

# INSIGHT 2.0 USER GUIDE

**YOUR GUIDE TO UNDERSTANDING INSIGHT:  
AUSTRALIA'S REGIONAL COMPETITIVE INDEX**

January 2019



**REGIONAL  
AUSTRALIA  
INSTITUTE**



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## ABOUT INSIGHT

Australia's regional areas are developing at different paces. Each has different potential for positive growth and change.

InSight enables Australians to access the information they need on regions to make better-informed decisions for regional communities.

InSight is a competitiveness index. Competitiveness refers to the combination of institutions, policies and factors that determine the level of productivity of a country or region.

InSight builds on significant international experience in the development of competitiveness indices. The design of InSight reflects the experience and approach of the World Economic Forum's Global Competitiveness Report methodology, the European Union's Regional Competitiveness Index and Centre for International Competitiveness in the UK.

However, the InSight framework is unique to Australia's economic situation. InSight is also one of the finest grained and comprehensive assessments ever undertaken for the Australian economy.

The ten themes and 71 indicators used in InSight focus on the economic drivers that determine longer-term competitiveness. InSight assesses all of the main areas in which governments influence a region's economic outcomes.

Competitiveness is assessed at both the Local Government Area (LGA) level and also at the Regional Development Australia (RDA) region level and includes both regional and metropolitan Australia.

As a result, InSight provides 600 individual regional profiles covering the whole of Australia at both the local and regional scales.

InSight also goes further than most indices, as the Regional Australia Institute (RAI) makes all of the data available through the online interactive map for use alongside reporting of the results. This puts over 92,000 pieces of information on the Australian economy at the fingertips of every Australian.

InSight is an essential tool for assessing our capacity to build new prosperity and a better quality of life across our diverse nation.

## INSIGHT REVISIONS

InSight 2.0 is the third iteration of Australia’s regional competitiveness index, but the second major edition update.



InSight 2.0 includes a complete set of updated data and refined methodology. Key changes include:

- An updated method for calculating the distance for residences and businesses to key **infrastructure** and **essential services** and **natural resources**;
- An improved methodology for analysing IP data with patents and trademark rates per 10,000 people in **innovation**;
- **Updated data** on all census-based measures;
- A new **decile-based approach** to ranking to simplify comparison and reduce the influence of ‘noise’ in the data (see figure 1); and
- A forthcoming Pulse theme to show **real-time economic indicators** at a regional level.

Figure 1: The decile ranking system involves grouping data into ten segments (called deciles)



# USING INSIGHT

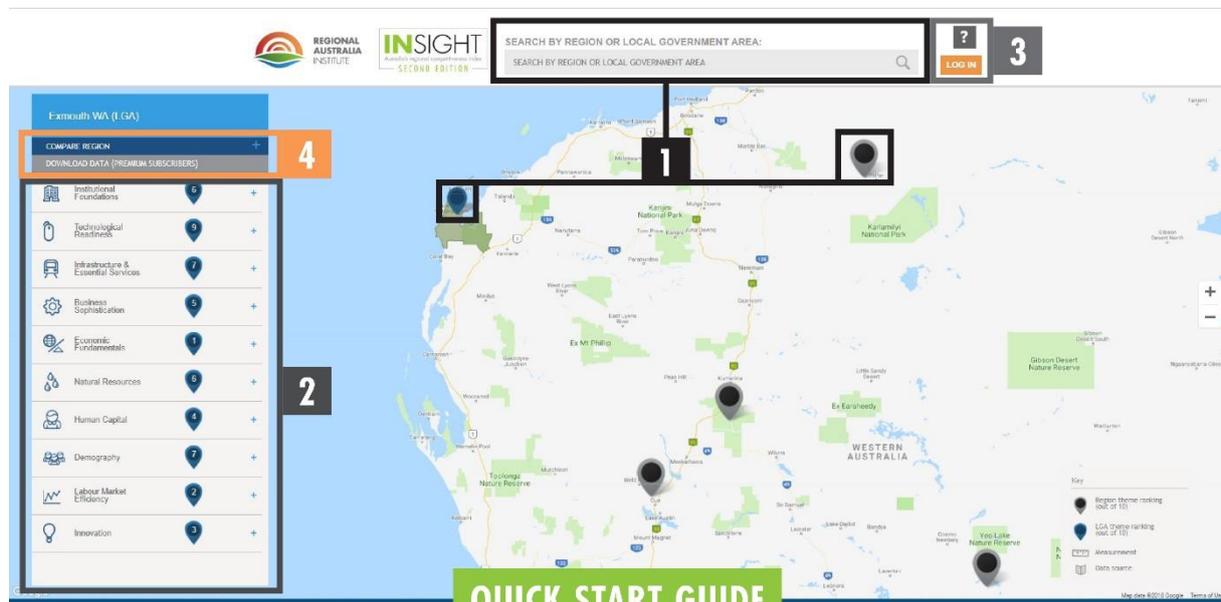
InSight has a diverse range of applications, and its results can be used in many ways by all Australians.

InSight can be accessed at [insight.regionalaustralia.org.au](https://insight.regionalaustralia.org.au). From the InSight home page users can:

- Access basic information on InSight including fact sheets, this user guide and key findings;
- Explore all of the InSight data using the interactive online map; and
- Download the RAI’s summary analysis for each theme and other analysis reports.

## USING THE ONLINE INTERACTIVE MAP

The online tool is user-friendly and interactive. The first screen shows the Quick Start Guide on how to access data in InSight in four easy steps:



**1** Select a LGA (blue pin), or RDA region (grey pin), or use the search bar.

**2** View the data for your selected region on the left. Click the **i** for more information on each theme.

**3** Click the **?** for help and further information. Log in to InSight Premium.

**4** **InSight Premium Users**  
Click **+** to add up to 10 regions to the Compare Region list. Download the data for the selected region.

# INSIGHT THEMES AND INDICATORS

A description of each theme and its associated indicators is provided on the following pages, along with details on the sources of data used in InSight.

## THEME 1: ECONOMIC FUNDAMENTALS

The economic fundamentals of an LGA or region include measures of the size and relative activity level in the economy. Solid economic fundamentals support local businesses and workers and indicate a region is successfully translating economic potential into activity and growth.

InSight measures the economic fundamentals of each LGA and region on a per person basis. This approach allows more populated LGAs and regions to be compared to less populated areas.

A larger stock of industrial and commercial buildings means an area can produce a relatively larger amount of private sector activity. Higher wages, more hours worked, and larger business turnover per person indicates a region is more effectively translating its workforce and other assets into economic activity. Strong investment in residential and other buildings indicates confidence in the future and growing capacity in the economy.

This theme has been expanded and refined for InSight 2.0 with the addition of the three new measures: the number of hours worked, and two measures of the current asset base of an area (value of commercial and industrial buildings). Building Approvals in the previous index has been deconstructed into residential and non-residential which provides deeper insight into an area's economic profile.

The Economic Fundamentals theme includes three perspectives on each LGA and region – the stock of productive assets, business and labour activity, and levels of recent investment (Table 1).

Table 1: Competitiveness Indicators for Economic Fundamentals Theme

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Wage/labour costs</b>	Average wage and salary income	Wage & salary earner statistics ABS 5673.0.55.003	Better rankings result from higher wages	Updated data	Yes
<b>Business turnover</b>	Business turnover per capita	ABS, cat. 8165.0	Better rankings result from higher turnover	Updated data	Yes
<b>Number of hours worked</b>	Average number of hours worked per week per working-age person	ABS Census, 2016	Better rankings result from more hours worked	Updated data	Yes
<b>Building approvals – residential</b>	\$ value of residential building approvals per capita	Building approvals Australia, ABS	Better rankings result from higher values	Updated data	Yes
<b>Building approvals – non-residential</b>	\$ value of non-residential building approvals per capita	Building approvals Australia, ABS	Better rankings result from higher values	Updated data	Yes
<b>Value of industrial buildings</b>	Value of industrial buildings per capita	Geoscience Australia	Better rankings result from higher values	Updated data provider	No
<b>Value of commercial buildings</b>	Value of commercial buildings per capita	Geoscience Australia	Better rankings result from higher values	Updated data provider	No

## THEME 2: LABOUR MARKET EFFICIENCY

Labour Market Efficiency measures how well a region engages its people within the economy. Efficiency suggests a strong matching of workforce size and skills to the needs of local firms. Maintaining efficiency over time suggests adaptability of workforce size and skills to changing needs.

InSight measures Labour Market Efficiency through two measures of current employment rates, three measures of the utilisation of the potential workforce, and a measure of skilled labour (Table 2).

Employment rates indicate the current level of demand relative to the supply of workers in the region. Unemployment may also reflect a mismatch between the local labour force and firm needs.

The level of utilisation of the potential workforce indicates whether a region has longer-term structural challenges in achieving Labour Market Efficiency. The presence of long-term unemployment, lower participation rates and high welfare dependence suggests longer-term efficiencies issues in a region.

Skills are also important, and most regions will need a mixture of skilled and unskilled labour. A lack of skilled labour will limit the sophistication of local firms and the adaptability of the economy to changing needs.

Table 2: Competitiveness Indicators for Labour Market Efficiency Theme

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Unemployment rate</b>	% persons in the labour force looking for work	Small Area Labour Market Estimates, Department of Employment	Better rankings result from lower unemployment	Updated data	Yes
<b>Youth unemployment</b>	% persons in the labour force aged 15-24 looking for work	ABS Census, 2016	Better rankings result from lower unemployment	Updated data	Yes
<b>Participation rate</b>	% of (aged 15+) population in the labour force	Social Health Atlas of Australia PHIDU, University of Adelaide	Better rankings result from higher percentages	Updated data	Yes
<b>Skilled labour</b>	% of the workforce employed as managers and professionals	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Welfare dependency</b>	% population over 15 years receiving age pension, unemployment benefit or other payment	Social Health Atlas of Australia PHIDU, University of Adelaide	Better rankings result from lower percentages	Updated data	Yes
<b>Long term unemployment</b>	% People receiving an unemployment benefit for longer than six months	Social Health Atlas of Australia, PHIDU, University of Adelaide	Better rankings result from lower percentages	Updated data	Yes

## THEME 3: BUSINESS SOPHISTICATION

Firms provide a majority of jobs for most communities and ensure local resources and the potential of a region can be translated into economic success.

A region with a more diverse business community, profitable small businesses and good local access to financial expertise and facilitators of exports, imports and wholesale trade is best positioned to compete in Australia's economy (Table 3).

Table 3: Competitiveness Indicators for the Business Sophistication Theme

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Economic diversification</b>	Hachman index of relative economic diversification* comprising measures regional industry structure relative to the national industry structure	Calculated from ABS Census, 2016 – employment by industry data	Better rankings result from lower measurements	Updated data	Yes
<b>Exporters, importers, wholesalers</b>	% employed as importers, exporters or wholesalers	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Income source – own business</b>	Average own unincorporated business income	Estimates of personal income for small areas, 2014-15, ABS	Better rankings result from higher incomes	Updated data	Yes
<b>Access to local finance</b>	Number of people employed in banking, building society operation, credit union operation, other depository financial intermediation, depository financial intermediation & non-depository finance	ABS Census, 2016	Higher rankings result from greater access	Updated data	Yes* *However this was previously represented as a 10x actual result (e.g. 0.3 was represented as 3%)

## THEME 4: HUMAN CAPITAL

This index reflects the definition of human capital as the skills and capacities that reside in people and put to productive use. Given the critical importance of lifting the standards of human capital development in regional Australia, this update of InSight's Human Capital index shifts the focus to measures of the development of human capital.

Each of the indicators tends to be specific to individuals' particular stage of life.

Table 4: Competitiveness Indicators for the Human Capital Theme

Indicator	Description	Measurement	Data Source	InSight 2.0 Changes	Comparable to 2011
<b>Early childhood development</b>	% of children developmentally vulnerable on two or more domains.	% of children developmentally vulnerable on two or more domains, an average of 2009, 2012 & 2015 Australian Early Development Census (AEDC) results. Children who score below the 10th percentile of the national AEDC population are classified as 'developmentally vulnerable'. These children demonstrate a much lower than average ability in the developmental competencies in that domain.	Australian Early Development Census, 2009, 2012, 2015	Updated data	Yes
<b>Primary school literacy &amp; numeracy</b>	summary of nationally-consistent literacy and numeracy test results for primary school students	Average of 5 NAPLAN test scores (years 3 & 5)	Calculated from Australian Curriculum Assessment Authority, Australian Government, 2016	Nil	Yes
<b>Secondary school literacy &amp; numeracy</b>	summary of nationally-consistent literacy and numeracy test results for secondary school students	Average of 5 NAPLAN test scores (years 5 & 7)	Calculated from Australian Curriculum Assessment Authority, Australian Government, 2016	Nil	Yes
<b>High school completion</b>	% of population that completed year 12	% of population completing year 12 (persons usually resident)	ABS Census, 2016	Updated data	Yes
<b>Learning or earning</b>	young adults' participation in education or the workforce (15-24 years)	% of people aged 15-24 years engaged in education or employment (persons usually resident)	ABS Census, 2016	Updated data	Yes
<b>Technical qualifications</b>	presence people with certificate and diploma level qualifications	% of population with certificate and diploma qualifications (persons usually resident)	ABS Census, 2016	Updated data	Yes
<b>University qualifications</b>	presence of university-level qualified people	% of population with university qualifications (persons usually resident)	ABS Census, 2016	Updated data	Yes
<b>Workforce skills</b>	a summary measure of the overall skill level of the workforce	Index of ANZSCO occupational skill level: a higher value indicates that the region has a workforce mix of higher-skilled occupational groups	Calculated from ABS Census, 2016	Updated data	Yes
<b>Adult learning</b>	engagement in learning after entering the workforce (25-64 years)	% of population aged 25-64 attending an educational institution (persons usually resident)	ABS Census, 2016	Updated data	Yes

## THEME 5: INFRASTRUCTURE AND ESSENTIAL SERVICES

Infrastructure and Essential Services facilitate economic activity. A region that is well connected to external markets and has good access to essential services best enables businesses to compete in the wider economy and the facilitation of new investment.

Transport infrastructure – roads, rail, airports and ports – are critical to the efficient delivery of goods and services, and support a region’s competitiveness in economic markets by reducing freight costs.

Educational infrastructure is a vital component in the development of a region’s population. InSight contains measures of access to primary, secondary, technical and further education, and tertiary education, indicative of a region’s ability to develop a skilled and productive workforce.

Health infrastructure – access to medical facilities, allied health and GP services – supports the ability of a community to sustain a healthy workforce.

Table 5(a): Competitiveness Indicators for Infrastructure & Essential Services Theme – Transport

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Distance to airport</b>	The average distance for residents and businesses to the nearest commercial airport (km)	GIS calculations, Airport Traffic Data 1985-2011, Bureau of Infrastructure, Transport and Regional Economics	Better rankings result from shorter distances	Nil	Yes
<b>Distance to port</b>	The average distance for residents and businesses to the nearest port (km)	GIS calculations; Map of Australian ports, Ports Australia	Better rankings result from shorter distances	Nil	Yes
<b>Road infrastructure</b>	The average distance for residents and businesses to the nearest major road.	GIS calculations using GEODATA TOPO 2.5M 2003, Geoscience Australia	Better rankings result from shorter distances	Nil	Yes
<b>Rail infrastructure</b>	Average distance from SA1 to the nearest rail station (either freight or passenger)	GIS calculations; GEODATA TOPO 2.5M 2003, Geoscience Australia	Better rankings result from shorter distances	Nil	Yes

Table 5(b): Competitiveness Indicators for Infrastructure & Essential Services Theme – Essential Services

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Access to tertiary education services</b>	% of working age population attending university or another higher education institution	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Access to technical and further education</b>	% of working age population attending technical or further education institutions	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Access to primary education services</b>	Distance to nearest primary school	GIS calculations; MySchool, Australian Government	Better rankings result from shorter distances	Updated data	Yes
<b>Access to secondary education services</b>	Distance to nearest secondary school	GIS calculations; MySchool, Australian Government	Better rankings result from shorter distances	Updated data	Yes
<b>Distance to a medical facility</b>	Average distance to nearest medical facility	GIS calculations	Better rankings result from shorter distances	Nil	Yes
<b>Access to allied health services</b>	% of workforce employed in health services (excluding hospitals)	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes

## THEME 6: INSTITUTIONAL FOUNDATIONS

Regions that can mobilise local resources are more likely to be successful than those who submit to the influence of external forces.

The Organisation for Economic Co-operation and Development (OECD) and others have identified that institutions are crucial to this mobilisation of resources in any region<sup>i</sup>. Institutions are important because they facilitate negotiation, dialogue and collaboration among key actors in a region. Institutions also enable a region to exert external influence by engaging on behalf of the region with higher levels of government and other external actors important to a region's economy (such as major corporations or potential investors).

Formal institutions (such as local government or a major organisation such as a university) and informal institutions (such as local industry or community networks) are important for development as both can work to mobilise resources within and beyond a region.

Measuring the status and impact of institutional factors in InSight remains challenging as what constitutes an effective mix of institutions will differ between areas. It will also change over time as conditions in a region change<sup>ii</sup>. Research on institutions has also noted that more institutions are not always better.

While some places can be challenged by institutions that are too small or too few to facilitate growth, other places have a plethora of institutional actors that conflict or crowd each other out and undermine the successful mobilisation of local resources.

Given these theoretical and practical challenges, the InSight Institutional Foundations theme does not seek to provide a comprehensive assessment of institutional status or performance in regional Australia. Rather, InSight provides a consistent and objective assessment of whether the foundations exist for strong and successful local institutions in each part of regional Australia.

Regions with stronger Institutional Foundations as measured in InSight are more competitive, as they are better positioned to develop and maintain an effective mix of institutions over time.

The theme includes measurements identifying the relative capacity and focus of local government towards business and economic development. Local government is amongst Australia’s most important regional development institutions as it is present in every local area, is locally run and has formal powers to facilitate or constrain local economic development.

However, formal institutions outside of local government are also important to competitiveness in regional Australia. To identify an area’s Institutional Foundations beyond local government, InSight measures the presence of other major organisations and the relative size of the public sector workforce. These factors expand the formal institutional presence in a region and deepen external institutional connections.

The presence of people with the qualifications and experience to support institutional performance as well as the engagement of local people in voluntary activity is also included, providing an estimation of both the foundations for informal institutions. It also indicates whether formal institutions are likely to be supported by local people with the capacity and commitment to make them successful.

InSight measures these different facets of institutional competitiveness through eight indicators (Table 6).

*Table 6: Competitiveness Indicators for Institutional Foundations Theme*

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Public sector workforce</b>	% of workforce employed in public administration	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Leadership capacity</b>	% of the workforce employed in management, the professions or self-employed (including farmers)	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Community skills base</b>	% of the local population with a degree	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Volunteering</b>	% people aged 15 years and over who participate in voluntary work	Social Health Atlas of Australia, PHIDU, University of Adelaide	Better rankings result from higher percentages	Updated data	Yes

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Presence of major organisations</b>	Presence of post-school educational institution (university or TAFE); major hospital and other major publicly-funded facilities (excluding defence)	Various websites – see page 17 for a full list	Better rankings result from more organisations	Nil	Yes
<b>Local economic development support</b>	Systematic assessment of the availability of business information and pro-business policies	Local government websites (refer to page 19)	Better rankings result from higher scores	Nil	Yes
<b>Local government discretionary expenditure</b>	Local roads and general purpose spending (per capita), estimated entitlement	Local Government National Report 2011-2012, Department of Infrastructure and Regional Development	Better rankings result from greater expenditure	Nil	Yes
<b>Financial burden of local government</b>	Rate revenue (per capita)	Various websites – refer to page 20 for full details	Better rankings from lower values	Nil	Yes

## THEME 7: INNOVATION

Start-ups, business accelerators, co-working spaces, entrepreneurs, new products and services, and innovative businesses are emerging across Australia. But what does Australia's innovative capacity look like?

This theme highlights the growth of vibrant and dynamic entrepreneurial communities in regional Australia and areas where conditions are ripe for innovation.

The index contrasts traditional measures of innovation that focus on Research and Development (R&D) and Science, with Business Dynamo which measures the commercial innovation environment in each region.

Regions with a high innovation capacity as shown through InSight are those with strong rankings in both R&D and Science, and Business Dynamo. This dual-focus approach to measuring innovation reveals a diverse picture of innovation capacity in regional areas.

Table 7(a): R&D – Science: established measures of innovation that emphasise technical, scientific or engineering developments through research

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Science &amp; engineering qualified</b>	% of employed persons qualified in science, technology and engineering, 2016	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Research &amp; development managers</b>	Employment as research and development managers, 2016	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Registered research service providers</b>	Presence of organisations registered with Innovation Australia to conduct research & development, 2015	Innovation Australia – Registered research organisations	Better rankings result from higher values	Nil	Yes
<b>Patent applications</b>	The average annual number of applications for patents per 10,000 working-age population, 2007-16	Intellectual Property Government Online Data, IP Australia & MIIPA	Better rankings result from higher values	Methodology improvements, Updated data	No

Table 7(b): Business Dynamo: innovation through implementation in the business or commercial sphere

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Business entries</b>	Business entries as a proportion of total businesses, 2010-2014	Counts of Australian Businesses Including Entries & Exits, ABS	Better rankings result from higher percentages	Updated data	Yes
<b>Owner-managers</b>	Owner-managers as a proportion of total employed persons, 2016	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Trademark applications</b>	The average annual number of applications for trademarks per 10,000 working-age population 2007-16	Intellectual Property Government Online Data, IP Australia & MIIPA	Better rankings result from higher values	Methodology improvements, Updated data	No
<b>Knowledge-intensive business services</b>	Employees in knowledge-intensive business services per 10,000 working age population	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes

## THEME 8: TECHNOLOGICAL READINESS

Technological Readiness is an important facilitator of internal regional growth. The physical location of a person or a product is increasingly less important in the Australian and international business environment than it used to be.

Communication technologies are now essential to efficient commercial practices and productivity. They are transforming the way industries operate, propelling Australia's previously isolated regional economies into national and global markets.

A region's Technological Readiness or its ability to rapidly absorb and make use of new technologies is now a vital determinant of competitiveness.

Three key interdependent components of Technological Readiness are reflected in the measures chosen for this theme (Table 8). Relative availability of technology infrastructure indicates the opportunity for technology-linked growth in regions. Technology take-up at a household level reflects relative engagement with technology in the population. Finally, the presence of a technology workforce in the region provides a measure of the capacity for technology-based innovation.

Table 8: Competitiveness Indicators for Technological Readiness Theme

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable with 2011
<b>Broadband coverage</b>	2-10 Scale of access to high-quality broadband	My Broadband, Department of Communications	Better rankings result from higher scores on the scale	Updated data	Yes
<b>Mobile internet</b>	1-6 Scale of access to mobile broadband services and the speed of those broadband services	My Broadband, Department of Communications	Better rankings result from higher scores on the scale	Updated data	No
<b>Mobile coverage</b>	% of the area that is covered by a Telstra 3G service	My Broadband, Department of Communications	Better rankings result from higher percentages	Updated data, new data source	No
<b>Internet connections</b>	% of households with an internet connection	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes – however, use of mobile internet may have affected results
<b>Employment in technology-related industries</b>	% of workforce employed by technology-related businesses	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Employment in ICT and electronics</b>	% employed as ICT and electronics specialists	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes

## THEME 9: DEMOGRAPHY

The inclusion of the Demography theme in InSight 2.0 recognises the importance of people and population to a region's competitiveness.

Demography is difficult to change through regional development. History, wider demographic trends (such as an ageing population) and national trends shape a region's competitive position. Demography is something that each region must work with to succeed.

Each region has its own demographic profile. For instance, large populations attract a diverse range of businesses, which find it convenient to be located near other relevant businesses, forming agglomeration economies. However, population change – growth, loss or turnover – affects employment or lifestyle opportunities. A stable population supports the formation of social capital.

Measures in this theme describe the size, change, composition and distribution of each LGA and a region's population.

Table 9: Competitiveness Indicators for Demography Theme

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Population size</b>	Number of people in the region	Regional Population growth 2015-16, ABS	Better ranking results from a larger population	Updated data	Yes
<b>Population density</b>	Number of people per square kilometre	Regional Population growth 2015-16, ABS	Better ranking results from higher density	Updated data	Yes
<b>Population growth</b>	% change in population from 2015 to 2016	Regional Population growth 2015-16, ABS	Better ranking results from higher growth	Updated data	Yes
<b>Population turnover</b>	People that moved to or from the region in the last five years as a % of the current population	Australian Population & Migration Research Centre estimates using Census 2016, ABS	Better rankings result from lower percentages	Updated data	Yes
<b>Senior dependency</b>	Seniors (65+ years) as a proportion of the working age (15-64 years) population	Data by Region 2017, ABS	Better rankings result from a lower senior dependency ratio	Updated data	Yes
<b>Youth dependency</b>	Youth (14 years or below) as a proportion of the working age (15-64 years) population	Data by Region 2017, ABS	Better rankings result from a lower youth dependency ratio	Updated data	Yes

## THEME 10: NATURAL RESOURCES

Much of economic activity in regional Australia is directly linked to local natural resources. Access to natural resources can create economic opportunities through offering inputs to production (such as access to water or good quality soil) and can be used to generate production outputs (such as minerals or extractives) or as a foundation for services such as tourism and recreation. The nature of a region's physical endowments, regarding both the access to natural resources and the physical attributes of the region, are hugely influential in many regions' current economies and future opportunities.

Natural resources are a component of a region's competitiveness that is relatively difficult or impossible for regions to influence meaningfully. As a result, less competitive regions have limited scope for improving their competitiveness over time through development efforts. The challenge for regions is in translating their competitiveness into economic opportunities through the way in which local resources are used in the economy.

InSight 2.0 provides a diverse measure of natural resources competitiveness, reflecting the diverse resources available across regional Australia. The theme includes six measures (Table 10) indicating the workforce associated with mineral, timber, aquatic, and agricultural resources and two measures identifying the proximity of the region to the coast and nature reserves which can provide foundations for tourism. Highly ranked regions in this theme are those with a diversity of natural resource opportunities.

Table 10: Competitiveness Indicators for Natural Resources Theme

Indicator	Description	Data Source	Indicator Ranking System	InSight 2.0 Changes	Comparable to 2011
<b>Mineral and energy resources</b>	% employment in mining	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Timber resources</b>	% of local workforce employed in logging	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Commercial fishing and aquaculture</b>	% of local workforce employed in fishing & aquaculture	ABS Census, 2016	Better rankings result from higher percentages	Updated data	Yes
<b>Coastal access</b>	Distance from the midpoint of each LGA to the nearest coastline	GIS calculations*	Better rankings result from shorter distances	Updated data – slightly different method	No
<b>National parks</b>	Average distance (km) for a region's residents to the nearest nature reserve or national park	GIS calculations*	Better rankings result from shorter distances	Nil	Yes
<b>Agriculture</b>	% of local workforce employed in agriculture	ABS Census, 2016	Better rankings result from higher rates	Updated data	Yes

\*See 'Calculating Distance Scores in InSight' (page 17) for more information.

# NOTES ON DATA COLLECTION AND INDICATOR CALCULATIONS

InSight provides access to the most up to date, nationally consistent data on LGAs and regions. This section provides some notes on data and indicator calculations that underpin indicators across many of the ten themes.

## HACHMAN INDEX OF ECONOMIC DIVERSIFICATION

The Hachman index has been used to calculate the economic diversification indicator in the Business Sophistication theme. It accounts for the disparity between the economic structure of a region and that of a reference economy. The Hachman index shows how diverse a given region's economic structure is relative to that of the Australian economy. Values closer to one mean that the region's economic structure is very diverse. Values closer to zero mean that the region does not have a diverse industrial structure as compared to the nation.

## CALCULATING DISTANCE SCORES IN INSIGHT

For some indicators, InSight relies on distance measures. Distance measures in InSight are derived using Geospatial Information Systems (GIS) software.

The GIS software contains digital spatial boundaries for very small geographic areas (including ABS-derived Statistical Areas Level 1 and Mesh Blocks), population quantities for those areas and location data for geographical positions of interest such as roads, ports, airports etc.

Distance scores in InSight are calculated by measuring the distance from the centres of the small geographic areas to the nearest geographic location of interest, then weighting these distances by the population. The data is then aggregated to LGA and regional boundaries, giving a population-weighted score to indicate the proximity of the area's population to the particular feature of interest.

## WEBSITES USED TO SOURCE PRESENCE OF MAJOR ORGANISATION

### HOSPITALS SOURCES

Victorian information from the Department of Health, Victoria:

[www.health.vic.gov.au/hospitals/pubwebs.htm](http://www.health.vic.gov.au/hospitals/pubwebs.htm)

[www.health.vic.gov.au/privatehospitals/index.htm](http://www.health.vic.gov.au/privatehospitals/index.htm)

NSW information from the Health Engine website:

[healthengine.com.au/find/Public\\_Hospital/NSW/](http://healthengine.com.au/find/Public_Hospital/NSW/)

[healthengine.com.au/find/Private\\_Hospital/Australia/](http://healthengine.com.au/find/Private_Hospital/Australia/)

Queensland information from the Health Engine website:

[healthengine.com.au/find/Public\\_Hospital/QLD/](http://healthengine.com.au/find/Public_Hospital/QLD/)

[healthengine.com.au/find/Private\\_Hospital/QLD/](http://healthengine.com.au/find/Private_Hospital/QLD/)

WA information from the Health Engine website:

[healthengine.com.au/find/Private\\_Hospital/Australia](http://healthengine.com.au/find/Private_Hospital/Australia)  
[healthengine.com.au/find/Public\\_Hospital/WA](http://healthengine.com.au/find/Public_Hospital/WA)

South Australia information from the NHPA My Hospitals website:  
[www.myhospitals.gov.au/private-hospitals](http://www.myhospitals.gov.au/private-hospitals) & from SA Health.

Tasmania info from the NHPA MyHospitals website:  
[www.myhospitals.gov.au/browse/tas](http://www.myhospitals.gov.au/browse/tas)

NT info from the NHPA MyHospitals website:  
[www.myhospitals.gov.au/browse/nt](http://www.myhospitals.gov.au/browse/nt)

ACT info from the NHPA MyHospitals website:  
[www.myhospitals.gov.au/browse/act/canberra](http://www.myhospitals.gov.au/browse/act/canberra)

Some data are from the MyHospitals website run by the National Health Performance Authority:  
[www.myhospitals.gov.au](http://www.myhospitals.gov.au)

## MAJOR PUBLICLY-FUNDED FACILITY

CSIRO: [www.csiro.au/](http://www.csiro.au/)

PIRSA: [www.pir.sa.gov.au/](http://www.pir.sa.gov.au/)

Department of Environment and Primary Industries (DEPI) work locations:  
[www.depi.vic.gov.au/\\_data/assets/pdf\\_file/0005/183128/DEPI-Work-Locations.pdf](http://www.depi.vic.gov.au/_data/assets/pdf_file/0005/183128/DEPI-Work-Locations.pdf)

NSW Department of Primary Industries:  
[www.dpi.nsw.gov.au/aboutus/about/office](http://www.dpi.nsw.gov.au/aboutus/about/office)

Queensland Government Department of Agriculture, Fisheries and Forestry:  
[www.daff.qld.gov.au/about-us/contact-us/offices](http://www.daff.qld.gov.au/about-us/contact-us/offices)

Government of Western Australia Department of Agriculture and Food:  
[www.agric.wa.gov.au/office-locations](http://www.agric.wa.gov.au/office-locations)

Inland Fisheries Service:  
[www.ifs.tas.gov.au/about-us/contact-us](http://www.ifs.tas.gov.au/about-us/contact-us)

Forestry Tasmania:  
[www.forestrytas.com.au/contact](http://www.forestrytas.com.au/contact)

Northern Territory Government Department of Primary Industry and Fisheries (DPIF):  
[www.nt.gov.au/d/Primary\\_Industry/index.cfm?header=Key%20Contacts](http://www.nt.gov.au/d/Primary_Industry/index.cfm?header=Key%20Contacts)

## POST-SCHOOL EDUCATIONAL INSTITUTIONS (UNIVERSITY OR TAFE)

### TAFE

[www.tafensw.edu.au](http://www.tafensw.edu.au)

[www.vic.gov.au/education/tafe-training/tafe-training-courses.html](http://www.vic.gov.au/education/tafe-training/tafe-training-courses.html)

[tafeqld.edu.au](http://tafeqld.edu.au)

[www.tafesa.edu.au](http://www.tafesa.edu.au)

[www.central.wa.edu.au/Pages/default.aspx](http://www.central.wa.edu.au/Pages/default.aspx)

[www.tastafe.tas.edu.au](http://www.tastafe.tas.edu.au)

[www.cdu.edu.au/cdu-vet](http://www.cdu.edu.au/cdu-vet)

### UNIVERSITIES

All universities as a list at:

[www.australianuniversities.com.au/list](http://www.australianuniversities.com.au/list)

## ASSESSMENT METHODOLOGY FOR LOCAL ECONOMIC DEVELOPMENT SUPPORT

The assessment of the availability of business information and pro-business policies was made using a score of 0, 0.5 or 1 for each of the following data set elements, giving a total score of 0-10. A score of ten means all of the information is readily accessible via the LGA website.

### Business Accessibility

1. Business page: the LGA has a business/economic development/investment page on their website;
2. Statistics/Investment Prospectus: information on why it is good to invest in the LGA is accessible on their website;
3. Business links: links are provided on their website to further useful information;
4. Business content: more information, substantive to business interest, is provided on their website;
5. Quality of Business content: regarding all of the above, are the pages substantial?

### Pro-Business Policy

6. Business grants the LGA distributes;
7. Business advisory program: the LGA has programs that offer one-on-one advice on starting a business;
8. Business classes/workshops/seminars run by the LGA;
9. Business awards; and
10. Other business support programs.

## WEBSITES USED TO SOURCE REVENUE INFORMATION – FINANCIAL BURDEN OF LOCAL GOVERNMENT

Victorian data from the Department of Transport, Planning and Local Infrastructure website (2012-13)  
[www.dpcd.vic.gov.au/localgovernment/find-your-local-council/alpine](http://www.dpcd.vic.gov.au/localgovernment/find-your-local-council/alpine)

New South Wales data from the Office of Local Government document titled “Comparative Information on NSW Local Government: Measuring Local Government Performance 2012-13”  
[www.dlg.nsw.gov.au/dlg/dlghome/dlg\\_DocumentsIndex.asp?sectionid=1&documenttype=6&mi=3&mi=2](http://www.dlg.nsw.gov.au/dlg/dlghome/dlg_DocumentsIndex.asp?sectionid=1&documenttype=6&mi=3&mi=2)

All other data was sourced from annual reports or financial reports published on LGA websites.

### A CAUTION ON SMALL AREA DATA

The RAI’s aim for InSight has been to present the best available, nationally consistent information we have about competitiveness in regional Australia.

Regional Australia includes a wide diversity of regions, from densely populated regional cities to our many small rural and remote Heartland communities.

Some small area data in InSight, particularly population related indicators, carries a higher risk of error (i.e. the measure does not accurately reflect the true situation) than data on more populated areas.

Things can also change more rapidly in small areas because smaller numbers of people or the arrival of a new business or investment will have a much greater impact on the overall competitiveness situation for the community.

Some users have suggested that given these challenges, the RAI should exclude data for the smallest areas from InSight. However, the RAI believes that this approach risks mirroring the pattern of excluding or ignoring these areas in most mainstream analysis of the Australian economy.

On balance, the RAI believes that it is better to make information available, even if it has limitations than to exclude areas from this index. In most cases, InSight relies on data from national agencies, particularly the ABS, meaning we use the best and most reliable data available across the index.

Nevertheless, accurate measurement for sparsely populated areas is challenging, even for our national statistical agencies. Data for areas with only a few hundred people or less should be used with some caution. The RAI recommends that users of data on small area seek to confirm the current situation and recent trends in small communities by engaging directly with local institutions in the area.

## SPATIAL BOUNDARIES IN INSIGHT

InSight provides data based on the primary administrative boundaries used by Australia's three levels of government.

InSight provides data for each of the 540 LGAs in Australia.

InSight 2.0 is based on LGA boundaries as at September 2016. These boundaries reflect the ABS definition of LGA administrative boundaries at the 2016 census.

InSight 2.0 also provides data and rankings for 59 regions including 52 RDA regions that align to state regional development boundaries, and eight state and territory regions that sit within the national RDA structure (see [www.rda.gov.au](http://www.rda.gov.au) for more information). Note that the RDA regions for Tasmania and the Northern Territory have both been further sub-divided into three regions each.

These spatial boundaries make InSight usable for the widest range of applications in regional development across Australia.

## CALCULATING INSIGHT RANKINGS AND DECILES

InSight has been developed as a series of independent indices rather than one index with a single rank for each region. InSight includes 20 separate indices comprised of:

- An LGA index for each of the ten themes, comparing the performance of all LGAs to each other; and
- A region index for each of the ten themes, comparing the performance of all RDA regions to each other.

LGAs are then ranked initially from 1 to 540 and regions are ranked from 1 to 59. Rankings are applied at the theme level and also for each indicator. Rankings are then adjusted to deciles using  $Decile\ rank(LGA) = LGA \frac{rank}{54}$  for LGA level geography or  $Decile\ rank(RDA) = RDA \frac{rank}{5.9}$  for

RDA region level. The rationale for displaying the final ranks is twofold:

- Firstly, it makes the data much more readily comparable; and
- Secondly, while the decile approach reduces the resolution of the ranking, this overcomes any noise in the data. Previously, if one LGA has ranked one or two places above another LGA, this small difference may have been due to error or noise in the data and not a meaningful difference between the regions.

The ranking approach is used to ensure users can identify the relative position of a region as well as the status of each measure.

An overall index of competitiveness combining the ten themes is purposely excluded because it is difficult to meaningfully aggregate relative performance across such a wide range of themes. This approach also encourages users to concentrate on the nuance of each region's competitive position. Each LGA and RDA region has a mix of both competitive strengths and challenges that shape its competitive position.

## INDEXATION METHODOLOGY

Indexation in InSight involves the indicators in each theme being transformed to provide a composite index score for each LGA and, separately, for each RDA region.

Indexation is necessary as there are no common units or scales across the indicators within the themes. Indicator data is represented in dollars, persons, incidence rates or other forms of quantity and volume depending on the competitiveness factor measurement.

An indexation approach enables us to combine different measures into an overall assessment of competitive position for each theme.

Several methods of transforming indicators to enable indexation are available. InSight uses the common 'min-max' method of rescaling which is based on the following formula:

$$NX = \frac{x_i - \min(x)}{\max(x) - \min(x)}$$

This transforms the indicator data ( $x$ ) into scores with a range from zero to one (i.e. the most competitive region receives a score of 1 and the least a score of 0). This approach does not change the relative position of indicators in the distribution, and it is straightforward and transparent.

However, it is noted that this transformation rewards higher values. A very good result on a few indicators is more advantageous to a region's ranking than a larger number of average scores.

## OUTLIER ADJUSTMENT IN THE THEME RANKINGS

Given the tendency for the 'min-max' normalisation approach to favour very high values, the 'Tukey' method has been used to reduce the influence of positively ranked outliers on the theme rankings in InSight.

This method identifies outliers within indicators as values beyond an upper or lower fence value. Outliers in the data set were identified using the following formula:

If higher values lead to higher rankings for an indicator:

Upper fence = indicator mean + (3 x indicator interquartile range)

Outlier = any indicator value > lower fence

If lower values lead to higher rankings for an indicator:

Lower Fence = indicator mean - (3 x indicator interquartile range)

Outlier = any indicator value < upper fence

An adjusted normalised score is then calculated by excluding the outlier values. Outlier values are given the maximum value of 1 in the adjusted score. This adjusted score is used for theme ranking.

The reason for this adjustment is to increase the spread of values in the adjusted normalised score without impacting on the relative distribution of non-outliers. This prevents an outlier in one indicator from unreasonably influencing the location's position within the theme ranks.

Based on the average of the normalised scores for each indicator, LGAs and RDA regions are ranked in descending order for each theme. A higher average score translates into a higher ranking.

No weightings have been applied in the formation of the InSight indices.

This simple approach to indexation is preferred by the RAI to more complex methods (such as principal components analysis). It enables the relationship between indicator data and the theme ranking to be understood by all users. This is important for InSight where all of the data and rankings at the indicator level are made available to users, regardless of their statistical analysis abilities.

Additional notes on index rankings:

- Regions with the same measurement for an indicator are given the same ranking; and
- Locations with more than 25 percent of indicator value missing have not been allocated a theme rank.

## RANKING SYSTEM LIMITATIONS

For many indicators, there is a simple competitiveness relationship where 'more' or 'less' is a more competitive position. For example, having a greater percentage of the working-age population participating in the economy or more mineral reserves improves competitiveness.

However, for some InSight indicators, there are also potential challenges involved in having a very high or low score. These indicators include:

- Economic diversification does not take into account the benefits of specialisation and limitations to growth that may flow from having firms spread across many sectors;
- The dominance of large employers does not take into account the limitations for a region's economy that may result from having no large employers that bring a diversity of jobs, more management positions and greater capacity for growth and innovation;
- Population turnover does not take into account the challenges that may arise in very stable communities where no new people join the population, bringing new skills, energy and networks;
- Youth and senior dependency does not account for the possible social costs of having communities where there are few or no older or younger people;
- Population density does not take into account the costs of congestion that can arise in very densely populated areas;
- Timber resources use an employment measure which does not take into account whether this employment is based on sustainable use of forest resources; and
- Fishing and aquaculture use an employment measure which does not take into account whether this employment is based on sustainable use of aquatic resources.

The RAI has not adjusted rankings in these indicators to reflect these possible costs that may counter the primary competitive benefit being measured by InSight.

In most cases, the relative impact of these costs compared to wider competitive benefits flowing from the factors cannot be measured. As a result, the ideal level at which a region is most competitive cannot be identified to enable adjustment of the ranking approach.

Users of InSight and particularly those LGAs and regions with very high scores and ranks in these indicators are encouraged to consider the relative costs and benefits of these factors in the economy as part of a more detailed analysis.

## COMPARABILITY

Some of the substantial InSight changes observed in the indicators, themes, and rankings that are not actual change may fall into one of the following categories:

- **A data provider (data source) used a new method.** Examples of this are the measures for industrial building values and commercial building values (NEXIS datasets). This is modelled data, and the model changed between 2011 and 2016. “NEXIS is a unique modelling capability designed to compile best publicly available information, statistics, spatial and survey data to create comprehensive and nationally consistent exposure information. NEXIS provides aggregated exposure information for residential, commercial and industrial buildings, and agricultural commodities in Australia.”<sup>iii</sup>
- **Regional Australia Institute used a refined method.** This was the case with some of the distance calculations such as coastal distance. An improved method was also used for calculating the IP data used for trademarks and patents. Previously, this underestimated larger LGAs.
- **Data source no longer available.** For example, the Telstra mobile coverage data was no longer available (My Broadband data was used as an alternative), and GP visits were also no longer available.
- **Geography.** Previously, some data used in the 2014/16 update was built up from SA2s. These did not always align with the 2016 LGA boundaries used in the InSight 2.0 update. Another minor issue involved allocating older data sets to new LGA boundaries, for example where councils amalgamated or split over NSW, Queensland, and WA.

## DATA REVIEW AND CHECKING PROCESSES

InSight has been subject to a thorough review and checking process to ensure the data and indices are correct and consistent with the methodology. The indicator and theme data review process included:

- The preparation and review of descriptive statistics for each indicator to examine data distribution, missing values, and outliers;
- The preparation of correlations to ensure the consistency and relevance of indicators within each theme;
- All derived data was compared against similar information available from the Australian Bureau of Statistics (ABS);
- A systematic internal review of all calculations was conducted to ensure the accurate transformation of data and calculation of theme scores and rankings; and
- An early beta version was released to research partners for feedback.

The RAI is confident that these processes have produced an accurate set of indicators and theme scores for each LGA and region.

If a user identifies possible errors or inaccuracies, please contact the RAI office on (02) 6260 3733 or [info@regionalaustralia.org.au](mailto:info@regionalaustralia.org.au) and we will review the issue immediately.

## DATA REVISIONS – FURTHER UPDATES

The RAI is working to access additional data sources to improve the ability of regions to get a snapshot of how they compare regarding competitiveness nationally.

Users are encouraged to revisit InSight regularly to access further InSight developments.

## ENDNOTES

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<sup>i</sup> OECD (2012) *Promoting Growth in All Regions*. Paris: OECD; OECD (2009) *How Regions Grow*. Paris: OECD

<sup>ii</sup> Rodríguez-Pose, A (2013), 'Do institutions matter for regional development?', in *Regional Studies*

<sup>iii</sup> Australian Government (2017) *National Exposure Information System (NEXIS) Building Exposure - Local Government Area (LGA)*. Available at: [data.gov.au/dataset/national-exposure-information-system-nexis-building-exposure-local-government-area-lga](https://data.gov.au/dataset/national-exposure-information-system-nexis-building-exposure-local-government-area-lga)