborative innovation environment can provide benefits for the many users of the innovation district by increasing cross-sector partnerships and encouraging different companies to work together. Additionally, "external" actors – such as product realization experts, technical advisors and experienced collaborators – can help accelerate development timelines and reduce the complexities of moving from concept to physical prototype.

Business model integration

Integrating business model development into the demonstration and enablement process is critical to the success of the innovation district. For example, NTT East's e-City Labo in Tokyo evolved strategically across four phases: proof-of-concept development, commercialization showcase, production testbed and business model establishment (see Innovation District Spotlight 10). This has enabled the hub to develop two new business models – system integration and managed private 5G services – transforming niche infrastructure into mainstream technology solutions.

NTT East created a new private 5G market in Japan, generating over $35 million in revenue and securing leading market share. By engaging diverse stakeholders, including the University of Tokyo (a leader in 5G research) and the Tokyo Metropolitan Government (a supporter of corporate digital transformation), the facility has enabled dozens of companies to conduct trials of two-year periods, resulting in breakthrough applications in high-resolution video, robotics and end-to-end private 5G solutions.

INNOVATION DISTRICT SPOTLIGHT 10

NTT East – performance-driven governance in Japan's 5G innovation hub

Overview

In 2020, NTT East – a subsidiary of Nippon Telegraph and Telephone Corporation (NTT) – established the Local 5G Open Lab in Tokyo, becoming Japan's first innovation hub for private 5G technology following the country's December 2019 spectrum allocation.

Strategic governance

This facility has demonstrated how strategic governance can transform emerging technology into a viable market through four evolutionary phases:

- Proof-of-concept development.
- Commercialization showcase.
- Production testbed.
- Business model establishment.

Public-private partnership

The lab provides vendors and solution providers with access to actual private 5G networks for testing devices and developing use cases, significantly lowering adoption barriers. Strategic partnerships with the University of Tokyo (5G research leader) and Tokyo Metropolitan Government (corporate digital transformation supporter) have strengthened the ecosystem. Within two years, dozens of companies conducted trials, leading to breakthrough applications in high-resolution video, robotics and end-to-end solutions.

Smart factory model bridges "valley of death"

NTT East positions itself as the business owner, channelling outcomes into two models: system integration for complete onsite solutions and managed "as-a-service" offerings that make private 5G accessible at affordable prices. The lab's smart-factory environment bridges the "valley of death" between concept and deployment.

This governance model has generated over ¥5 billion (approximately $35 million) in cumulative revenue. Evolution into NTT e-City Labo has expanded the focus beyond private 5G to smart agriculture and disaster prevention, attracting 20,000+ international visitors and supporting 60+ business innovation projects.

Source: NTT East.[68]

5 From principles to practice

Distilling eight actions for innovation districts based on learnings from across the globe.

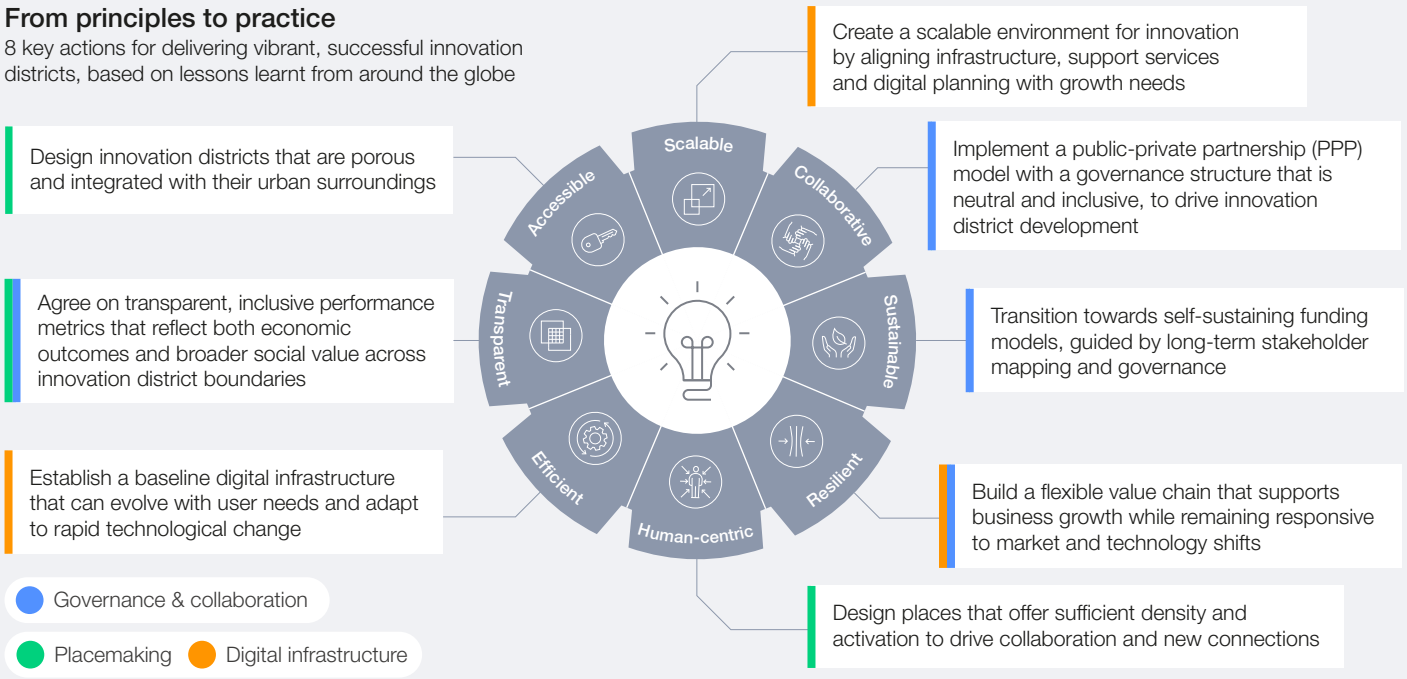
As the breadth of examples and experience in this report have shown, there is no single template for an innovation district – but rather, a rich diversity of inspiring models and practical lessons to draw from.

While each district must respond to its specific context, those that succeed in establishing themselves and scaling-up often do so by articulating a differentiated identity. Defining a clear USP that is regionally or (ideally) globally unique is essential. Innovation districts thrive when they have a distinct identity and market focus that attracts investment, talent and community support. The most successful districts position themselves as the best place in the world to pursue innovation in their chosen areas of focus.

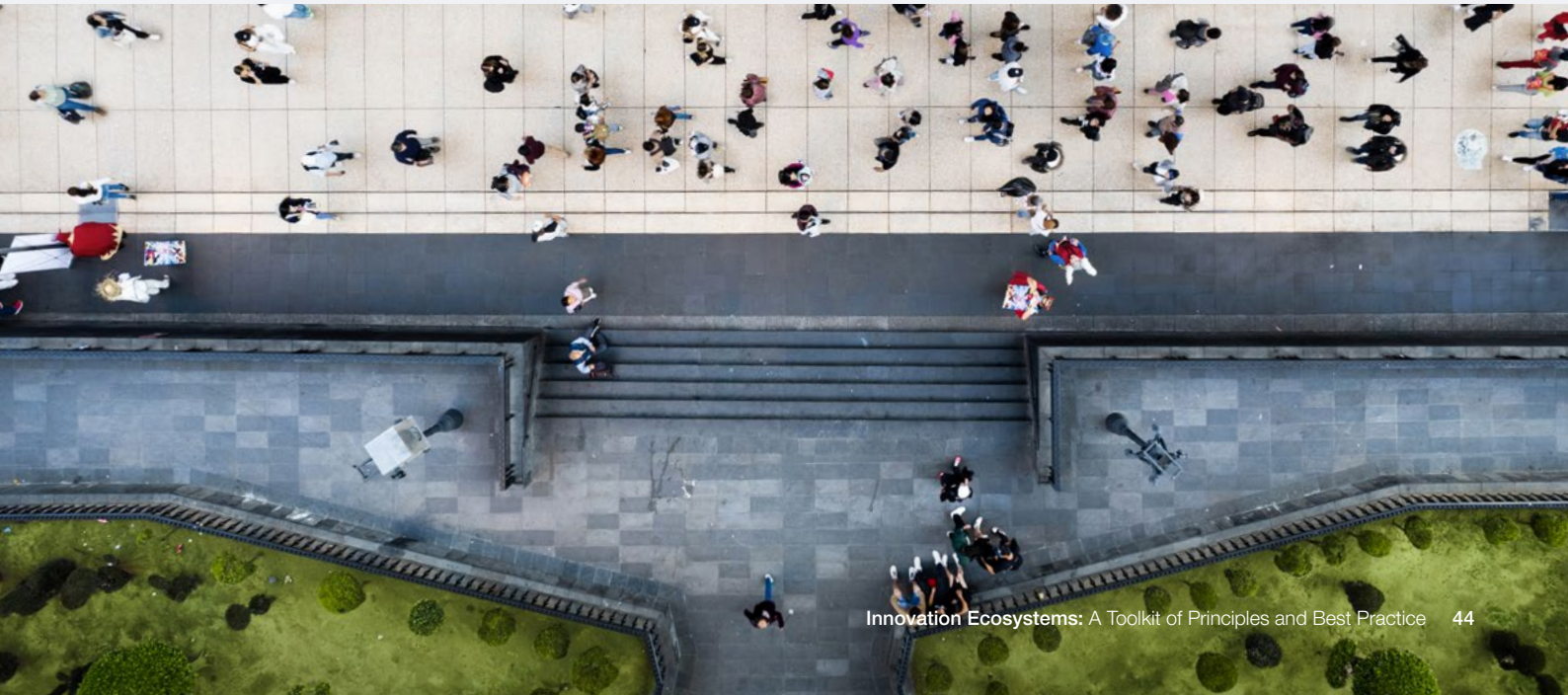
In parallel to creating this unique offer, there are several actions to be taken by innovation districts looking to get established and grow (see Figure 4). These eight actions demonstrate how the eight principles introduced in Chapter 1 can be applied in practice, underscoring the need for a comprehensive approach to place – one that considers both the physical environment and the way it is programmed to foster the collision of ideas essential to innovation.

The actions in Figure 4 are distilled from the core elements of governance and collaboration, placemaking and digital infrastructure explored in this toolkit, and reflect shared success factors drawn from global innovation districts featured as case studies throughout this report.

FIGURE 4 **Eight actions for innovation districts based on learnings from across the globe**



Source: Jacobs.



5.1 Eight actions for innovation districts to deliver the eight principles

Collaborative

Implement a public-private partnership (PPP) model with a governance structure that is neutral and inclusive, to drive innovation district development

Public-private collaboration is needed to balance diverse stakeholder interests while leveraging their strengths. Strategic boards can guide expansion and partnerships, operational leaders can manage programme delivery, while programmatic directors oversee daily execution. This clarity supports complementary contributions – government offers scale, academia provides research and talent, and industry delivers market access and commercial insight.

This structure must be neutral and welcoming to all industry players they serve, creating a level playing field for all competitors and participants. Places that are seen as the private province of a dominant industry player are typically shunned by others and will not be successful in achieving a reputation as a global or regional hub for innovation in an industry sector.

Sustainable

Transition towards self-sustaining funding models, guided by long-term stakeholder mapping and governance

While the "Sustainable" innovation principle also encompasses environmental and social dimensions, this action focuses on establishing self-sustaining funding mechanisms – a key success factor and common challenge identified across case studies. Innovation districts often rely on public and/or philanthropic funding at the outset, due to the financial limitations of early-stage start-ups. Over time, districts should shift towards self-sustaining economic models driven by corporate and start-up users, reducing reliance on public support while maintaining oversight. Mapping stakeholder roles and contributions from the beginning helps guide this transition. Flexibility is key, as funding strategies must adapt to changing political and economic landscapes.

Resilient

Build a flexible value chain that supports business growth while remaining responsive to market and technology shifts

This must be backed by a value chain that helps businesses expand, while remaining adaptable to future industry changes and macroeconomic shifts. Spaces should be designed with flexibility in mind, balancing modular and static needs to support both current operations and long-term evolution. Districts with large and diverse user bases (i.e. many small users) can achieve greater economic resilience.

Human-centric

Design places that offer sufficient density and activation to drive collaboration and new connections

The scale of a space shapes behaviour and the activation of that space drives mission and belonging. Environments that are vast and open can feel impersonal and discourage informal interaction. Spaces in innovation districts must be intentionally scaled, curated and activated. Research by MIT shows that collaboration is highest within a single building and dies away entirely beyond 800 metres of separation.[69] Consider creating a "central hub" in the middle of the district that acts as the catalyst for community-wide collaboration, giving the entire district a warm, identifiable heart.

Efficient

Establish a baseline digital infrastructure that can evolve with user needs and adapt to rapid technological change

Digital infrastructure should enable connectivity, data exchange and digital services that reduce administrative friction and support collaboration and testing environments. Infrastructure must align with the district's identity and sector focus. Specialisms such as autonomous vehicles, robotics and advanced manufacturing require low-latency connectivity and environmental sensing, making resilient, high-performance digital infrastructure essential.

Transparent

Agree on transparent, inclusive performance metrics that reflect both economic outcomes and broader social value across innovation district boundaries

As innovation districts grow, performance measurement must be transparent and should evolve to capture both quantitative results (e.g. start-up survival, investment) and qualitative impacts (e.g. local employment, public amenities, housing). Metrics should extend beyond formal boundaries to reflect wider economic and social contributions to the area.

Accessible

Design innovation districts that are porous and integrated with their urban surroundings

Innovation districts must be more than just workplace clusters – they should be vibrant, inclusive neighbourhoods. Permeable design and inclusive programming foster trust, engagement and long-term value by ensuring that innovation benefits are shared beyond district boundaries, whether by providing local business support, jobs or upskilling opportunities.

Scalable

Create a scalable environment for innovation by aligning infrastructure, support services and digital planning with growth needs

Scaling-up innovation requires more than market focus – it demands access to testbeds, investors, venture capital and expert guidance on strategy, IP and productization. The infrastructure itself must be scalable and resilient. Co-developing a digital roadmap with providers, tenants and industry leaders helps anticipate future connectivity needs and align with emerging trends, ensuring competitiveness and readiness for new technologies and industries.

5.2 Ten sequential steps to embed key actions for maximum success

While the eight key actions outlined above are relevant to innovation districts at any stage of their lifecycle, emerging districts have a unique opportunity to embed these from the outset – significantly enhancing their potential for success. To achieve this, the following 10 sequential steps should be taken:

BOX 1

10 steps to success

1 Gather the players and set up the governance

Identify the public, private and academic stakeholders in the location and build a consensus that an innovation district is possible, scalable and desirable in your location. Agree on shared incentives and a structure for collaboration.

2 Establish a shared vision for the district among all stakeholders

For what industries will you become the "best in the world" or at least the best in your part of the world? Ensure that the vision is welcoming to all players, to attract the best emerging businesses, ideas, research and talent.

3 Build your advisory team

Identify the placemaking, infrastructure and innovation district experts that can help you refine your plan.

4 Build a strategy for differentiation

What are the concrete moves you will make to convince leading innovators from around the world to relocate or build in your location?

5 Define what success looks like, both within and beyond the innovation district

Set out an evaluation plan and metrics that go beyond the physical boundary of the innovation district to ensure benefits are felt by the wider area.

6 Build the budget

Assess and plan the investments needed to "win" as a best in the world destination for your target innovators, with a view to creating a self-sustaining business model over time.

7 Secure the capital

Identify and secure the necessary capital, often from public sources in early phases.

8 Design the place

Achieving excellence in both urban design and innovation campus specifications is essential, but it is too often left as a detail rather than treated as a defining feature. Plan for world-class "hardware" for your innovation district.

9 Plan the infrastructure

Ensure the infrastructure can support future sector and industry needs, by planning for it from the start. Digital infrastructure, like good placemaking, can often be overlooked, to the detriment of innovation district success.

10 Create the programme for collaboration

Design the activities and programmes necessary to succeed with your strategy. The focus should be on how to attract and retain world-class innovators and enable them to collaborate intensively.

The success and dynamism of innovation districts today showcase the potential for the kind of transformational, positive change that can grow economies and support communities – whether through reducing humanity's carbon footprint, discovering the next breakthrough cancer treatment or creating more equitable societies.

The innovation districts highlighted throughout this report are testament to the tenacity and collaborative spirit of diverse people and the breakthrough ideas that result from bringing them together in spaces that are imaginative, efficient and inspiring. They establish a legacy from which to learn and build upon for decades to come.

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