

Executive summary

Innovation is at the heart of competitive advantage for firms and economies. It takes many forms – from improvements in products and processes through to new services, products and ways of doing business. It underlies productivity at the firm level and the creation of jobs throughout the economy. In many cases it can lead to success in global markets.

Innovative firms can be anywhere, from city to regional areas. Often they may cluster together, perhaps sharing common services or forming part of a supply chain for a larger firm or industry. Wherever they are located, they underpin the economic prosperity of NSW.

Over the last few decades, a new generation of technologies and increased connectivity has driven an unprecedented change in the scale, depth, speed and spread of innovation across industries. This has been described as the emergence of a globalised innovation economy. One feature of this innovation economy has been the increasing importance of agglomeration – where businesses concentrate in specific geographic areas to match skills, to collaborate, or to share knowledge and resources in a cost-effective way.

Concentrated place-based innovation activity, often referred to as an ‘innovation precinct’, is increasingly seen as key to offering economic and productivity advantages to businesses, investors, and workers. They create market visibility and identity for industry and research clusters and build on the opportunities and characteristics of their location. The proximity between firms, institutions and investors enhances collaboration, attracts skilled workers and provides the spaces and infrastructure that suit the various participants – anchor tenants, businesses, research organisations, investors, entrepreneurs, incubators and accelerators.

Unsurprisingly, there is global interest by governments, businesses and research institutions in developing and fostering innovation precincts.

In NSW, innovation precincts are emerging in cities, in regions and in greenfield and brownfield developments.

Locations across NSW have strengths in a range of sectors including healthcare, scientific instruments, financial and business services, biopharmaceuticals, defence, software and communications, ag-tech, engineering and creative industries. These precincts are frequently centred around universities, research-intensive local health districts with large hospitals such as Westmead Hospital, major infrastructure or significant research facilities, such as the Australian Nuclear Science and Technology Organisation (ANSTO) facility.

Their opportunities are anchored to their unique place-based characteristics and innovation ecosystem, including NSW's strong research sector and skilled workforce. Globally, significant innovation precincts take years to develop, and strong market drivers are critical to their success. The NSW Government, the Greater Sydney Commission and other organisations including universities and major hospitals, are supporting emerging precincts to become more competitive, to grow and to drive economic activity and create high-value jobs. This support needs to involve multiple stakeholders and be coordinated and long-term in its approach.

Side by side with innovation precincts, other place-based innovation activities, clusters and collaboration areas are emerging and adding to the range of innovation location sizes, types and sectors that are needed to create a diverse innovation ecosystem in NSW. These activities benefit the broader economy as they provide important multipliers, spillovers and agglomeration advantages.

Lessons from international experience

This report has been developed by the NSW Innovation and Productivity Council as a resource for local, state and federal government agencies, universities, local health districts, and the wide range of actors in the innovation ecosystem – from large businesses, property developers and real estate providers, through to small to medium-sized enterprises (SMEs), startups and accelerators.

Drawing on case studies and international examples, the report provides stakeholders with a clear view of what makes innovation precincts succeed or falter and builds upon previous work by the NSW Innovation and Productivity Council on the innovation economy.

It aims to educate and encourage innovation precinct stakeholders to draw on the lessons from international experience in assessing the strengths, weaknesses, opportunities and priority actions for their individual precincts.

The complex mix of stakeholders, economic drivers and local factors needed for innovation precincts to succeed makes them particularly vulnerable to the market failures that hinder innovation more generally. The tendency for firms to under-invest in innovation, the information gaps between investors and startups, or between business and knowledge institutions, and the governance and coordination failures within and between the different stakeholders in the innovation ecosystem can all keep a precinct from reaching its potential. This report encourages better coordination between stakeholders.

Innovation locations vary in size, scale and stage of development, but only a few will grow to become high-profile, international innovation precincts. Whether the innovation precincts emerging in NSW will achieve global recognition depends on multiple factors, including the size of the market opportunity, the competitiveness of the local research and industry strengths, and the capacity of research, business and entrepreneurial stakeholders to work together to maximise the opportunity in collaboration with government.

The potential benefits of innovation precincts

Successful innovation precincts deliver benefits to local and national economies – from higher wages and quality jobs for workers to superior products for consumers and higher tax revenues for government. There are many examples of innovation precincts demonstrating higher than average productivity and firm growth, and firms located in a precinct experiencing higher than average export growth.

Successful innovation precincts make an outsized contribution to the economy and are more resilient to economic downturns. The clustering of industries in precincts facilitates collaboration, knowledge flows and knowledge spillovers between industry, researchers and entrepreneurs, which plays a critical role in increased levels of innovation, particularly for new ventures. Higher rates of innovation also mean an increased capacity to deliver products and services at reduced cost to the consumer.

Successful precincts make productive use of land and buildings and capture more returns on sunk public investments in infrastructure facilities, government funding for research and development and the education of workers. Precincts can offer a means for NSW to better leverage investments in major assets such as hospitals, universities and airports and to accelerate an economic transition to a more diversified economy.

What does success look like?

Some precincts emerge organically, others are catalysed by targeted investment, and a small number are shaped by government programs. Irrespective of their beginnings, the experience of globally significant innovation precincts suggests seven broad factors for success:



1 Market drivers

Strong market demand for the goods or services; competitive pressure in the sector to innovate; access to markets, skills and investors; reliability of the jurisdictional legal and intellectual property (IP) protections and the competitive regulatory environment needed for a well-functioning innovation economy.



2 Competitive advantage

Clearly defined market advantage or sector specialisation that is communicated through strong branding to attract and retain talented workers and financial investment, supported by pro-productivity regulatory settings.



3 Collaboration

Facilities and programs to support collaboration between diverse organisations – from spaces for informal social ‘collisions’ through to commercial frameworks for joint ventures.



4 Infrastructure

Physical, transport and digital infrastructure that supports research, innovation activity and business connectivity within and outside of the precinct.



5 Amenity

A vibrant and liveable location that attracts people to work, play and live there. It offers a sense of place for participants in the innovation ecosystem and the workers that provide ancillary services to the precinct and is underpinned by flexible and adaptive land use planning regulations and the provision of well-designed local cultural infrastructure.



6 Enterprise culture

Strong entrepreneurial culture of risk-taking, collaboration and sharing ideas. This culture is supported by mentoring programs and a diversity of organisations and workers, and is influenced by the culture of the anchor institution.



7 Leadership

Robust governance, strong leadership, political commitment and a shared vision.

Barriers to success

Efforts to establish and grow innovation precincts are not always successful. As locations for the creation of new-to-market and new-to-firm innovations, precincts are affected by the same types of risks and barriers that hinder innovation more generally. International research suggests a number of factors are at play in precincts that falter:

Weak market demand

Precincts may not have the factors needed for them to be economically viable, or there may be little evidence of new economic activity or innovation from businesses locating there. There are also risks when precincts are established primarily because of political will rather than market demand.

Barriers to investment and commercialisation

Factors that impact the investment in and commercialisation of research and development (R&D) will slow innovation activity and the success of precincts. These can include restrictive intellectual property controls, a closed academic culture and a tendency for industry to under-invest in research.

Lack of entrepreneurial culture

The precinct may not provide quality incubator and accelerator programs or other support needed for precinct participants to interact collaboratively with startups and smaller firms.

Poor access to capital

Firms in startup and growth phases may not be able to access enough capital from angel and venture capital investors, standard investment groups or public funding.

Poor access to skills

Local skills shortages can hinder the capacity of the precinct to innovate and scale.

Poor place-making and connectivity

Insufficient amenity, inadequate public transport and poor tenant infrastructure will reduce the attractiveness of the precinct to employers, workers and startups.

Restrictive regulation and a lack of policy support and coordination

Policies and long-term funding decisions of stakeholders may not support the new technologies, emerging business models and changing demand for skills that are central to successful precincts. Planning regulations can create financial or bureaucratic impediments to zoning land to support mixed uses, while poor IP regulations can restrict knowledge sharing and have a negative impact on innovation activity in the economy.

NSW innovation precincts

A broad-range of place-based innovation activity is occurring across NSW in a range of sectors including healthcare, scientific instruments, financial and business services, biopharmaceuticals, defence, software and communications, agtech, engineering and creative industries. These innovation locations span different scales – from a single building to a cluster of affiliated locations to an innovation corridor defined by the opportunities and characteristics of the location. A number of them are developing into innovation precincts where research and business collaborations are attracting capital and fostering further innovation.

Drawing on international research, precincts developing in NSW can be broadly categorised under four typologies:

- 1 Health and education innovation precincts
- 2 Innovation precincts around universities
- 3 Innovation precincts around a major asset
- 4 Inner city innovation locations.

In NSW, health and education innovation precincts are developing around some of the major research hospitals and universities, including the Randwick Health and Education Precincts, the Westmead Health and Education Precinct and the Camperdown Ultimo Health and Education Precinct. These have built an active network of medical research institutions, ancillary facilities and a mix of complementary industry tenants. The Greater Sydney Commission's *A Metropolis of Three Cities* also identified additional health and education precincts for future expansion.

Innovation precincts are developing around universities in NSW, including regional precincts around the University of New England in Armidale and the Charles Sturt University campuses in Bathurst and Wagga Wagga. These innovation precincts are leveraging their research strengths and assets to attract business and investment across a range of disciplines that include digital technology, biotechnology, agricultural technology, and creative industries.

Specialist precincts are emerging in NSW around major assets to leverage the large public investment and access to supply chains. These include the Australian Nuclear Science and Technology Organisation (ANSTO) precinct in applied nuclear science and technology, the emerging precinct around the Williamstown Aerospace Centre near Newcastle for aerospace and defence, and the GATE in Orange that is designed to develop agtech ideas and fast-track the adoption of agricultural R&D.

Innovation precincts are developing in inner city locations around the Sydney CBD including the Sydney Startup Hub, Central to Eveleigh and in North Sydney to take advantage of the growing entrepreneurial and innovation activity in digital and financial technology. The large mix of creative talent has also created a dense innovation corridor of creative industries across Surry Hills, Redfern (including Australian Technology Park) and Moore Park.

Two innovation precincts are also proposed close to the future Western Sydney Airport to leverage its links to global supply chains and access to new export partners: the Western Sydney Aerospace and Defence Industries Precinct; and Luddenham Science Park, with a focus on advanced science, technology, engineering and maths (STEM) research and development.

The role of stakeholders

Precinct development is driven primarily by market forces and the preferences of workers and businesses, and relies on effective governance and collaboration between institutions, industry, entrepreneurs, investors and land owners. Pro-innovation government policies, regulations and planning settings are also needed to create the right environment.

Institutions, businesses and entrepreneurs

Institutions such as universities, research-intensive hospitals and defence facilities are often the catalyst and coordinator of precincts as they provide the scale and appetite to catalyse innovation activity and act as anchors to attract and retain talent and capital.

Innovation businesses provide important network and knowledge sharing opportunities and can further connect the precinct to the broader supply chain of connected businesses, while entrepreneurs provide the vision, enthusiasm and risk-taking appetite that are important ingredients in an innovation precinct.

Investors, accelerators and incubators and real estate partners

Investors provide the capital and expertise needed to finance ventures that commercialise product and process innovations. Accelerator and incubator programs also support early stage firm development and are critical to the success of an innovation precinct and the innovation ecosystem more broadly. Real estate developers are increasingly acting to facilitate and foster innovation precincts.

The role of government

The activity of a precinct and its level of success and sustainability will ultimately be driven by the businesses, institutions, entrepreneurs and researchers working there. Governments provide the microeconomic and tax policies to support business development, and policies that facilitate the attraction of skilled workers and protect IP. As the major funder of universities, the Australian Government can also provide incentives for universities to collaborate more effectively with industry and the community. Local government can play a role in community leadership and land use planning and regulation. It can help promote and brand a precinct and, where appropriate, co-locate staff and facilities within a precinct.

State governments are instrumental in creating a regulatory and business climate that supports firm growth and economic activity. They also control planning, infrastructure and program levers that can shape and foster precinct development, particularly when well-coordinated across portfolios. They can also assist in bringing stakeholders together to assess opportunities and foster collaboration.

State governments have a leadership role in precinct development at the point of making catalytic public investments that have the potential to change the innovation landscape. These can include the development of major facilities, such as the significant infrastructure investment to support the Randwick Health and Education Precinct, Westmead Health and Education Precinct and the Western Sydney Airport. A proactive approach to identifying key success factors and priority actions, coordinating government programs and working with stakeholders helps such efforts to drive the development of a successful innovation precinct.

Next steps

This report provides a basis for understanding the success factors for globally recognised precincts that could be used to support successful precinct development in NSW. It is not a government strategy, nor an assessment of the potential of existing or planned innovation precincts in NSW.

The NSW Innovation and Productivity Council encourages stakeholders to use the information in this report as a starting point for their own assessments of the strengths, weaknesses and opportunities for individual innovation precincts in NSW.

Public or private support for innovation precincts ought to be assessed on a case-by-case basis, proportional to the market opportunity, sustained over the longer term and coordinated with the activities of other major stakeholders and the wider innovation economy.

Introduction

This report provides a review of the drivers, benefits and common barriers to successful innovation precincts. It is based on a review of international experience and informed by local stakeholder consultations. It builds on work already published by the NSW Innovation and Productivity Council on the innovation economy.

The innovation economy and innovation precincts

The speed of technological change together with growing global integration and competition has significantly increased innovation activity. An 'innovation economy' is emerging rapidly as a new generation of technologies, combined with smart enterprise models and investment capital, transform both established and emerging industries. This economy depends on a strong and connected 'innovation ecosystem' of firms, institutions, customers, infrastructure, supply chains, labour markets and investment systems to drive business creation, capitalisation, and growth.

A new generation of technology-powered industries and firms that rely on proximity to markets as well as a talent pool that prefers urban locations and lifestyles is leading to a concentration of innovation activity in geographic areas.

Although technology increasingly enables work to be done remotely, innovation is supported by face-to-face collaborations. This has led businesses and institutions to co-locate to share knowledge, services and infrastructure. When such locations start to gain economic momentum they come to be known as innovation hubs, clusters, or districts. In Australia, these large innovation locations are generally referred to as 'innovation precincts' (Chapter 1).

Growing interest in innovation precincts

Firms are attracted to innovation precincts because they offer access to skilled workers and knowledge-sharing opportunities. Businesses, workers, entrepreneurs, researchers, students, and investors gain advantages from the proximity and interaction that precincts make possible. Collaborators such as universities, hospitals and other anchor institutions help to create dynamic working environments that are attractive to investors and skilled workers.

Governments seek to foster precincts because they can support industries, firms, workers and places to embrace economic transition and enterprise opportunity, and deliver economic benefits through new knowledge-intensive jobs and improved economic resilience.

Precincts can play a key role in increasing the visibility of the local innovation economy, supporting the branding of specific clusters of expertise and signalling investment or trade opportunities to markets.

The international experience

Studies of globally recognised precincts show that successful precincts can have a positive impact on local and national economies. Globally recognised precincts are distinguished from smaller clusters of innovating businesses by the degree of this impact. The most significant innovation precincts translate science and discovery into leading patents, new processes or products for multiple industries and increase internationally-traded IP and new innovations that disrupt whole industries.

Precincts seem to offer a means to accelerate economic transition to advanced sectors and support a diversified economy to deliver multiplier and spillover benefits (Chapter 2) – including increased disposable income, deepening of supply chains, talent development and retention, urban restructuring and more optimal use of land and buildings. They can also support education and skill development through the co-location of universities and research institutes, industry and startups that include student internships, collaborative research projects and student startups.

Not all precincts are successful or deliver such tangible benefits. Review of the international literature shows that there are multiple factors needed to drive success (Chapter 3), and that work to inhibit the precinct (Chapter 4) shows the importance of understanding how these factors might shape the opportunities and commercial potential of NSW precincts.

The NSW context

There is a significant body of government-supported innovation activity across NSW, and a number of innovation precincts developing in key locations (Chapter 5), but there is no single agency responsible for precinct development and support. NSW Government support for innovation precincts is shaped by a range of policy drivers and a suite of targeted actions delivered by multiple agencies under related strategies such as its whole-of-government Innovation Strategy, Jobs for NSW, *A Metropolis of Three Cities*, Future Transport 2056 and the NSW State Infrastructure Strategy. A range of NSW Government programs and services also support key participants within the broader innovation ecosystem where there is a net benefit to the NSW community, including support for SMEs, startups and entrepreneurs.

This report aims to provide a shared understanding of the success factors of globally recognised precincts to guide the efforts of government, industry, research, and other stakeholders (Chapter 6) in developing the emerging innovation locations in NSW.

Report overview

Chapter 1 provides global context on the phenomenon of innovation precincts, their multiple types and formats, and their different stages of evolution and maturity.

Chapter 2 details the potential benefits from successful precincts across a range of indicators.

Chapter 3 examines the ingredients of globally recognised precincts, and identifies seven distinct factors for success.

Chapter 4 looks at the common reasons for the failure of precinct projects, and illustrates some of the factors that can impede precinct development.

Chapter 5 observes four broad types of innovation precinct that are emerging in NSW, and maps the developing and proposed innovation precincts across NSW.

Chapter 6 identifies the key stakeholders that are essential to the success of precincts and their capacity to maintain their competitiveness through multiple economic and political cycles.