

# Economic Importance of the Macquarie Park Innovation District in the Local, State, and National Economy

Prepared for Macquarie University

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Level 4, 143 Macquarie Street,  
Sydney NSW  
Australia 2000

**T** 1300 800 984

**E** [requests@biointellect.com](mailto:requests@biointellect.com)

**[www.biointellect.com](http://www.biointellect.com)**

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# Abbreviations

Abbreviation	Description
BTR	Build To Rent
CBD	Central Business District
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTU	Clinical Trials Unit
EIA	Economic Impact Assessment
FSR	Floor Space Ratio
FTE	Full time equivalent
GCHKP	Gold Coast Health and Knowledge Precinct
GDP	Gross Domestic Product
GCC	Greater Cities Commission
GMP	Good Manufacturing Practice
GNI	Gross National Income
GRP	Gross Regional Product
I-O	Input-Output
GSP	Gross State Product
IP	Intellectual Property
LGA	Local Government Area
MPID	Macquarie Park Innovation District
MTP	Monash Technology Precinct
NRF	National Reconstruction Fund
NSW	New South Wales
OECD	Organisation for Economic Cooperation and Development
OGTR	Office of the Gene Technology
PPP	Public-Private Partnerships
PV	Present Value
mRNA	Messenger RNA
sRNA	Synthetic RNA
R&D	Research and Development
SME	Small and Medium sized Enterprises
TFP	Total Factor Productivity
TGA	Therapeutic Goods Administration
TOD	Transit Oriented Development

<b>Abbreviation</b>	<b>Description</b>
BTR	Build To Rent
CBD	Central Business District
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTU	Clinical Trials Unit
EIA	Economic Impact Assessment
FSR	Floor Space Ratio
WFH	Working From Home

# Executive Summary

Macquarie Park Innovation District (MPID) is Australia's first innovation district, home to the world-class Macquarie University, headquarters of multi-national organisations, start-up, scale-up and established Australian businesses across a variety of high growth, deep technology sectors. MPID's strengths include its diverse innovation activity, proximity to key population areas and Sydney's CBD, and access to a pipeline of talent via partnership with Macquarie University. Opportunities to build upon this ecosystem of innovation-driven economic growth are vast.

The New South Wales (NSW) Government exhibited the Macquarie Park Innovation Precinct – Stage 1 rezoning proposal ('the rezoning proposal') in late 2023. Macquarie University commissioned Biointellect to conduct an independent review of the evidence base regarding the rezoning proposal, to highlight the value of innovation activity at MPID and the importance of considering the potential economic impact of the rezoning proposal on the innovation ecosystem. This report draws on a review of the published and grey literature and is supplemented by key stakeholder consultations.

## Economic importance of MPID

MPID has been a remarkable economic success story. Today, MPID hosts leading organisations in high value adding sectors including financial services, professional, scientific, and technical services, property services, information media, telecommunications, and health<sup>1</sup>. MPID and the surrounding Ryde Local Government Area (LGA) contribute immensely to NSW and Australia's prosperity, acting as a long-term growth engine for an innovation and knowledge-based economy:

- MPID makes a sizeable annual economic contribution of approximately \$13.6 billion<sup>2,3</sup>. This represents more than half of the Ryde LGA's gross regional product (GRP), seeing the LGA, along with North Sydney, place behind only the City of Sydney in contributing to NSW's Gross State Product (GSP)<sup>4,5</sup>.
- MPID possesses a highly educated, highly productive, high-income workforce of more than 63,000<sup>6</sup>, with plans provisioning for tens of thousands of additional jobs under the Macquarie Park Place Strategy<sup>7</sup>.
- A precinct comprising a diverse set of innovation-driven, research and development (R&D) intensive industry sectors, with the second largest centre for R&D in Greater Sydney, estimated at over \$700 million annually in 2020<sup>8</sup>.

<sup>1</sup> NSW Treasury. (2023). *About the NSW economy*. <https://www.treasury.nsw.gov.au/nsw-economy/about-nsw-economy>

<sup>2</sup> REMPLAN Economy. (2024). *Value-Added Report - Productivity*. Data sourced from ABS.

<sup>3</sup> REMPLAN Economy. (2024). *Employment Report*. Data sourced from the ABS. *Economic contribution is the product of number of employees in the defined region multiplied by value-add (productivity) per worker.*

<sup>4</sup> SGS Economics. (2019). *Economic performance of Australia's cities and regions*. [https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning\\_Economic-Performance-of-Australian-Cities-and-Regions.pdf](https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning_Economic-Performance-of-Australian-Cities-and-Regions.pdf)

<sup>5</sup> idCommunity. (2023). *North Sydney Council Area Gross product*. <https://economy.id.com.au/north-sydney/gross-product>

<sup>6</sup> REMPLAN Economy. (2024). *Employment Report*. Data sourced from the ABS. *This includes all workers in the region defined by ABS industry classification. Note this excludes from consideration retail employees and Macquarie University employees on the basis the former is not considered to contribute to knowledge and innovation in classical economic sense and latter is not strictly a commercial institution (higher education) although it still critically contributes to the MPID ecosystem.*

<sup>7</sup> New South Wales Government. (2022). *Macquarie Park Place Strategy*. <https://www.planningportal.nsw.gov.au/draftplans/made-and-finalised/macquarie-park-place-strategy>

<sup>8</sup> City of Ryde. (2020). *Economic Development Strategy 2020 to 2024*. <https://www.ryde.nsw.gov.au/Council/Plans-and-Publications/Economic-Development-Strategy>

MPID's industrial profile encompasses higher education, research, innovative and emerging industries, which together are expected to generate continuous, high levels of R&D activity and make an important contribution to the continued growth of NSW and Australian productivity and economic output. CSIRO (2021) has estimated that the economy-wide returns on every \$1 dollar of R&D investment are approximately \$21 (or \$3.50 in present value terms, as benefits accrue into the future)<sup>9</sup>.

**Innovative industries at the MPID, with high levels of R&D expenditure, are a clear driver of economic prosperity for NSW and Australia.** Even with conservative assumptions about the level of annual expenditure on R&D currently at MPID (estimated at \$732 million annually in 2020<sup>10</sup>), this **R&D activity at MPID translates into an estimated \$2.6 billion additional Australian Gross Domestic Product (GDP)** (present value)<sup>11</sup>. Assuming NSW takes a share of this growth in output equivalent to its share of Australian GDP (31%)<sup>12</sup>, **this represents approximately \$780 million incrementally annually to the NSW GSP** (present value).

**It is critical that the specific contributions of MPID and its future potential to attract and increase investment in R&D in Australia be considered in decisions regarding the future use of land and the mix of organisations that are targeted to locate or invest in MPID.**

## Review of the economic impact assessment of the MPID rezoning proposal

The rezoning proposal establishes the MU1 zone and provides greater flexibility in the E2 and E3 commercial zones to construct build-to-rent (BTR) developments at MPID, accompanied by incentives that are understood by stakeholders to increase the immediate attractiveness of BTR developments.

An economic impact assessment (EIA) exhibited alongside the rezoning proposal focuses on the direct and indirect impacts on the creation of jobs and dwellings, and the contribution to economic output. The value framework utilised to conduct the EIA excludes the value of R&D generated by future commercial development of MPID. Given the long-term benefits of R&D for the economy highlighted by CSIRO, underinvestment in R&D-intensive sectors at MPID represents a significant opportunity cost, both now and into the future and has implications for the regional, NSW and Australian economies.

Focusing on the flexibly zoned E2 and E3 zones under the rezoning proposal, we estimate the opportunity cost of lost R&D activity in the context of the EIA, where BTR developments are pursued in place of commercial developments, and the impact that this has, longer-term on GSP and GDP.

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<sup>9</sup> CSIRO Futures. (2021) *Quantifying Australia's returns to innovation*. CSIRO, Canberra.  
<https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

<sup>10</sup> City of Ryde. (2020). *Economic Development Strategy 2020 to 2024*. <https://www.ryde.nsw.gov.au/Council/Plans-and-Publications/Economic-Development-Strategy>

<sup>11</sup> CSIRO Futures. (2021) *Quantifying Australia's returns to innovation*. CSIRO, Canberra.  
<https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>. As per the CSIRO methodology, it is conservatively assumed that after R&D is embodied into productive economic capital and subsequently incorporated into economic activity, this translates into improved productivity and economic output levels in approximately 15 years' time. To reflect this outcome in 'present value' terms, this result is reduced by discounting to give an estimate of its present-day impact. Discount rate is 5%.

<sup>12</sup> Australian Bureau of Statistics. (2023). *Australian National Accounts: State Accounts (2022-23 financial year)*. ABS.  
<https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-state-accounts/latest-release>.

Results are presented in Table 1 – for the estimated development of 5,040 dwellings cited in planning documents. These figures are all in present value terms and conservatively assuming that MPID organisations spend 2.5% to 5.0% of total revenues on R&D:

- Unaccounted for (in the EIA) benefits from R&D investment (ranging between \$717m and \$1.2bn per year) estimated at (in present value terms) \$2.5 to \$4.0 billion for Australian GDP and \$765 million to \$1.2 billion for NSW GSP; and
- Opportunity cost of lost R&D investment (from BTR) is estimated at between \$436m to \$878 million, with foregone impact (in present value terms) on Australian GDP of between \$1.5 to \$3.1 billion and NSW GSP of between \$465 to \$938 million.

An alternative analysis (Table 2) considers the impact if all of the 1.2 million sqm floor space was developed solely for BTR dwellings. While this is outside of the planning expectations in the flexibly zoned E2 and E3 zones, it is a useful thought experiment to understand the potential implications of the rezoning proposal (without any controls on the proportion of space that may be developed as BTR):

- Opportunity cost of lost R&D investment is estimated at between \$1.2 to \$2.3 billion, with a foregone impact (in present value terms) on Australian GDP of between \$4.0 to \$8.1 billion and NSW GSP of between \$1.2 to \$2.5 billion.

**There is a significant opportunity cost, both now and into the future, of underinvesting in R&D-intensive commercial development at MPID, with implications for the regional, NSW and Australian economies.**

**Table 1: Estimated macroeconomic impact of commercial developments and opportunity cost of BTR developments due to R&D expenditure**

Scenario	Dwellings	Commercial development (not accounted for in EIA)			Opportunity cost of BTR developments		
		Annual R&D spend	Long-term annual impact on Australian GDP (PV)	Long-term impact on NSW GSP (PV)	Foregone annual R&D spend	Foregone long-term impact on Australian GDP (PV)	Foregone long-term impact on NSW GSP (PV)
<i>Base case, R&amp;D expenditure estimated at 2.5% of MPID organisation revenues</i>							
All proposed BTR in E2/E3	5,040	\$717m	\$2.5bn	\$765m	\$436m	\$1.5bn	\$465m
50% proposed BTR in E2/E3	2,520	\$935m	\$3.3bn	\$998m	\$218m	\$763m	\$233m
No BTR in E2/E3	0	\$1.2bn	\$4.0bn	\$1.2bn	\$0	\$0	\$0
<i>Sensitivity analysis, R&amp;D expenditure estimated at 5% of MPID organisation revenues</i>							
All proposed BTR in E2/E3	5,040	\$1.4bn	\$5.1bn	\$1.5bn	\$878m	\$3.1bn	\$938m
50% proposed BTR in E2/E3	2,520	\$1.9bn	\$6.6bn	\$2.0bn	\$439m	\$1.5bn	\$469m
No BTR in E2/E3	0	\$2.3bn	\$8.1bn	\$2.5bn	\$0	\$0	\$0

Notes:

1. Results subject to rounding
2. Estimated NSW GSP impact reflects pro-rata apportionment of estimated NSW % of Australian GDP (30.5%)
3. PV=present value (discounted at 5%)
4. Estimates based on application of CSIRO calculated ratio (2021), which estimates that on average, for every \$1 of R&D investment, the Australian economy realises approximately \$3.50 in economy-wide benefits. See referenced CSIRO paper for further details.

**Table 2: Estimated macroeconomic impact of commercial developments and opportunity cost of BTR developments if all the E2 and E3 zones were developed as BTR**

Scenario	Dwellings	Commercial development			Opportunity cost of BTR developments		
		Annual R&D spend	Long-term annual impact on Australian GDP (PV)	Long-term impact on NSW GSP (PV)	Foregone annual R&D spend	Foregone long-term impact on Australian GDP (PV)	Foregone long-term impact on NSW GSP (PV)
<i>Base case, R&amp;D expenditure estimated at 2.5% of MPID organisation revenues</i>							
All E2/E3 BTR development	13,333	\$0	\$0	\$0	\$1.2bn	\$4.0bn	\$1.2bn
<i>Sensitivity analysis, R&amp;D expenditure estimated at 5% of MPID organisation revenues</i>							
All E2/E3 development	13,333	\$0	\$0	\$0	\$2.3bn	\$8.1bn	\$2.5bn

Notes:

1. Results subject to rounding
2. Estimated NSW GSP impact reflects pro-rata apportionment of estimated NSW % of Australian GDP (30.5%)
3. Potential upper limit of dwellings estimated at 13,333, based on total available space of 1.2 million sqm and an average 90 sqm per dwelling
4. PV=present value (discounted at 5%)
5. Estimates based on application of CSIRO calculated ratio (2021), which estimates that on average, for every \$1 of R&D investment, the Australian economy realises approximately \$3.50 in economy-wide benefits. See referenced CSIRO paper for further details.

## Reaching MPID's potential as a world-class innovation district

MPID performs strongly against the success factors for global innovation districts. The presence of a diverse, deep technology sector and innovation activity at MPID is a key driver of success. Levels of investment and economic contribution are similar or exceed that seen in other leading Australian innovation districts. MPID's strength is centred on an enterprise culture, featuring partnerships between diverse organisations, with multinational and emerging organisations across high-growth sectors located alongside world-class research and knowledge institutions.

Supportive policies and targeted investments provide an opportunity to capitalise on this success. Priority areas to realise the vision of a future state MPID which continues to thrive have been identified based on a review of global innovation district success factors, stakeholder consultation and key documentation, including the rezoning proposal:

- **Commercial land development** as a key aspect of infrastructure which requires further investigation – in addition to public and enabling infrastructure; and
- **Operational enhancement** focusing on leadership, competitive advantage, and collaboration as a means of improving upon MPID's performance against global innovation district success factors.

While it is recognised that MPID is an established innovation district, continued support is required to ensure that MPID remains globally competitive and continues to propel NSW and Australian economic growth.

## A roadmap to realise the vision of an innovation-driven knowledge economy for MPID

Significant investment has been made into MPID historically, and newer innovation districts within the state by the NSW Government in more recent times. It is important to consider means by which not only new innovation districts are grown, but also by which more mature districts such as MPID are optimised in order to reap the best possible outcomes for the entire innovation ecosystem in NSW. An alternative vision for MPID focuses on further commercial development and the expansion of dedicated innovation spaces, which can leverage the existing knowledge base within the district to catalyse benefits to the Ryde LGA and NSW economy and society.

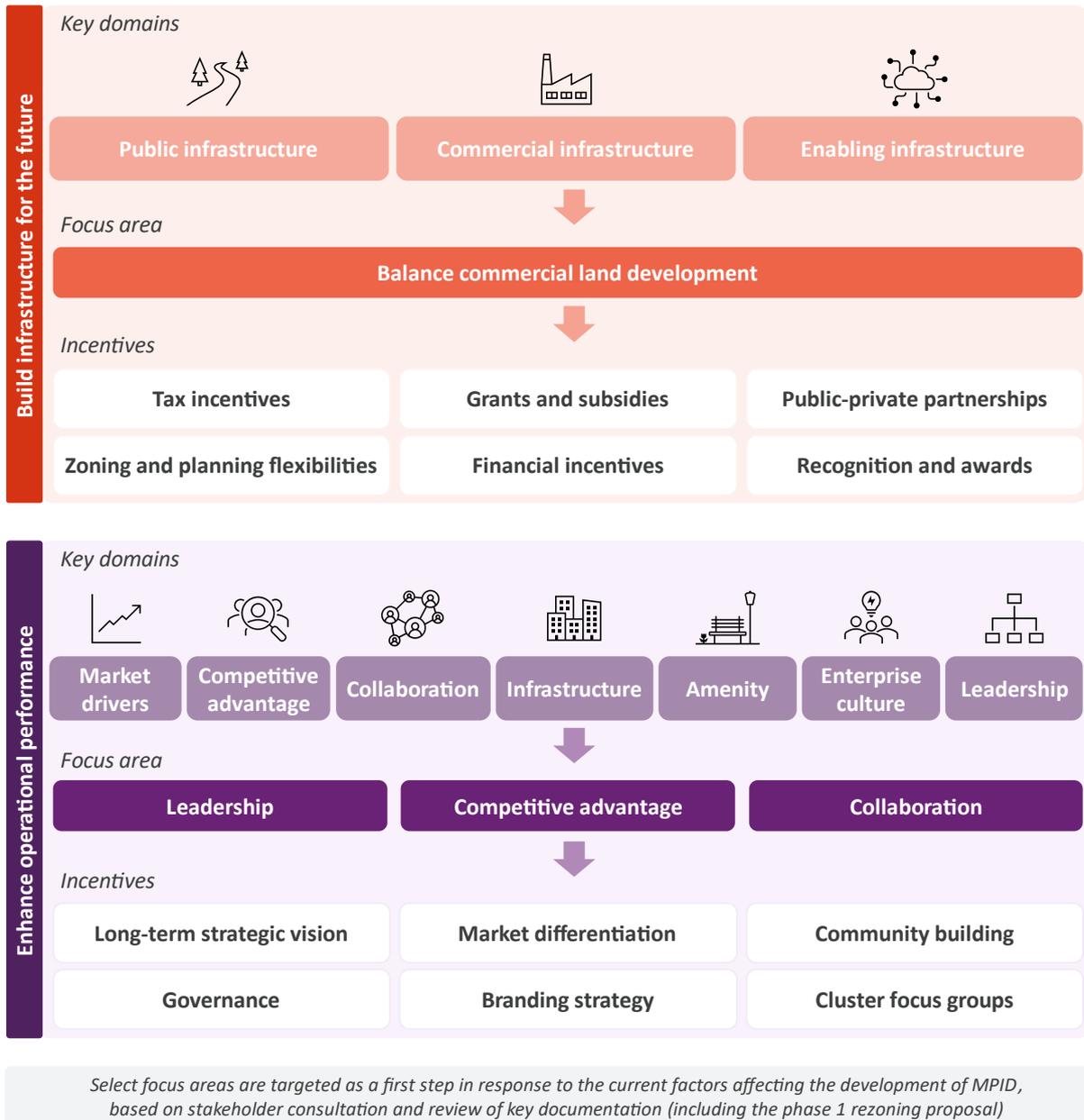
Policies supporting such developments (i.e., in the construction phase) will aim to preserve and enhance the mission and integrity of Macquarie Park as an innovation district through creating built infrastructure that meets the needs of expanding innovative sectors. Operational incentives, centred around enhancing the district's leadership, competitive advantage, and culture of collaboration, including government and wider industry stakeholders, offer the potential to shape the district's performance towards future growth and broadened economic impact.

The roadmap reflects a long-term strategic vision that includes investments in infrastructure and policy settings that promote the development of R&D-intensive industries in MPID is required to catalyse growth and to realise the potential of MPID as a leading, diverse, deep technology innovation district.

- Policy proposals include incentives such as grants and subsidies, zoning and planning flexibilities and tax incentives geared towards **commercial developments** may enable more balanced land use at MPID.
- Operational incentives based on areas for improvement within **innovation district success factors** provide opportunities for MPID tenants to enhance leadership, competitive advantage, and collaboration.

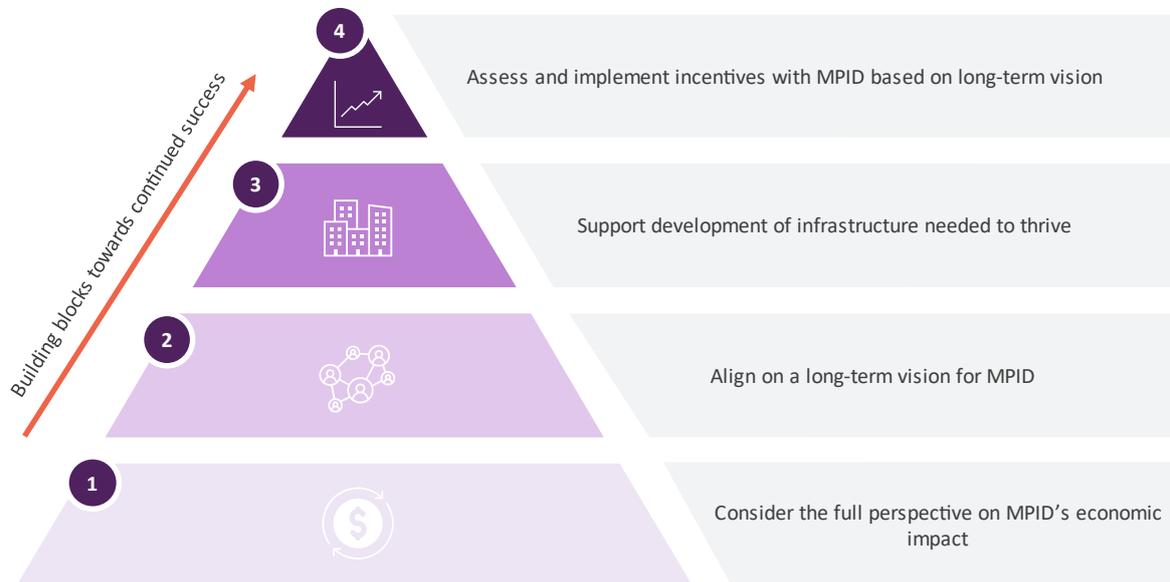
A conceptual framework to realise the success of a future roadmap is outlined in Figure 1. Although it is an established innovation district, MPID should be elevated and supported as part of a NSW-wide strategy on the development of the innovation ecosystem.

**Figure 1: Roadmap of key areas of future development for MPID**



Lastly, the role of government is crucial to catalyse the growth of MPID as a globally competitive innovation district. Figure 2 outlines potential high-level objectives for government to consider moving forward.

**Figure 2: Objectives and priorities for NSW Government to ensure MPID’s continued success**



## Concluding statements

MPID is a leading Australian innovation district and attracts world-class research and innovative companies to NSW, contributing an estimated \$13.6 billion to GSP each year. Further development of MPID is critical to cementing this role and the strength of NSW in globally competitive deep technology sectors.

The rezoning proposal threatens the innovation ecosystem at MPID by allowing for existing commercially zoned space to be developed as BTR. While it is out of scope of this paper to review the value of additional BTR development, we highlight the importance of considering the opportunity cost of lost investment in R&D for the Australian and NSW economies. Put simply, one sqm at MPID is of higher value than one sqm in an average commercial space in NSW, due to the innovative organisations and highly skilled workforce located there. It appears that this has not been accounted for in the government’s EIA; we contend that it should be.

Should the rezoning proposal skew development towards BTR, there is a risk that the value proposition for innovative companies to locate at MPID will be undermined through eroding the ecosystem and the associated ‘network effect’ of the innovation district. In the context of a highly competitive global market for attracting innovative companies, this may have important implications for the growth of the NSW and Australian economies.

*“Innovation districts are a story of evolution. There is no endpoint. There is no endgame. It is a process of growth, discovery, experimentation, evolution, adaption. This is what this is, and it should be building on your natural strengths and the investments that you have laid in the decades prior”<sup>13</sup>.*

- Julie Wagner (President, the Global Institute on Innovation Districts)

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<sup>13</sup> Pursuit. (2017). What are the keys to a successful urban innovation district? <https://pursuit.unimelb.edu.au/podcasts/what-are-the-keys-to-a-successful-urban-innovation-district>

# Introduction



## Key Takeaways

- MPID is Australia's first innovation district, established in 1964.
- MPID is an active innovation hub, where Wi-Fi was first successfully commercialised, and home to several deep technology industry clusters including life sciences, technology, and electronics.
- This report aims to highlight the value of innovation at MPID and to outline an alternative proposal to drive sustainable economic growth for the state of NSW.
- The alternative proposal focuses on balancing the protection and promotion of innovation as an economic driver with the need to support the availability of affordable housing and invest in infrastructure for the sustainable future of MPID.

## Australia's first innovation district

Macquarie Park's evolution from pastoral beginnings to Australia's first innovation district represents the pioneering approach of the NSW Government, in line with the development of a modern knowledge economy. Originally consisting of farms, market gardens, and orchards, the area's trajectory shifted significantly with the establishment of Macquarie University in 1964 by the NSW Government<sup>14</sup>. The Government vision for the area was based on the concept of 'technology corridors', modelled after Stanford University's approach in Palo Alto, California. It was positioned as a purpose-built precinct consisting of an anchor University surrounded by business and high-tech industry, fostering a collaborative environment between academia and the commercial sector.

Through this strategic vision, the following decades saw successful expansion of both the University and commercial activity within the district. Early employers within technology sectors were drawn to the area due to the availability of expansive lot sizes with central proximity between the Western suburbs, Northern suburbs and CBD, and the opportunity for direct engagement with academic research. A notable development was the arrival of Australian telecommunications giant Optus, which established a purpose-built campus in Macquarie Park.

Subsequent improvements in retail and connectivity, including the introduction of the Macquarie Centre, M2 motorway and the Sydney Metro, further amplified the area's attractiveness to businesses and residents. An increase in residential development, characterised by a surge in apartment building constructions, transformed the demographic landscape, leading to a more diverse and dynamic community within Macquarie Park.

In 2020, the district's reputation was further reinforced when the NSW Premier identified MPID as one of four Greater Sydney regions earmarked for rapid development as a key economic and innovation precinct.

<sup>14</sup> *Connect MPID. (2022). A road map for Macquarie Park | collaboration, innovation, transformation.*  
<https://www.connectmpid.com.au/about-us>

Today, Macquarie Park is an innovation hub where business, talent, and new ideas flourish. Home to more than 63,000 highly skilled, highly educated, high income employees, MPID ranks as the fourth largest employment centre in Greater Sydney and the premier non-CBD office market in Australia. The district is notable for its diverse industry cluster, featuring leaders in telecoms, life sciences, digital technology, and electronics, including global household names such as Johnson & Johnson, Sanofi, Astra Zeneca, Abbott, Optus, Philips, Fujitsu, DXC Technology, and Hyundai.

The success behind many of these transformational milestones can largely be attributed to the close collaboration and incentive setting between the NSW Government, Macquarie University, tenants, and property developers in the area, working together with a vision towards the growth of a modern innovation hub.

## Purpose of this report

NSW Government exhibited the Macquarie Park Innovation Precinct – Stage 1 rezoning proposal in late 2023. This report aims to highlight the value of innovation activity at MPID and the importance of considering the potential economic impact of the rezoning proposal on the innovation-driven ecosystem. It is structured as follows:

- **Economic importance of MPID** provides an overview of the contribution of MPID to the NSW and national economies.
- **Review of the economic impact assessment of the rezoning proposal** analyses this proposal and the associated Economic Impact Analysis exhibited by NSW Government in 2023, underscoring the importance of valuing the innovation-intense commercial activity at MPID.
- **Reaching MPID’s potential as a world-class innovation district** reviews the evidence base surrounding innovation districts and assesses the current state of MPID against the key success factors for innovation districts, identifying focus areas for future development.
- **A roadmap to realise the vision of an innovation-driven knowledge economy for MPID** draws on previous analysis and dives deeper to generate recommendations around infrastructure developments and policy initiatives to catalyse the continued growth of the knowledge economy of MPID and NSW into the future.

## Limitations

The analysis presented in this paper is limited to a review of the published and grey literature (including policy and thought leadership papers from Australia and internationally) and limited consultation with MPID stakeholders. A critique of the EIA conducted for the rezoning proposal is based on the published report, and without access to detailed methodology or calculations.

The goal is to highlight and review the evidence base relating to areas that NSW Government is consulting on for the rezoning proposal. Clearly, any future policy proposals would need to be further developed and subjected to an appropriate stakeholder consultation process.

# Economic importance of the Macquarie Park Innovation District



## Key Takeaways

- MPID and the surrounding Ryde LGA significantly contribute to NSW and Australia's economy, acting as a sustainable growth engine through a knowledge-based economy:
  - MPID makes a sizeable annual economic contribution of approximately \$13.6 billion<sup>15,16</sup>. This represents more than half of the Ryde LGA's GRP<sup>17</sup>, seeing the LGA, along with North Sydney, place behind only the City of Sydney in contributing to NSW's GSP<sup>18,19</sup>.
  - It possesses a highly educated, highly productive, high-income workforce of more than 63,000<sup>20</sup>, with plans provisioning for tens of thousands of additional jobs under the Macquarie Park Place Strategy<sup>21</sup>.
  - A diverse set of innovation-driven industry sectors, as the second largest centre for R&D in Greater Sydney, estimated at \$700 million in 2020<sup>22</sup>.
- MPID's industrial profile reflects an innovative and knowledge-driven economy, encompassing higher education, research, and emerging industries which together, through the innovation district ecosystem, are expected to generate continuous, high levels of R&D activity.
- R&D is pivotal to driving sustainable improvements in economic productivity and growth. The CSIRO (2021) has conservatively estimated that the long-term economy-wide returns on every \$1 dollar of R&D investment are approximately \$21 (or \$3.50 in present value terms)<sup>23</sup>.

## Overview

MPID has a unique economic impact on NSW, not only by providing substantial direct, immediate economic outcomes, but also to growing its long-term economic prosperity.

<sup>15</sup> REMPLAN Economy. (2024). Value-Added Report - Productivity. Data sourced from ABS. Economic contribution is the product of number of employees in the defined region multiplied by value-add (productivity) per worker.

<sup>16</sup> REMPLAN Economy. (2024). Employment Report. Data sourced from ABS.

<sup>17</sup> REMPLAN Economy. (2024). GRP Expenditure Report. Data sourced from ABS.

<sup>18</sup> SGS Economics. (2019). Economic performance of Australia's cities and regions. [https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning\\_Economic-Performance-of-Australian-Cities-and-Regions.pdf](https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning_Economic-Performance-of-Australian-Cities-and-Regions.pdf)

<sup>19</sup> idCommunity. (2023). North Sydney Council Area Gross product. <https://economy.id.com.au/north-sydney/gross-product>

<sup>20</sup> REMPLAN Economy. (2024). Employment Report. Data sourced from ABS.

<sup>21</sup> NSW Government. (2022). Macquarie Park Place Strategy. <https://www.planningportal.nsw.gov.au/draftplans/made-and-finalised/macquarie-park-place-strategy>

<sup>22</sup> City of Ryde. (2020). Economic Development Strategy 2020 to 2024. <https://www.ryde.nsw.gov.au/Council/Plans-and-Publications/Economic-Development-Strategy>

<sup>23</sup> CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

MPID is a closely interconnected hub of education and research institutes, high tech digital, health and medical, telecommunications, and manufacturing ('deep tech') designed to increase R&D, collaboration, knowledge translation and transformation, economic innovation and ultimately increased economic activity. Home to global employers, a growing community of residents and an emerging network of start-ups, scale-ups, and innovators, MPID has been a remarkable economic success story.

The Macquarie Park Place Strategy, finalised by the NSW Government in 2023, demonstrates a strong commitment to ensuring that MPID reaches its full potential. The Strategy acknowledges that new and innovative businesses require different modes of working. To continue to grow Macquarie Park's economic capacity, it needs to transform, including by making it easier to share, collaborate and innovate. In doing so, the Strategy outlines critical approaches to continue building a robust precinct that encourages consistent investment, innovation, collaboration, and employment over the long term<sup>24</sup>.

As an advanced and mature economy, the importance of Australia improving its stagnating economic productivity performance, as well as declining underlying levels of Australian R&D activity witnessed in the last decade, have been increasingly acknowledged as concerns that need to be addressed<sup>25,26</sup>. Australia's economy has changed. Almost 90% of Australians now work in service industries, including education, health, hospitality, retail, and finance<sup>27</sup> and historically, achieving productivity improvement in these areas has been challenging.

Successive NSW Governments have acknowledged the importance of attracting innovation investment through the establishment of innovation precincts, including MPID, distinct efforts to attract innovative industries (e.g., mRNA research and manufacturing) with large R&D components, to the state of NSW<sup>28</sup>. It has also set in motion specific plans for MPID (i.e., the Macquarie Park Place Strategy) and the R&D 20-Year R&D Roadmap<sup>29</sup>, which outlines how to target key technology themes and leverage existing comparative industrial advantages. While MPID is a considerable direct contributor to NSW economic activity, the critical role of its R&D activity and resulting economic innovation to the continued long-term growth of the NSW and Australian economies must also be considered. Creating new, more efficient production processes, products, services, and industries contributes to continual, permanent improvements in NSW's and Australia's long-term economic prosperity.

MPID acknowledges the importance of ensuring that there is sufficient residential development in Sydney and NSW, with the district continuing to deliver on residential growth. However, it is critical that existing and future R&D activity continues to be supported and encouraged, including through creation of the right policy settings. This section:

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<sup>24</sup> NSW Government. (2022). *Macquarie Park Place Strategy*. <https://www.planningportal.nsw.gov.au/draftplans/made-and-finalised/macquarie-park-place-strategy>

<sup>25</sup> Productivity Commission (2023). *Productivity inquiry (2023)*. <https://www.pc.gov.au/inquiries/completed/productivity#report>

<sup>26</sup> Universities Australia (2023). *R&D investment in freefall*. <https://universitiesaustralia.edu.au/media-item/rd-investment-in-free-fall/>

<sup>27</sup> Productivity Commission (2023). *Productivity inquiry (2023)*. <https://www.pc.gov.au/inquiries/completed/productivity#report>

<sup>28</sup> NSW Government. (2023). *Global Leader to Operate \$96 Million RNA Facility at Macquarie University*. [https://www.chiefscientist.nsw.gov.au/news/global-leader-to-operate-\\$96-million-rna-facility-at-macquarie-university](https://www.chiefscientist.nsw.gov.au/news/global-leader-to-operate-$96-million-rna-facility-at-macquarie-university)

<sup>29</sup> NSW Government. (2022). *NSW 20-Year R&D Roadmap*. <https://www.chiefscientist.nsw.gov.au/rd-action-plan/nsw-20-year-r-and-d-roadmap>

- Outlines the economic profile of MPID, including the direct benefits it brings to the immediate Ryde LGA and the NSW economy;
- Highlights examples of existing large-scale R&D and related translational work being conducted or facilitated by organisations located at MPID, outlining the local and broader benefits they have brought;
- Describes the broader economic impact that MPID brings to the NSW and national economies, through its precinct design which co-locates R&D-intensive industries in close proximity; and
- Provides an overall estimate of the broader economic impact of R&D investments by MPID organisations in NSW and Australia.

## Macquarie Park Innovation District economic profile

### Economic snapshot

MPID hosts more than 700 companies, including 180 large internationals, and contains the Australian headquarters for nine of the 100 largest companies in the world<sup>30</sup>. The MPID is home to Macquarie University, a world top 1% university<sup>31</sup>, with one of Australia's largest annual university R&D expenditures<sup>32</sup>, an estimated 3,000 staff, and 44,000 students<sup>33</sup>. MPID is also home to Macquarie University Hospital (opened 2010), CSIRO, and Macquarie University Incubator (opened 2017)<sup>34</sup>. The innovative nature of the area is reflected in it having the most intellectual property (IP) registrations by postcode<sup>35</sup>.

With an estimated \$13.6 billion annually in economic activity<sup>36,37</sup>, the MPID represents more than half of the Ryde LGA's estimated GRP of \$20.1 billion<sup>38</sup>, and sees the Ryde LGA, along with North Sydney, place behind only the City of Sydney in contributing to NSW's GSP<sup>39,40</sup>. MPID economic output is estimated from ABS data:

<sup>30</sup> New South Wales Government. (2022). *Macquarie Park Innovation Precinct Place Strategy* <https://pp.planningportal.nsw.gov.au/draftplans/under-consideration/macquarie-park-innovation-precinct-stage-1-rezoning-proposal>

<sup>31</sup> Quacquarelli Symonds. (2023). *Rankings released! QS World University Rankings 2024* <https://www.qs.com/rankings-released-qs-world-university-rankings-2024/>

<sup>32</sup> Australian Government. (2020). *Higher Education Expenditure on R&D (HERD) time series*. <https://www.education.gov.au/research-block-grants/resources/higher-education-expenditure-rd-higher-education-provider>

<sup>33</sup> Macquarie University. (2023). <https://mq.edu.au/about/about-the-university/mq-story/at-a-glance>

<sup>34</sup> New South Wales Government. (2022). *Macquarie Park Innovation Precinct Place Strategy* <https://pp.planningportal.nsw.gov.au/draftplans/under-consideration/macquarie-park-innovation-precinct-stage-1-rezoning-proposal>

<sup>35</sup> Connect MPID. (2022). *A road map for Macquarie Park | collaboration, innovation, transformation*. <https://www.connectmpid.com.au/about-us>

<sup>36</sup> REMPLAN Economy. (2024). *Value-Added Report - Productivity*. Data sourced from ABS.

<sup>37</sup> REMPLAN Economy. (2024). *Employment Report*. Data sourced from the ABS. *Economic contribution is the product of number of employees in the defined region multiplied by value-add (productivity) per worker.*

<sup>38</sup> REMPLAN Economy. (2024). *GRP Expenditure Report*. Data sourced from the ABS.

<sup>39</sup> SGS Economics. (2019). *Economic performance of Australia's cities and regions*. [https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning\\_Economic-Performance-of-Australian-Cities-and-Regions.pdf](https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning_Economic-Performance-of-Australian-Cities-and-Regions.pdf)

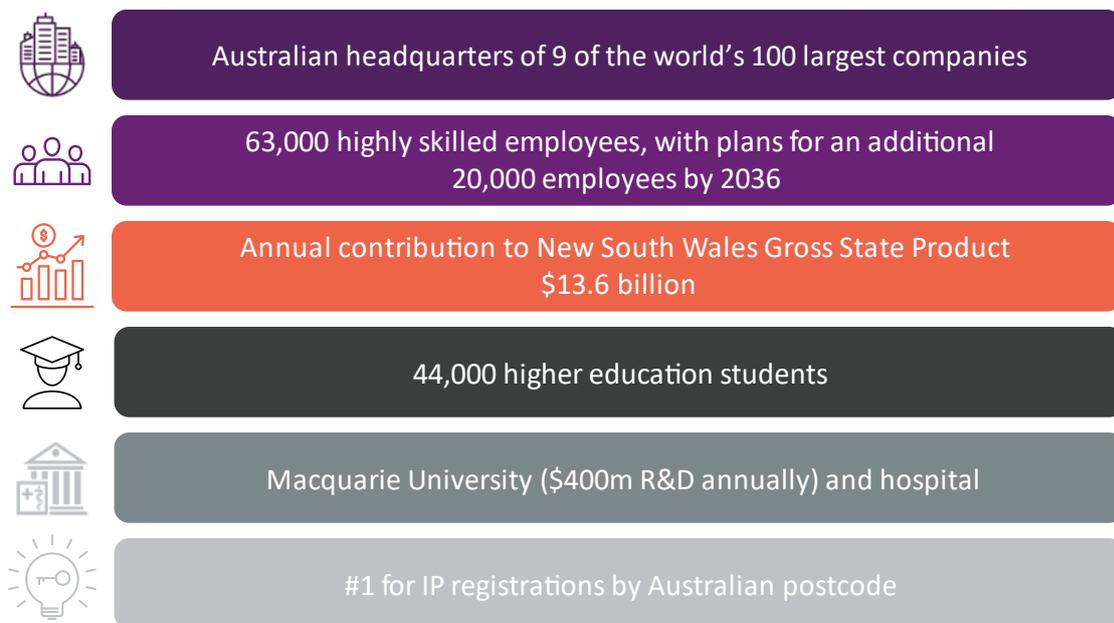
<sup>40</sup> idCommunity. (2023). *North Sydney Council Area Gross product*. <https://economy.id.com.au/north-sydney/gross-product>

- An estimated 63,000 employees<sup>41</sup> across a range of key commercial knowledge and innovation-based industries; and
- A highly productive workforce, with value added (GRP) per capita worker approximately \$216,000<sup>42</sup>, greater than the City of Sydney, NSW overall, and Australia<sup>43</sup>.

MPID ranks as the fourth largest employment centre in Greater Sydney and the premier non-CBD office market in Australia<sup>44</sup>. More than 70% of employees hold bachelor-level qualifications or higher<sup>45</sup>, representing one of the most highly educated employment precincts in the country. Employees working within the MPID generated in excess of \$7.9 billion of income in 2023, or more than \$125,000 per worker<sup>46</sup>.

In short, MPID reflects a unique geographical concentration of high value, innovation, and knowledge-based economic activity. The Macquarie Park Place Strategy aims to further build on this by optimising its potential as a critical hub for business, innovation, research, and education. By encouraging increased connectivity and commercial space development, it aims to ensure the MPID setup encourages consistent investment over the long term<sup>47</sup>.

**Figure 3: Macquarie Park Innovation District economic and innovation profile: a snapshot**



<sup>41</sup> REMPLAN Economy. (2024). *Employment Report*. Data sourced from the ABS. Note this excludes from consideration retail employees and Macquarie University employees on the basis the former is not considered to contribute to knowledge and innovation in classical economic sense and latter is not strictly a commercial institution (higher education) although it still critically contributes to the MPID ecosystem.

<sup>42</sup> REMPLAN Economy. (2024). *Value-Added Report – Productivity*. Data sourced from the ABS.

<sup>43</sup> idCommunity. (2023). *City of Sydney Worker productivity*. <https://economy.id.com.au/sydney/worker-productivity-by-industry?sEndYear=2021>

<sup>44</sup> NSW Government. (2022). *Macquarie Park Innovation Precinct Place Strategy* <https://pp.planningportal.nsw.gov.au/draftplans/under-consideration/macquarie-park-innovation-precinct-stage-1-rezoning-proposal>

<sup>45</sup> REMPLAN Community. (2024). *Qualifications (2021 Census - Work in Region - People)*. Sourced from ABS data (2021 Census).

<sup>46</sup> REMPLAN Economy. (2024). Data based on: ABS 2021 Census Place of Work Employment (Scaled)

<sup>47</sup> NSW Government. (2022). *Macquarie Park Innovation Precinct Place Strategy* <https://pp.planningportal.nsw.gov.au/draftplans/under-consideration/macquarie-park-innovation-precinct-stage-1-rezoning-proposal>

## MPID: An innovative commercial precinct with a ‘deep tech’ industry profile

MPID contains an estimated 700 companies and organisations of an innovative nature (collectively a ‘deep tech’ mix) residing in approximately 905,000m<sup>2</sup> of commercial floor space<sup>48</sup>. The mix includes education & research (7%), telecommunications (7%), medical and pharma (19%), digital (20%), and industrial & technology (25%)<sup>49</sup>. Amongst these are Australian headquarters of brand name global corporations (e.g., DXC Technology, Honeywell, Oracle, Canon, Fujitsu, Novartis, Ericsson, Johnson & Johnson), as well as head offices of Australian ASX-listed companies (e.g., Aristocrat, Boral, Cochlear, Medtronic, Optus, Sonic Healthcare), and other well-known Australian brands (e.g., Foxtel).

The innovative nature of the area is reflected in it having the most IP registrations by postcode<sup>50</sup>; as well as being home to the second highest level of annual R&D (after the Sydney CBD) within the Greater Sydney region<sup>51</sup>. MPID also serves as the locale for high-value collaborations, including the recently announced mRNA research and pilot facility<sup>52</sup> and the Google-Macquarie University research collaboration on quantum computing research and chemistry<sup>53</sup>.

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<sup>48</sup> Connect MPID. (2022). A road map for Macquarie Park | collaboration, innovation, transformation. <https://www.connectmpid.com.au/about-us>

<sup>49</sup> Connect MPID. (2022). A road map for Macquarie Park | collaboration, innovation, transformation. <https://www.connectmpid.com.au/about-us>

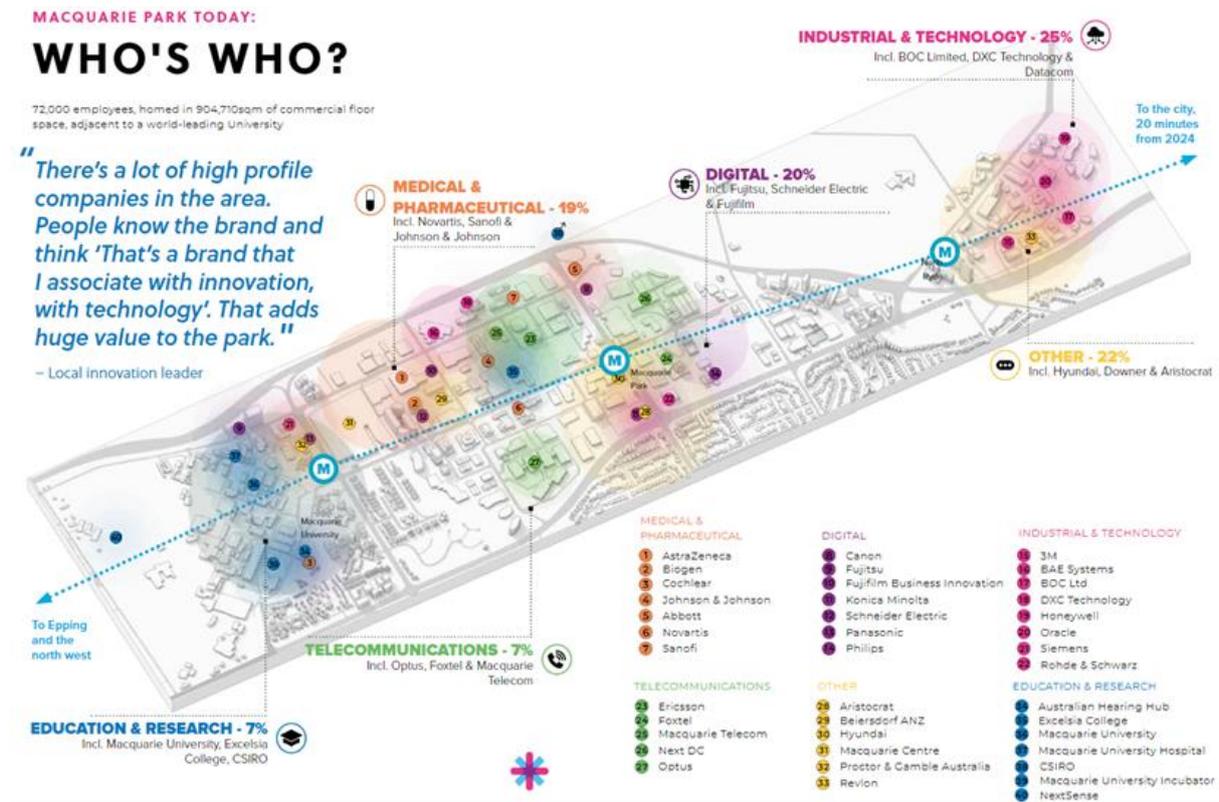
<sup>50</sup> Connect MPID. (2022). A road map for Macquarie Park | collaboration, innovation, transformation. <https://www.connectmpid.com.au/about-us>

<sup>51</sup> City of Ryde. (2020). Economic Development Strategy 2020 to 2024. <https://www.ryde.nsw.gov.au/Council/Plans-and-Publications/Economic-Development-Strategy>

<sup>52</sup> Connect Macquarie Park Innovation District. (2023). \$96 million RNA facility is coming to Macquarie Park. <https://www.connectmpid.com.au/news/macquarie-park-rna-facility>

<sup>53</sup> Macquarie University. (2023). New partnership to advance quantum computing research. <https://www.mq.edu.au/faculty-of-science-and-engineering/news/news/macquarie-university-and-google-partner-to-advance-quantum-computing-research>

Figure 4: The Macquarie Park Innovation Precinct: Innovation by industry



Source: Connect MPID (2022). A road map for Macquarie Park | collaboration, innovation, transformation.  
<https://www.connectmpid.com.au/about-us>

## Gross Regional Product, employment, productivity & income

The power of MPID's direct economic contribution to the state of NSW is evident, with it delivering approximately \$13.6 billion<sup>54,55</sup> of NSW's economic output in 2023, or approximately 1.9% of NSW's \$733 billion GSP<sup>56</sup>. This represents more than half of the Ryde LGA's estimated GRP of \$20.1 billion<sup>57</sup>, and sees the Ryde LGA, along with North Sydney, place behind only the City of Sydney in contributing to NSW's GSP<sup>58</sup>.

With more than 63,000 highly-skilled employees<sup>59</sup>, MPID represents the fourth largest employment centre in Greater Sydney and the largest non-CBD office market in Australia<sup>60</sup>. Productivity is a key factor in attracting investment and creating jobs. This is reflected as 'value add', the marginal economic value added by each of the industry sectors in a defined region. It can be calculated by subtracting local expenditure and expenditure on regional imports from the output generated by an

<sup>54</sup> REMPLAN Economy. (2024). Employment Report. Data sourced from ABS.

<sup>55</sup> REMPLAN Economy. (2024). Employment Report. Data sourced from the ABS. Economic contribution is the product of number of employees in the defined region multiplied by value-add (productivity) per worker.

<sup>56</sup> Australian Bureau of Statistics. (2023). Australian National Accounts: State Accounts (2022-23 financial year). <https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-state-accounts/latest-release>.

<sup>57</sup> REMPLAN Economy. (2024). GRP Expenditure Report. Data sourced from the ABS.

<sup>58</sup> SGS Economics. (2019). Economic performance of Australia's cities and regions. [https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning\\_Economic-Performance-of-Australian-Cities-and-Regions.pdf](https://sgsep.com.au/assets/main/Publications/SGS-Economics-and-Planning_Economic-Performance-of-Australian-Cities-and-Regions.pdf)

<sup>59</sup> REMPLAN Economy. (2024). Employment Report. Data sourced from the ABS.

<sup>60</sup> NSW Government. (2022). Macquarie Park Place Strategy. <https://www.planningportal.nsw.gov.au/draftplans/made-and-finalised/macquarie-park-place-strategy>

industry sector. MPID per worker productivity (\$215,995)<sup>61</sup> exceeds that of the City of Sydney (\$202,357)<sup>62</sup>, as well as being significantly higher than the NSW average (\$135,745)<sup>63</sup> and Australia (\$139,202)<sup>64</sup> generally. Incremental per worker productivity is particularly notable in Financial and Insurance Services; Education & Training; Health Care & Social Assistance; Information Media & Telecommunications; Manufacturing; Professional, Scientific & Technical Services.

MPID employees earned an estimated \$7.9 billion in income in 2023<sup>65</sup>. Employee income and jobs are presented in Table 3 and Figure 5 and are concentrated in Health Care & Social Assistance (\$674 million, 13% of jobs); Wholesale Trade (\$1,591 million, 22% of jobs); Professional, Scientific & Technical Services (\$1,284 million, 17% of jobs); Education & Training (\$749 million, 9% of jobs); Information Media & Telecommunications (\$1,085 million, 14% of jobs); and Manufacturing (\$830 million, 12% of jobs).

**Table 3: Per worker productivity (value added): MPID vs City of Sydney vs NSW vs Australia**

Industry	MPID	City of Sydney	Australia	New South Wales
Average per worker productivity	<b>\$215,995</b>	<b>\$202,357</b>	<b>\$139,202</b>	<b>\$135,745</b>
Health Care and Social Assistance	\$112,000	\$91,892	\$85,716	\$82,518
Education & Training	\$176,000	\$135,107	\$87,464	\$93,052
Construction	\$217,000	\$177,279	\$127,894	\$130,227
Transport, Postal and Warehousing	\$185,000	\$193,736	\$139,728	\$151,690
Prof, Sci & Tech Services	\$193,000	\$158,820	\$135,190	\$148,444
Wholesale Trade	\$232,000	\$269,090	\$221,660	\$251,600
Manufacturing	\$287,000	\$170,491	\$133,646	\$142,491
Info Media & Tele	\$391,000	\$260,201	\$222,830	\$251,401
Financial & Insurance Services	\$503,000	\$335,843	\$310,626	\$309,708

Source: idCommunity. (2023). City of Sydney Worker productivity. <https://economy.id.com.au/sydney/worker-productivity-by-industry?sEndYear=2021>; REMPLAN Economy (2024). Value-Added Report – Productivity. Data sourced from the ABS; REMPLAN Economy (2024). Employment Report. Data sourced from the ABS.

Notes:

1. City of Sydney and NSW data sourced from 2021-22 financial year; MPID 2023 calendar year.
2. MPID amounts rounded to nearest whole dollar

Workers in the MPID earn 31% more, relative to the rest of NSW, and 27% compared with the rest of Australia. This is particularly concentrated in high value, district critical industries including education & training (54% higher in the MPID than the NSW average, 50% higher than the Australian average); finance & insurance services (32%, 31%); information media & telecommunications (23%, 19%); manufacturing (56%, 50%); rental, hiring & real estate (24%, 21%); and wholesale trade (56%,

<sup>61</sup> REMPLAN Economy. (2024). Value-Added Report – Productivity. Data sourced from the ABS.

<sup>62</sup> idCommunity. (2023). City of Sydney Worker productivity. <https://economy.id.com.au/sydney/worker-productivity-by-industry?sEndYear=2021>

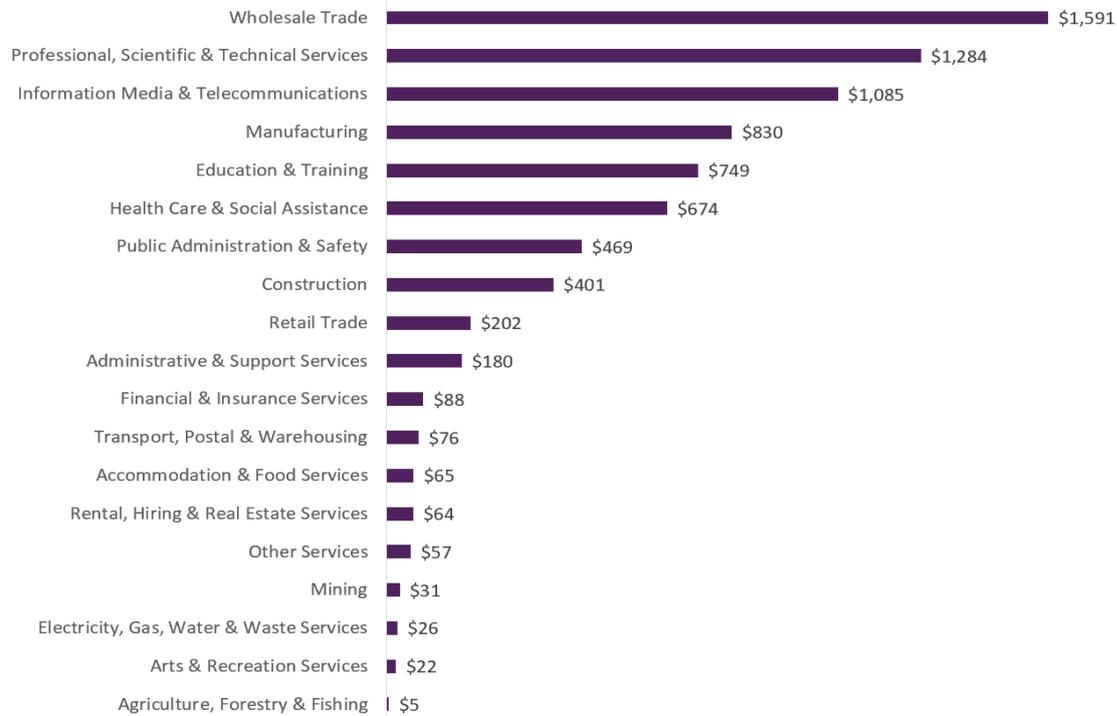
<sup>63</sup> idCommunity. (2023). City of Sydney Worker productivity. <https://economy.id.com.au/sydney/worker-productivity-by-industry?sEndYear=2021>

<sup>64</sup> idCommunity. (2023). City of Sydney Worker productivity. <https://economy.id.com.au/sydney/worker-productivity-by-industry?sEndYear=2021>

<sup>65</sup> REMPLAN Economy. (2024). Wages and Salaries Report. Data sourced from the ABS.

51%)<sup>66,67</sup>. Almost three-quarters of workers in MPID hold a bachelor's degree or higher<sup>68</sup>. This comfortably exceeds the New South Wales population average (ages 15 to 74) of 28% and is almost three-fold the Australian average<sup>69</sup>.

**Figure 5: Income generated by employment in the MPID by industry, \$ millions, 2023**



Source: REMPLAN Economy. (2024). *Wages and Salaries Report*. Data sourced from the ABS.

<sup>66</sup> REMPLAN Economics (2024). *Employment Report*. Data sourced from the ABS.

<sup>67</sup> Australian Bureau of Statistics. (2023). *Average Weekly Earnings, Australia*. [www.abs.gov.au/statistics/labour/earnings-and-working-conditions/average-weekly-earnings-australia/latest-release](https://www.abs.gov.au/statistics/labour/earnings-and-working-conditions/average-weekly-earnings-australia/latest-release)

<sup>68</sup> REMPLAN Community. (2024). *Qualifications (2021 Census - Work in Region - People)*. Sourced from ABS data (2021 Census).

<sup>69</sup> Australian Bureau of Statistics. (2023). *Education and Work, Australia*. <https://www.abs.gov.au/statistics/people/education/education-and-work-australia/latest-release>.

**Figure 6: Salary levels within MPID relative to NSW state average, selected industries**



Source:

Australian Bureau of Statistics. (2023). *Average Weekly Earnings, Australia*. [www.abs.gov.au/statistics/labour/earnings-and-working-conditions/average-weekly-earnings-australia/latest-release](http://www.abs.gov.au/statistics/labour/earnings-and-working-conditions/average-weekly-earnings-australia/latest-release); REMPLAN Economics (2024). *Employment Report*. Data sourced from the ABS.

## An innovative commercial precinct with high R&D spending propensity

Relative to the rest of the NSW economy, the industrial profile at MPID is particularly pronounced towards innovative industries. These industries require the constant development of new products to stay competitive, represent new industrial frontiers, or are particularly disposed towards the increasing proportion of economic activity in information-based services.

Globally, the pharmaceutical industry has historically benchmarked spending 20% of sales revenue on R&D<sup>70</sup>; for MedTech industries, anywhere around 7% on average<sup>71</sup>. For digital and software industries, ratios of 15 to 40% can occur<sup>72,73</sup>, depending on the nature of the technology, the specific product and industry maturity. Universities are also renowned for their high spending on R&D

<sup>70</sup> US Congressional Budget Office. (2021). *Research and Development in the Pharmaceutical Industry*. <https://www.cbo.gov/publication/57126>

<sup>71</sup> Statista. (2024). *Worldwide medtech research and development spending as percent of medtech revenue from 2011 to 2024*. <https://www.statista.com/statistics/309305/worldwide-medtech-research-and-development-spending-as-percent-of-revenue/>

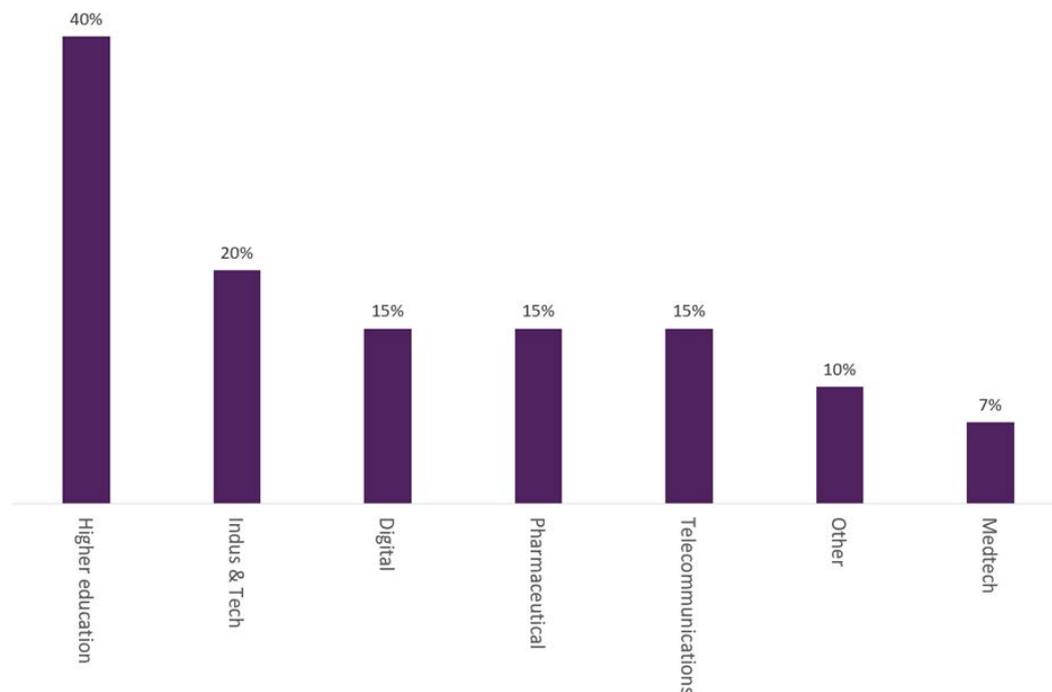
<sup>72</sup> Boston Consulting Group. (2022). *Software companies tackling research and development conundrum*. <https://www.bcg.com/publications/2022/software-companies-tackling-research-and-development-conundrum>

<sup>73</sup> Harvard Business Review. (2019). *It's time to stop treating R&D as a discretionary expenditure*. <https://hbr.org/2019/01/its-time-to-stop-treating-rd-as-a-discretionary-expenditure>

relative to revenues, with Macquarie University spending approximately 35 to 40% of revenue equivalent on R&D<sup>74</sup>.

In contrast, the estimated R&D spend of the Australian economy as a percentage of GDP as of 2021-22 is 1.7% and in NSW is approximately 1.1%<sup>75</sup>. While not an exact 'like for like' comparison (noting that R&D as a proportion of sales or revenue is distinct from R&D as a percentage of GDP), it nonetheless demonstrates the collective industrial amalgamation of R&D-intensive industries that forms a significant concentration of NSW's economic transformation stock.

**Figure 7: Typical R&D expenditure as a proportion of sales/revenue by selected industry at MPID**



**Notes:**

1. Higher education figure based on Macquarie University R&D expenditures only.
2. Other estimates sourced from global studies.
3. Actual R&D activity may vary, e.g., being conducted in different geographical regions globally, vary from year to year etc.

The scale of this R&D activity is evident when looking at some of the activities of the largest contributors, relative to overall Australian R&D spending. The most recent nation-wide R&D expenditure figures (released in 2023) highlight that out of the approximately \$38 billion spent on R&D in Australia in 2021, \$20.6 billion was private business investment, with approximately \$7.5 billion was in NSW alone<sup>76</sup>. In addition, the higher education sector in NSW was estimated to spend

<sup>74</sup> Department of Education. (2021). Higher Education Expenditure on R&D (HERD) time series. <https://www.dese.gov.au/higher-education-publications/resources/2020-higher-education-providers-finance-tables>. Conservative assumption 40% based on Macquarie University ratio of R&D spend to revenue for 2020 calendar year.

<sup>75</sup> ABS. (2023). Research and Experimental Development, Businesses, Australia. <https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-businesses-australia/latest-release#methodology>

<sup>76</sup> ABS. (2023). Research and Experimental Development, Businesses, Australia. <https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-businesses-australia/latest-release#methodology>

\$3.95 billion of the \$12.7 billion spent nationwide on higher education R&D<sup>77</sup>, with Macquarie University alone spending \$438 million of this (Table 4).

Highlighting some of the larger R&D expenditure levels or R&D allocations of companies located at MPID puts the district's clear contribution to NSW and Australian economic development into perspective.

**Table 4: Large R&D expenditure (within Australia) organisations located at MPID**

Company/Organisation	Industry	Estimated annual/total R&D spend (\$)
Macquarie University	Higher education	\$438 million <sup>78</sup>
Aristocrat	Entertainment	\$528 million <sup>79</sup>
Novartis Pharmaceuticals	Health care	~\$20-\$30 million <sup>80</sup>
Cochlear	Health care	~\$144 million <sup>81,82</sup>
Sanofi-Pasteur	Health care	\$30 million <sup>83</sup>

Notes:

1. Not all R&D expenditure may necessarily be completely incurred within NSW.
2. R&D expenditure may fluctuate annually depending on numerous factors; e.g., for pharmaceutical companies it can be dependent on year-to-year variations in clinical trial activity.
3. Aristocrat spend was converted at exchange rate of Euros to \$AUD average 2022 exchange rate of 1EUR:\$AUD1.52.
4. Cochlear has publicly stated that approximately 80% of its R&D is conducted in Australia (see reference below).

This level of R&D spending is validated when referring to broader Ryde LGA region R&D expenditures estimates, estimated at \$732 million in 2020. Positioned in the context of the Greater Sydney region, the significant levels of R&D expenditure MPID and Ryde LGA undertakes is very clear, coming second only to the Sydney city region (approximately \$2.3 billion)<sup>84</sup>.

<sup>77</sup> ABS. (2022). *Research and Experimental Development, Higher Education Organisations, Australia*. <https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-higher-education-organisations-australia>

<sup>78</sup> Department of Education. (2022). *Higher Education Expenditure on R&D (HERD) time series*. <https://www.education.gov.au/research-block-grants/resources/higher-education-expenditure-rd-higher-education-provider>

<sup>79</sup> European Commission. (2022). *The 2022 EU Industrial R&D Investment Scoreboard*. <https://iri.jrc.ec.europa.eu/scoreboard/2022-eu-industrial-rd-investment-scoreboard>. Amount was converted from Euros to \$AUD at average 2022 exchange rate of 1EUR:\$AUD1.52

<sup>80</sup> Commonwealth Treasury. (2018). *Novartis submission on Research and Development Tax Incentives Amendment*. <https://treasury.gov.au/sites/default/files/2020-01/novartis.pdf>

<sup>81</sup> Cochlear. (2020). *2020-21 Pre-Budget Submission*. [https://treasury.gov.au/sites/default/files/2020-09/115786\\_COCHLEAR\\_AND\\_OTHERS.pdf](https://treasury.gov.au/sites/default/files/2020-09/115786_COCHLEAR_AND_OTHERS.pdf). Cochlear estimates 80% of its total R&D is conducted in Australia

<sup>82</sup> Commonwealth Treasury. (2018). *Consultation on Treasury Laws Amendment (Research and Development Incentive) Bill 2018*. <https://treasury.gov.au/sites/default/files/2020-01/cochlear.pdf>

<sup>83</sup> Commonwealth Treasury. (2022). *Sanofi 2022-23 Pre-Budget Submission*. [https://treasury.gov.au/sites/default/files/2022-03/258735\\_sanofi.pdf](https://treasury.gov.au/sites/default/files/2022-03/258735_sanofi.pdf)

<sup>84</sup> City of Ryde. (2020). *Economic Development Strategy*. <https://www.ryde.nsw.gov.au/Council/Plans-and-Publications/Economic-Development-Strategy>

## Macquarie Park R&D case studies



### Case Study – NextSense

NextSense is Australia's largest non-government provider of therapy, education, and diagnostic services for children with hearing or vision loss, dedicated to advancing research, education, and care.

NextSense sold their existing headquarter site and invested in a 90-million-dollar facility. They chose MPID based on its strategic location, the known collaborative atmosphere and opportunity to build further partnerships with industry, academia, and research organisations. The custom-built NextSense centre for innovation (supported by a \$12.5 million Australian government grant) will open in 2024 and house a school and pre-school for children with vision and hearing loss. It will also host spaces available to other organisations in the hearing and vision loss space looking for collaboration opportunities and to educate future professionals in this sector. The facility will house 300 employees and create 250 construction jobs<sup>85</sup>.

NextSense believes that this move will drive further innovation to improve the lives of people living with vision and hearing loss and boost partnerships. "Our new centre will be at the heart of a broader ecosystem that will help build a more inclusive Australia." In addition to the schools established by NextSense, the organisation also partners with Macquarie University to offer a Master of Disability Studies program, providing further evidence of the multiplier effect of partnerships within the district on economic growth, as well as education and talent development in the region.



### Case Study – Cochlear

Cochlear's global headquarters and manufacturing operations are located in a purpose-built facility on the Macquarie University campus. Cochlear and Macquarie University have partnered to deliver multiple projects aimed at driving advancements in hearing healthcare. A notable example is the 2016 Global Research Symposium, which convened over 200 international experts to enhance research and patient outcomes. This partnership has also created outward benefits to the surrounding community through the development of professional programs, customised workshops, access to a broad range of educational offerings, and academic placements for over 200 university students<sup>86</sup>.

<sup>85</sup> Macquarie University. (2021). Approval granted for new state-of-the-art facility for hearing and vision loss. <https://www.mq.edu.au/thisweek/2021/05/11/approval-granted-for-new-state-of-the-art-facility-for-hearing-and-vision-loss/>

<sup>86</sup> Macquarie University. (n.d.). Hearing clearly - Macquarie University and Cochlear. [https://www.mq.edu.au/\\_\\_data/assets/pdf\\_file/0003/1147701/MU\\_Corp\\_Engage\\_Cochlear\\_Case\\_Study\\_A4\\_2pp\\_flyer\\_0218\\_FINAL\\_v2\\_LR.pdf](https://www.mq.edu.au/__data/assets/pdf_file/0003/1147701/MU_Corp_Engage_Cochlear_Case_Study_A4_2pp_flyer_0218_FINAL_v2_LR.pdf)

Cochlear is one of Australia's leading investors in R&D, with expenditures of an estimated \$180 million each year on R&D alone, with 80% of this R&D being undertaken in Australia<sup>87</sup>.



### Case Study – Google

Macquarie University and Google have embarked on a collaboration aimed at advancing research in quantum computing and chemistry to address some of the most challenging scientific and technological issues facing the world today. The partnership forms part of Google's five-year, \$1 billion Digital Future Initiative, which aims to strengthen Australia's digital infrastructure, technology and talent offering. This partnership will also focus on quantum chemistry, targeting the efficient production of fertiliser and the development of clean energy solutions, such as advanced battery and solar-cell technologies<sup>88</sup>.



### Case Study – RNA research and pilot manufacturing facility

In 2021, the NSW Government announced a \$96 million investment in the RNA research and pilot manufacturing facility, with \$72 million funded by the state, underscoring a commitment to strengthen the district's existing biotech R&D capabilities. The site selection included recognition of the existing life sciences R&D activity in MPID and proximity for many multinational healthcare companies.

The facility will feature state-of-the-art laboratories and various support spaces, distinguishing it as Australia's only facility – and one of a select few globally – capable of independently producing a comprehensive range of RNA therapeutics and potential delivery technologies. This local development and testing hub will not only strengthen Australia's sovereign capabilities but also reduce dependency on international supply chains. The facility's integration with the existing local vaccine manufacturing industry positions MPID as a future leader in biomedical therapy research and production in Australia<sup>1</sup>.

## Importance of R&D activity to long-term economic performance

Simply put, 'technology' represents new, innovative, more economically productive methods of combining economic labour, capital, natural resources, and entrepreneurship. This leads to improved economic efficiency, i.e., greater economic output from given inputs. For advanced economies such as Australia, long-term economic growth is largely attributable to productivity growth. Labour productivity has contributed more than 80% of the growth in Australia's living

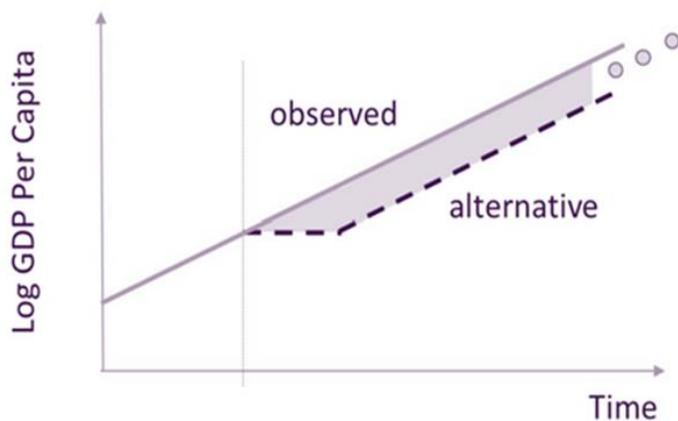
<sup>87</sup> Commonwealth Treasury (2018). Consultation on Treasury Laws Amendment (Research and Development Incentive) Bill 2018 <https://treasury.gov.au/sites/default/files/2020-01/cochlear.pdf>

<sup>88</sup> Macquarie University. (n.d.). New partnership to advance quantum computing research. <https://www.mq.edu.au/faculty-of-science-and-engineering/news/news/macquarie-university-and-google-partner-to-advance-quantum-computing-research>

standards, measured by real gross national income (GNI) per person, over the last 30 years<sup>89</sup>. However, there have been increasing concerns regarding Australia’s productivity, with productivity growth since 2005 averaging 1.2% annually, about half the rate of the 1990s productivity boom<sup>90</sup>. The power of R&D lies in its permanent ‘multiplier effect’ on economic activity.

Based on the assumption that economic growth of an advanced nation like Australia is entirely attributable to growth in its total factor productivity (TFP)<sup>91</sup>, i.e., using its labour force and capital stock more effectively. If innovation investment is delayed one year, productivity growth is effectively zero for that year, meaning all subsequent years experience foregone economic growth (i.e., an ‘opportunity cost’) carried forward in perpetuity (Figure 8).

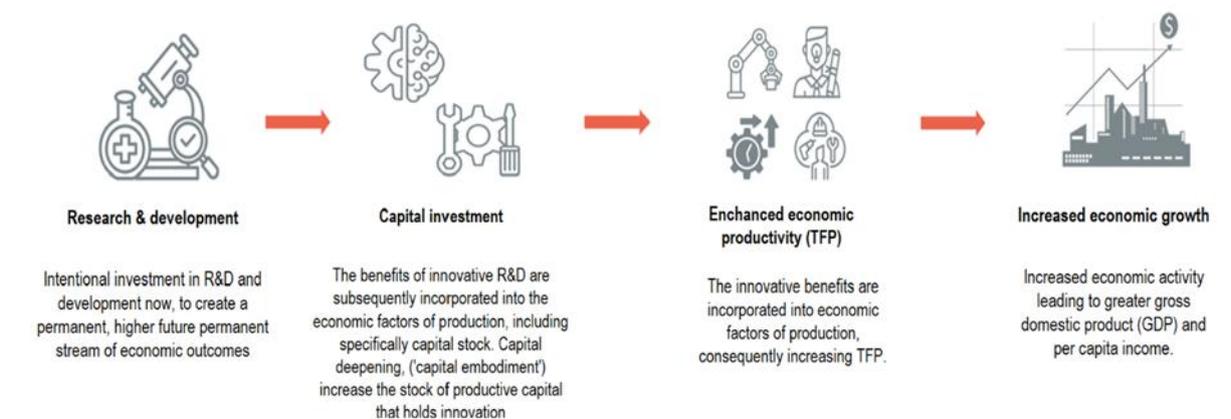
**Figure 8: Observable GDP growth with and without productivity growth delay**



Source: Jones, B. F., & Summers, L. (2020). *A Calculation of the Social Returns to Innovation*. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3700691>

R&D that is subsequently translated into new knowledge, embodied into new capital equipment, or results in innovative products processes and services, all ultimately have powerful lasting impacts on economic productivity (Figure 9), increasing economic output per unit of input (e.g., labour or capital).

**Figure 9: The importance of R&D activity to long-term economic performance**



<sup>89</sup> Commonwealth Treasury. (2021). *2021 Intergenerational Report*. <https://treasury.gov.au/publication/2021-intergenerational-report>

<sup>90</sup> Commonwealth Treasury. (2021). *2021 Intergenerational Report*. <https://treasury.gov.au/publication/2021-intergenerational-report>

<sup>91</sup> CSIRO. (2021). *Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis*. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

## NSW and Australian current R&D activity

Australia’s lagging productivity rates<sup>92</sup> and stagnating R&D investment levels have been issues of public concern in recent times at both state<sup>93</sup> and national levels<sup>94</sup>. Currently, Australia’s R&D spend as a proportion of GDP is 1.7%<sup>95</sup>, lagging below the Organisation for Economic Cooperation and development (OECD) country average of 2.4% and similarly economically advanced nations United States (3.5%), the United Kingdom (2.9%), South Korea (4.9%), and Japan (3.3%)<sup>96</sup> (Figure 10).

Figure 10: Gross Expenditure on R&D (GERD) as % of national GDP: Australia vs. the world



Source: OECD. (2024). Gross domestic spending on R&D (indicator). [https://www.oecd-ilibrary.org/industry-and-services/gross-domestic-spending-on-r-d/indicator/english\\_d8b068b4-en](https://www.oecd-ilibrary.org/industry-and-services/gross-domestic-spending-on-r-d/indicator/english_d8b068b4-en)

In NSW, business R&D spend as a percentage of GSP has declined from 1.19% in 2015-16 to 1.08% in 2021-22<sup>97</sup>; between 2013-14 and 2021-22, with absolute annual business R&D increasing by only 13%, or approximately 1.7% annually<sup>98</sup>.

The NSW Government’s R&D 20-Year R&D Roadmap<sup>99</sup> (released in 2022) recognises R&D as a critical driver of new business creation, jobs and investment and the importance of capitalising on the state’s existing competitive advantages in R&D-intensive sectors. The roadmap outlines four key

<sup>92</sup> Commonwealth Treasury. (2021). 2021 Intergenerational Report. <https://treasury.gov.au/publication/2021-intergenerational-report>

<sup>93</sup> NSW Government. (2022). NSW 20-Year R&D Roadmap. <https://www.chiefscientist.nsw.gov.au/rd-action-plan/nsw-20-year-r-and-d-roadmap>

<sup>94</sup> Commonwealth Treasury. (2021). 2021 Intergenerational Report. <https://treasury.gov.au/publication/2021-intergenerational-report>

<sup>95</sup> ABS. (2023). Research and Experimental Development, Businesses, Australia. <https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-businesses-australia/latest-release#methodology>

<sup>96</sup> OECD. (2024). Gross domestic spending on R&D (indicator). <https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

<sup>97</sup> ABS. (2023). Research and Experimental Development, Businesses, Australia. <https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-businesses-australia/latest-release#methodology>

<sup>98</sup> ABS. (2023). Research and Experimental Development, Businesses, Australia. <https://www.abs.gov.au/statistics/industry/technology-and-innovation/research-and-experimental-development-businesses-australia/latest-release#methodology>

<sup>99</sup> NSW Government. (2022). NSW 20-Year R&D Roadmap. <https://www.chiefscientist.nsw.gov.au/rd-action-plan/nsw-20-year-r-and-d-roadmap>

technology themes (digital, material/chemistry, biotechnology, and energy), and respective areas of competitive advantage in NSW.

Several of these, including digital, MedTech and pharmaceuticals, already have a strong presence at MPID<sup>100</sup>. Critically, the Roadmap notes that the success of NSW in attracting R&D activity relies on being at the cutting edge of a highly competitive global R&D market.

“Further disruptive technologies are inevitable. Robotics, Internet of Things, gene editing and quantum computing are already emerging and disrupting existing industries. **However, whether these innovations are developed and applied in NSW is not inevitable.** In an increasingly connected global market for goods and services, businesses that invest in world-leading R&D dominate industries... Economies and businesses that are unable to sustain sufficient rates of R&D and technology adoption are likely to fall behind their international competitors that can.”<sup>1</sup>

- NSW Government, NSW 20-Year R&D Roadmap

## Quantifying the long-term economic impact of R&D spending on economic performance

Recently, the CSIRO outlined the economic impact of R&D on the broader Australian economy. In short, it estimates that \$1 invested in R&D today yields \$20.80 additional permanent economic benefits (i.e., GDP) in 15 years' time (or \$3.50 in present value terms)<sup>101</sup>, or an approximate 10% annual return on investment.

The CSIRO methodology employs the US-developed approach of Jones & Summers (2020)<sup>102</sup>, with conservative modifications to account for capital expenditure required to convert innovation into productive economic capital, and a 15-year delay to full economic realisation of innovation benefits.

The CSIRO approach is also more conservative than other cost-benefit approaches. While limitations are noted with the measure<sup>103</sup>, it robustly estimates the 'weighted average' return to R&D, i.e., incorporating the impacts of both R&D 'successes' and 'failures', rather than positive case outcomes only. Table 5 and Table 6 summarise the calculation approach.

<sup>100</sup>NSW Government. (2022). NSW 20-Year R&D Roadmap. <https://www.chiefscientist.nsw.gov.au/rd-action-plan/nsw-20-year-r-and-d-roadmap>

<sup>101</sup>CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

<sup>102</sup>Jones, B. F., & Summers, L. (2020). A Calculation of the Social Returns to Innovation. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3700691>

<sup>103</sup>CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>. Two key limitations identified by the CSIRO are particularly worth noting. 1. Not all innovation activities are captured by available R&D statistics and so this methodology is limited in that it excludes non-R&D innovation (e.g., changes related to business management, institutional organisation, human capital, and industrial relations). 2. This approach does not indicate the exact magnitude of a GDP increase if R&D spending was increased by a certain amount; this study's approach is limited to measuring the average rate of return to the economy.

**Table 5: Summary: Adapted CSIRO method and outcome – estimated economic return on R&D expenditure**

Baseline equations	Equation	Notation
Ratio of economy-wide benefits to cost of innovation investments	$P = \beta \frac{g/r}{x/y}$	P = average economy-wide benefit-cost ratio r* = average economy-wide rate of return β = corrective factor (0 < β < 1) g = GDP per capita growth rate r = discount rate x/y = gross R&D expenditure share of GDP
Economy-wide internal rate of return to innovation investments	$r^* = \frac{\beta \times g}{x/y}$	

Source: CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

**Table 6: Adjustments to baseline equations and Australian specific input assumptions**

Adjustments to baseline	Equations	Notation
<b>Delay in R&amp;D benefits realisation</b> Incorporates a lag period between R&D investments and their payoffs	$\beta_1 = e^{-(r-g)D}$	D = delay in years
<b>Embodied capital deepening</b> Incorporates the concept that R&D must be built into new capital inputs.	$\beta_2 = \frac{x/y}{y + (i_{deep} \times g)}$	i <sub>deep</sub> = capital stock to GDP ratio
<b>Combined adjustment</b> Delay in R&D benefits realisation and embodied capital deepening.	$\beta = \beta_1 * \beta_2$	N/A

Source: CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

In discounting back economic benefits to their present value, the CSIRO paper employs a 5% discount rate, in alignment with NSW Treasury cost-benefit analysis guidelines<sup>104</sup>. Using a 7% discount rate per Commonwealth Government’s guidance<sup>105</sup>, we estimate that the economy-wide benefit reduces to \$14.90 (undiscounted, realised 15 years from original R&D investment). This is still a healthy long-term return on investment. As outlined earlier, these returns reflect a permanent uplift in economic outcomes, rather than a once-off outcome.

<sup>104</sup> New South Wales Treasury Department. (2023). TPG23-08 NSW Government Guide to Cost-Benefit Analysis [https://www.treasury.nsw.gov.au/sites/default/files/2023-04/tpg23-08\\_nsw-government-guide-to-cost-benefit-analysis\\_202304.pdf](https://www.treasury.nsw.gov.au/sites/default/files/2023-04/tpg23-08_nsw-government-guide-to-cost-benefit-analysis_202304.pdf)

<sup>105</sup> Office of Impact Analysis, Department of Prime Minister and Cabinet. (2020). Cost-benefit analysis Guidance Note. <https://oia.pmc.gov.au/sites/default/files/2021-09/cost-benefit-analysis.pdf>

MPID's profile of high R&D spending industry sectors makes it one of NSW's and Australia's critical industry hubs. Even with more conservative assumptions about the level of R&D currently at MPID (estimated at \$732 million annually in 2020<sup>106</sup>), this effectively means that approximately \$2.6 billion (in present value terms, using a 5% discount rate) would be generated in additional annual Australian GDP.

Applying a simple assumption of the relative size of the NSW state economy (31%)<sup>107</sup>, this would contribute approximately \$780 million incrementally each year in present value terms (i.e., each year's additional R&D investment would generate \$780 million of equivalent GSP value, on top of that from prior years).

It therefore remains critical that not only do government policy setting and incentives facilitate retaining the existing core of innovative companies at MPID including available land and facilities required by these organisations, but that this continues to provide for additional facilitation of R&D investment and subsequent collaboration at the district.

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<sup>106</sup> City of Ryde. (2020). *Economic Development Strategy 2020 to 2024*. <https://www.ryde.nsw.gov.au/Council/Plans-and-Publications/Economic-Development-Strategy>

<sup>107</sup> ABS. (2023). *Australian National Accounts: State Accounts (2022-23 financial year)*. <https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-state-accounts/latest-release>.

# Review of the economic impact assessment of the MPID rezoning proposal



## Key Takeaways

- The rezoning proposal establishes the MU1 zone and provides greater flexibility in the E2 and E3 commercial zones to construct build-to-rent (BTR) developments at MPID, accompanied by incentives that are understood by stakeholders to increase the immediate attractiveness of BTR developments.
- The government's economic impact assessment (EIA) for the rezoning proposal focuses on the direct and indirect impacts on the creation of jobs and dwellings, and their contribution to economic output, but does not estimate the impact of R&D expenditure.
- Utilising CSIRO's methodology of the economy-wide foregone impact of reduced R&D spending – for the development of 5,040 dwellings cited in planning documents for the E2 and E3 zones, we estimate:
  - Unaccounted for (in the EIA) benefits from R&D investment (in proposed commercial space) for the macroeconomy estimated at between \$2.5 to \$8.1 billion for Australia and \$765 million to \$2.5 billion for NSW; and
  - Opportunity cost of lost R&D investment (from BTR space) is estimated at between \$436 to \$878 million, with an impact on Australian GDP of \$1.5 to \$3.1 billion and NSW GSP of \$465 to \$938 million.
  - These figures are all in present value terms and assuming that MPID organisations spend 2.5% to 5.0% of total revenues on R&D.
- Impacts on lost R&D investment, GDP and GSP are even higher if BTR developments exceed the 5,040 planned dwellings (we estimate an upper bound of 13,333 potential dwellings).

## Overview

This section provides an overview of the rezoning proposal, outlines a high-level critique of the EIA, and argues that the opportunity cost associated with underinvestment in the R&D-intensive commercial development of MPID should be considered.

It is understood that the EIA was completed in accordance with NSW Government guidelines, and to the satisfaction of NSW Government. In the absence of access to the underlying analysis, such as input-output (I-O) modelling, there are limited opportunities to methodologically critique the analysis undertaken at a detailed level.

As a result, focus has been directed on the value framework utilised and, in particular, the exclusion of the value of R&D generated by future development of MPID. **Given the highly skilled workforce and R&D-intensive sectors operating at R&D, we contend that the value of one sqm of commercial space at MPID exceeds the state and national averages.** Indeed, as demonstrated in the previous section, the economic benefits of R&D expenditure extend into the future and fuel productivity improvements and sustainable economic growth.

Given this focus, supporting components of the Macquarie Park Place Strategy have been excluded, e.g., public, and open spaces, increased connectivity, and increased leisure options. It is noted that any construction activity to enhance either residential or commercial floor space will generate base economic benefit relative to business as usual (although it could also arguably be characterised as a cost).

### MPID rezoning proposal

The rezoning proposal was exhibited for public consultation in November 2023. In contrast to the 2022 Macquarie Park Place Strategy's focus on innovation, the rezoning proposal emphasises residential development:

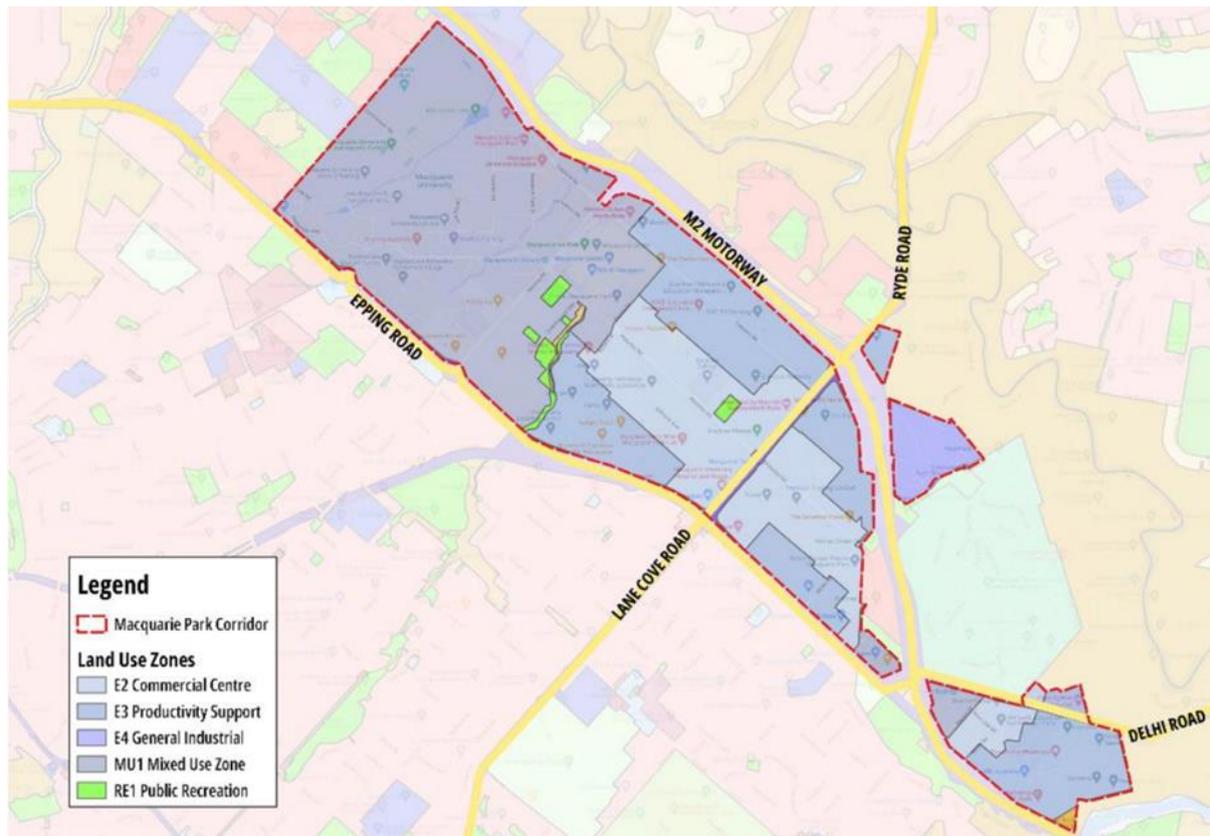
- 275,000 sqm of residential floor space for 3,060 new dwellings in the proposed MU1 Mixed Use zone<sup>108</sup>; and
- 1,200,000 sqm of commercial floor space within the E2 Commercial Centre and E3 Productivity Support zones, offering the option for Build-To-Rent (BTR) developments.

These zones are shown on MPID map in Figure 11.

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<sup>108</sup> Department of Planning and Environment. (2023). *Explanation of Intended Effect - Macquarie Park Innovation Precinct Stage 1 Rezoning proposal*.

Figure 11: Macquarie Park Corridor



Source: Atlas Economics. (2023). *Macquarie Park Innovation Precinct - Economic Impact Assessment*. NSW Department of Planning and Environment.

Stakeholders consulted in the development of this paper consider that the E2 and E3 zones represent the “commercial heart of the district”.

Several additional incentives that would foster residential developments have been proposed:

- Under a land tax discount for new BTR housing projects effective until 2040, eligible BTR properties will receive a 50% reduction in land value for land tax purposes, reducing the overall land tax liability.
- New BTR developments are exempt from foreign investor duty and land tax surcharges<sup>109</sup>.
- A bonus Floor Space Ratio (FSR) of up to 30% and a height bonus of up to 30% for proposals that include a minimum of 15% of the gross floor area as affordable housing<sup>110</sup>.

The rezoning proposal, coupled with the government’s drive to assist developers with BTR housing and their latest version of Transit Oriented Development (TOD)<sup>111</sup>, also aimed towards more housing for Macquarie Park, will see over 15,000 additional apartments built in the Innovation District. This would add to over 22,000 apartments already planned for Macquarie Park, and may require an

<sup>109</sup> Revenue NSW. (2022). *Land Tax Build to Rent*. [https://www.revenue.nsw.gov.au/news-media-releases/land-tax-build-to-rent#:~:text=Eligible%20Build%20to%20Rent%20\(](https://www.revenue.nsw.gov.au/news-media-releases/land-tax-build-to-rent#:~:text=Eligible%20Build%20to%20Rent%20()

<sup>110</sup> Planning NSW. (n.d.). *Housing SEPP*. <https://www.planning.nsw.gov.au/policy-and-legislation/housing/housing-sepp#:~:text=New%20bonuses%20for%20affordable%20housing>

<sup>111</sup> Planning NSW. (n.d.). *Transport Oriented Development SEPP*. <https://www.planning.nsw.gov.au/policy-and-legislation/housing/transport-oriented-development-program/transport-oriented-development-sepp>

additional school, as well as other infrastructure (above what is already planned), to cope with the significant increase in population<sup>112</sup>.

## Review of the Economic Impact Assessment (EIA)

### Topline outcomes and drivers of the EIA

The rezoning proposal envisions future construction projects in MPID as the primary driver of its economic impact, comprising:

- \$2.9 billion in additional direct and indirect output during the construction phase (\$972 million contribution to GRP);
- \$1.4 billion in additional output from future commercial operations (\$713 million contribution to GRP); and
- \$388 million in additional output from household expenditures (\$227 million contribution to GRP), through the creation of new dwellings in MPID.

The EIA therefore assumes that the new construction would encompass a mix of both commercial and BTR developments, which is supported by analysis of demand for both commercial and residential spaces<sup>113</sup>.

Given the incentives for BTR developments in the rezoned areas, however, stakeholders have raised concerns that the actual development may skew towards BTR and away from commercial. This is difficult to substantiate within the scope of this report, as it would require a detailed analysis of expected relative returns from BTR and commercial spaces (see Box). We do, however, underline the importance of ensuring that the potential for these policies to divert commercial, R&D-intensive investment away from MPID has been fully considered. That is, the opportunity cost of not supporting the development of the R&D-intensive sector at MPID.

A review of estimated economic activity in the post-construction phase provides insights into the assumed mix of uses in the newly constructed buildings under the rezoning proposal. The EIA estimates that 3,060 new dwellings and 3,246 additional full-time equivalent (FTE) jobs will be created (in the post-construction phase), with 1,964 additional FTE jobs directly related to activity in MPID. Household expenditure associated with residents in the new dwellings would have flow-on effects to create a further 1,279 FTE jobs<sup>114</sup>.

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<sup>112</sup> City of Ryde. (2023). *New campaign aims to protect Macquarie Park Innovation District jobs*. <https://www.ryde.nsw.gov.au/Council/Media-Centre/News-and-Public-Notices/New-campaign-aims-to-protect-Macquarie-Park-Innovation-District-jobs>

<sup>113</sup> NSW Government. (2023). *Macquarie Park Innovation Precinct – Stage 1 Rezoning Proposal*. <https://pp.planningportal.nsw.gov.au/draftplans/under-consideration/macquarie-park-innovation-precinct-stage-1-rezoning-proposal>

<sup>114</sup> Atlas Economics. (2023). *Macquarie Park Innovation Precinct - Economic Impact Assessment*. NSW Department of Planning and Environment.

## Potential implications of the rezoning proposal for the mix of residential and commercial development in the E2 and E3 zones

The EIA considers two scenarios:

- Scenario 1 – Commercial only
- Scenario 2 – Mix of commercial and BTR (flexible zoning, left to property developers to determine use)

It assumes that the true impact would lie somewhere between these two scenarios. It estimates that approximately 3,000 new dwellings will be delivered under either scenario (see Table 7).<sup>115</sup>

The majority of land in MPID is privately held and, hence, property developers will largely determine the nature of new construction projects, factoring in the relative risks and returns of pursuing commercial or BTR developments. Hence, the incentives for new BTR developments in the rezoning proposal will play a significant role in guiding MPID's future.

Stakeholders commented that incentivisation towards BTR may attract developers seeking short-term reward rather than long-term investment into this type of development at MPID. Over the longer-term, however, there is apprehension among property developers regarding BTR developments, stemming from potential reductions in returns, attributed to escalating construction costs and fluctuating demand for premium high-rise housing.

## Decision problem underlying the EIA

The EIA compared the incremental impacts of the rezoning proposal to permit more flexibility for residential property development, inclusive of BTR relative to a status quo 'business as usual' scenario of retaining existing commercially focused land zoning.

Economic impacts were estimated over the period 2024 to 2044 using an Input-Output model<sup>116</sup> and estimated economic impact for the Ryde LGA, assuming:

- **Base Case:** The Precinct continues to operate under current planning controls, including existing operations and projected growth in commercial development over the next 20 years.
- **Proposal Case:** The Precinct is developed under the Stage 1 Master Plan, including 3,060 residential units and future commercial over the next 20 years, stimulated through the additional dwellings via household expenditure, available labour force, and increased open space and infrastructure amenity.

Assuming the subsequent building of residential units, the assessment distinguishes the economic impacts during construction and those that are more permanent ('operational'). The analysis

<sup>115</sup> Atlas Economics. (2023). *Macquarie Park Innovation Precinct - Economic Impact Assessment*. NSW Department of Planning and Environment.

<sup>116</sup> Input Output models work by capturing the direct and indirect effects of expenditure in the economy by accounting for the linkages between different industries in the economy. For each industry in the economy, the Input Output table traces the industries it purchases inputs from and the industries to which it sells its outputs. These linkages are used to estimate the multiplier effect of expenditure.

considers impacts of output, gross regional product, FTE employment. Table 7 summarises the decision problem.

**Table 7: Decision problem, scenarios, methodology, key parameters and metrics in the EIA**

Parameter	Baseline (current policies)	Stage 1 rezoning proposal (NGW Govt)	Direct/ indirect effects
<b>Key development parameters</b>	2024-2031 +10K sqm additional floor space p.a. 2032-2044 +12K sqm p.a.	2024-2031 +10K sqm additional floor space p.a. 2032-2044 +16K sqm p.a.	Output, Gross Regional Product, FTEs and Incomes & Salaries
<b>Proposals</b>	<p><b>Base Case:</b> The Precinct continues to operate under current planning controls, including existing operations and projected growth in commercial development over the next 20 years.</p> <p><b>Proposal Case:</b> The Precinct is developed under the Stage 1 Master Plan, including a minimum of ~3,060 residential units and future commercial over the next 20 years, with BTR flexibility potentially increasing total dwellings.</p> <p>In <b>Scenario 1</b>, the Stage 1 rezoning could accommodate some 54,000 workers and 3,060 new dwellings (275,000sqm of residential floor space).</p> <p>In <b>Scenario 2</b>, the rezoning could accommodate some 31,000 workers (reduced for BTR dwellings) and circa 3,000 new dwellings (in rezoned areas) (1.2m sqm commercial floorspace with BTR flexibility)</p>		
<b>Time horizon</b>	20 years (2024 to 2044)		
<b>Geographic/ economic region</b>	MPID, Ryde LGA		
<b>Stage 1 rezoning proposal incremental value add rationale</b>	Like other commercial office markets across Australia, there has been a ‘re-setting’ of demand for office floorspace across Macquarie Park. Overall demand has been softer, with a significant amount of vacant floorspace across the market (>20%). Vacancy rates are expected to remain elevated to 2028. There is assumed to be sufficient demand for the projected 3,060 additional dwellings.		

Source: Atlas Economics. (2023). Macquarie Park Innovation Precinct - Economic Impact Assessment. NSW Department of Planning and Environment.

## Commentary on the EIA

In the absence of access to the underlying analysis (i.e., I-O modelling) it is challenging, *per se*, to methodologically critique the analysis at a detailed level. Instead, we focus on the value framework utilised and, in particular, the exclusion of the value of R&D generated by future development of MPID. Given the highly skilled workforce and R&D-intensive sectors operating at R&D, we contend that the value of one sqm of commercial space at MPID exceeds the state and national averages.

## Assumed economic interchangeability of MPID

The EIA approach implicitly assumes that land and properties at MPID are interchangeable with other urban areas in NSW offering commercial or residential spaces. The prior section, ‘Economic Importance of the Macquarie Park Innovation District’ demonstrated however the higher levels of economic activity at the MPID ecosystem relative to elsewhere (GRP, per worker productivity, per worker income), underpinned by a highly educated workforce.

This relates to the ‘network effect’ created by the proximity of R&D-intensive industries and organisations, which continues to draw new entrants into the district. As outlined in the case studies in this report, companies and projects have been uniquely attracted to the characteristics of MPID, with the district effectively ‘beating out’ interstate or international competitors.

In not considering the unique nature of MPID, the EIA fails to acknowledge the characteristics of the district that leads to high economic value generation. Subsequently, the analysis does not attempt to quantify the risk of MPID network effect erosion and potential for decline in ongoing economic value generation.

## Value of R&D-intensive commercial activity at MPID

Where additional R&D is being drawn into the NSW and Australian economies, the true underlying commercial value of MPID real estate would be bolstered by its potential to drive productivity improvements and sustainable economic growth, which has not been accounted for in the EIA<sup>117</sup>.

Erosion of the network effect present at the MPID would not only erode the direct and indirect local economic benefits. To the extent that it results in an overall reduction in investment in the state by innovative companies, it would also see a loss of these longer-term and broader benefits to the state and national economies.

## General comments

There are also several general critiques or uncertainties in the analysis immediately apparent which, along with inability to access the underlying analysis, make critique challenging:

- **Dispersed employment claim**

The EIA states that the Proposal Case will generate ‘dispersed employment’ through persons working from home (WFH) in the new residential dwellings. It is unclear that provision of additional dwellings (e.g., under BTR) where residents are WFH constitutes job creation that is truly attributable to the economic development of the MPID.

If individuals are WFH (for a company in a different location), then they are unlikely to be engaged in the MPID’s knowledge economy and contributing to the network effect of knowledge workers and innovative companies. A survey conducted by MPID in 2018 indicates that more than 80% of those working in the MPID travelled from outside<sup>118</sup>.

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<sup>117</sup> CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

<sup>118</sup> Connect MPID. (2018). Our road map for Macquarie Park: New access alignments <https://www.connectmpid.com.au/news/macquarie-park-tomorrow-new-access-alignments>

While the extent of office-based working has undoubtedly changed post-pandemic, this likelihood is still captured when considering data from the 2021 ABS Census, which estimated that average annual person income of Macquarie Park residents was approximately \$70,000 per year<sup>119</sup>. In contrast, the average annual per person income of MPID employees estimated to be more than 125,000 per year<sup>120</sup>.

While the importance of providing residential dwellings is acknowledged, WFH 'employment' may therefore be less economically valuable to MPID, compared with employment directly connected to companies operating in the area, and would be unlikely to contribute to the associated R&D spillover that would generate longer-term increases in economic growth.

- **Lack of clarity in underlying assumptions for the Proposal Case**

The Proposal Case assumes that 3,060 new dwellings would be created. The inclusion of the two scenarios as part of the Proposal Case combines a commercial only scenario with some mix of commercial and BTR, reducing the job creation assumption from 54,000 to 31,000 and states that, "The eventual built outcome is likely to fall between the two land use scenarios"<sup>121</sup> (giving a final estimate of 39,599 new jobs, or 23,875 directly related to activity at the precinct).

It is unclear, though, why the EIA has limited the assumption of new dwelling creation to 3,060 (i.e., the minimum number expected) and has not considered the alternative of 5,040, which has been cited in NSW Government documents, as a potential outcome of the rezoning proposal.

The actual outcome of BTR dwellings could be even higher, as 5,040 reflects only 'part' of the flexibly zoned area being developed as BTR. Based on an estimated 90 square metres per dwelling (as indicated for the 3,060 BTR dwellings), 5,040 dwellings represents less than half of the 1.2 million square metre flexibly zoned area. It would seem prudent to stress-test the potential for unintended consequences (i.e., higher than expected BTR development) due to the rezoning proposal on EIA findings.

- **Lack of clarity in scenario definitions**

It is unclear why floor space does not increase between the time period 2024 to 2031 relative to the base case scenario if construction is happening. This effectively implies a considerable time period for the benefit of additional commercial and residential floor space to occur. This represents a considerable opportunity cost in the form of a foregone opportunity for an innovative, R&D spending company to locate at MPID.

Similarly, Section 5.2. of the EIA states that during the operational phase.

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<sup>119</sup> ABS. (2022). 2021 Macquarie Park, Census All persons QuickStats. <https://abs.gov.au/census/find-census-data/quickstats/2021/SAL12446>

<sup>120</sup> REMPLAN Economics. (2024). Employment Report. Data sourced from the ABS.

<sup>121</sup> Atlas Economics. (2023). Macquarie Park Innovation Precinct - Economic Impact Assessment. NSW Department of Planning and Environment.

*“Base Case: The Precinct will continue to facilitate direct employment through current activities undertaken onsite and projected future growth in commercial activity.*

*Proposal Case: The Precinct will retain existing operations and generate expanded ongoing employment activity through additional commercial development.*

The distinction between the base and proposal cases is unclear and therefore being able to determine incremental impacts is challenging.

These factors influence the outcome of the EIA and warrant further review and discussion.

## Valuing the opportunity cost of the rezoning proposal

Given the economic impact of R&D expenditure estimated by CSIRO in 2021, i.e., approximately \$3.50 (in present value terms) in additional economic activity for every \$1 spent<sup>122</sup>, underinvestment in R&D-intensive sectors at MPID represents a significant opportunity cost, both now and into the future. This has implications for the regional, NSW and Australian economies.

Considering the globally competitive market for attracting players in R&D-intensive sectors, an erosion of the MPID ecosystem, and the associated ‘network effect’ would lead to lasting, negative, direct and indirect economic impacts.

Based on the floor space available for BTR in the rezoning proposal, there is a clear long-term economic opportunity cost from it not being utilised commercially for innovation-intensive uses. We conduct an indicative scenario analysis, focusing on the flexible component of the rezoning plan (part two) open to BTR, estimating the long-term economic opportunity cost of the proposal, as well as the economic impacts of commercial floor use not accounted for by the EIA. The analysis focuses on the E2 and E3 zones, representing 1.2 million sqm of space for development, which are proposed for flexible zoning for either commercial development or BTR.

## Decision problem

We estimate the potential long-term economic opportunity costs of the proposal, as well as the positive economic impacts of commercial floor use not accounted for by the EIA, for the following ‘contestable’ commercial floorspace:

- 1.2 million sqm of commercial floorspace, which reflects capacity for approximately 23,000 additional jobs. Part of this area can be used for 5,040 homes build-to-rent, depending on market demand<sup>123</sup>.

We estimate the impacts on GSP and GDP of annual R&D expenditure not captured by the EIA, as well as foregone R&D expenditure where BTR development occurs in place of innovation-intensive commercial development. Three scenarios of BTR development are considered:

1. Fully built (5,040 new dwellings)

<sup>122</sup> CSIRO. (2021). Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis. <https://www.csiro.au/en/news/all/articles/2021/november/value-innovation-investment>

<sup>123</sup> NSW Government. (2023). Macquarie Park Innovation Precinct – Stage 1 rezoning proposal. <https://www.planning.nsw.gov.au/plans-for-your-area/priority-growth-areas-and-precincts/macquarie-park>

2. Half are built (2,520 new dwellings)
3. None are built (0 new dwellings).

The analysis does not estimate the impact of foregone revenue otherwise earned by companies, nor employment income otherwise earned by employees at MPID. The analysis does not attempt to account quantitatively for any possible consequential second order 'erosion' of commercial space at MPID.

## Methodology

We employed the following methodology:

1. Derived the average revenue generated per square metre of commercial floor space for the major commercial sectors present at the MPID<sup>124,125</sup> based on analysis of existing floor space and sales revenue of commercial organisations at MPID.
2. Applied an estimated R&D spend as a proportion of revenue for the major sectors represented at MPID to estimate current annual R&D spending. Although industries at MPID can characteristically have higher R&D spending ratios, analysis employs a very conservative estimate of 2.5% of revenue, reflective of the case studies explicitly identified in Table 4. The impact is explored in sensitivity analysis by an average MPID R&D ratio of 5% of revenue.
3. The estimated annual R&D expenditure activity not captured by the EIA during its estimate of economic impact, as well as R&D foregone from BTR, are calculated under 3 scenarios of residential dwelling development assuming all (5,040), half (2,520) and none (0) of the BTR residential allotment is used.
4. The consequential long-term impacts on GDP and NSW GDP are estimated using the CSIRO economic output multiplier (PV-adjusted) and apportioning the resulting permanent impact in GDP to NSW GSP on the basis of NSW's share of Australian GDP.
5. An additional scenario analysis explores the implications for R&D spending and subsequent long term macroeconomic impacts for Australia and NSW if all of the E2 and E3 zones were developed as BTR.

## Key assumptions and inputs

Key assumptions and inputs are summarised in Table 8.

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<sup>124</sup> REMPLAN Economics. (2024). *Output Report*. Data sourced from the ABS.

<sup>125</sup> Connect MPID. (2022). *A road map for Macquarie Park | collaboration, innovation, transformation*. <https://www.connectmpid.com.au/about-us>

**Table 8: Key Assumptions and Inputs**

Assumption/Input	Description	Source/Rationale/Comments
Applicable floor space evaluated	Base case analysis considers the 1.2m sqm floor space available for 5,040 potential BTR dwellings. Only part of the 1.2m sqm is assumed available for BTR. Maximum commercial occupancy yields 23,000 employees.	NSW Government (2023). <a href="#">Macquarie Park Priority growth areas and precincts.</a>
Assumed average sqm per residential apartment	Residential floor space average 90sqm per dwelling (assuming 3-person occupancy per dwelling).	NSW Government (2023). <a href="#">Macquarie Park Priority growth areas and precincts.</a> Part one estimates 275,000sqm will equate to 3,060 residential dwellings (~90sqm per dwelling).
R&D spend as % of revenue	Conservative 2.5% base case, with 5.0% sensitivity analysis	Reflects accounted for case studies of R&D spending in MPID (Table 4); sensitivity analysis reflects conservative doubling (R&D spend still below that typically expected for MPID industry mix).
Commercial revenue per sqm (\$)	Revenue earned by commercial activities in MPID \$38,736/sqm.	Based on estimated current commercial floor space (904,700 sqm). <a href="#">Connect MPID (2022). A road map for Macquarie Park   collaboration, innovation, transformation.</a> Estimated commercial revenues at MPID for 2023 \$36.74bn (REPLACE Economics (2024). Output Report. Sourced from ABS data).
Broader GDP R&D multiplier (5% discount rate) present value	\$3.50, i.e., \$1 R&D spend yields \$3.50 economic benefits in PV terms	CSIRO. (2021). <a href="#">Every dollar invested in research and development creates \$3.50 in benefits for Australia, says new CSIRO analysis.</a>
Interpretation of PV multipliers	PV discounts future economic outcomes generated 15 years from now due to R&D investment in the current period, back to their PV by application of discounting.	Interpretation of PV multipliers
NSW GSP as % of Australian GDP	Analysis estimates that approximately 30.5% of any broader macroeconomic benefits due to R&D (output), accrue to NSW.	NSW generates an estimated 30.5% of Australia's GDP. ABS (2022-23-financial-year), Australian National Accounts: State Accounts, ABS Website, accessed 4 March 2024.
Scenario Analysis	Assuming full 1.2m sqm potentially available. Based on 90sqm per residential dwelling, an estimated 13,333 dwellings.	Hypothetical scenario to demonstrate broader implications should all space be made available for BTR.

## Results

Table 9 and Table 10 summarise the results. Even with conservative estimates of R&D spending, the permanent long-term impacts on the NSW and Australian economies from foregone R&D activity are evident. Assuming a 2.5% R&D ratio, full BTR allocation use sees an estimated \$436m annual R&D spending foregone; resulting in long-term decremental impact on Australian GDP of \$1.5bn (PV) and

\$465m on NSW GSP (PV). Similarly, assuming a 5% R&D ratio, full BTR allocation use sees an estimated \$878m annual R&D spending foregone; resulting in long-term decremental impact on Australian GDP of \$3.1bn (PV) and \$938m (PV) on NSW GSP.

It must be emphasised that the opportunity cost of lost R&D to the economy is cumulative. Prospective tenants not ultimately moving to the MPID (and those leaving) therefore represent a significant permanent economic opportunity cost to the state of NSW and Australia that builds for every year innovative commercial tenants are not occupying the MPID.

We also note the respective long-term economic benefits of R&D that existing commercial occupancy generates to the benefit of Australia and the broader NSW economy. While not explicitly referenced as such, these amounts demonstrate the potential lost annual benefits should the MPID 'network effect' be sufficiently eroded going forward.

**Table 9: Estimated macroeconomic impact of commercial developments and opportunity cost of BTR developments due to R&D expenditure**

Scenario	Dwellings	Commercial development (not accounted for in EIA)			Opportunity cost of BTR developments		
		Annual R&D spend	Long-term annual impact on Australian GDP (PV)	Long-term impact on NSW GSP (PV)	Estimated foregone annual R&D spend	Estimated foregone long-term impact on Australian GDP (PV)	Estimated foregone long-term impact on NSW GSP (PV)
<i>Base case, R&amp;D expenditure estimated at 2.5% of MPID organisation revenues</i>							
All proposed BTR in E2/E3	5,040	\$717m	\$2.5bn	\$765m	\$436m	\$1.5bn	\$465m
50% proposed BTR in E2/E3	2,520	\$935m	\$3.3bn	\$998m	\$218m	\$763m	\$233m
No BTR in E2/E3	0	\$1.2bn	\$4.0bn	\$1.2bn	\$0	\$0	\$0

Notes:

1. Results subject to rounding
2. Estimated NSW GSP impact reflects pro-rata apportionment of estimated NSW % of Australian GDP (30.5%)
3. PV=present value (discounted at 5%)
4. Estimates based on application of CSIRO calculated ratio (2021), which estimates that on average, for every \$1 of R&D investment, the Australian economy realises approximately \$3.50 in economy-wide benefits. See referenced CSIRO paper for further details.

**Table 10: Estimated macroeconomic impact of commercial developments and opportunity cost of BTR developments due to R&D expenditure**

Scenario	Dwellings	Commercial development (not accounted for in EIA)			Opportunity cost of BTR developments		
		Annual R&D spend	Long-term annual impact on Australian GDP (PV)	Long-term impact on NSW GSP (PV)	Foregone annual R&D spend	Foregone long-term impact on Australian GDP (PV)	Foregone long-term impact on NSW GSP (PV)
<i>Sensitivity analysis, R&amp;D expenditure estimated at 5% of MPID organisation revenues</i>							
All proposed BTR in E2/E3	5,040	\$1.4bn	\$5.1bn	\$1.5bn	\$878m	\$3.1bn	\$938m
50% proposed BTR in E2/E3	2,520	\$1.9bn	\$6.6bn	\$2.0bn	\$439m	\$1.5bn	\$469m
No BTR in E2/E3	0	\$2.3bn	\$8.1bn	\$2.5bn	\$0	\$0	\$0

Notes:

1. Results subject to rounding
2. Estimated NSW GSP impact reflects pro-rata apportionment of estimated NSW % of Australian GDP (30.5%)
3. PV=present value (discounted at 5%)
4. Estimates based on application of CSIRO calculated ratio (2021), which estimates that on average, for every \$1 of R&D investment, the Australian economy realises approximately \$3.50 in economy-wide benefits. See referenced CSIRO paper for further details.

## Scenario analysis

While the rezoning plan assumes up to 5,040 dwellings will be flexible for BTR use, it is not entirely clear that this would necessarily preclude the remaining floor space otherwise allocated for commercial use being also used for this purpose. As such, an additional scenario analysis explores the implications for R&D spending and subsequent long term macroeconomic impacts for Australia and NSW if all of the E2 and E3 zones were developed as BTR.

Applying the existing assumption that each new dwelling would occupy 90 sqm of floor space, we estimate in excess of 13,000 potential residential dwellings within the estimated 1.2 million sqm of floor space.

Annual forgone R&D spending is estimated at \$1.2 bn, with consequential forgone Australian GDP of \$4.0 bn (PV) and NSW GSP of \$1.2 bn (PV) respectively. If the assumed annual R&D spend increases to 5% of revenues, these figures effectively double (\$2.4bn R&D, \$8.1bn Australian GDP (PV), \$2.5bn NSW GSP (PV)).

**Table 11: Estimated macroeconomic impact of commercial developments and opportunity cost of BTR developments if all E2 and E3 zones were developed as BTR**

Scenario	Dwellings	Additional commercial space			Opportunity cost of BTR space		
		Annual R&D spend	Long-term annual impact on Australian GDP (PV)	Long-term impact on NSW GSP (PV)	Foregone annual R&D spend	Foregone long-term impact on Australian GDP (PV)	Foregone long-term impact on NSW GSP (PV)
<i>Base case, R&amp;D expenditure estimated at 2.5% of MPID organisation revenues</i>							
All E2/E3 BTR development	13,333	\$0	\$0	\$0	\$1.2bn	\$4.0bn	\$1.2bn

Notes:

1. Results subject to rounding
2. Estimated NSW GSP impact reflects pro-rata apportionment of estimated NSW % of Australian GDP (30.5%)
3. Potential upper limit of dwellings estimated at 13,333, based on total available space of 1.2 million sqm and an average 90 sqm per dwelling
4. PV=present value (discounted at 5%)
5. Estimates based on application of CSIRO calculated ratio (2021), which estimates that on average, for every \$1 of R&D investment, the Australian economy realises approximately \$3.50 in economy-wide benefits. See referenced CSIRO paper for further details.

**Table 12: Estimated macroeconomic impact of commercial developments and opportunity cost of BTR developments if all E2 and E3 zones were developed as BTR**

Scenario	Dwellings	Additional commercial space			Opportunity cost of BTR space		
		Annual R&D spend	Long-term annual impact on Australian GDP (PV)	Long-term impact on NSW GSP (PV)	Foregone annual R&D spend	Foregone long-term impact on Australian GDP (PV)	Foregone long-term impact on NSW GSP (PV)
<i>Sensitivity analysis, R&amp;D expenditure estimated at 5% of MPID organisation revenues</i>							
All E2/E3 BTR development	13,333	\$0	\$0	\$0	\$2.3bn	\$8.1bn	\$2.5bn

Notes:

1. Results subject to rounding
2. Estimated NSW GSP impact reflects pro-rata apportionment of estimated NSW % of Australian GDP (30.5%)
3. Potential upper limit of dwellings estimated at 13,333, based on total available space of 1.2 million sqm and an average 90 sqm per dwelling
4. PV=present value (discounted at 5%)
5. Estimates based on application of CSIRO calculated ratio (2021), which estimates that on average, for every \$1 of R&D investment, the Australian economy realises approximately \$3.50 in economy-wide benefits. See referenced CSIRO paper for further details.

## Discussion

There is a significant opportunity cost, both now and into the future, of underinvesting in R&D-intensive commercial development at MPID, with implications for the regional, NSW and Australian economies. The results highlight:

- Significant long-term economic impacts of R&D-intensive commercial development that have not been considered by the EIA; and
- Opportunity costs, or forgone long-term economic benefits, as a result of land in the E2 and E3 zones being developed as BTR instead of R&D-intensive commercial.

The opportunity cost of lost R&D to the economy is cumulative. Each year foregone represents a permanent annual loss in NSW and Australian economic output. Prospective tenants not ultimately moving to the MPID therefore represent a significant permanent economic opportunity cost to the state of NSW.

We note that for this to represent a true opportunity cost, it is necessary to assume that there is demand to fill the proposed floor space of commercial development at MPID. It was out of scope of this paper to challenge the EIA's findings regarding soft demand for commercial spaces in Sydney currently.

However, this highlights the role of additional policies and incentives in ensuring that demand among the types of tenants that will drive innovation at MPID remains strong, to preserve the unique value of the MPID and set up for future success. This is further discussed in the next section.

# Reaching MPID's potential as a world-class innovation district



## Key Takeaways

- MPID performs well based on review of global innovation district success factors and has the potential to grow even further.
- MPID has established diverse innovation activity similar to and often exceeding that seen in other leading Australian innovation districts; however, there is a current misalignment between infrastructure and precinct needs which demands greater coordination and placemaking efforts within MPID.
- Enhancement of MPID's public, enabling, and commercial infrastructure would increase its attractiveness to innovative companies in a globally competitive marketplace.

## The role of innovation districts in promoting technological advancement and economic growth

An innovation district is a specific geographic location, usually within a city, where high concentrations of people work in knowledge-intensive industries, in conjunction with other related companies and institutions<sup>126</sup>. Notable success stories of innovation districts around the world include Kendall Square in Cambridge, Massachusetts, known for its thriving biotech and tech scene, and Barcelona's 22@ District, which has transformed a former industrial area into a dynamic tech and innovation hub.

Innovation districts encourage collaboration across diverse sectors to tackle complex national and global challenges. They are instrumental in boosting productivity through enhanced employment, attracting investments, and promoting skills development. Importantly, these districts translate research into commercial success, thereby providing a competitive edge in the global market.

Beyond innovation and economic growth, innovation districts benefit the wider communities by facilitating interactions and providing a vibrant atmosphere conducive to entrepreneurial spirit and social inclusivity in various settings, from streets and cafes to public spaces<sup>127</sup>. Strategically located and amenity-rich districts attract innovative businesses and skilled workers and enhance urban life, boost investment, talent inflow, and overall community life in the area.

Innovation districts play a key role in NSW and Australia's strategic push to drive R&D. The Australian Government is investing heavily in research capabilities and industry-research collaborations through initiatives like the National Reconstruction Fund<sup>128</sup>. As 26% of Australia's highly cited

<sup>126</sup> Aretian Urban Analytics and Design. (2019). *The Atlas of Innovation Districts*.

<sup>127</sup> Lawrence, S., Hogan, M. Q., & Brown, E. (2019). *Planning for an Innovation District: Questions for Practitioners to Consider*. RTI Press Publication. <https://doi.org/10.3768/rtipress.2018.op.0059.1902>

<sup>128</sup> Department of Industry, Science and Resources. (2022). *National Reconstruction Fund: diversifying and transforming Australia's industry and economy*. <https://www.industry.gov.au/news/national-reconstruction-fund-diversifying-and-transforming-australias-industry-and-economy>

researchers is concentrated in the Six Cities Region's innovation ecosystem, these districts serve as vital hubs for collaboration and innovation<sup>129,130</sup>.

The NSW Innovation and Productivity Council as outlined<sup>131</sup>, seven key success factors based on research on globally significant precincts. These factors are described as:

1. **Market drivers:** *High market demand, competitive innovation pressure, access to markets, skills and investors, reliable legal/IP protections, and a favourable regulatory environment.*
2. **Competitive advantage:** *Clearly defined market advantage or sector specialisation communicated through strong branding to attract and retain talented workers and financial investment.*
3. **Collaboration:** *Facilities and programs to support collaboration between diverse organisations.*
4. **Infrastructure:** *Physical, transport and digital infrastructure that supports research, innovation. and business connectivity within and outside of the precinct.*
5. **Amenity:** *A vibrant location suitable for work, play, and living, supported by flexible and adaptive land use planning regulations and well-designed cultural infrastructure.*
6. **Enterprise culture:** *Strong entrepreneurial culture of risk-taking, collaboration and sharing ideas.*
7. **Leadership:** *Robust governance, strong leadership on a district coordinative level, political commitment, and a shared vision.*

The current state of MPID requires strategic evaluation and planning to support the seven success factors, thereby creating a holistic environment conducive to innovation.

## MPID currently performs strongly across innovation district success factors

### Assessing MPID against other world-class innovation districts

MPID performs well against innovation district success factors. There are some areas where MPID can improve, most notably within the infrastructure, amenity, and leadership categories. The table below summarises examples of strong performance and potential areas of improvement within the district, relative to the success factor framework. Brief case study examples are also included to demonstrate the gold standard for each success factor.

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<sup>129</sup> Clarivate. (2022). *Highly Cited Researchers*. [https://clarivate.com/highly-cited-researchers/?campaignname=Highly\\_Cited\\_Researchers\\_SAR\\_Global\\_2022&campaignid=7014N000001uvdq&utm\\_campaign=Highly\\_Cited\\_Researchers\\_SAR\\_Global\\_2022&utm\\_source=earned\\_coverage&utm\\_medium=press](https://clarivate.com/highly-cited-researchers/?campaignname=Highly_Cited_Researchers_SAR_Global_2022&campaignid=7014N000001uvdq&utm_campaign=Highly_Cited_Researchers_SAR_Global_2022&utm_source=earned_coverage&utm_medium=press)

<sup>130</sup> World Intellectual Property Organisation. (2022). *Global Innovation Index 2022: What is the Future of Innovation-driven Growth? In World Intellectual Property Organization & S. L. Dutta (Eds.), WIPO Knowledge Repository (15th edition)*.

<sup>131</sup> NSW Innovation and Productivity Council. (2018). *NSW Innovation Precincts: Lessons from international experience*. <https://www.treasury.nsw.gov.au/sites/default/files/2020-10/Full-Report-IPC-NSW-Innovation-Precincts-2018.pdf>

**Table 13: Innovation Success Factors: Market drivers**

	Success factor characteristics	Examples in MPID
Performs well	Supportive legal and IP framework	<ul style="list-style-type: none"> <li>Operating in Australia where regulations and policies protect IP</li> <li>Highest number of IP registrations in the country, with breakthroughs like Wifi, Cochlear implants, and Till payments<sup>132</sup></li> </ul>
	Strong industry and investment base	<ul style="list-style-type: none"> <li>Home to Macquarie University, Macquarie University Hospital, regional headquarters of 10% of the world's top 100 companies, over 200 SMEs, and two start-up incubators</li> <li>Presence of high-growth industry clusters: medical and pharmaceutical (19%), digital (20%), industrial and technology (25%), education and research (7%), and telecommunications (7%)<sup>133</sup></li> <li>Highly favourable location for employees traveling from Eastern, Northern and Western suburbs with proximity to the CBD</li> <li>Acreage allows for innovation spaces that require large/flexible land lots e.g., manufacturing, warehousing</li> </ul>
	Access to knowledge and research institutions	<ul style="list-style-type: none"> <li>Direct access to knowledge and research institutions, including Macquarie University and Macquarie University Hospital which hosts more than 100 active clinical trials</li> <li>Access to a strong talent pool of graduates from Macquarie University where companies have active student placement and graduate programs in place</li> </ul>
	Macroeconomic factors	<ul style="list-style-type: none"> <li>Benefits from Australian programs and grant funding that support research, collaboration, entrepreneurship, and commercialisation</li> </ul>
Needs improvement	Access to funding and finance	<ul style="list-style-type: none"> <li>Limited funding and support from the state government for critical infrastructure and innovation initiatives</li> <li>Maturing and marketing of MPID will help attract international investment</li> </ul>



### Case Study – Silicon Valley, US

Silicon Valley is a global hub for technology, innovation, and entrepreneurship, hosting a total of 550,000 innovation jobs<sup>134</sup>. Silicon Valley is powered by a combination of market drivers, including demand from federal customers, a dense network of investors, a cooperative culture,

<sup>132</sup> Connect MPID. (n.d.). About Mac Park. <https://www.connectmpid.com.au/about-macquarie-park>

<sup>133</sup> Connect MPID. (2022). A road map for Macquarie Park | collaboration, innovation, transformation. <https://www.connectmpid.com.au/about-us>

<sup>134</sup> Collaborative Economics (COECON). (2020). Silicon Valley Competitiveness and Innovation Project 2020 Update. Silicon Valley Leadership Group. [https://www.svl.org/wp-content/uploads/2021/03/SVCIP\\_2020.pdf](https://www.svl.org/wp-content/uploads/2021/03/SVCIP_2020.pdf)

and access to top-class facilities. This blend of factors has established Silicon Valley as a leading global innovation hub, highlighting areas where MPID could enhance its competitive edge and market appeal<sup>135</sup>. MPID benefits from operating within a supportive legal framework, a robust industry base, direct access to research institutions and favourable location. However, it faces challenges in accessing finance and lacks state support for infrastructure and innovation, which hinders its capacity to attract international investment.

**Table 14: Innovation Success Factors: Competitive advantage**

	<b>Success factor characteristics</b>	<b>Examples in MPID</b>
<b>Performs well</b>	Defined market advantage	<ul style="list-style-type: none"> <li>Perceived advantage in life sciences due to presence of several players</li> </ul>
	Cluster of skills and talent	<ul style="list-style-type: none"> <li>Highly skilled workforce and student population</li> <li>Access to a large, qualified labour pool as part of the Eastern Economic Corridor which contains one-third of Greater Sydney's jobs<sup>136</sup></li> <li>Clustering of university, hospital, and businesses enhances collaborative opportunities</li> </ul>
<b>Needs improvement</b>	Defined market advantage	<ul style="list-style-type: none"> <li>Diversity of industries present less well known to external parties</li> </ul>
	Talent attraction and retention	<ul style="list-style-type: none"> <li>Absence of amenities and identity limits attractiveness for workers</li> <li>Insufficient availability of flexible and affordable spaces to accommodate the diverse needs of innovation sector firms<sup>137</sup></li> </ul>
	Branding and positioning	<ul style="list-style-type: none"> <li>Government and CMPID long-term vision and objectives for the district are not clearly communicated/visible</li> <li>Stronger efforts in branding and positioning MPID are required with an aim both internally within the district and externally towards government and society</li> </ul>



### Case Study – 22@Barcelona, Spain

22@Barcelona is one of the most well-known innovation precincts in the world, specialising in digital and mobile communication technologies, with 3000+ firms and 90,000+ employees. It's selection as the 'Mobile World Capital' and the successful hosting of the Mobile World Congress

<sup>135</sup> NSW Innovation and Productivity Council. (2018). *NSW Innovation Precincts: Lessons from international experience*. <https://www.treasury.nsw.gov.au/sites/default/files/2020-10/Full-Report-IPC-NSW-Innovation-Precincts-2018.pdf>

<sup>136</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>137</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

highlights its clear vision, leadership in the field, and international recognition<sup>138</sup>. In contrast, MPID has a defined market advantage in life sciences and a cluster of skills and talent. However, MPID's competitive advantage is challenged by its less well-known diversity of industries, issues in talent attraction and retention due to a lack of amenities and identity, and a need for clearer branding and positioning.

**Table 15: Innovation Success Factors: Collaboration**

	Success factor characteristics	Examples in MPID
Performs well	Active networking	<ul style="list-style-type: none"> <li>Programmed initiatives and events by network organisation Connect MPID to promote networking<sup>139</sup></li> </ul>
	Commercial partnerships	<ul style="list-style-type: none"> <li>Collaboration between university and tenant organisations</li> <li>Presence of diverse industry clusters</li> <li>University's partnerships with corporate and business entities (e.g., Cochlear, NextSense, Optus, Fujitsu)</li> </ul>
Needs improvement	Active networking	<ul style="list-style-type: none"> <li>Additional shared spaces, open spaces, restaurants, and cafes are required to encourage informal meetups and ad-hoc networking</li> <li>Limited number of organisations (all large) involved as members of Connect MPID</li> </ul>
	Culture	<ul style="list-style-type: none"> <li>Low degree of informal communications to support collaboration and sharing of ideas and capabilities</li> </ul>



### Case Study – MaRS Discovery District, Canada

MaRS Discovery District supports over 1,400 science and tech companies, focusing on cleantech, health, fintech and enterprise software<sup>140</sup>. The success of MaRS can be attributed to the deliberate collaboration among medical institutions, including dense clustering strategies, strategic relocation of R&D functions, reconfiguration of real estate assets, and integration of research and entrepreneurship. This model has facilitated commercialisation of publicly funded medical research and technological innovations, supported by a non-profit corporation that bridges government, capital providers, and stakeholders<sup>141</sup>.

MPID demonstrates strong efforts in promoting networking and commercial partnerships, highlighted by programmed initiatives and events by Connect MPID and collaborations between the university and tenant organisations. MPID would benefit from enhancing networking and

<sup>138</sup> NSW Innovation and Productivity Council. (2018). *NSW Innovation Precincts: Lessons from international experience*. <https://www.treasury.nsw.gov.au/sites/default/files/2020-10/Full-Report-IPC-NSW-Innovation-Precincts-2018.pdf>

<sup>139</sup> Connect MPID. (n.d.). *Connect MPID News*. <https://www.connectmpid.com.au/news>

<sup>140</sup> About MaRS. (n.d.). *MaRS Discovery District*. <https://www.marsdd.com/about/>

<sup>141</sup> NSW Innovation and Productivity Council. (2018). *NSW Innovation Precincts: Lessons from international experience*. <https://www.treasury.nsw.gov.au/sites/default/files/2020-10/Full-Report-IPC-NSW-Innovation-Precincts-2018.pdf>

collaboration opportunities by encouraging wider involvement of organisations in its network to deepen collaboration and idea sharing, and by strategically reconfiguring infrastructure assets to facilitate engagement between research and entrepreneurial ecosystems.

**Table 16: Innovation Success Factors: Infrastructure**

	Success factor characteristics	Examples in MPID
Performs well	Digital and specialist infrastructure	<ul style="list-style-type: none"> <li>• Presence of market-leading telecommunications and advanced technologies players serves as a platform for R&amp;D, innovation, and product development</li> </ul>
	Digital and specialist infrastructure	<ul style="list-style-type: none"> <li>• Additional purpose-built buildings and specialist infrastructure for R&amp;D and innovation are required</li> </ul>
Needs improvement	Transport infrastructure	<ul style="list-style-type: none"> <li>• Auto-centric environment with local car congestion</li> <li>• Shortage of safe crossings, direct pedestrian paths, and bike paths</li> </ul>
	Flexible facilities, services, and amenities	<ul style="list-style-type: none"> <li>• Lack of flexible and adaptable space for SMEs<sup>142</sup></li> <li>• Commercial office spaces cater to large scale corporate users</li> <li>• Lack of leisure spaces, experimental and temporary sites that create casual interactions and collaboration</li> </ul>
	Affordable commercial rent	<ul style="list-style-type: none"> <li>• Lack of flexible and affordable space for SMEs<sup>143</sup></li> <li>• Large proportion of A-grade offices</li> </ul>



### Case Study – Alderley Park, UK

Alderley Park is home to 60+ established and 150 pre-start-up life science and tech companies. It provides ready-to-go labs, along with specialist and open-access labs and scientific services, which facilitate an easy and low investment setup. Additionally, it offers a variety of collaborative workspaces, including coworking desks, serviced offices, and leased spaces<sup>144</sup>.

MPID faces challenges in transport infrastructure, flexibility of facilities, and affordability of commercial spaces. To enhance its status as an innovation district, MPID learn from Alderley Park by increasing support for start-ups and scale-ups, expanding access to specialised lab and co-working office spaces, and improving the overall infrastructure to nurture a vibrant innovation ecosystem.

<sup>142</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>143</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>144</sup> Alderley Park. (n.d.). Alderley Park. <https://www.alderleypark.co.uk>

**Table 17: Innovation Success Factors: Amenity**

	Success factor characteristics	Examples in MPID
Performs well	Sustainability	<ul style="list-style-type: none"> <li>• Sydney’s greenest CBD, with green spaces such as Shrimptons Creek and Lane Cove National Park</li> <li>• Macquarie University ranks 39<sup>th</sup> globally in the Times Higher Education 2023 Impact Rankings<sup>145</sup></li> </ul>
	Liveability and sense of place	<ul style="list-style-type: none"> <li>• Office Park perception<sup>146</sup></li> <li>• Low levels of street level activation or night-time/weekend economy</li> <li>• Lack of identity leading to poor market appeal</li> </ul>
Needs improvement	Social interaction and inclusion	<ul style="list-style-type: none"> <li>• Lack of concentrated ‘hot spots’ (e.g., bars and cafes) to foster collaboration</li> </ul>
	Housing choice	<ul style="list-style-type: none"> <li>• Limited affordable housing options</li> <li>• Large rent increases in recent years<sup>147</sup></li> </ul>
	Vibrant mix of uses	<ul style="list-style-type: none"> <li>• Scarce recreational and cultural amenities</li> </ul>
	Sustainability	<ul style="list-style-type: none"> <li>• Implementation of sustainable and efficient utility solutions is required (e.g., solar power, recycled water)</li> </ul>



### Case Study – Cortex Innovation Community, US

The Cortex Innovation Community hosts 425 companies and 11 innovation centres and activators across five priority industry clusters: life sciences, technology, cybersecurity, geospatial, and national security. It is designed to support tech businesses and their employees by blending restaurants, shops, green spaces, and apartments with office space, capital investment, and educational opportunities<sup>148,149</sup>. This model fosters a sense of community and aims to create a dynamic, 24/7 neighbourhood. In contrast, MPID faces challenges related to liveability, social inclusion, and mixed-use development. As such, the Cortex Innovation Community could serve as a model for MPID, guiding efforts to cultivate a vibrant and integrated community.

<sup>145</sup> Connect MPID. (2023). Macquarie University sustainability rankings on the rise. <https://www.connectmpid.com.au/news/macquarie-university-recognised-for-its-sustainability-impact>

<sup>146</sup> Department of Planning, Industry and Environment. (2021). Macquarie Park Strategic Masterplan - Appendix B Economic Development Study.

<sup>147</sup> Burke, K. (2023). Sydney suburbs where rents soared most over the past year. Domain. <https://www.domain.com.au/news/sydney-suburbs-where-rents-soared-most-over-the-past-year-2-1222996/>

<sup>148</sup> Cortex Innovation District. (n.d.). Cortex Innovation Community. <https://www.cortexstl.org/>

<sup>149</sup> Cortex Innovation Community. (2022). Cortex Innovation Community 2022 Impact Report. [https://cortexstlorg.blob.core.windows.net/media/1884/cortex\\_impact\\_report\\_final\\_spreads.pdf](https://cortexstlorg.blob.core.windows.net/media/1884/cortex_impact_report_final_spreads.pdf)

**Table 18: Innovation Success Factors: Enterprise culture**

	Success factor characteristics	Examples in MPID
Performs well	Culture of entrepreneurship and risk-taking	<ul style="list-style-type: none"> <li>• Presence of two successful start-up incubators</li> <li>• Fostering the creation of spinouts (e.g., Celosia Therapeutics, Number 8 Bio, Redback Systems)</li> </ul>
	Diverse businesses and people	<ul style="list-style-type: none"> <li>• Diverse mix of companies, institutions, and start-ups</li> </ul>
	Anchor institutions	<ul style="list-style-type: none"> <li>• Anchor university with strong research output and entrepreneurial culture</li> <li>• Macquarie University ranked among the top 10 entrepreneurial universities in Australia<sup>150</sup></li> </ul>
Needs improvement	Culture of entrepreneurship and risk-taking	<ul style="list-style-type: none"> <li>• Enhanced mentorship, educational support, and skill development among young firms, entrepreneurs, researchers, students, mentors, and specialised advisors are desirable</li> </ul>



### Case Study – Herzliya, Israel

Herzliya is known for its focus on the internet, telecommunications, energy and cleantech industries. It’s enterprise culture thrives on risk-taking, failure acceptance, and inter-generational mentorship. These factors collectively cultivate a pro-innovation mindset and foster a synergistic relationship between agile start-ups and established firms<sup>151</sup>. In comparison, MPID's enterprise culture benefits from vibrant start-up incubators and a diverse mix of businesses, anchored by a university with a strong entrepreneurial spirit. To bolster this ecosystem, MPID could enhance its enterprise culture by improving mentorship, educational support, and skill development, drawing inspiration from the model of Herzliya to foster a deeper culture of entrepreneurship and risk-taking.

<sup>150</sup> Macquarie University. (2022). Annual Report 2022. [https://www.mq.edu.au/\\_\\_data/assets/pdf\\_file/0019/1263421/Macquarie-University-Annual-Report-2022.pdf](https://www.mq.edu.au/__data/assets/pdf_file/0019/1263421/Macquarie-University-Annual-Report-2022.pdf)

<sup>151</sup> NSW Innovation and Productivity Council. (2018). NSW Innovation Precincts: Lessons from international experience. <https://www.treasury.nsw.gov.au/sites/default/files/2020-10/Full-Report-IPC-NSW-Innovation-Precincts-2018.pdf>

**Table 19: Innovation Success Factors: Leadership (referring to district coordination)**

	Success factor characteristics	Examples in MPID
Performs well	Supportive governance framework	<ul style="list-style-type: none"> <li>• Presence of Connect MPID, a stakeholder-led association that facilitate partnerships between industry, research, education, and government and guide MPID progress</li> </ul>
Needs improvement	Precinct leadership	<ul style="list-style-type: none"> <li>• Need for a clear leadership model and defined roles and responsibilities among stakeholders, including City of Ryde, MPID, and the NSW government<sup>152</sup></li> </ul>
	Shared vision	<ul style="list-style-type: none"> <li>• Long-term vision not publicly visible to external parties</li> </ul>
	Political commitment and support	<ul style="list-style-type: none"> <li>• Political commitment weakened by the dissolution of the Greater Cities Commission (GCC)</li> <li>• Limited support available to boost entrepreneurs, e.g., tax</li> </ul>



### Case Study – Boston Seaport Innovation District, US

The Boston Seaport Innovation District, with over 200 start-ups and 5,000+ employees, exemplifies the success of a centralised and visionary leadership approach in innovation district development. Led by former Mayor Thomas Menino, this district was a planned initiative that successfully attracted major tenants and anchors such as MassChallenge and Vertex, engaged the community, and mobilised resources for significant waterfront infrastructure improvements. This approach led to a comprehensive and cohesive strategy that included the creation of a wider mix of housing options and effectively promoted the district<sup>153</sup>.

MPID is supported by a concierge and governance body known as Connect MPID, where leading employers, landowners, and Macquarie University collaborate with the government to advance Macquarie Park. Despite these efforts, challenges in leadership and vision persist, with political support and resources appearing limited. MPID could benefit from adopting a leadership approach similar to that of the Boston Seaport Innovation District, focusing on a more centralised vision and effectively mobilising resources and community engagement to promote innovation and growth.

### MPID enables diverse and internationally recognised innovation activity

MPID's innovation ecosystem is further enriched by the presence of two start-up incubators which have been instrumental in bridging the gap for deep tech start-ups, which often encounter

<sup>152</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>153</sup> NSW Innovation and Productivity Council. (2018). *NSW Innovation Precincts: Lessons from international experience*. <https://www.treasury.nsw.gov.au/sites/default/files/2020-10/Full-Report-IPC-NSW-Innovation-Precincts-2018.pdf>

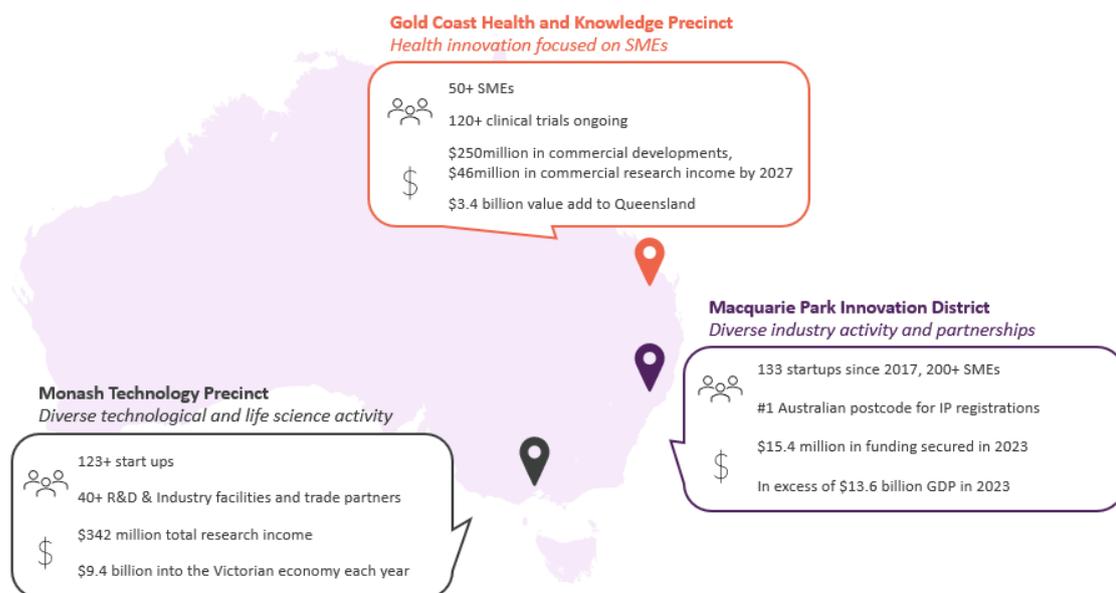
prolonged timelines for commercialisation. Since its opening in 2017, the Macquarie University Incubator has supported over 133 start-ups, showcasing the vibrant start-up ecosystem around Macquarie. In 2023 alone, it secured over \$15.4 million in external funding, generating \$13.5 million in revenue, employing over 201 people, and facilitating 29 IP applications<sup>154</sup>. These figures underscore the incubator’s significant contribution to nurturing and advancing the innovation within MPID.

In comparison with other Australian innovation districts, MPID performs well with regards to its active efforts to promote innovation activity, recognised as one of the top five most recommended accelerators/incubators in the country<sup>155</sup>. As shown in Figure 12 below, both Monash Technology Precinct (MTP) and Gold Coast Health and Knowledge Precinct (GCHKP) are active innovation hubs representing different focus areas and maturity. While MTP is both more mature and varied in its innovation activity, GCHKP is a younger innovation district with a distinct focus on clinical research.

At MTP, an incubator program, called “The Generator” offers two different early-stage innovation programs, alongside an 8-week program focused on researchers. Similarly, GCHKP also offers early-stage entrepreneurial support. However, this support is specifically targeted towards health innovation. For example, the Clinician Entrepreneurship Change Agents Program, aimed at promoting clinical innovation and commercialisation. This free training program is aimed at clinicians providing entrepreneurial and intrapreneurial training, team support, mentoring, regulatory/financial/legal support in an accelerator environment with a goal of improving the commercialisation rate of new innovations being developed within the precinct.

When compared to both examples, it is apparent that MPID’s industry, technology and stage agnostic and innovation-driven approach has allowed the district to build a diverse community of start-ups and scaleups, across diverse industry sectors which ranks it amongst Australia’s leading innovation hubs.

**Figure 12: MPID innovation activity is similar to that seen in other Australian innovation districts**



<sup>154</sup> Macquarie University Incubator. (2023). Report Card. Macquarie University.

<sup>155</sup> Startup Muster. (2023). Startup Muster 2023 Report.

## Key strengths and areas for future investment in MPID

MPID's strengths include its enterprise culture, featuring partnerships between diverse organisations. There are strong market drivers in place with the strong presence of globally recognised organisations across high-growth sectors, alongside access to research and knowledge institutions. Despite these strengths, priority areas for future investment have been identified based on review of global innovation district success factors, stakeholder consultation and review of key documentation, including the stage 1 rezoning proposal:

1. **Commercial land development** as a key aspect of infrastructure which requires further investigation based on analysis of the phase 1 rezoning proposal which largely accounts for public and enabling infrastructure.
2. **Operational enhancement** focusing on leadership, competitive advantage, and collaboration as a means of improving upon global innovation district success factor performance.

Based on these identified focus areas, an initial roadmap has been developed which proposes targeted incentives that may be utilised to help MPID reach its potential as an innovation district.

# A roadmap to realise the vision of an innovation-driven knowledge economy for MPID



## Key Takeaways

- The right policies will enable MPID to thrive as an established innovation district, while ineffective policy may stifle innovation and growth and, potentially, erode the innovation ecosystem that has been built.
- Evidence-based policy proposals to incentivise R&D-intensive commercial development, drawing on the experiences of Australian and international innovation districts, include incentives such as grants and subsidies, zoning and planning flexibilities and tax incentives.
- Once built, operational incentives are proposed to address the areas for improvement for MPID against innovation district success factors, providing opportunities for MPID tenants to enhance leadership, competitive advantage, and collaboration, ultimately contributing to and enhancing the innovation ecosystem.

## Overview

MPID is a successful innovation district, however, there is ample opportunity to further improve on this success. This roadmap aims to highlight opportunity areas for consideration and proposes incentives focused on intentional investment that can enable further growth. This call to action is supported by further commentary on MPID infrastructure challenges, and highlights incentives geared towards the development and protection of commercial innovation space at MPID. Based on identified improvement areas within leadership, competitive advantage and collaboration, operational incentives are proposed towards MPID tenants that may further advance MPID's future success.

## Current infrastructure status and challenges

### Misalignment between current built form and tenant requirements

There is currently a lack of flexible and affordable space to cater to the full array of innovation sector firm, such as SMEs and start-ups, at MPID. Commercial office spaces in Macquarie Park are predominantly tailored for large-scale corporate users, resulting in a scarcity of affordable options for SMEs<sup>156</sup>. This gap has led SMEs to seek alternatives in less desirable office markets such as Chatswood and St Leonards, diverting a considerable segment of SME demand away from MPID.

<sup>156</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

Moreover, a shift in working arrangements following COVID-19 has led to a decrease in demand for office and retail floor space and a high vacancy rate across the market<sup>157</sup>.

In contrast, there has been an increase in demand for industrial floor space and dwellings with flexible spaces to accommodate companies at various stages of development and facilitate their expansion. However, the lack of affordable and adaptive space in MPID has limited its ability to attract a diverse array of businesses<sup>158</sup>.

### **Lack of amenity and public transport**

MPID lacks leisure spaces and experimental sites that foster casual interactions and collaboration between the diversity of tenants based in Macquarie Park. Moreover, there is no street level activation in Macquarie Park or night-time/weekend economy, which makes the area less appealing for prospective tenants. Despite its large size, MPID's sprawling nature has been a barrier to effectively being serviced by business and retail services that contribute to overall amenity<sup>159</sup>.

Despite the availability of three Sydney Metro Northwest stations, 30 bus routes, and cycling paths along Waterloo Road, Talavera Road, and Shrimptons Creek, about 70% of Macquarie Park's workforce opts to commute by car<sup>160</sup>. This has created an auto-centric environment marked by significant car congestion and extended delays during peak travel times. Pedestrian access is generally limited to short distances, connecting people to key locations such as Macquarie University, Macquarie Centre, various businesses, and green spaces like Shrimptons Creek and Lane Cove National Park. The feasibility of walking as a primary mode of transport for longer distances is hindered by a shortage of safe crossings and direct pedestrian paths<sup>161</sup>.

### **Collaborative misalignment**

A significant challenge facing the development of MPID is the collaborative misalignment between stakeholders within the district and government bodies. The strategic decisions and development plans, particularly highlighted by the rezoning proposal, often miss reflecting the precinct's actual innovation needs and demands. Feedback from MPID's internal stakeholders indicates that the government's current vision for MPID does not reflect the real market demand for innovation spaces, leading to unoccupied buildings and diminished business interest. This gap in coordination has led to missed opportunities for creating a cohesive and forward-thinking development strategy that aligns with the innovation goals of MPID.

### **Restrictive land-use regulations**

Disruptions from the proposed housing plan could undermine MPID's status as a centre for technological and scientific progression. The precinct's vitality depends significantly on the aggregation of diverse innovative enterprises and a culture of collaboration; thus, the potential displacement of significant corporations may dismantle a well-established innovation ecosystem. An

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<sup>157</sup> Atlas Economics. (2023). *Macquarie Park Innovation Precinct - Economic Impact Assessment*. NSW Department of Planning and Environment.

<sup>158</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>159</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>160</sup> Department of Planning and Environment. (2022). *Macquarie Park Innovation Precinct Place Strategy*.

<sup>161</sup> Department of Planning and Environment. (2022). *Macquarie Park Innovation Precinct Place Strategy*.

illustrative case is the potential impact on collaborations between start-ups in Macquarie University's incubators and researchers due to rezoning.

It is essential to evaluate MPID's infrastructure requirements and identify gaps to inform strategic planning and future development. This presents an opportunity to leverage insights from both local and international best practices in planning infrastructure that supports R&D and innovation while balancing residential growth.

## Future infrastructure needs

The essence of innovation districts lies in the relationship between the physical realm and the innovation ecosystem, where connectivity, proximity, and vibrant public spaces foster both formal and informal exchanges of ideas and collaboration. It is important to elevate the precinct's appeal through enhanced infrastructure and amenities, making it a compelling destination for work, life, and play. This entails commercial infrastructure to support diverse business activities, enabling infrastructure that includes accessible open and green spaces for community engagement, and robust public infrastructure like roads, water, and electricity to ensure connectivity and sustainability.

### Commercial buildings

MPID's diverse mix of industries necessitates a unique and varied approach to commercial space. The district's unique role extends beyond offering commercial office space; it must provide specialised business floor space catering to these industries specific requirements, including manufacturing, warehousing, laboratory, research, and co-working space.

Given the vital role SMEs play in job creation — accounting for nearly 60% of total employment growth in Australia's private sector between 2013 and 2018<sup>162</sup> — their presence is crucial for the continued growth and diversification of key industries, including MedTech, health, and biomedical sciences. MPID currently houses a smaller share of SMEs compared to the broader Greater Sydney and Australian markets<sup>163</sup>. To address this imbalance, MPID needs to offer flexible and affordable spaces that cater to the varying needs of these businesses. This includes modular spaces that can be adapted as needs change, such as for increasing manufacturing capacity or expanding service offerings, alongside innovation spaces like co-working areas and maker spaces. Such infrastructure must provide the flexibility and room for expansion required at different innovation stages, thereby supporting the dynamic nature of SME operations.

### Co-working spaces

There are existing co-working spaces in MPID, but additional facilities would further enhance collaboration within the district, offering shared workspace environments for individuals and small teams. Co-working spaces offer flexible seating arrangements, such as hot desks, private offices, and meeting rooms, in addition to communal facilities like kitchens, lounges, and event spaces. Integrating co-working spaces and standard corporate offices with residential areas requires minimal additional considerations in terms of infrastructure planning, as such mixed-use buildings have become quite common nowadays.

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<sup>162</sup> Commonwealth Government. (2020). *Small Business Sector Contribution to the Australian Economy*.

<sup>163</sup> Australian Bureau of Statistics. (2015).

## Prototyping spaces

Prototyping spaces are essential in various industries such as technology, digital, medical devices, and robotics, serving to create and refine product models before mass production. These spaces should be equipped with a diverse array of tools and technology for design and fabrication, capable of accommodating a wide range of industry-specific projects and workflows, including the use of 3D printers, robotics, and CNC machines. Additionally, due to rapid advancements in these fields, the space should be designed for flexibility. This allows adaptation to new technologies and methods, as well as potential expansion for future manufacturing nearby. MedTech companies may also benefit from proximity to a hospital, as it facilitates collaboration with clinicians.

## Biotech facilities

The Macquarie University DeepTech Incubator offers laboratories, equipment, secure offices, and co-working areas to support biotech founders and innovators in developing and commercialising their ideas<sup>164</sup>. MPID could further enhance its appeal to biotech businesses by adding more such facilities and shared spaces, accommodating the expansion of existing companies and attracting new ones to the district.

Biotech companies have distinct infrastructure requirements crucial for their development and success, including the need for laboratory facilities accredited under Good Manufacturing Practice (GMP) and Office of the Gene Technology Regulator (OGTR) guidelines. These facilities, essential yet costly to establish and maintain, must comply with regulatory requirements such as containment measures for hazardous materials and GMOs, adequate lighting, proper ventilation systems, suitable floor-to-floor height, and efficient waste disposal systems for chemicals.

Additionally, shared services like pathology platforms, advanced microscopy, and access to skilled technicians and researchers are invaluable, especially for smaller biotech firms and start-ups engaged in proof-of-concept work. Such infrastructure not only accelerates research and development processes but is also essential in enabling these companies to efficiently progress from concept validation to commercialisation. Importantly, the availability of such high-quality infrastructure domestically encourages biotech manufacturers to remain onshore and mitigates the risk of selling technology overseas. This not only retains economic and intellectual benefits within Australia but also enhances the global competitiveness of the local biotech sector.

## Clinical trial facilities

It is important to anticipate and accommodate the future infrastructure needs for research conducted at the Macquarie University Clinical Trials Unit (CTU) to support Australian and international clinical trials. Australia's appeal as a clinical trial destination is bolstered by its world-leading infrastructure, streamlined regulatory system, and cost-effectiveness<sup>165,166</sup>. Additionally, government grants and incentives, such as the R&D Tax Incentive, funding for rare disease research, and infrastructure support for mRNA-based vaccines and therapeutics, are attracting global

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<sup>164</sup> DeepTech Incubator. (n.d.). Macquarie University. <https://www.mq.edu.au/partner/access-business-opportunities/innovation-entrepreneurship-and-it/incubator/deeptech-incubator>

<sup>165</sup> Australian Trade and Investment Commission. (2022). Australia: A go-to destination for clinical trials. <https://www.austrade.gov.au/en/news-and-analysis/analysis/australia-a-go-to-destination-for-clinical-trials>

<sup>166</sup> Australian Government Department of Health. (2015). *Analysis of Recently Conducted Clinical Trials*.

pharmaceutical companies and innovative start-ups. This trend is expected to boost clinical trial activity in Australia in the coming years.

As clinical trials proliferate, the Macquarie University CTU will need to expand its current facilities to meet the increasing demand. This expansion will include enhanced good clinical practice (GCP) compliant trial facilities, additional procedure rooms, consultation spaces, and controlled environments for storing trial materials (e.g., drugs and biological samples) equipped with fridges and -20°C and -80°C freezers. The inclusion of services such as sterile and non-sterile compounding pharmacies on-site to provide customised medication preparations will offer additional advantages to research and clinical operations. These upgrades are essential to support the growing scope and complexity of clinical trials, ensuring Macquarie University remains at the forefront of medical research and innovation.

### **Manufacturing facilities**

Manufacturing facilities within MPID, such as specialised cleanrooms operated by companies like Memjet, have distinct infrastructure needs to support their intricate operations and regulatory compliance. These facilities require an intensive supply of water and power to sustain their day-to-day activities, underscoring the need for reliable and sustainable utility sources. Additionally, the design of these facilities must prioritise easy loading and unloading to streamline the movement of materials and products, which is critical for maintaining efficient production cycles. Effective waste management systems are essential not only for environmental compliance but also for ensuring the safety and cleanliness of the manufacturing environment. Adherence to strict safety regulations is non-negotiable to ensure operational integrity and safeguard against hazards.

For life science, biotech, and med manufacturing, manufacturing facilities also need to follow guidelines set by regulatory bodies such as the Therapeutic Goods Administration (TGA) and the OGTR. This includes the provision for cleanroom environments or controlled areas to prevent contamination, systems for secure and traceable handling of materials, and dedicated spaces that facilitate compliance with Good Manufacturing Practice (GMP) guidelines.

The new RNA research & pilot manufacturing facility at MPID will become a stimulant for adjacent industries and workforce development, encompassing areas such as quality testing for manufacturing, enhancing clinical trials in RNA-based therapies, and nurturing start-ups specialising in the RNA field. There are opportunities for the development of new satellite facilities, driven by the expansion of emerging RNA technologies and the need to scale production beyond pilot levels. To prepare for future growth, the infrastructure supporting the RNA facility itself needs to be robust, including warehousing space for the storage of raw materials and products, as well as corporate offices for operational staff. Additionally, it must possess the capability to scale up for the production of phase 3 clinical trial products.

Another potential area of development involves leveraging the existing mRNA facility's infrastructure to expand into synthetic RNA (sRNA) manufacturing. This expansion might include the construction of a satellite facility for sRNA manufacturing, sharing specific production stages with the existing mRNA facility, thereby optimising resources and processes. Within the broader vision of MPID, the RNA manufacturing facility needs to be recognised as a key driver for expanding innovation services. This underscores the importance of co-locating peripheral services and facilities to support the RNA facility's operations and growth adequately. Comprehensive infrastructure planning is vital to ensure

that the facility not only meets its current production demands but is also well-positioned for future expansion and innovation in the rapidly evolving field of RNA technology.

### **Warehouses**

The future infrastructure of warehouses in MPID must be thoughtfully designed to meet the evolving needs of the industries it serves. Key considerations include the incorporation of sufficient and strategically placed loading docks to accommodate various types of transport vehicles, ensuring smooth and efficient movement of goods. Durable flooring materials are essential to withstand heavy machinery and frequent traffic. Climate control systems are critical for managing the storage of temperature-sensitive goods, maintaining product quality and compliance with regulatory standards. The integration of cold chain facilities further supports this by providing a seamless temperature-controlled supply chain crucial for pharmaceuticals and perishables. Additionally, facilities for the sampling and dispensing of materials are necessary for manufacturing processes, enabling quality control and efficient material handling.

### **Digital infrastructure and technology**

The presence and expansion of high-tech companies in MPID underscore the need for enhanced digital infrastructure and technology. Robust data infrastructure and strict data privacy are essential, particularly for safeguarding patient data. It is advantageous to have cyber security experts within the precinct to provide essential protection, especially for protecting sensitive patient information and facilitating secure environments for innovation. This is crucial for start-ups, which often lack direct access to patient data, big data, and AI, and therefore rely on secure environments to protect their intellectual property and sensitive information. Looking forward, the district's data infrastructure is poised to incorporate future-ready technologies, including both wet and dry, as well as advanced data informatics and big data capabilities. Cloud labs, such as AWS Cloud Labs by Amazon, Google Cloud Labs, and Microsoft's Azure Cloud Labs, offer highly automated environments that allow researchers to design and conduct experiments remotely.

### **Automotive R&D spaces**

The presence of existing automotive companies within MPID underscores the district's potential as a hub for automotive innovation, particularly in the context of the industry's shift towards electrification and automation<sup>167</sup>. Key requirements encompass advanced R&D facilities for the development and testing of next-generation battery technologies and energy storage solutions, as well as charging solutions, which are vital for improving EV range and efficiency. Moreover, investment in software and connectivity test beds is crucial for the integration of advanced vehicle-to-everything (V2X) communication technologies. This involves communication between a vehicle and any entity that may affect or be affected by the vehicle, thereby enhancing the EV driving experience and safety. Additionally, there is a significant need for data analytics and AI labs to refine the auto-manufacturing process and further the automation of vehicles<sup>168,169</sup>.

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<sup>167</sup> PWC. (2018). *Five trends transforming the Automotive Industry*. <https://www.pwc.com/gx/en/industries/automotive/assets/pwc-five-trends-transforming-the-automotive-industry.pdf>

<sup>168</sup> Vishnuraj, S. (2023). *India: The epicentre of R&D global automotive industry*. *Manufacturing Today*. <https://www.manufacturingtodayindia.com/sectors/india-the-epicentre-of-rd-global-automotive-industry>

<sup>169</sup> Breunig, M., Kässer, M., Klein, H., & Stein, J. (2016). *Building smarter cars with smarter factories: How AI will change the auto business*. <https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Building%20smarter%20cars/Building-smarter-cars-with-smarter-factories.pdf>



## Gold Coast Health and Knowledge Precinct

GCHKP is currently developing infrastructure to support its health innovation focus including start of the art research facilities and innovation space designed to increase collaboration. Lumina RDx will offer R&D facilities with flexible tenancy options connected directly to the Gold Coast Private Hospital, with spaces for medical research, digital health, and advanced technology-assisted health services, along with specialist medical consulting suites and collaboration spaces.

North Star will be equipped with laboratories, medical consulting, health care services, research and technology and offices, whilst also offering retail opportunities for restaurants and cafes. Proxima, another new development within the district, will offer opportunities for specialised health providers, researchers, commercial office users, consultants, educators, and carers to collaborate and work together.

### Enabling infrastructure

The future enabling infrastructure of MPID plays a crucial role in transforming it into a thriving innovation ecosystem. Having dynamic public spaces and quality amenities is essential in facilitating both formal and informal exchanges of ideas and collaboration, supporting innovation-related activities, and attracting and retaining highly skilled talent.

### Public spaces, density, and urban design

There is a need for MPID to evolve from its current low-density layout to a more vibrant, high-density innovation district. The existing low-density arrangement limits the potential for close concentrations of people, diminishing the district's vibrancy and energy. Adopting finer grain layouts with smaller block sizes will allow for diverse mixes of uses that encourage activity throughout the day and night<sup>170</sup>. Examples include designated areas for casual catchups, public courtyards for relaxation and social interaction, and spaces for pop-up markets that can host a variety of local artisans and food vendors, enhancing the community feel. The development of green public spaces can also add to the appeal of the area and can serve as informal meeting points, encourage outdoor work sessions, and host community events.

### Amenity development and night-time economy

There is a need to develop amenities in key nodes around Macquarie Centre and the Macquarie Park station to enhance the precinct's overall appeal<sup>171</sup>. This development will enhance not only daytime activities but also stimulate a night-time and weekend economy. This aligns with an 18-hour economy strategy, as outlined in the Macquarie Park Place Strategy, and is crucial for attracting and retaining a diverse workforce.

<sup>170</sup> Department of Planning, Industry and Environment. (2021). *Macquarie Park Strategic Masterplan - Appendix B Economic Development Study*.

<sup>171</sup> Atlas Economics. (2023). *Macquarie Park Innovation Precinct - Economic Impact Assessment*. NSW Department of Planning and Environment.

## Public infrastructure

### Connectivity and transport enhancements

It is important to update the transport infrastructure within MPID. Improved road infrastructure will facilitate efficient movement for manufacturing and warehousing operations, particularly important for large truck accessibility. Additionally, developing more transport options will not only improve access to talent but also enhance MPID's reputation as a well-connected innovation centre. This includes not just better road connections but also the expansion of public transport, walking, and cycling networks, which fosters a well-connected precinct conducive to the "collision" of ideas.

### Efficient and sustainable utility supplies

Acknowledging the energy and water-intensive needs of businesses within MPID, particularly those in manufacturing, it is important to prioritise sustainable and efficient utility solutions. For instance, the Tonsley Innovation District in South Australia has implemented an independent embedded electrical network, significantly supported by a substantial solar array<sup>172</sup>. This innovative approach not only supplies businesses and residents with more affordable power but also contributes to an annual offset of 3,500 tonnes of carbon dioxide emissions. Additionally, Tonsley offers recycled water for non-potable uses, showcasing a commitment to sustainable utility management that could serve as a model for MPID, ensuring it meets the high demands of its diverse industrial landscape while fostering environmental stewardship.

## Opportunities for mixed-use development to support diversity and collaboration at MPID

MPID has an opportunity to evolve into a mixed-use space that integrate commercial, retail, and controlled residential areas. By incorporating place-making strategies, attracting hospitality businesses, and developing specialised commercial spaces, MPID can enhance its appeal to a diverse range of businesses and foster a lively and integrated community.

### Developing specialised commercial spaces

There is an opportunity to develop purpose-built buildings located within the commercial core, that offers curated, affordable, and agile working space. These buildings can be designed to accommodate diverse commercial spaces including labs, prototyping spaces, medical consulting, healthcare services, clinical research, technology, and offices. These facilities are ideally situated near the hospital to promote collaboration with clinicians and clinical trials.



### Kendall Square, Boston, USA

LabCentral in Kendall Square, a shared lab in an MIT-owned building provides space for 60 emerging biotech firms across 15 lab suites and an open lab. Set up with the help of a state government economic development agency grant of US\$5m, MIT has been one of the key real estate partners and sponsors—total sponsorship acquired is US\$22m each year. Tenant residents

<sup>172</sup> Tonsley Innovation District. (2021). What makes Tonsley Innovation District a winning combination? <https://tonsley.com.au/news/what-makes-tonsley-innovation-district-a-winning-combination/>

are on month-to-month agreements and pay in the region of \$15,000 per month for a lab pod and \$425 per month for membership. As of 2020, Harvard University and MIT are responsible for the highest number of active connections between resident scientists and entrepreneurs in the lab, which has produced over US\$9bn in venture capital in eight years.

### Versatile R&D facility types

Investments should focus on versatile R&D facilities, including PC1, PC2 dedicated lab spaces, and class 8 cleanrooms to cater to a various research and technological needs. Adapting models like 'ready to go' labs, specialist and open-access labs, and scientific services will enable low investment set-ups and flexible operations for emerging enterprises.



### Case Study – BiOspace, UK

BiOspace in Manchester's innovation district provides pay-as-you-go access to facilities and equipment. BiOspace offers competitive rates on lab and office space and flexible access to essential research tools, including instruments for protein production, purification, molecular biology, diagnostics development, as well as specialised training from experienced PhD-level scientists in fields such as drug discovery and medical device prototyping. This model can drastically reduce R&D costs, enabling start-ups to rapidly bring their products to market<sup>173</sup>.

### Diverse office space solutions

The availability of diverse office space solutions, such as coworking desks and serviced offices, will cater to the diverse needs of businesses in MPID. Underutilised retail or office spaces could be transformed into coworking areas, while engaging established coworking space providers, such as WeWork or Hub Australia, would introduce a supportive environment conducive to cross-industry collaboration. These spaces accommodate a broad spectrum of businesses and enhance the collaborative dynamics that are essential for innovation within MPID.

### Creating a distinct sense of place

To enhance MPID's marketability, it is essential to develop a strong sense of place that goes beyond more than just physical infrastructure. This development should integrate cultural and community elements to create a unique and engaging environment that blends work, life, and place.

The implementation of a controlled mixed-use development strategy that includes residential spaces will vitalise the precinct beyond standard business hours. This will attract hospitality businesses and alter the perception of MPID from a traditional office park to a dynamic, active area. The introduction of cafes and restaurants will encourage social interaction within MPID, significantly

<sup>173</sup> *European Pharmaceutical Manufacturer. (2017). Busting biotech wide open: BiOspace lab now open in Manchester.*  
<https://pharmaceuticalmanufacturer.media/pharma-manufacturing-news/busting-biotech-wide-open-biospace-lab-now-open-in-mancheste/>

contributing to the employee value proposition and enhancing the overall work-life experience. This strategic investment in the urban realm is essential for MPID to effectively compete with other prominent centres, such as the CBD, in attracting both top talent and tenants.



### Case Study – Grand Canal Innovation District, Dublin, Ireland

Trinity College Dublin is transforming its 2.2 ha site adjacent to Grand Canal Quay into an innovation campus. This €1.1 billion development will feature 60% non-academic space, emphasizing innovation spaces for entrepreneurs, startups, and corporate innovation teams, as well as 20,000 sqm for cultural uses. A research institute focusing on cross-disciplinary solutions to global challenges, spanning 20,000-25,000 sqm, is set to open in 2027, alongside relocated research facilities to foster industry engagement and interaction. A key focus of the district is to bridge the gap between several multinationals which exist in the area and startups within a public space which will draw visitors to the area.



### Case Study – Cortex Innovation Community, St Louis, USA

The Cortex Innovation Community is a 740,000 sqm district blends 385,000 sqm dedicated to research and innovation, 72,000 sqm for commercial and retail use, and 1,410 residential dwellings. Anchored by institutions like Washington University, Barnes-Jewish Hospital, and St. Louis University, Cortex aims to be a dynamic neighbourhood offering office space, capital investment, business education, talent acquisition, mentoring, and networking opportunities. The community's design incorporates restaurants, shops, green spaces, and apartments to support the tech businesses within, promoting a vibrant, 24/7 lifestyle.

## Policies and incentives to support the alternative vision

While the success of innovation districts must ultimately exist within market forces, these precincts still rely on government policy, regulation, and support. The right policies will enable MPID to thrive, while ineffective policy may stifle innovation and growth. Policy and incentive settings offer the opportunity to directly address the challenges faced by MPID, bridging the gap between the current state and best practice as part of the alternative vision for the district.

Policies and incentives proposed in this report focus on two key areas and corresponding stakeholder groups; firstly, around the construction of commercial innovation space targeted at land developers, and secondly, around operational improvements that can optimise future returns across MPID, targeted at current and prospective tenants. Both cases represent an opportunity for government to support MPID in unlocking its potential and safeguarding its future as a thriving innovation district.

## Land development incentives

As described within this report, the current rezoning proposal provides incentives for the development of residential property at MPID both within residential zones and commercial zones with flexibility on BTR. This section proposes counter incentives towards commercial property development within the commercial zones outlined with flexibility on BTR, to ensure that innovation activity is protected within this area, supporting MPID's overall performance as an innovation district across global innovation district success factors.

### Tax incentives

**Property tax reductions** could be designed and offered to landowners and property developers who allocate a portion of new or existing developments to selected tenants, such as start-ups, SMEs, innovation labs and R&D companies. Offering this reduction in property taxes will encourage landowners and developers to allocate space for companies whose work is centred around innovation and R&D output, whilst simultaneously enabling local start-ups and R&D companies to remain in or join MPID.

This incentive could be implemented by offering a sliding scale of property tax reductions which are applied based on the percentage of total leasable space dedicated to target tenants. The greater portion of space allocated to target tenants would result in a greater tax reduction to the property owner. Implementation of this incentive should be supported by clear guidelines for eligibility, including target tenants, the minimum percentage of space to be allocated to the target tenants and a verification process to ensure upfront and ongoing compliance.

### Grants and subsidies

The demand for innovation spaces described previously, alongside MPID's existing ecosystem geared towards innovation, offers an opportunity to incentivise the development and subsidisation of needed lab spaces, and affordable co-working environments. Many start-ups cannot afford the high rent prices within Sydney CBD. Given the high throughput of successful start-up activity through the existing MPID incubator, incentives towards partial reduction of rent for SMEs have the potential to enable increased commercialisation activity, job creation and economic output within MPID.

**Development subsidies** can be offered to developers for the specific purpose of converting or constructing buildings to be used by target tenants who contribute to innovation output in the district, such as start-ups, SME's, innovation labs and R&D companies. This would include offering financial subsidies that cover a portion of the development or conversion costs for projects that meet select criteria. The objective of development subsidies is to reduce the investment required by developers undertaking projects to create or convert spaces to suit selected tenants needs, thereby fostering an increase in such developments.

In implementing this incentive, criteria for subsidy eligibility should be clearly defined, focusing on project size, location and the intended use and tenant of the space. Subsequently, a robust review process to assess and approve projects for subsidies should be established.

**Rental subsidies for select tenants** could be introduced with the objective of lowering the financial barrier for emerging businesses seeking to establish or expand their operations within MPID. This incentive is designed to enable a more innovative business ecosystem by facilitating access to

suitable spaces for emerging businesses, particularly in high-demand, innovative or specialised fields such as technology, Biotech, and the automotive industry.

This incentive could be introduced by allocating funds specifically for the purpose of subsidising a portion of the rent paid by select tenants. Subsidies could be structured as:

1. Direct payments to select tenants, for example, covering a percentage of their rent for a defined period; or
2. Reimbursements to property developers, incentivising them to offer lower or below-market rent rates to eligible tenants.

Structuring these subsidies via the channels outlined above not only supports emerging businesses or those contributing to innovation output, but also offers a unique value proposition for landowners and property developers whereby they are participating in the growth of the innovation economy whilst benefiting from reliable rental income.

These subsidies could be tiered based on criteria such as the tenant organisation size, revenue and growth potential, or the strategic importance of their industry to MPID and broader NSW economic development goals. Eligibility criteria and parameters around the duration and scale of support should be established manage the funds allocated to this incentive and to ensure intended outcomes are achieved.

### **Zoning and planning flexibilities**

In order to continue supporting innovation at MPID, infrastructure and commercially available space must continue to meet the needs of target tenants. These tenants may require specialised commercial spaces such as, dry lab and wet lab spaces, prototyping spaces, co-working spaces and manufacturing facilities. Incentives that encourage landowners and developers to invest in the development and conversion of these spaces and facilities should be prioritised to maintain MPID as a home for organisations focused on research and innovation.

**Fast-track approval processes** could be introduced to accelerate the development process for projects that include the build and fit out of select commercial spaces. Fast-tracked approval processes could include expedited planning and zoning approvals to encourage developers to build spaces that cater to the needs of organisations who most align to and contribute to the district and States' priorities for innovation and economic development.

**Bonus FSR** could incentivise developers to include innovation focused commercial spaces in new developments by allowing them to access bonus FSR, scaled according to the size of the commercial component that is being made available for innovation spaces.

### **Public-Private Partnerships**

**Co-investment opportunities** could be offered to landowners and developers in MPID to stimulate private investment in developments that align to government priorities for the district. Similar to the recent co-investment made by the NSW Government into the RNA Pilot Manufacturing Facility, in MPID, this incentive could include government co-investing in strategically aligned developments that support the operations of the Pilot Facility or broader growth priorities for the State.

## Financial incentives

Financial incentives can act as mechanisms to encourage landowners and developers to create spaces and facilities that cater to the needs of priority commercial tenants. These incentives can be designed to reduce the capital cost for developers, making it more economically viable and risk tolerable for developers to invest in projects that support emerging businesses and the innovation sector.

**Low interest loans** could be offered to provide affordable financing options to property developers who are committed to building or adapting spaces that cater to select tenants that support the innovation ecosystem, including those requiring lab spaces or similar specialised facilities.

**Guaranteed tenant programs** could be introduced to reduce the vacancy risk for developers who dedicate space to commercial tenants that support the Macquarie Park innovation ecosystem. Designing an incentive around this focus would aim to encourage landowners and developers to commit a portion of their developments to prioritised commercial tenants, which may otherwise be seen as higher risk. This incentive could work in practice, by government or a government appointed agency offering a certain level of occupancy or income from leased spaces allocated to prioritised tenants. This may include a direct subsidy covering a portion of the rent for eligible tenants, or a compensation mechanism for any unleased space within a designated area for a specific period.

## Recognition and awards

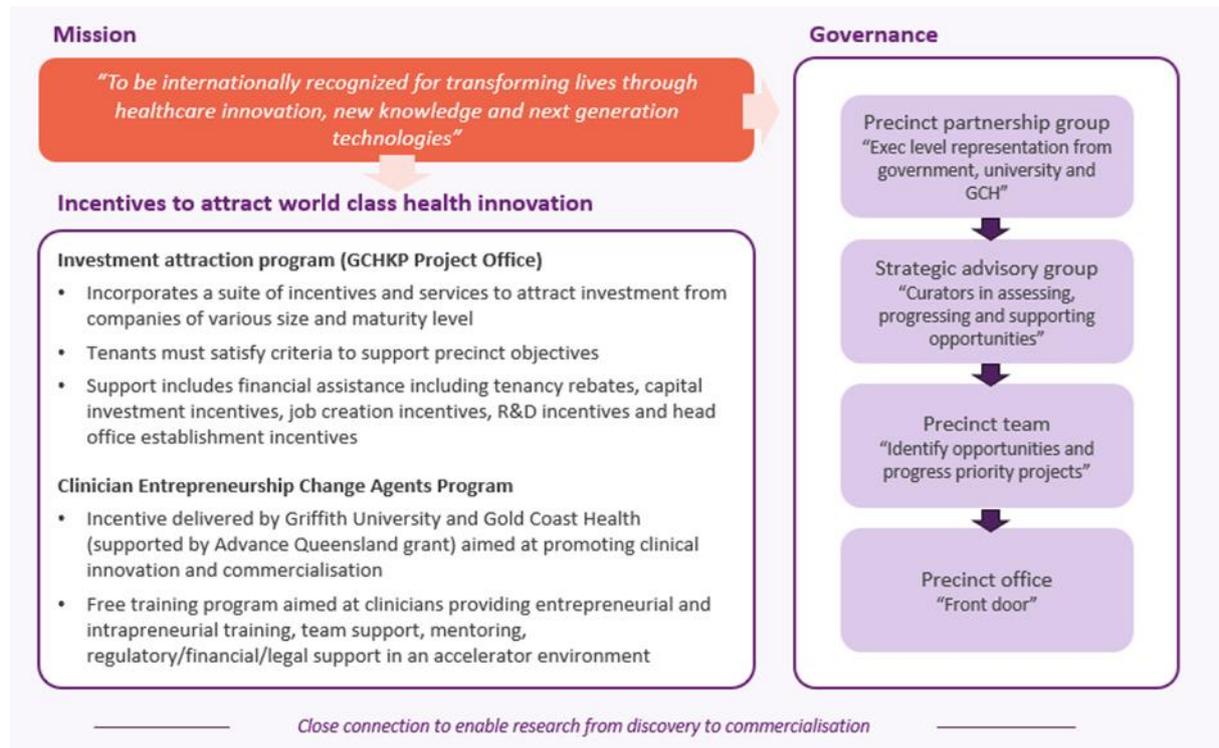
**Recognition programs** could be introduced across MPID for developers who lead in providing innovative and sustainable solutions for target commercial tenants. This incentive could enable local developers to enhance their corporate reputation and may encourage other landowners and developers in the district to follow suit and become more actively involved in preserving and boosting MPID's innovation sector.

The incentives outlined above can be strategically designed to support and enhance the infrastructure for organisations that are pivotal to the innovation ecosystem within MPID. By addressing the key financial and operational challenges that developers may look to offset, the range of incentives aim to encourage landowners and property developers to build and transform spaces to meet the needs of tenants that contribute to the innovation sector. Whilst these incentives offer a framework for supporting the innovation ecosystem and protecting commercial spaces in MPID, their viability and feasibility should be further assessed through further evaluation. In addition, the successful implementation of these incentives will require a collaborative approach between key stakeholders, such as government bodies, landowners and tenants within the district.

## Operational incentives

In addition to incentives geared towards the development of commercial innovation space, several operational incentives can also be utilised by MPID tenants to improve the overall performance of the district. Based on the areas of improvement previously highlighted for MPID current state, incentives may be implemented across different success factor categories to help MPID improve their future performance based on global standards. This report will focus on leadership, competitive advantage and collaboration as areas previously identified for improvement. A previously described case study, GCHKP provides a real-world example of how these success factors can be incentivised (Figure 13).

Figure 13: Overview of Gold Coast Health and Knowledge Precinct's mission-led approach



### Leadership (district coordination)

**The creation of a long-term strategic vision** for MPID is a key activity that could underpin a clear incentives roadmap for the district. GCHKP provides an example of a distinct and publicly visible long-term strategic vision outlining what the district strives toward (to become internationally recognised within health innovation) and the actions they will take to get there (by attracting and retaining innovation activity and collaboration within the district) which has guided a variety of major infrastructure and incentive decisions.

**Creation of a taskforce across stakeholder groups** may allow MPID to consolidate multiple perspectives and build a holistic strategic vision. This may involve convening key stakeholders from Macquarie University, Connect MPID, City of Ryde and NSW government representation. Such a taskforce should first consider a mission statement for MPID which will act as a guiding star and set the precedent for their future strategy.

Through alignment on what the district needs to differentiate itself, MPID can design a long-term vision which incorporates key focus areas (e.g., growth objectives by industry) and anticipate future changes within the broader environment. By identifying clear key performance indicators and tracking performance over time, the district can gauge progress against their strategy and adjust focus areas as needed.

**The governance** which underpins the realisation of MPID's strategic vision must also be considered to ensure that the correct people, processes, and performance measures are put in place to support a clear purpose. GCHKP provides an example of a multilevel governance structure designed to support its strategic vision at various levels of the organisation, enabling priority activities of strategic importance to be effectively triaged and monitored.

## Competitive advantage

As highlighted by an internal stakeholder within the district, “there are a lot of great things happening at Macquarie, the problem is a lot of people don’t know that”. To elevate the status of the district and reinforce its status as a successful innovation district, a strong market differentiation and branding strategy is required.

**Market differentiation** may enable MPID to attract and retain tenants within the district. Activities focusing on analysis of the wider innovation district landscape both within NSW, Australia and internationally. Analysis of MPID’s strengths, weaknesses, opportunities and threats may enable the taskforce to develop a revised commercial model for the district and importantly, a distinct value proposition that will enable MPID to stand out from other districts both nationally and internationally.

**A clear branding strategy** may help MPID raise its profile both within and outside the district. Within the district itself, a range of activities can help enable sharing of success stories and highlight collaboration opportunities. Potential options may include creation of an interactive dashboard allowing tenants to explore current ongoing activities, identify mutual points of interest and identify potential collaboration opportunities. Targeted community activities may supplement such a resource. For example, providing tenants with the opportunity to workshop and co-create their vision of what MPID brand could look like may allow the district to refine its strategy, while simultaneously promoting a sense of ownership and collaboration between tenant organisations, allowing them to have a say in the shaping of MPID’s future.

Differentiation is a key aspect within external branding. GCHKD has differentiated itself by prioritising solely on health innovation, focusing mainly on SMEs rather than large organisations. By leveraging prior activities undertaken to define its strategic vision, MPID can prioritise high opportunity focus areas based on the district’s unique value proposition that can be broken down into a list of key activities designed to maximise the district’s point of difference within the wider Australian and international ecosystem, allowing MPID to attract local and international investors.

## Collaboration

Despite the presence of partnerships between different organisations within MPID, much of the innovation activity which currently takes place within the district occurs in silos. The breadth and variety of organisations located in close proximity at MPID represents a great opportunity to further incentivise collaboration and further enhance this key success factor.

**Community building incentives** such as organising district events, networking opportunities and workshops can help facilitate stronger relationships between different organisations within the park and promote a greater sense of inclusion.

**Cluster focus groups** which bring together representatives from similar industries to focus on shared problem-solving and knowledge sharing could also facilitate industry-specific collaboration within the district.

**Student mentorship programs and industry placements** at MPID may also be further leveraged to promote enterprise culture not only within the district but also within the wider community. For example, extending outreach programs towards high school students within the surrounding local

community can help build the talent pipeline for the area and promote creation of a highly skilled future workforce.

# Concluding statements

The collective evidence provided within this report serves to highlight the need for further government consideration into the potential impact of the rezoning proposal on the MPID ecosystem; in particular, its ability to foster R&D activity in NSW. The success and legacy of MPID represents the cumulation of years of close collaboration between NSW Government, Macquarie University, and organisations within the district, striving towards a shared goal of creating a vibrant and successful innovation ecosystem. In contrast, the rezoning proposal poses a risk towards significantly impacting the commercial heart of the district, displacing current and prospective tenants, and eroding the innovation ecosystem.

The success of innovation districts is dependent on the co-location of businesses, collaboration opportunities and flexibility for companies to grow their infrastructure as needs change<sup>174</sup>. A focus on residential development at MPID risks not only displacing potential commercial office developments, but also R&D labs, manufacturing, and other essential innovation infrastructure. Organisations are attracted to MPID's current innovation ecosystem. Should companies find changes made to the district less attractive in the future, this will have a knock-on effect on both current and future tenants, and ultimately the ecosystem itself.

*"Because innovation precincts tend to develop over a long time-scale – beyond the standard property, economic, and political cycles – the necessary investments may be overlooked for development offering faster returns, such as high-density residential developments"<sup>175</sup>.*

- NSW Innovation and Productivity Council

Further analysis is required to understand the full implications of the rezoning proposal and to ensure that the best possible outcomes are achieved for governments, the tenants of MPID, surrounding communities and broader Australian society. To aid further reassessment, the alternative vision outlined proposes commercial assets that offer the potential to address current challenges and target opportunity areas of key strategic importance, alongside initiatives that may be implemented to achieve an alternative future state for MPID based on observed market demands and continue its successful progress to date.

<sup>174</sup> Aretian Urban Analytics and Design. (2019). *The Atlas of Innovation Districts*.

<sup>175</sup> NSW Innovation and Productivity Council. (2018). *NSW Innovation Precincts: Lessons from international experience*.

**This Report is an analysis of the indicative economic impact assessment for the Macquarie Park Innovation District undertaken by Biointelect Pty Ltd (Biointelect) relating to the macroeconomic impact of research and development (R&D) activity within MPID, including impact on Gross Regional Product (GRP), Gross State Product (GSP), Gross Domestic Product (GDP) and employment.**

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**March 2024**

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Level 4, 143 Macquarie Street,  
Sydney NSW  
Australia 2000

**T** 1300 800 984

**E** [requests@biointellect.com](mailto:requests@biointellect.com)

[www.biointellect.com](http://www.biointellect.com)