JOBS
FOR NSW

Jobs for the Future

Adding 1 million rewarding jobs in NSW by 2036

NSW
MAKING IT HAPPEN

Jobs for the Future

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August 2016

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Preface

Jobs for NSW was launched in August 2015 as a private sector-led and NSW Government-backed initiative. Its goals are twofold: to help make the NSW economy as competitive as possible, and to fulfil the Premier's primary objective for NSW of creating more jobs across the State.

Over the last nine months, we have been working on answering the question:

What should the State of NSW do in the next three years to secure more opportunity, inclusion, engagement and productivity for our workforce in the 2030s?

This has not been a desk exercise. Building on the analytical underpinnings from our partner McKinsey & Company, we have drawn on the experience and insights of influential leaders from across the NSW economy and community.

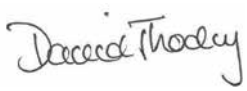
We especially thank our reference group members, who have given their time and expertise with generosity and commitment to inform and test our perspectives, and all of the government agencies that have engaged fully and constructively.

This paper presents our view on how NSW will secure its jobs for the future.

We have suggested actions that would require a whole-of-government response, with roles for multiple government agencies and non-government, business, financial, education and community stakeholders.

It marks the beginning of a journey towards a fully integrated plan for jobs creation in NSW, aligned with portfolio priorities and programs.

We look forward to working with you on that plan, and putting it into action.



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Reference group

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Glossary of terms

automatable	jobs or tasks that are able to be undertaken by a machine
CAGR	compound annual growth rate
cluster	networks of businesses in the same or related industry sectors that share infrastructure and knowledge bases and can share initiatives to foster employment and innovation
concierge	a single government contact for a target, globally competitive growth sector, whose role is to help government and the sector advance an opportunity or remove a barrier to growth
gazelles	small to medium enterprise (SME) with payroll over $750,000 and with revenues that grow at least 20% annually for 3 consecutive years[1]
globally competitive	having potential to sell into international markets with distinctive competitive advantages
hotspot	geographic clusters of at least 1,000 people working in just one ANZSIC-code industry, and at least three times more likely to host employment in that industry than the national average
interactive skills	complex problem-solving and social-emotional skills (see page 49)
knowledge-intensive jobs	jobs that involve more complex problem-solving and social-emotional skills, or both, and draw on our experience and context as well as specialist knowledge
job	work for pay, profit, commission or payment in kind, or for a family business or on a farm (adopting the ABS definition)[2]
job archetypes	the three types of jobs—knowledge-intensive, routine and physical—identified by the McKinsey Global Institute (though with different names) and used in this report
knowledge economy	that (growing) part of the global economy representing knowledge-intensive goods and services, as opposed to labour-, capital- or resource-intensive ones[3]
physical jobs	jobs that are defined by their work with physical materials and space
routine jobs	jobs dominated by regular exchanges, with either people or information, that can typically be scripted
sectors	traditional industry sectors as defined by the ANZSIC codes
segments	groupings of industries and sectors that face common investment barriers and growth drivers (see page 34)
stackable	the modules within a VET training course that add skills to build a person's readiness for a particular job
tradeable sectors	industries and firms that produce goods or services that are, or may be, traded internationally
unbundling	the process or event in which specialist businesses perform the component tasks of a formerly single job

Executive summary

Over the past 20 years, the NSW economy has delivered the jobs we have needed for a stable, prosperous and sustainable society. Now, while our economy and jobs growth are strong, we should prepare for the future. This *Jobs for the Future* report seeks to engage the State's public and private sectors in setting an aspiration for that future, and a clear plan for reaching it.

We see four unavoidable challenges to our future jobs growth, and have proposed a strategy for each that turns those challenges into opportunities. Two strategies act on the demand for jobs; two on the supply of suitably skilled workers. The Jobs for the Future plan includes enduring, 20-year priorities for each of these strategies, and an initial agenda for action.

A strong 20-year track record

- From 1996 to 2015, NSW added 925,000 new jobs—286,000 more than our population growth would explain—to reach 3.71 million people in paid work.
- In that time, the nature of our work has changed dramatically while our skills and education levels have adjusted impressively to match. Our jobs have paid more, with wage growth outstripping CPI growth by 20% since 1997.[4]
- The benefits have been widespread, with regional residents, women and older people all participating more.

We now face four primary challenges

We now face fundamental challenges to our strong jobs story (in addition to the inevitable yet unpredictable economic cycles and shocks). Each offers opportunities as well as risks, and it is our responses that will determine our future, rather than the challenges themselves.

1. **Increasing global trade in the knowledge economy.** Trade is increasingly made up of services, with information flowing across the internet in addition to physical merchandise flows. As the global knowledge economy grows, talent and capital are becoming more adept at flowing towards the best opportunities. Companies can compete more easily across borders, including against NSW firms in NSW.

2. **New challengers in faster changing industries.** What was promised in the dotcom boom at the turn of the century is now coming to fruition. People hold smaller, more powerful electronic devices in their hands, with advanced levels of connectivity. Every industry and supply chain is subject to digital disruption. The firms that are exploiting this speed of change are proving to be newcomers rather than incumbents.

3. **Task automation and unbundling.** These forces are changing the very nature of work. Tasks are increasingly automatable—able to be done by smarter and more dexterous machines. And more of our jobs will be unbundled—their different tasks being performed by the most competitive specialist businesses, wherever they may be.

4. **Our population is ageing.** This may be the biggest challenge of all. In 20 years, there will be just 1.5 people of working age for every younger or older dependent, not the two we have now. All else being equal, that shift alone would mean around 370,000 fewer people in paid work than if our current age mix had continued.[5] With fewer people in our labour force, our per capita gross state product (GSP) may be approximately $6,000 less than otherwise, reducing the funds available for individuals and governments to meet our community's needs.

Our 2036 aspiration

If we want to maintain our jobs and incomes growth through these challenges, we have to set an aspiration, ensure all stakeholders are aware of it, and draw them together to reach it. Jobs for NSW recommends we adopt this jobs aspiration:

Ensure everyone in NSW has the opportunity for a meaningful working life, today and in the future, leading to 1 million more jobs in NSW by 2036.

The aspiration has two elements. The first is qualitative: the opportunity for a meaningful working life. We cannot determine whether everyone in NSW will have a meaningful working life, or even a job. But we can and should aspire to everyone having that opportunity.

The second is quantitative. We aspire to add another 1 million jobs in the next 20 years. That would achieve strong growth in jobs and per capita income, despite an ageing population. This is a stretch target, one that is c.200,000 jobs more than projected in the *NSW Intergenerational Report 2016* under favourable economic and policy settings. We believe, however, that if we pursue the strategies set out in this report, our aspiration of 1 million additional jobs is achievable.

Strategies to achieve our aspiration

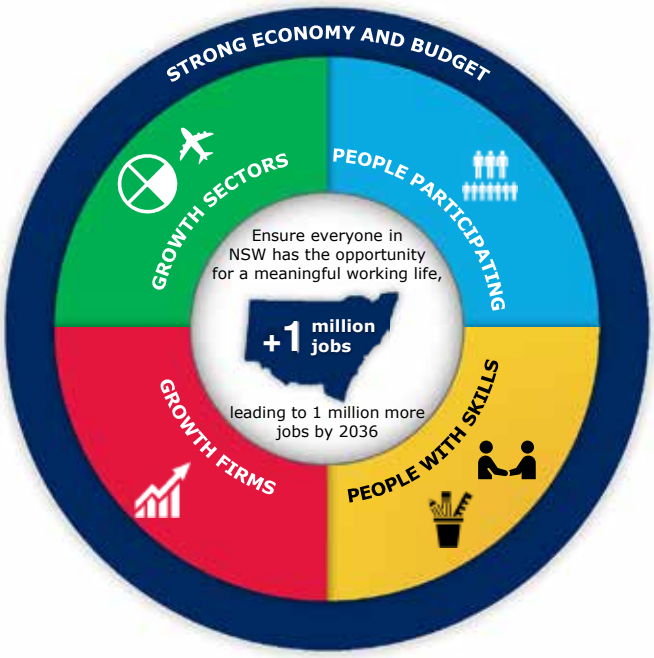
Reaching our 2036 aspiration demands that government, business, educational and community leaders work together on four long-term strategies. These strategies would build on current priorities and actions; respond to our four challenges; be expansive enough to take us there; and require consistent whole-of-government action. The first three also align with strategies to maintain or boost productivity in our economy. All of them would signal a shift in employment policy from single-industry or large-firm interventions, to creating the conditions for a thriving, job-creating economy.

The first two strategies, on the left of Figure 1, would help build demand for jobs:

Figure 1: Jobs for NSW's recommended aspiration and the 4 strategies to achieve it

1. Nurture our globally competitive growth segments
Nurture high-quality jobs in globally competitive, tradeable segments—with geographic clusters and policy reform to overcome their barriers to growth

2. Open doors for entrepreneurs
Make NSW the place of choice for 'gazelles' to grow and succeed—by building a stronger entrepreneurial culture, ecosystems and skills and stimulating early-stage funding



4. Draw on all of our people
Make NSW the best state for people to enjoy paid work—by ensuring good livability across NSW and removing barriers for people 65 and over, women with children, and regional youth

3. Skill up for the knowledge economy
Ensure people of all ages have the interactive skills they need for the digital future—by supporting the integration of those skills in schools and a responsive, outcomes-based VET system

1. **Nurture our globally competitive growth sectors.**
   Goal: Up to 40% of our jobs are in tradeable sectors, up from 29%.

   Though the NSW jobs market is strong, 70% of jobs and 80% of recent jobs growth are in sectors that are not trade-exposed. A good number of those sectors are already strong and do not require additional government action. We should focus our resources on tradeable sectors which have the potential to be globally competitive and create large numbers of resilient jobs. A government concierge program, in particular working through geographic sector clusters, will help do that. Working with the Australian Government, NSW may better coordinate initiatives across government agencies, prioritise investment in enabling infrastructure, improve inefficient regulatory barriers, and remove regulation that is ineffective or has unintended negative consequences.

2. **Open doors for entrepreneurs.**
   Goal: Up to 5% of our businesses are high-growth gazelles, up from 3.2%.

   Over the past six years, high-growth small and medium enterprises (SMEs) that make up just 6% of NSW firms created over 1 million new jobs. They more than offset the 600,000 jobs that larger firms shed as they increased their productivity, often by buying from smaller, specialised firms. Of these SMEs, the firms with the highest rates of jobs growth are termed gazelles. More high-growth SMEs could become gazelles, and more new firms could become high-growth SMEs, with stronger entrepreneurial ecosystems, culture and skills, and greater access to early-stage funding.

The next two strategies would support the supply of people to do the jobs:

3. **Skill up for the knowledge economy.**
   Goal: NSW has skilled workers to support knowledge-intensive jobs being 60% of total jobs, up from 48%.

   To date, our jobs market has responded well to the challenges of automation and unbundling, with 80% of jobs growth being higher-paying, more resilient knowledge-intensive jobs. To consolidate that positive response, we must continue to skill up and re-skill: integrate problem-solving, social-emotional and specialist skills in our schools, and ensure an agile, outcomes-based vocational education and training (VET) system can meet changing job needs.

4. **Draw on all of our people.**
   Goal: Participation rates are at least 24% for people 65 and over and 75% for women with children, and unemployment for regional youth is one-fifth lower.

   NSW has an ageing population, and the proportion of working age people in NSW will fall from around 66% to 61% of the population over the next 20 years. As more people are reaching retirement age, we risk losing a vast reservoir of experience and talent. We therefore need the NSW jobs market to be as inclusive as possible, full of desirable places to live and work, especially for people 65 and over as well as women with children and regional youth.

Enduring priorities and an initial action agenda

Each of the four strategies has priorities that should endure over the full 20 years. These jobs priorities are the core of our recommendations. None of them are easy. They are long-term drivers of jobs growth that would engage multiple stakeholders and demand constancy of purpose over two decades.

It is impossible to map out the actions that will be needed to fulfil these priorities and achieve our strategic goals over 20 years. Instead, we suggest actions for each priority that should be explored or implemented immediately (see Figure 2).

Figure 2. Jobs for the future strategies, enduring priorities and initial agenda for action

Strategies	Enduring priorities (over 20 years)	Proposed Initial actions (~3–4 years)	Status
1. Nurture our globally competitive growth segments	1.1 Unlock barriers to growth for a small set of target segments	▪ Government Concierge to work with leading employers to identify and remove barriers to growth and competitiveness	Action
	1.2 Promote the development of distinctive geographic clusters	▪ Cluster champions to advance profile and levers for growth ▪ Three place-based policy pilots, one each in inner and Western Sydney and in regional NSW	
2. Open doors for entrepreneurs	2.1 Build a supportive ecosystem for entrepreneurs	▪ Sydney School of Entrepreneurship ▪ Expanded network of entrepreneur shared spaces ▪ Government and Corporates as first customers	Action Explore
	2.2 Stimulate early-stage investment in future gazelles	▪ Sydney and regional funding and networking opportunities ▪ Jobs for NSW Gazelle Financing programs	Action
	2.3 Support and signal a strong culture of entrepreneurship	▪ Targeted reforms to the NSW Jobs Action Plan	Explore
	2.4 Make NSW the easiest state to start and grow a business	▪ Existing NSW State Priority: 'Strong Budget and Economy' ▪ Review of NSW's regulatory management system	Action
3. Skill up for the know-ledge economy	3.1 Accelerate reforms for integrating interactive-skills learning in schools	▪ Interactive skills pilots for K-12 ▪ School leaver readiness and networking pilots (also for SP4.3)	Explore
	3.2 Promote a more flexible, outcomes-based VET system	▪ More flexible qualifications and apprenticeship models ▪ Stronger outcomes-based management of VET sector	Action
4. Draw on all of our people	4.1 Make NSW the best place to work for people 65 and over	▪ Barrier reductions for workers aged 65 and over	Explore
	4.2 Make NSW the best place to work for women with children	▪ Greater childcare access and reduced disincentives for increasing hours of paid work	
	4.3 Promote thriving regional centres that create work opportunities for youth	▪ Accelerated strategic place-based investment to drive regional economic growth and jobs	
	4.4 Make NSW the most 'liveable' State	▪ 'Liveability' and job outcome criteria for transport and planning projects	

- **Explore** means that the lead department should thoroughly investigate the action, with a view to making it happen should it be supported by rigorous analysis.
- **Action** means that the lead department should proceed with implementing the action. In some cases, these actions are already underway.

These actions form the initial agile agenda to create jobs in NSW: an agenda that pursues our strategic priorities and is fiscally responsible, but that is flexible and responsive to changing economic and social conditions. The agenda must remain agile, with actions changing over time, expanded when successful, adapted to suit conditions, and dropped when unsuccessful or having met their objective.

The result will be a stronger NSW economy and jobs growth, driven by globally competitive sectors and a lively entrepreneurial ecosystem, a growing population well prepared for the knowledge economy, and an active workforce across all genders, ages and locations. Such a state will offer rewarding working lives for our citizens within a rich cultural mix, with world-class amenities, and a vibrant, balanced and diverse economy.

Jobs for the Future

Adding 1 million rewarding jobs in NSW by 2036

Securing NSW's jobs for the future

Introduction

Jobs are essential for a stable, prosperous and sustainable society. They give us opportunities to learn and grow, as well as income for our basic needs and aspirations. They draw people from differing families, regions and cultures together for a common purpose, underpinning social cohesion. And they generate funds for businesses and governments to deliver what's needed for communities and ecologies, local and global.

Over the past 20 years, the NSW economy has delivered those jobs. Now, while the NSW economy and its jobs growth are strong, we should prepare for the future.

The NSW Government has established Jobs for NSW as its lead agency to focus solely on job creation. It is our role to advise the government on what it should do to help create jobs, today and tomorrow, and to lead some of that action.

Our *Jobs for the Future* report offers that advice. It also seeks to engage NSW public and private sectors in setting an aspiration for jobs growth in the State, and a clear plan for reaching that aspiration.

The question we set out to answer in our Jobs for the Future project is:

What should the State of NSW do in the next five years to secure our jobs for the future: that is, more opportunity, inclusion, engagement and productivity for our workforce in the 2030s?

To answer our question, we explored what generates jobs in NSW, the strengths our State has built over the past 20 years, the challenges we face over the next 20 years, and strategies for creating high quality jobs for the future.

We also had to answer two implied questions. What is the role of government in securing jobs for its people, given that most jobs are created by private firms and individuals? And how can we add to that role, given all that the NSW Government is already doing?

Our report sets out our answers to these questions.

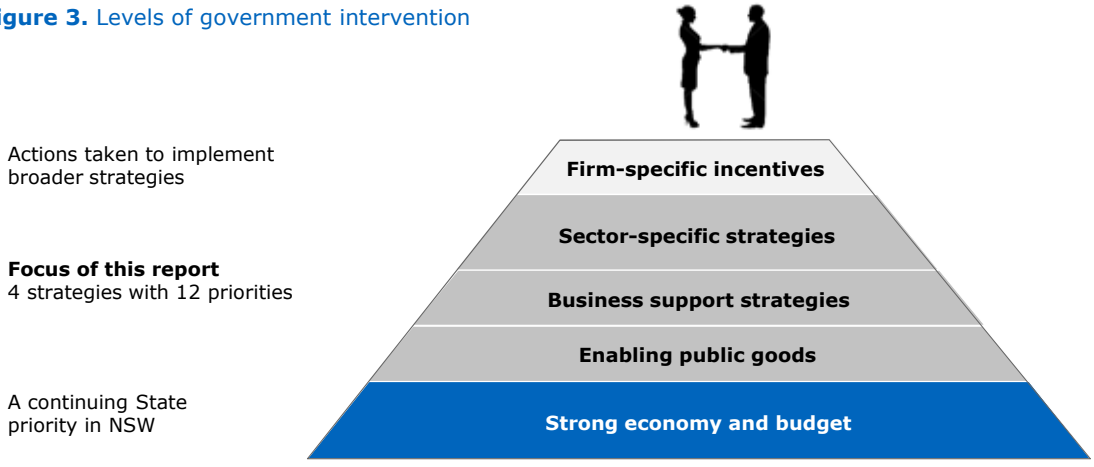
Introduction	**Confirming the government's role in jobs creation.** Given that we are already securing a strong budget and economy, how can we otherwise foster job creation?
Part A	**NSW's strong 20-year track record.** The NSW economy has grown its job numbers by 925,000 or 33% over 20 years, more than our population growth would account for, with widespread benefits.
Part B	**Our aspiration for 2036.** We face four clear challenges that will make continuing that growth rate difficult unless we respond effectively, and set an aspiration that spans both the quality and quantity of our jobs growth.
Part C	**Four strategies to reach that aspiration.** We present a chapter on each of the four jobs-growth strategies that will convert our challenges into opportunities—two on the demand side, and two on the supply side. 1. Nurture our globally competitive growth sectors 2. Open doors for entrepreneurs 3. Skill up for the knowledge economy 4. Draw on all of our people Each chapter and strategy poses a specific challenge, and presents clear 20-year priorities to address it along with our recommended initial actions.
Part D	**An initial agenda for action.** A wrap-up of all of the recommended actions under the four strategies.

The government's role for a strong economy and job creation

Put simply, a job is created when one person wants to hire another to do something (the demand), there is someone with the skills needed to do that job (the supply), and the two parties agree to work together.

While most jobs are created in the private sector, job creation does not happen in a vacuum. Government's role is to ensure the productive conditions and set the safe boundaries in which these agreements can occur. Government will typically take action to support job creation on one of five levels (see Figure 3).

Figure 3. Levels of government intervention



It is best to view the layers of government action from the bottom up, from the broadest priority to secure a strong budget and economy, up to the most pointed actions to support an individual firm as part of a broader strategy. Although there are substantial interdependencies between each layer, actions at each level will have less success to the extent that the levels beneath it are not yet sound.

This report and the strategies and actions it proposes focus on the middle three layers: job-enabling public goods, effective support for business, and sector-specific strategies.

- **Strong budget and economy.** These two critical conditions underpin all jobs in NSW. The State's current and continuing number one priority is to take the actions needed to deliver a strong budget and economy. The evidence is that the NSW Government is succeeding with this priority. NSW is delivering budget surpluses averaging over $3 billion from 2014–15 to 2016–17, and is forecasting surpluses averaging $2 billion for the forward estimate years.[6] Fiscal discipline and asset recycling has reduced general government sector debt to zero. Our economy is growing faster than any other state, and most comparable global economies, with gross state product forecast to grow by 3% in 2016–17, and 2.75% the year after. We have a AAA credit rating, a balanced budget and, most importantly, strong jobs growth and low unemployment. This condition implies that any actions proposed in this report must be fiscally responsible.

- **Job-enabling public goods.** Better public safety, health care, transport, communication, education, amenities, housing and environments are all public goods that are as valuable for a healthy jobs market as they are for individuals and communities. None are possible without a strong budget and economy. With them, NSW has been able to increase infrastructure expenditure on education by 37% in the two years to 2016-17, and on health by 14%, transport and roads by 16%, police by 59% and TAFE by 76%.[7] While many state priorities are already focused on these public goods, a keener eye may be needed on their implications for job creation. For example, the integrated planning approach of agencies such as the Greater Sydney Commission and Urban Growth are now aligning housing and transport investments with job creation objectives.

- **Business-support strategies.** The next layer represents government actions that encourage people to invest their time and capital in business, drawing on but without diminishing our public goods. The aim is to make it easier for people in NSW to start and run a business, in any sector, so that their success or otherwise is determined by the market and not by government over-regulation or lack of services. Many of our current state priorities fall in this layer: cutting the red tape needed to start a business, encouraging business investment, accelerating major project assessment, and providing better government digital services. More action might be targeted at supporting the culture and ecosystems within which our entrepreneurs would drive jobs growth.

- **Sector-specific strategies.** Government can make targeted interventions to help industries and sectors achieve their potential for job growth, without impeding other community and economic priorities. The objective is not to pre-empt market demand nor resist long-term trends, which risk acting against the market. Rather, this strategy would help these segments take advantage of long-term market trends, and overcome short-term or cyclical events that threaten a healthy jobs trajectory. More action might be targeted at assisting sectors with the greatest potential for job growth.

- **Firm-specific incentives.** At the top of Figure 3, closest to the act of job creation, the government might create incentives for particular firms or employees. However, these actions would typically only occur as part of broader strategies that target firms with specific characteristics, such as size or industry sector.

All levels foresee constructive actions: there is an implied assumption that government should do no harm to job creation. Also at every level, governments will deal with what economists refer to as market failures or externalities. These occur where there is a barrier to a widely-desired public or economic good, but no non-government party has the incentive to overcome that barrier; or where one part of the economy takes undue advantage of a public good that is provided too cheaply to it.

Clearly, the NSW Government is already doing many of the things needed for our strong jobs growth to continue, on all levels of potential action. Our next question was: how can we constructively add to this existing agenda?

Completing a whole-of-government plan for jobs growth

As the government agency focused solely on the Premier's priority of job creation in NSW, Jobs for NSW seeks to galvanise all government agencies and the community around a shared aspiration and plan for the State. Given all the State's successful initiatives and continuing efforts—public and private—our best contribution is to focus on long-term, whole-of-government strategies and priorities that are grounded in current and near-term actions.

- **Long-term horizons.** Our economy is subject to profound, slow-moving tectonic shifts. Actions can be taken with urgency, but results may not appear for over a decade. Annual budgets and four-year cycles are not the best lenses to look through. We need to gauge actions by their contributions to long-term, 20-year goals and other public benefits.

- **A bias to action.** We must give ourselves an agenda that we can act on, rather than ideas and reports that will fade. Though some will be harder than others, all of the priorities in this report can be acted on—now. Yet while we advocate a steady hand on long-term priorities, our specific actions must be agile, responsive to the evidence of what is working and what is not.

- **Whole-of-government commitment.** No single agency holds all the keys to our economy, and no strategy or single initiative can be executed by one agency alone. We need to use open planning and collaborative action to make sure we prioritise the right things, and do them well. To do so, we will need the coordinating leadership of an agency whose sole focus is creating jobs for NSW. In Part D of this report, we present the potential role for Jobs for NSW in this respect.

We believe the strategies and priorities in this paper would bring a long-term, whole-of-government commitment to the actions NSW is currently pursuing and others that may be soon launched. They would engage our public and private sectors in a confident plan for the essential work of job creation over the next 20 years.

Policy and personal readings of this report

This Jobs for the Future report is prepared for the NSW Government as recommendations on what it should do to help create jobs, today and tomorrow. It also seeks to engage NSW public and private sectors in setting an aspiration for jobs growth in the State, and a clear plan for reaching that aspiration. As part of the government policy process, we have suggested actions that would require a whole-of-government response, with roles for multiple state and local government agencies along with non-government, business, financial, education and community stakeholders.

However, we may also read the report as workers and parents, keen to understand how the jobs and industries of the future may be different to those of today, and to prepare ourselves and our families for them.

The nature of our jobs and working lives will change over the next 20 years, just as they have in the past 20 years. On one thing, this report is clear: it is not enough to have specialist skills or knowledge. We will all have to continue developing our general interactive skills if we are to prosper in the digital age. Global trends suggest that our future working lives will be less about a single career, industry or firm, and more about a life-long series of working experiences in different fields, using different skills—what has been called 'the gig economy'. Using our interactive skills to adapt and learn throughout our working lives will be increasingly valuable.

Beyond that, this report should not be taken to guide or restrain personal ambitions or passions in any way, nor to guide what specialist skills and interests a person should seek. The NSW economy is extremely diverse. Opportunities will continue to present themselves to individual workers across that economy, in both tradeable and non-traded sectors, in goods and more so in services.

Instead, the report is about the entire system of job creation in our economy, the best role of government within it, and a state-wide plan to create as many meaningful working lives as possible.

Our future working lives will be less about a single career, and more about a life-long series of working experiences in different fields, using different skills—'the gig economy'

A. NSW's strong 20-year track record

To begin to understand this plan, we need to go back and consider how jobs have been created in NSW over the last 20 years.

Over the past 20 years, the NSW economy has delivered many more jobs than may have been predicted as we emerged from our last recession back in 1993. Our economy has dealt with disruptive macroeconomic events and microeconomic reforms, globalisation, automation, a dotcom and resources boom cycle, and two significant financial crises. It has been marked by change and uncertainty. The offices and factories of 1995 are barely recognisable now. Email was still a novelty, websites unheard of, mobile phones still brick-like (and just phones). Super funds were still in their infancy.

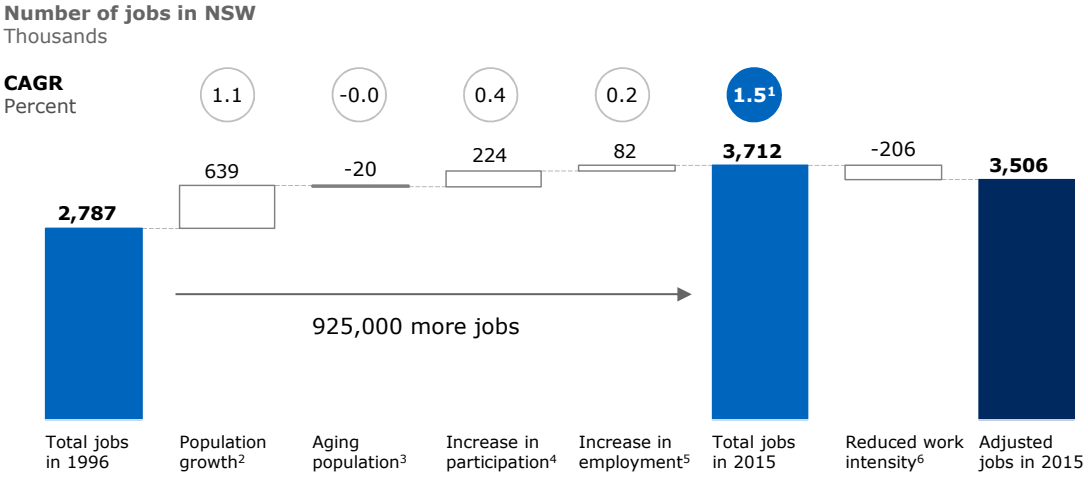
Our labour market sailed remarkably unscathed through all this. From 1996 to 2015, we added 925,000 new jobs—286,000 more than our population growth would account for—to reach 3.71 million people in paid work. Our skills and education levels have adjusted fluidly to the marked changes in the nature of our work. Our jobs have also paid more, with wage growth outstripping CPI growth by 20% since 1997.[8]

The benefits have been widespread, drawing in a broader cross-section of participants including regional people, women and the elderly. Employment in NSW has been more diversified, resilient and stable than in other Australian states. We explore these aspects below. Yet our topline performance disguises underlying concerns, especially as we face the demographic and economic challenges of the next 20 years.

More people in work

Figure 4 traces how our employment growth has been achieved. First, our population has grown at 1.1% per year. That's less than the Australia-wide rate of 1.5%, but still enough to have added 639,000 jobs to the NSW economy.

Figure 4. Over the past 20 years, job growth has outpaced population growth



SOURCE: ABS Labour force status by Age, Greater Capital City and Rest of State (ASGS), Marital status and Sex, February 1978 onwards (Table LM1), ABS Historical Population Statistics (Cat 3105)

Second, our ageing demographics meant that as our median age in NSW increased, our working age population (aged 15 to 64) declined in its proportion of the total population. This is despite almost all of our baby boomers (born 1946 to 1962) still being of working age. In all, the ageing population had a relatively small impact on employment: there being 20,000 fewer jobs in NSW than there might otherwise have been.

This context feeds into our third point, that more people wanted to work, especially women and older people. The participation rate (the proportion of the population seeking paid employment) rose from 62.3% to 63.7%, accounting for 224,000 more jobs. Several factors may have driven this rise: for example, better health, longer life expectancy, fewer children to care for, more access to childcare, the need or desire for higher income, changing social attitudes to stay-at-home mothers, workplace arrangements for flexible hours and shared positions.

Finally, more of those people looking for work found something suitable. Across NSW, our unemployment rate fell from 7.8% to 5.8% of the workforce, adding another 82,000 people to our employment ranks.[9]

These four shifts took the total number of people at work in NSW to 3.71 million. Meanwhile, our average working week shortened from 34.2 to 32.3 hours, the equivalent of 206,000 full-time jobs.

That substantial shortening of the average working week mainly reflects the surge in our part-time workers since 1996, from 23% to 30% of our working population.[10] At the same time, fewer people are now working more than 40 hours a week, down from 46% to 39% of the workforce.[11] These trends are positive, and have not come at the cost of those in full-time jobs.

With the benefits widespread

While the raw numbers of jobs growth in NSW are impressive, the research also suggests that the new jobs have been dispersed across NSW, both geographically and demographically. As well, the more dynamic NSW economy has delivered high-paying, and arguably better, jobs for its citizens.

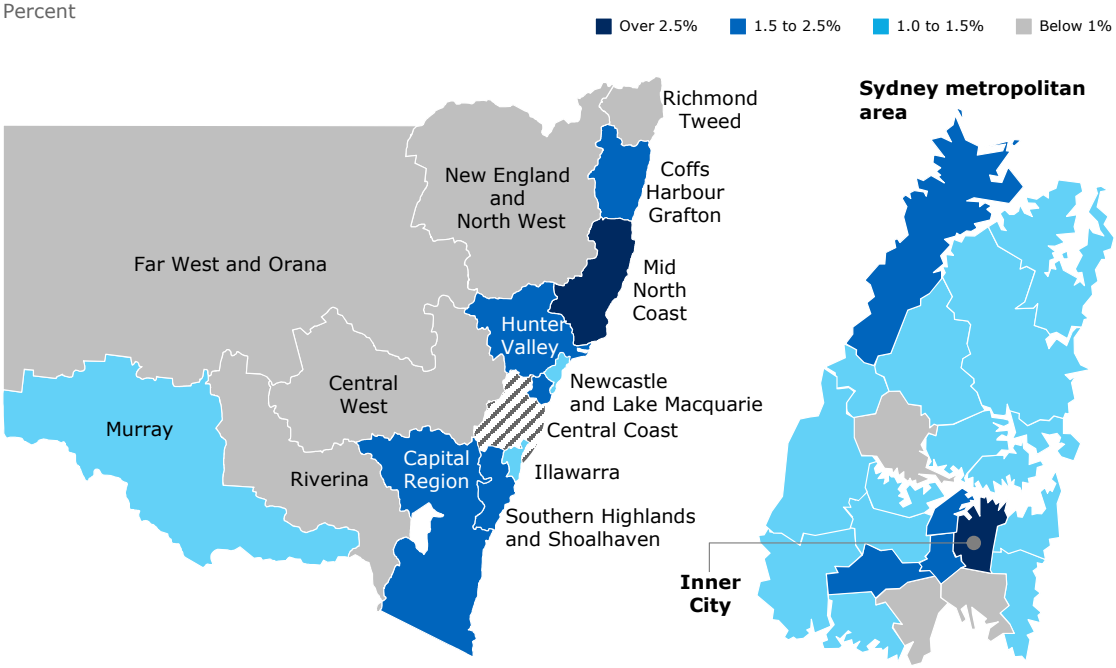
Underlying trends also suggest a more inclusive jobs market. More middle-aged people have stayed in work. In the 55-59 age bracket, participation has risen from about 69% to 79% for men, and from 40% to 65% for women. More women in all age groups have joined the workforce, lifting their share from 43% to 46%, with no decrease in the number of men employed.[12] At the same time, 15-24 year-old youth are now 24% more likely to be in education, preparing for their future jobs.[13]

The geographic spread of jobs growth across NSW has also been impressive (see Figure 5). Employment has grown in almost all areas of Sydney and regional NSW, with many areas exceeding state average growth. Foremost here are Sydney City, Parramatta, the Murray, and the Mid-North and Central Coasts. Regional NSW has gained as many jobs as metropolitan NSW, though unemployment rates are still 2% higher.[14]

Over the past two decades our jobs have paid more, with wage growth outstripping CPI growth by 20% since 1997.[15] This real wage growth was underpinned by a rise in the average skill-level of work: 25.8% of jobs required a bachelor degree or equivalent in 1995, rising to 32.7% today.[16] Our people have been more willing to switch jobs. The nature of these jobs is discussed in Strategy 3: Skill up for the knowledge economy.

Figure 5. There has been strong jobs growth across many of NSW's regions

CAGR of employment
Percent



SOURCE: ABS Labour force status by age, labour market region (ASGS) and sex, October 1998 onwards (Table RM1)

More women in all age groups have joined the workforce, lifting their share from 43% to 46%, with no decrease in the number of men employed.

B. Our aspiration for 2036

As we have seen, NSW has experienced consistent jobs growth for the past 20 years. Yet we face four fundamental challenges to our strong jobs story, and these challenges will test our ability to continue that jobs growth. Replicating the jobs growth of the last 20 years would be a real achievement. The *NSW Intergenerational Report* projects employment growth of up to 780,000 jobs through to 2036 without further job-creating strategies. We believe a tangible, achievable aspiration is to add 1 million jobs with sound long-term strategies.

Four challenges ahead

Global trade, increased competition and job automation are all aspects of the new digitalised, knowledge economy that will challenge continued strong jobs growth in NSW. They are not so much barriers to jobs growth, as realities to which we need to respond, and the nature of our response will determine the future levels of our jobs growth. The fourth challenge, our ageing population, is different in nature. That inescapable demographic trend will limit our jobs and income growth unless we take steps to increase our supply of available workers.

1. **Increasing global trade in the knowledge economy.** Trade increasingly comprises information flowing across the global internet rather than physical merchandise flows. Globally, this trade in knowledge-intensive goods and services is growing faster than labour- or capital-intensive trade. Companies can compete more easily across borders, including against NSW firms, in NSW. As the global knowledge economy grows, talent and capital are becoming more adept at chasing growth opportunities, wherever they are. We need to ensure our own tradeable sectors are well placed to take advantage of those opportunities.

2. **New challengers in faster changing industries.** The promise of the first dotcom boom is now coming to fruition. People hold smaller, more powerful electronic devices in their hands, connecting them increasingly to trade, information and each other. Every industry and supply chain is subject to digital disruption and it is the newcomers rather than the business incumbents that are exploiting this speed of change. If NSW is to prosper, its firms must be among those disrupters. We need to ensure that our entrepreneurs are well-placed to take a leading place in faster changing industries, both new and old.

3. **More automatable, complex and unbundled jobs.** These forces are changing the very nature of work. Tasks are increasingly automatable—able to be done by smarter and more dexterous machines. And more of our jobs will be unbundled—their different tasks being performed by the most competitive specialist businesses, wherever they are. Both trends are making different demands on our workforce. We need to ensure that workers of all ages can build, use or complement these machines by doing things machines cannot do, drawing on richer problem-solving and social-emotional skills, and on their experience and context.

4. **An ageing population.** As stated in the *NSW Intergenerational Report 2016*, people of working age (15 to 64) now make up almost 66% of our population. Over the next 20 years, that ratio will fall to around 61%. Put another way, the ratio of working-age people to younger and older people will fall from 4:2 to 3:2. If there are fewer people working per capita, it will be harder to sustain income growth per capita.

   This demographic shift will have a massive impact on our economy. Assuming NSW continues its existing wages and productivity trends, our ageing population would mean 370,000 fewer people in paid work and a gross state product (GSP) of approximately $6,000 less per capita, than if our current age mix had continued.

Yet we cannot necessarily assume that our rates of population, wages and productivity growth will continue. They will again be subject to inevitable yet unpredictable economic cycles and shocks, as well as the three other challenges noted above.

Our 2036 aspiration

If we want to maintain our jobs and incomes growth in the face of these challenges, we have to set an aspiration, and ensure our government, business, community and education sectors work together to reach it. Such an aspiration should be clear to all, and meet the reasonable expectations of the people of NSW.

This is the state aspiration recommended by Jobs for NSW:

Ensure everyone in NSW has the opportunity for a meaningful working life, today and in the future, leading to 1 million more jobs by 2036.

The aspiration has two elements. The first is qualitative: the opportunity for a meaningful working life. We cannot determine whether everyone in NSW will have a meaningful working life, or even a job. But we can and should aspire to everyone having that opportunity.

The second is quantitative. If 925,000 more people secured jobs in NSW over the last 20 years, to reach 3.7 million in all, what should be our aspiration for the next 20 years? Forecasts suggest that this rate of jobs growth is likely to slow, along with our per capita income, because our population is now ageing (see further at page 59). To maintain our income growth at near-current levels, we should be aiming for about 4.7 million jobs by 2036, achieving our aspiration of adding 1 million jobs in NSW.

If we fulfil this aspiration, 1 million more of our people will be on the way to fulfilling their personal and professional aspirations, and as a state we will maintain strong per capita income growth.

Meaningful opportunities

As our aspiration states, we want our people to have opportunities for the best possible, meaningful working lives. This applies both to the individual and to our workforce as a whole. By 'meaningful' we mean:

- rewarding both financially and in personal purpose and professional pride
- resilient against the threats of automation and offshoring; sustainable through global trends and transitioning from industries that are losing the battle against digital technologies, that are otherwise in global or structural decline, or that would compete on price against low-paid workers in developing economies
- inclusive; that is, offering prosperity to the widest possible spectrum of people, including people of all ages and regions; people with disability; Aboriginal people; people from linguistically and culturally diverse backgrounds; and lesbian, gay, bisexual, trans and intersex (LGBTI) people, and
- expansionary in their scope, among the many internationally competitive segments that offer opportunities to be part of a globally significant enterprise.

Adding 1 million jobs by 2036

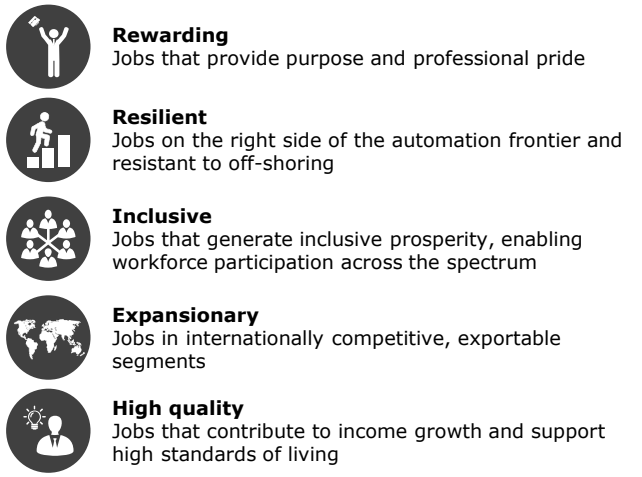
One million jobs by 2036 is not just a big round number. Reaching it would mean achieving a number of milestones, including:

- **Maintaining healthy jobs growth.** Adding 1 million jobs will mean that we have built on the excellent track record of our past 20 years, and maintained a similar rate of jobs and income growth. It will be a clear sign that the NSW economy is in good shape, with high income jobs for a broad spectrum of our workforce, in internationally competitive segments.

- **Maintaining per capita income growth.** On our current settings, our income would grow at only two-thirds of the average rate for the past 20 years, falling from 1.3% a year to just 0.9%. Our aspiration is to maintain income growth at 1.2% a year, enough to provide for the infrastructure, education and health we expect. This would require continued improvements in participation and productivity, but is within reach.

If we act while our economy is strong, there is every reason to believe we can meet this aspiration. We have sound educational, legal and financial systems to build on. We have overcome recent and severe global economic challenges, both cyclical and structural. We remain in the perfect position, geographically and economically, to offer products and services to the still-growing middle classes of Asia. Yet we do need to act from this position of strength, to prepare NSW well for the jobs of the future.

Figure 6. Our Aspiration



C. A 20-year plan to add 1 million jobs

Securing an additional 1 million high-quality working lives by 2036 may not happen if left to chance or the market. Our government, business, education and community leaders will need to work together, understanding and appreciating each other's roles in job creation.

As a state-wide jobs plan, we propose four mutually supporting strategies of jobs growth, each of which is targeted at one of the four identified challenges (see Figure 7). The first three strategies also align with actions to maintain or boost productivity in our economy. Of course, all of these strategies must ultimately be in the public interest, meaning that their net public and economic benefits exceed their economic costs.

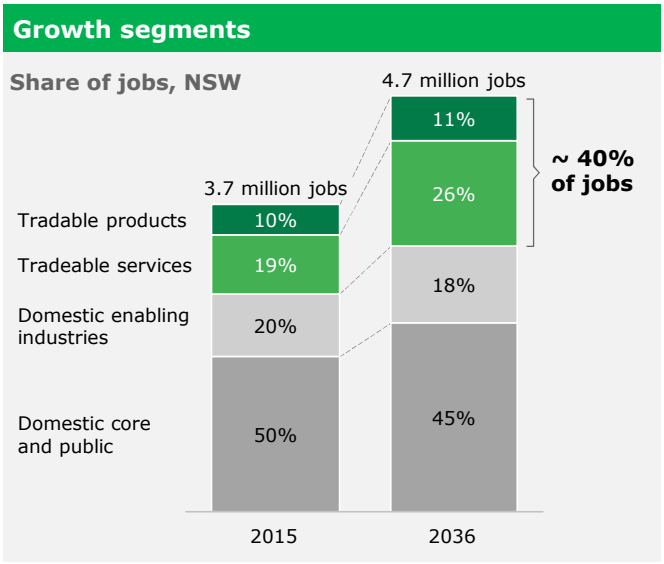
Figure 7. Proposed 20-year strategies and goals

	Strategy	Challenge	2036 Goal
	**1. Nurture our globally competitive growth segments** Nurture high-quality jobs in globally competitive, tradeable segments—with geographic clusters and policy reform to overcome their barriers to growth	NSW has grown jobs in its domestically focused sectors faster than its tradeable segments	**High-quality jobs in globally competitive segments** make up to 40% of NSW jobs, up from 29% in 2015
	**2. Open doors for entrepreneurs** Make NSW the place of choice for 'gazelles' to grow and succeed—by building a stronger entrepreneurial culture, ecosystems and skills and stimulating early-stage funding	High-growth small firms create all net new jobs, yet entrepreneurs face a range of barriers	**NSW the place of choice for 'gazelles' to scale and succeed** and make up 5% of NSW firms, up from 3.2% in 2015
	**3. Skill up for the knowledge economy** Ensure people of all ages have the interactive skills they need for the digital future—by supporting the integration of those skills in schools and a responsive, outcomes-based VET system	Job automation and 'unbundling' is changing the nature of jobs	**People of all ages have the interactive skills they need for jobs in the digital future** with 'knowledge-intensive' jobs making up 60% of NSW jobs, up from 48% in 2015
	**4. Draw on all of our people** Make NSW the best state for people to enjoy paid work—by ensuring good livability across NSW and removing barriers for people 65 and over, women with children and regional youth	Baby boomers now hitting retirement age, while participation of some groups is lower than our global peers	**NSW the best state for people to enjoy paid work** with the participation rate staying at ~64%, despite an ageing population

The first two strategies will build demand in NSW for people with skills and desire:

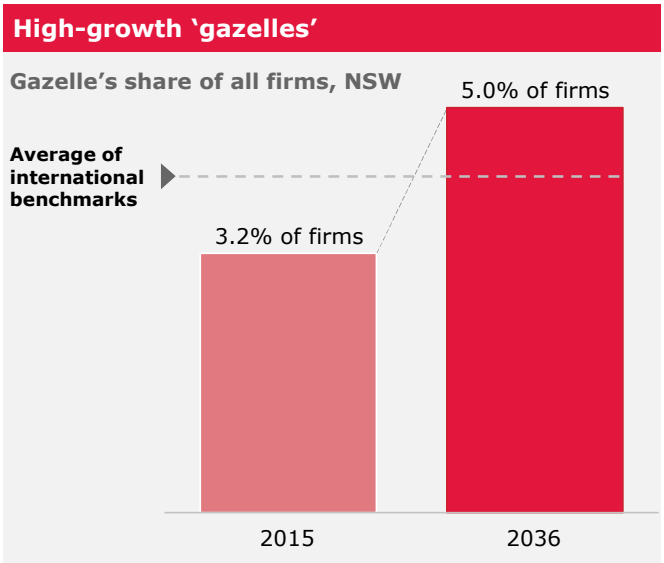
1. **Nurture our globally competitive growth segments.**
   Goal: Up to 40% of our jobs are in tradeable sectors, up from 29%.

A large proportion of the NSW jobs market currently serves our own population, with 70% of jobs and 80% of jobs growth in its domestic or non-trading segments. Yet evidence shows that globally competitive sectors offer the most rewarding and resilient jobs, along with economic growth opportunities beyond domestic consumption. We need to focus government action on nurturing and accelerating our potential growth segments, in particular by unleashing the power of geographic business clusters.



2. **Open doors for entrepreneurs.**
   Goal: Up to 5% of our businesses are high-growth gazelles, up from 3.2%.

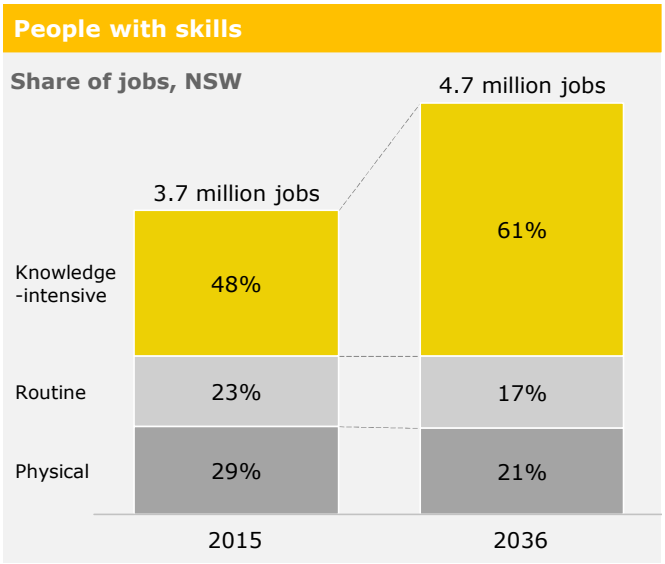
Over the past six years, high-growth small and medium enterprises (SMEs) making up just 6% of NSW firms created over 1 million new jobs.[17] They more than offset the 600,000 jobs that larger firms shed as they became more productive, often by buying services from smaller, specialised firms. The remaining 93% of NSW firms are SMEs who lack either the intent, capability or support to add to employment growth. The fastest growing subset of our high-growth SMEs are the 3.2% of all firms known as 'gazelles'. More high-growth SMEs could become gazelles, and more new firms could become high-growth SMEs, with stronger entrepreneurial ecosystems, culture and skills, and more early-stage funding.



Then, on the supply side, we have two strategies to increase the number of potential workers for those businesses.

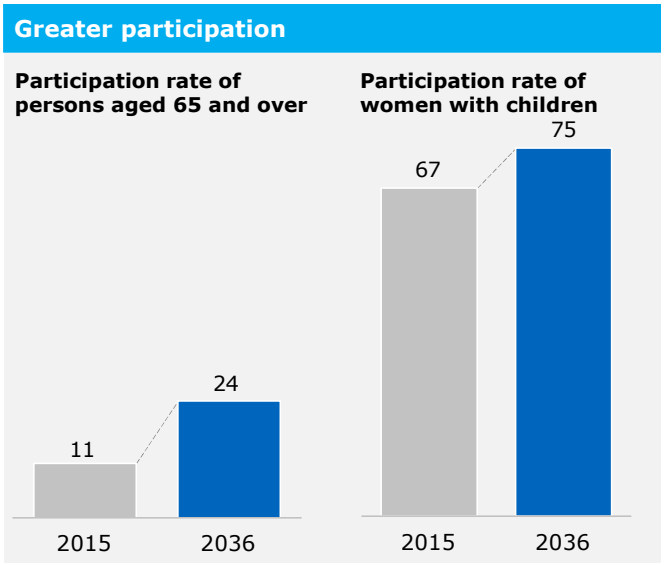
3. **Skill up for the knowledge economy.**
   Goal: NSW has skilled workers to support knowledge-intensive jobs making up 60% of total jobs, up from 48%.

As more tasks are automated, jobs are increasingly being unbundled to be performed by specialist businesses both here and overseas. To date, our jobs market has responded well, with 80% of jobs growth being higher-paying, resilient knowledge-intensive jobs. To continue that positive trend, we must continue to skill up and re-skill. This includes accelerating the integration of problem-solving, social-emotional and specialist skills in our school curriculum, and the VET system's ability to re-skill mature workers to meet changing job needs.



4. **Draw on all our people.**
   Goal: Participation rates are at least 24% for people 65 and over and 75% for women with children, and unemployment for regional youth is one-fifth lower.

Over the next 20 years, NSW's rate of population growth is projected to fall slightly from 1.09% to 1.05%, well short of the Australian rate of 1.47%. With the proportion of working age people also falling, fewer people would be in paid work to generate our income and jobs growth. We need the Sydney and NSW jobs market to be as inclusive as possible. They must be desirable as places to live and work, offering paid work opportunities for more people aged 65 and over, women with children, and regional youth.



1. Nurture our globally competitive growth segments

Nurture high-quality jobs in globally competitive, tradeable segments—by fostering geographic clusters and policy reform to overcome barriers to growth

Strategy summary

Not all sectors of the future economy will be alike in their capacity to increase job opportunities and per capita incomes. We should seek out the sectors with the most distinctive competitive advantages and international market potential. These sectors are the most likely to increase our state's productivity and incomes, and to create rewarding, resilient jobs for our people.

As discussed, however, the current NSW economy is increasingly focussed on serving our own population. Our domestic core and enabling sectors[18] account for 70% of our jobs, 80% of our jobs growth, and 16 of our top 20 growth industries. These include health and social care services, restaurants and cafés, and professional services.

These strong sectors are an essential part of our economy and suggest a positive story for jobs and growth. They are likely to continue growing, and we will rely on them to do so. However, their relative lack of international exposure may lead to NSW missing out on opportunities for globally driven productivity and jobs growth. We discuss this dynamic in more detail below.

For these reasons, we need a healthier balance between our domestic and global focus. To continue to enjoy high incomes and employment, we must capitalise on our high levels of education and become internationally competitive in a greater range of sectors, rather than relying on the health of our domestic sectors.

Our two priorities for this strategy focus on accelerating our most promising sectors. This would not be through specific support to large employers, but by addressing the micro-economic conditions that support all sectors with the potential to be globally competitive and create additional jobs in NSW.

- **Priority 1.1: Focus government reform and resources on supporting competitive environments and unlocking barriers for target segments.** Several target segments are already known for their competitive advantages and potential for expanding the pool of rewarding and resilient jobs. They include: food and other quality goods to Asia, tourism, international education, digital innovation, financial and professional services, advanced manufacturing, life sciences, regional HQs, smart cities, creative industries and environmental technologies. Jobs for NSW will accelerate the potential of these sectors by establishing a concierge or single point of contact, acting as a convener of top people from government and big business to help advance opportunities or remove barriers.

- **Priority 1.2: Promote distinctive geographic clusters as a focus for policy, development and energy of our globally competitive growth segments.** Global research[19] finds that geographic business clusters or hotspots offer their firms greater access to knowledge, talent, infrastructure and investment. This has been the experience for NSW's clusters, which account for over 26% of recent jobs growth and are spread over regional NSW (products) and Sydney (services).[20] Jobs for NSW will recognise a Cluster Champion for each cluster to help advance these levers for growth, and the government may take a more active, nurturing role in three place-based policy pilots, one each in inner Sydney, western Sydney and regional NSW.

Strategy	Enduring priorities (over 20 years)	Proposed initial actions (~3–4 years)	Status
1. Nurture our globally competitive growth segments	1.1 Unlock barriers to growth for a small set of target segments	▪ Government Concierge for companies in target segments	Action
	1.2 Promote the development of distinctive geographic clusters	▪ Cluster champions to advance profile and levers for growth ▪ Three place-based policy pilots, one each in inner and Western Sydney and in regional NSW	

The mixed outcomes of a strong domestic economy

Over the past 20 years, the NSW economy has seen jobs growth across a diverse range of sectors, particularly in services. Our next challenge is to address the current over-reliance on the domestic economy, harnessing the potential productivity and income growth that can be achieved by having more jobs in tradeable product and service sectors.

Research confirms that trade exposure unlocks a continuing cycle of productivity, income growth and jobs growth. Firms with international exposure have more than double the rate of productivity growth, better management quality, and greater innovation. As a result, globally connected economies see up to 40% more income growth than less-connected economies.[21]

The long-standing outperformance of trade-exposed industries will accelerate with the shift of global trade to bits (information flowing across the global internet) rather than pieces (physical merchandise flows). For NSW, a services-based and high-skill economy, this exposure presents tremendous global opportunities to continue to add services exports to our strong agricultural and mining exports—if we can meet the rising bar of competition. Conversely, our own domestic service sectors risk being increasingly challenged by overseas competitors.

The tradeable–domestic mix of the NSW economy is shown in Figure 8. Encouragingly, it reveals a recent trend towards exportable services. As our economy transitions from products to services, jobs growth in this sector has almost doubled that of the overall market (2.9% to 1.5% annually): see sidebar 'Towards a services economy' on page 32. However, that growth has not been quite large enough to offset the decline in jobs in tradeable products. The result is that NSW still maintains more jobs in domestically focused sectors than it did in 1996.

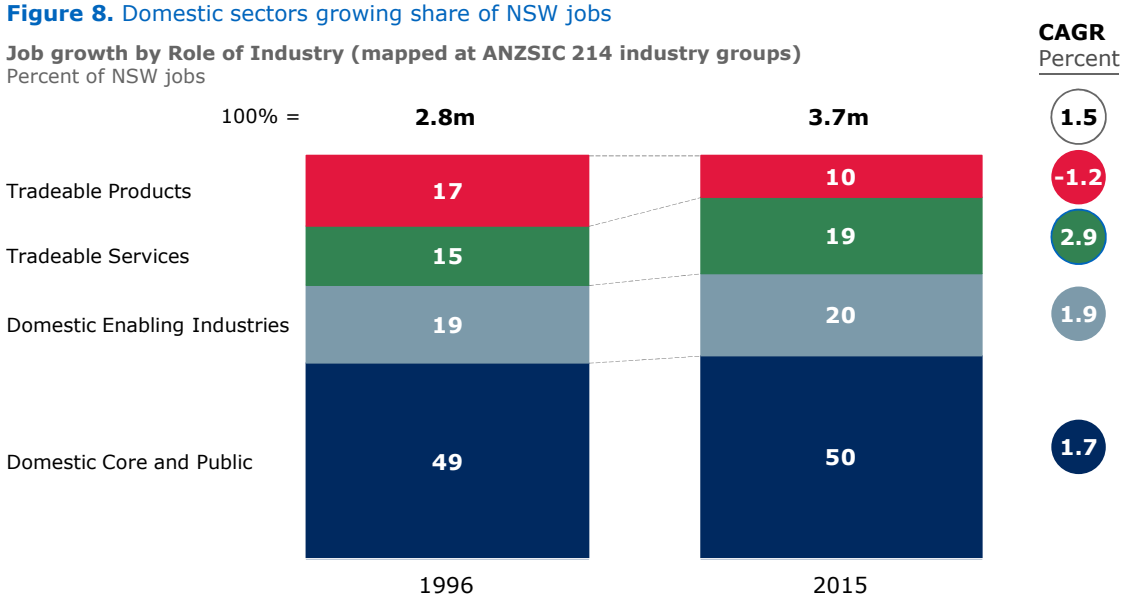
Our **domestic core**—wholesale and retail trade, telecommunications, domestic services and public services—now accounts for around 50% of the workforce. Productivity improvements in these sectors are always valuable to free up resources for other purposes, yet the core does not directly support the export sectors.

Our **enabling industries**—construction, finance, real estate, professional services, logistics and utilities—account for another 20% of our jobs. Enabling industries can support our frontline exporters with the globally competitive services they need.

Our domestic growth sectors include health services, hospitality and professional services (all projected to continue strong employment growth). Other domestic enablers include finance, construction, logistics and utilities. Without being exposed to international markets or even competition, many of these sectors risk lagging internationally in productivity.[22] That is now the case across Australia, with critical enabling industries lagging the US in their competitiveness, a sample of which are shown in Figure 9.[23] This in turn risks handicapping those NSW businesses that compete internationally, and rely on these sectors for many of their services.

Figure 8. Domestic sectors growing share of NSW jobs

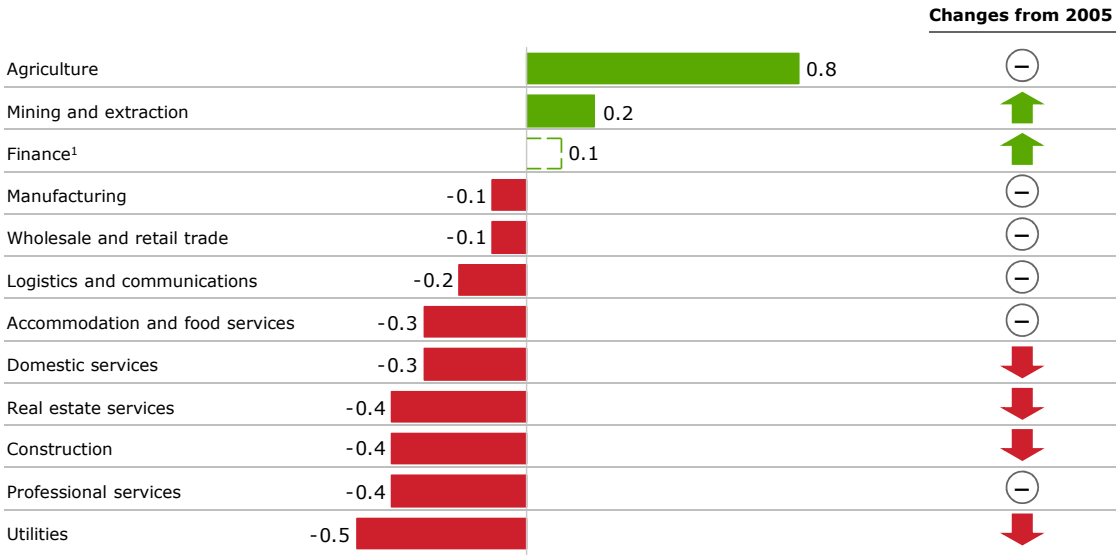
Job growth by Role of Industry (mapped at ANZSIC 214 industry groups)
Percent of NSW jobs



SOURCE: Compete to Prosper: Improving Australia's global competitiveness, McKinsey Australia (2014), ABS Employed persons by Industry group of main job (ANZSIC), Sex, State and Territory, November 1984 onwards (Table EQ06)

Figure 9. Australian industries are losing competitiveness

Australian Competitiveness Score compared to US



SOURCE: EU KLEMS, 2005, from revs published 2008 and 2011; Bureau of Economic Analysis; ABS

Clearly, to maintain our income growth and reach our jobs target, we need to double our efforts to nurture the internationally competitive sectors of our economy

In theory, our jobs and income risk declining as a result of this domestic focus. But in practice, over the past 10 years we have been protected by the income generated by the national resources boom. Over 90% of the growth in national income from 2005 to 2013 came from capital investment and improved terms of trade (the price of exports relative to imports).[24] Much of it has been managed in the Sydney financial centre.

That income source is now depleting. Despite positive results in mid-2016, growth in national resource exports continues to slow overall, and some sub-sectors are already declining. Our currency has also adjusted downward, eliminating the one-off income effects of temporarily higher resource prices. Investment in resource assets and infrastructure is also shrinking, which has implications for jobs growth given there are fewer jobs in running operations than there had been in building the assets.

Clearly, to maintain our income growth and reach our jobs target, we need to double our efforts to nurture the internationally competitive sectors of our economy. We have met this challenge before, most recently between 1990 and 2007, when NSW increased its exports from 7.8% to 12.4% of its gross state product.[25] Since then, the high Australian dollar has dampened demand for traditional NSW exports such as education, tourism, high-value manufacturing and agriculture. Yet these sectors have held their share of the state economy, and now the currency has turned in their favour.

Given the healthy diversity of the NSW economy, there is every reason to believe we can once again overcome our challenges, by unlocking barriers to growth for targeted internationally exposed sectors, and promoting distinctive geographic clusters for those sectors.

Towards a services economy

Of the 925,000 diverse new jobs created in NSW over the past 20 years, a remarkable 44% have come in sectors defined as health care and social assistance, and from professional, science and technical services. Figure 10 shows the breakdown of these leading growth industries, as well as those industries that have experienced jobs decline.

Health and social care accounts for 13% of our workforce, more than any other, with retail trade next at 10%. That one-in-eight of our people work in this sector reflects our ageing population and its higher expectations for healthcare and social support. Importantly, this category includes one of the fastest growing sectors: childcare jobs have grown by a compound 7.5% a year for 20 years, as more women stay in the paid workforce while raising their children.

The growth in our **professional, scientific and technical** sectors (excluding health and social care) represents a different trend. Legal and accounting services still count for the highest group in this sector, growing at an above average rate of 2.4% per year.

Meanwhile, the traditional professions are fast being overtaken by two groups that are laying down the **digital and physical infrastructure** of the 21st century. Jobs in computer system services have grown at 7% compound for 20 years, and now make up 2% of our workforce. Our **engineering, architecture and technical services** have grown at a 4.5% compound rate to now make up 2.3% of our workforce.

Figure 10. Jobs growth has been driven by domestic service sectors

Tradeable product sectors
Tradeable service sectors
Domestic Enabling Industries[3]
Domestic Core and Public sectors[3]

Top 20 growth industries (ANZSIC Groups of 214)
Growth in jobs in NSW ('000s), 1996–2015[2]

		CAGR
Cafes, Restaurants and Takeaway Food Services	64	2.5%
Computer System Design and Related Services	59	7.1%
Architectural, Engineering and Technical Services	48	4.5%
Other Social Assistance Services	45	4.6%
Adult, Community and Other Education	39	7.6%
Child Care Services	38	7.5%
Allied Health Services	35	5.0%
Legal and Accounting Services	34	2.4%
Hospitals	29	1.5%
School Education	26	1.1%
Residential Care Services	25	2.3%
State Government Administration	23	2.9%
Auxiliary Finance and Investment Services	23	4.3%
Other Construction Services	22	5.2%
Sports and Physical Recreation Activities	21	7.0%
Building Installation Services	21	1.9%
Public Order and Safety Services	20	2.4%
Real Estate Services	20	3.6%
Supermarket and Grocery Stores	18	1.4%
Building Cleaning, Pest Control and Gardening Services	18	2.2%

Top 20 decline industries (ANZSIC Groups of 214)[1]
Decrease in jobs in NSW ('000s), 1996–2015[2]

		CAGR
Sheep, Beef Cattle and Grain Farming	-42	-5.1%
Clothing and Footwear Manufacturing	-18	-6.9%
Other Fabricated Metal Product Manufacturing	-16	-7.7%
Rail Passenger Transport	-11	-10.5%
Basic Ferrous Metal Manufacturing	-9	-2.9%
Department Stores	-8	-1.3%
Timber and Hardware Goods Wholesaling	-7	-2.5%
Printing and Printing Support Services	-7	-2.0%
Superannuation Funds	-7	-5.2%
Central Government Administration	-6	-1.0%
Structural Metal Product Manufacturing	-6	-4.0%
Clubs (Hospitality)	-6	-1.0%
Fuel Retailing	-5	-2.2%
Newspaper, Periodical, Book and Directory Publishing	-5	-1.7%
Fruit and Tree Nut Growing	-5	-2.6%
Textile, Clothing and Footwear Wholesaling	-5	-4.4%
Furniture, Floor Covering and Other Goods Wholesaling	-5	-1.3%
Electrical Equipment Manufacturing	-5	-3.4%
Computer and Electronic Equipment Manufacturing	-5	-3.1%
Electricity Transmission	-5	-9.0%

SOURCE: ABS Employed persons by Industry group of main job (ANZSIC), Sex, State and Territory, November 1984 onwards (Table EQ06)

Priority 1.1: Unlock barriers to growth for a small set of target segments

Focus government reform and resources on supporting competitive environments and unlocking barriers for a small set of segments of the economy.

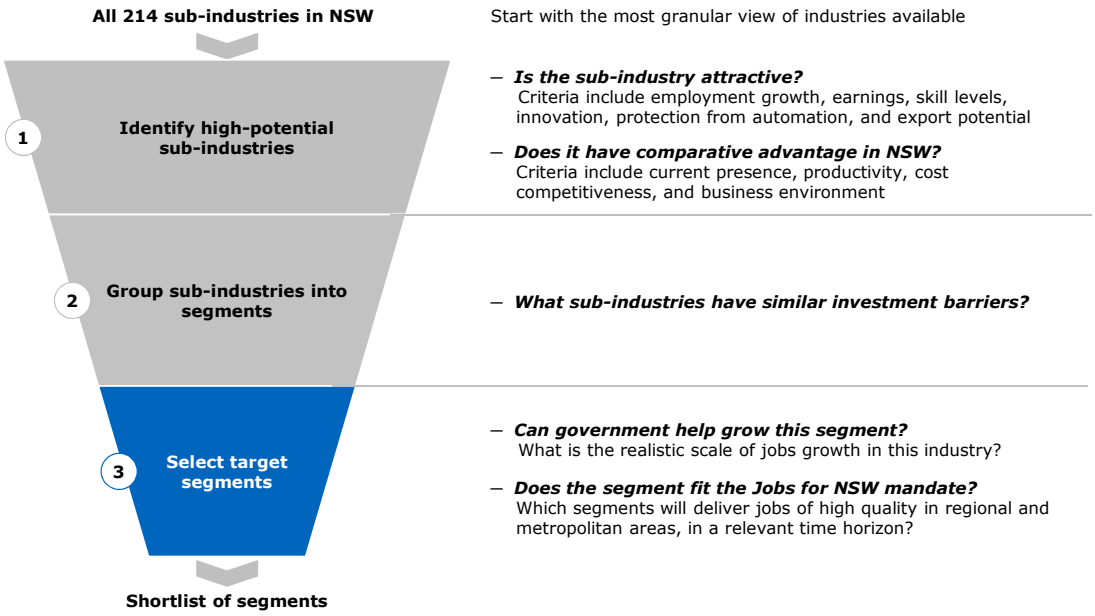
Being competitive requires first choosing where to compete. Trying to win at everything not only wastes resources, but ignores what the rest of the world offers: each business and each country doing what they do best, for us to enjoy.

We have selected eleven segments of our economy with strong potential for jobs growth over the next 20 years.[26] These segments transcend traditionally defined industries or industry sectors, capturing a part of the economy that is large enough to have material job-creation potential. We note also that strong domestic sectors, such as health, social care and construction, are already projected to grow significantly and consequently do not demand additional government focus.[27]

Selecting the segments

The selection process is set out in Figure 11, which we describe in more detail below that chart. It is a three step-process that starts with 214 sub-industries in NSW and identifies which are the most attractive for private investment, groups these into segments with material jobs-growth potential, and selects those most appropriate for government focus.

Figure 11. Three-step process to identify target segments



SOURCE: AlphaBeta

- **Step 1: Identify high potential sub-industries.** Two criteria are applied to select these sub-industries from the initial 214:
  - **Attractiveness.** The concept here is the potential job environment for the industry or sector, based on seven factors, rather than their current reality. The factors are employment growth, earnings, skills, innovation, export potential, resilience against automation, and fit with trends such as sustainability and demographics.
  - **Comparative advantage.** We should target industries and sectors that take advantage of our current or latent comparative advantages. These industries may leverage relatively high

productivity and low costs, and natural endowments such as NSW's arable land, natural beauty and broad pool of skilled labour. The industry in which Australia is currently most competitive on this basis is agriculture.[28] Tourism and education also present a global competitive advantage, demonstrated by their high shares of international markets.[29]

- **Step 2: Group sub-industries into segments based on common investment barriers.** We need industries or groups big enough to make a difference to job creation numbers. There are few single industries or sectors in our economy that are large enough on their own. But there are cross-industry segments that face common investment barriers and growth drivers, which government action can influence. For example, tourism includes transport, accommodation and attractions. The life sciences segment spans hospitals, pharmaceuticals and biotechnology. The start-ups segment spans young firms from every industry. And export industries may encompass agriculture, high-tech manufacturing and business services.

- **Step 3: Select target segments based on their actionability and fit with Jobs for NSW mandate.** This step means going back to the government's role in job creation, and how this plan can assist that role. We should be seeking segments where targeted barrier removal will make a material difference to jobs growth, without impeding other community priorities. The end result should fit our aspiration: to foster resilient, rewarding, high-quality jobs in globally competitive segments. These segments should include both our regional and metropolitan workforces.

What is a 'segment'?

Segments are parts of the economy that are not constrained by traditional industry definitions. They may be a group of industries, such as life sciences, or cross-cutting economic activity that includes parts of every industry, such as start-ups. The key feature of segments is that they are defined by common investment barriers and growth drivers. The 'goods export to Asia' segment may include some agriculture and high-tech manufacturing businesses that face common challenges to enter Asian markets. Segments are highly policy-relevant because all the firms in a segment face similar risks of market failure that may be addressed by government actions.

Targeting eleven globally competitive tradeable segments

On the basis of these criteria, eleven potential segments made it to the third-stage shortlist (see Figure 12 on the next page). On average, they each make up 2% to 2.5% of our current employment, and have the potential to contribute an average of 4% of the NSW jobs growth needed in the next four years.

Growth in each of these segments should be pursued over our 20-year horizon:

- **Food and other quality goods to Asia** includes both agriculture (grain, wool, cotton, horticulture and so on) and manufacturing (such as processed food, pharma, consumer medical equipment or specialised products)

- **Tourism** includes transport (airlines, road, rail and water), hospitality (accommodation, restaurants) and our cultural and natural attractions (museums, national parks and more)

- **Start-ups and digital innovation** includes data processing, computer system design, software publishing, internet search providers and fin-tech

- **International education** includes tertiary, adult and community, and some secondary education. It also contributes to tourism revenues by generating family and friends visits

- **Financial and professional services** include financing (retail and non-depository), financial asset investing, insurance and superannuation, legal services, accounting and management consulting

- **Infrastructure and smart cities** includes architecture, engineering services, construction, utilities (waste, water, energy) and related services
- **Creative industries** include motion picture and video, television broadcasting, performing arts and publishing
- **Advanced manufacturing** includes manufacturing of transport equipment, vehicles, computers, specialised machinery and pharmaceuticals
- **Life sciences** includes pharmaceuticals, biotechnology, pathology and related scientific research
- **Environmental technologies** include renewable energy and green-focused urban services (such as waste management)
- **Regional HQs of multi-nationals** may be attractive to industries such as IT, telecommunications, consumer goods, utilities, finance and pharmaceuticals.

These eleven segments span the fields often nominated as the growth sectors of the 'fourth industrial revolution'—the arts, engineering, artificial intelligence, robotics, nanotechnology, 3D printing, genetics and biotechnology[30]—but extend further than these hi-tech predictions and are more inclusive for jobs and communities.

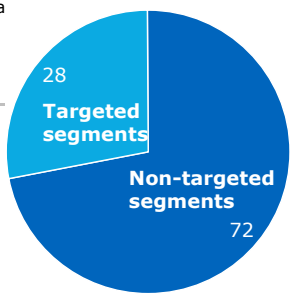
Figure 12. Jobs growth has been driven by domestic service sectors

Total employment in NSW
Share of current jobs; Percent

Targeted segments
Tradeable segments with the potential to be globally competitive and create additional resilient jobs

1. Food and other quality goods to Asia
2. Tourism
3. Start-ups & digital innovation
4. International education

5. Financial & professional services
6. Infrastructure & smart cities
7. Creative industries
8. Advanced manufacturing
9. Life sciences
10. Environmental technologies
11. Regional HQs of multi-nationals



Non-targeted segments
Strong, mostly non-traded segments expected to reach their potential and gain less from government intervention

- Domestic-market agriculture
- Mining
- Textile and other basic non-food manufacturing
- Defense & other public administration and safety
- Wholesale trade
- Retail trade
- Rental, hiring and real estate services
- Administrative and support services
- School education
- Healthcare and social assistance

Estimated share of jobs growth: 43%[1]

Estimated share of jobs growth: 57%[1]

SOURCE: AlphaBeta

Initial action for Priority 1.1

A number of actions could be taken by government to nurture these segments. These include working with the Australian Government to improve access to information, coordinating existing and potential initiatives across government agencies, building a business case for financial or fiscal support, and prioritising investment in enabling infrastructure.[31]

Government also has a continuing mandate to improve inefficient regulatory barriers, and to remove ineffective or unintentionally negative ones. A government concierge might help selected segments take related actions in a more focused, effective way. While Jobs for NSW aims largely to address such systemic issues, the organisation may also reach out to individual firms to promote job creation.

To advance this strategic priority, the NSW Government should initially:

- **Appoint and empower government concierges (*Action*).** A concierge would be a single point of contact to all levels of government for our target segments. Jobs for NSW will initially appoint a concierge for each of the following four segments: goods exports to Asia, tourism, international education and digital innovation. These segments are prioritised because they reflect NSW's comparative advantage, have the capacity to create jobs in metropolitan and regional areas, and generally pay above-average salaries.[32]

  A concierge would be senior in experience and status, able to convene the most relevant people from all parts of government to advance an opportunity or remove a barrier to growth. In particular, they would facilitate other Jobs for the Future strategies for their segment. They may identify or cultivate clusters for the target segment; accelerate place-based transport and infrastructure initiatives; identify and support cluster champions; promote investment into the target segment with introductions between government, investors and businesses; introduce government procurement opportunities to the segment, and otherwise promote the segment formally and informally.

Priority 1.2: Promote the development of distinctive geographic clusters

Promote distinctive geographic clusters as a focus for policy, development and energy of our globally competitive growth segments.

One clear action to support the segments with export potential is for NSW to nurture and expand its existing geographic clusters or 'hotspots'. The international experience of these clusters has been extremely positive, as has been the emerging experience in NSW. Industry clusters, particularly those in Sydney, have outstripped the state averages on every metric for the creation of high-quality working lives, and also map well against our target segments. We can continue to develop those clusters, focusing on the synergies and benefits that flow from geographic concentration, drawing where appropriate on state or national research centres and knowledge hubs.

How localised clusters create jobs, in NSW and elsewhere

Clusters are typically localised networks of businesses in the same or related industry sectors. They share infrastructure and knowledge bases, often being formed around higher education institutions, and can share initiatives to foster employment and innovation. On average, they offer their resident firms greater access to knowledge, talent, infrastructure and investment. They make effective recipients of new government programs: initiatives and resources can be applied intensely and locally, rather than spread across the state or nation.[33]

The United Kingdom provides a typical example: its 31 significant clusters host 8% of its businesses, but employ 14% of the working population on higher-than-average salaries and generate 20% of the UK's gross value add.

The study also found that clusters are best developed organically by firms choosing to base themselves where they can best access talent, infrastructure and institutional support. Public support is best targeted where a cluster and its location have clear competitive advantages and private sector momentum.

In NSW, organically grown clusters back up the international data. Our analysis is based on smaller clusters called 'hotspots'. These are restricted to just one industry ANZSIC code, with at least 1,000 people working, and are at least three times more likely to offer employment in the industry than the national average. On that metric, there are 77 such concentrated hotspots in NSW.

Representing only 1.2% of the possible geographic areas, these hotspots account for 12% of all jobs (312,500 positions) and delivered over 26% of new jobs in NSW in the five years to 2011 (151,000 new positions).[34] Figure 13 (on the next page) plots the size and geographic concentration of these

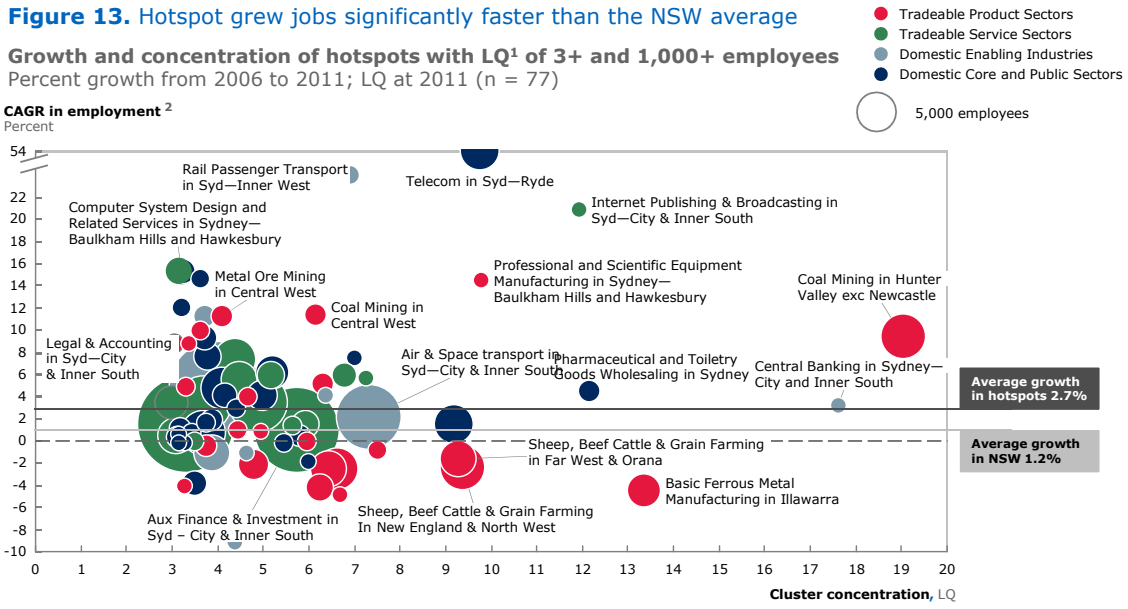
hotspots, and shows how their average rate of job creation (2.7% annually) more than doubles the state average of 1.2% (for that 5 year period).

That strong employment growth is evident in around half of the hotspots, which together delivered 6% annual jobs growth: the equivalent of all net new jobs in the period. Standout performers—such as rail in Sydney's inner west, telecommunications in Ryde, internet media in Sydney's inner south, scientific equipment in Sydney's northwest and coal mining in the Hunter Valley—enjoyed job growth rates above 8% and up to 54%.

The clusters are even more important for those looking to create NSW's future high-quality working lives. Not only did the clusters grow jobs at twice the rate of the state average from 2006 to 2011, they are twice as likely to be export-focused. Over two-thirds of the hotspots are dedicated to our eleven target tradeable segments, as are 63.5% of the jobs they provide (compared to the state average of 30.6%).[35]

Figure 13. Hotspot grew jobs significantly faster than the NSW average

Growth and concentration of hotspots with LQ[1] of 3+ and 1,000+ employees
Percent growth from 2006 to 2011; LQ at 2011 (n = 77)



SOURCE: Analysis using Census 2006 and 2011 data

In all, 28% of all target segment jobs are already found in our hotspots, with those in digital innovation and start-ups particularly concentrated here.[36] They are also more than 2.5 times as likely to offer a high-paying job. Indeed, the likelihood of a high-paying job being found in a hotspot consistently rises as the average salary in the sector rises.[37]

The six levers of cluster performance

Given the strong performance of NSW's emerging clusters, we should support these and facilitate the growth of others. International research has identified six essential levers for developing a high-performing cluster. Leadership, brand, networks and infrastructure are known to attract and develop talent and innovation in a virtuous circle of productivity.[38] That energy builds within the geographic cluster and through collaboration with the industry's supply chain, and with its research, education and government colleagues.

1. **Cluster leadership** is needed to develop the other levers, described below, and to promote the cluster locally and internationally. Leadership must come from within, and be recognised by government, stakeholders and other firms and institutions within the cluster. An example of leadership is the aviation cluster in Ohio, USA, which targeted gaps in the aviation supply chain.[39]

Mason, Ohio has set itself as the number-one US state supplier to Airbus and Boeing, creating a mega-cluster of 438 firms and 36,200 private sector jobs. The cluster leadership, which includes Mason city and state representatives, works together to problem-solve how the cluster might fill new gaps in the aviation supply chain, and create new jobs in Ohio. It spans the aviation and aerospace sectors, and includes North America's largest private airport (Wilmington Air Park) and NASA's Plum Brook space simulation test centre.

2. **Brand recognition** for each cluster means developing a distinctive name, brand and story, along with a single access point for people looking to trade with or invest in the cluster. Clusters may then be promoted internationally as part of an overarching NSW Inc narrative.

Western Sydney airport will be situated at Badgery's Creek. The airport and surrounding infrastructure will become another Sydney commercial and industrial hub, drawing together a host of transport, communications and logistics firms. It will serve as a gateway for exporters and to the rest of Australia's eastern seaboard. The airport itself will generate an additional 30,000 jobs, with indirect jobs growth in the area predicted to be more than double that number.

3. **People networks** can be developed both within and outside the cluster. Relationships can be promoted through idea sharing, investor partnerships, pitch days, joint business ventures, mentorship programs across businesses, and global peer relationships that would be beyond the capacity of any one business.

4. **Infrastructure**, in particular transport and telecommunications, is more readily attainable with a stronger business case that demonstrates the cluster's local and state-wide economic benefits. A cluster's coordinated support for local infrastructure has far more persuasive impact for governments, local communities and company investors, compared to the efforts of isolated firms.

Westmead Precinct is one of the largest health, research and education precincts in the world, focused on highly specialised and integrated innovation across the three sectors. The precinct ties together four hospitals, three research institutes, two universities and all associated transport and infrastructure. By 2036, after $1 billion of investment, the workforce at Westmead will double to 25,000 people, and the number of students will triple to 6,000.

5. **Innovation** can be accelerated through cluster networks, particularly when these include the higher education sector and firms along its value chain. Tertiary institutions that engage with a cluster may find a clear path to commercialising their ideas, accessing industry data, or finding appointments with cluster businesses or industry bodies. Shared accelerators, incubators or maker spaces may give start-ups access to the technical, office and social facilities they need. The Chinese Ministry of Science has recently committed $100 million to build an innovation precinct on the University of NSW campus.

UNSW Innovation Campus is an initiative of the Chinese Ministry of Science and Technology, part of the Chinese Torch program that has launched 150 similar innovation precincts in China. Initially, eight Chinese companies are investing $30 million to support research in energy, biotechnology, advanced materials and environmental engineering. UNSW's Kensington campus will house the first group of partners in an incubator space before a purpose-built innovation precinct is completed by 2025.

6. **Specialist skills** may be more easily attracted and developed by a cluster rather than a standalone business. Cluster employers may convene a workforce plan of future skills requirements, and co-develop curricula and facilities with local education and training providers. This also attracts school-leavers and graduates. The Ballarat Technology Park in regional Victoria[40] is an excellent example of this.

iAccelerate is a University of Wollongong (UOW) business incubator program, built around a robust educational program, business acceleration monitoring and one-to-one mentoring. Sited on campus, iAccelerate offers innovative start-up and high-growth SMEs the opportunity to draw on the resources of a university with 30,000 students, 2,000 staff and $2 billion in annual economic activity.

Initial actions for Priority 1.2

As mentioned, clusters should emerge organically from their own industries, networks and locations. However, there are several actions government may take to nurture those clusters and ensure their interactions with government and other stakeholders are as effective as possible. These include recognising cluster leaders or champions to advance the cluster's profile and its six levers for growth. State-level initiatives may also facilitate cluster access to government support, and accumulate and share strong cluster practices across the State.

To advance this strategic priority, the NSW Government should initially:

- **Identify clusters and cluster champions, to advance their growth (*Action*).** Existing clusters would be networks (likely geographic) within the segment with demonstrable scale in jobs, businesses or export terms, and which are already working in some way to promote the network's existence and purpose. A cluster champion would be an individual or body authorised as a representative, to deal with government, cluster members, stakeholders and investors.

  Working where appropriate with the government concierge, the cluster champions would work together on the five other levers of cluster development: improving brand recognition (for example, NSW beef), connecting people within and outside the cluster (such as the creation of sister university relationships), fostering innovation within a cluster (for example, connecting businesses with researchers), ensuring the cluster has the right skills base (such as connecting clusters with VET providers), and helping clusters improve infrastructure (for example, improving access to key ports).

- **Launch three place-based policy pilots, one each in inner and western Sydney, and in regional NSW (*Action*).** In these pilots, the NSW Government would recognise a cluster champion, but take on more of an active, nurturing role to ensure each of the five levers of cluster development are pulled. The White Bay-Glebe Island innovation district in Sydney's inner west could be a potential pilot. Another may leverage the sector growth opportunities to be afforded by Sydney's second airport. The Government, led by UrbanGrowth and the Greater Sydney Commission, would collaborate expansively with stakeholders on these pilots. It may for example invest in transport infrastructure to connect the site to other relevant locations and run staged procurement to attract anchor commercial or educational tenants.

2. Open doors for entrepreneurs

Make NSW the place of choice for gazelles to grow and succeed—by building a stronger entrepreneurial culture, ecosystems and skills, and by stimulating early-stage funding

Strategy summary

When a large firm fails, the loss of a thousand jobs will understandably prompt headlines of anger and disappointment. Yet when a thousand new firms create 150,000 new jobs, there is no particular moment to celebrate. The great unheralded story of the six years to 2014 has been the 6% of NSW businesses that started small but grew strongly, employing over 1 million people in the process.

We need more of these businesses. While many new businesses start each year in NSW, relatively few scale up to be real economic players, able to lead the export clusters we need. Cultural, institutional, skills and funding barriers all play a role. Many are interlinked, and drive much of our best entrepreneurial talent overseas. We need to offer these entrepreneurs a stronger ecosystem in which they can think big, get support and funding, and grow without constraint.

- **Priority 2.1: Build a supportive ecosystem for entrepreneurs that nurtures networks, mentorship, skills and business opportunities.** Our entrepreneurial ecosystem needs strengthening in many ways. Currently, NSW's entrepreneurs lack mentoring networks, investors do not see enough compelling investment cases, and university-industry collaboration is four-to-12 times lower in Australia than in comparable economies.[41] The Sydney School of Entrepreneurship, more shared space accelerators and 'first customer' policies, along with our other actions, would foster such a system.

- **Priority 2.2: Stimulate early-stage investment in future gazelles.** Currently, our venture capital investment equates to only 0.02% of GDP, compared to 0.38% in Israel, 0.28% in the US, and 0.07% in Sweden.[42] This is felt hardest in later-stage venture capital funding, when $5-20 million is needed to build a firm before it can either go public or call on bank lending. Jobs for NSW gazelle financing programs and Sydney and regional funding and networking events will provide funding and help uncover further direct and indirect sources to close these gaps.

- **Priority 2.3: Support and signal a strong culture of entrepreneurship.** Australian youth are only half as likely to join a start-up than their global peers,[43] and only 1.5% of those launching businesses expect to grow to more than 20 employees within five years, half the rate of the US. All of the actions in this strategy would help turn around that risk-averse culture. Exploring revenue-neutral relief or incentives for high-growth SMEs would signal to potential entrepreneurs that NSW is serious about providing a culture of support.

- **Priority 2.4: Make NSW the easiest state to start and grow a business.** Whatever the skills and intent of our entrepreneurs, they will be held back if the regulatory cost of starting and growing a business is too high. Existing regulatory requirements are often overly complex and poorly understood. To create a business-friendly environment for NSW entrepreneurs, the Government should reinforce its State priority of reducing or removing barriers, costs and complexity and make regulatory obligations easier to understand and implement.

Strategy	Enduring priorities (over 20 years)	Proposed initial actions (~3–4 years)	Status
2. Open doors for entrepreneurs	2.1 Build a supportive ecosystem for entrepreneurs	▪ Sydney School of Entrepreneurship ▪ Expanded network of entrepreneur shared spaces	Action
		▪ Government and Corporates as first customers	Explore
	2.2 Stimulate early-stage investment in future gazelles	▪ Sydney and regional funding and networking opportunities ▪ Jobs for NSW Gazelle Financing programs	Action
	2.3 Support and signal a strong culture of entrepreneurship	▪ Targeted reforms to the NSW Jobs Action Plan	Explore
	2.4 Make NSW the easiest state to start and grow a business	▪ Existing NSW State Priority: 'Strong Budget and Economy' ▪ Review of NSW's regulatory management system	Action

Starting with our high-growth SME jobs engine

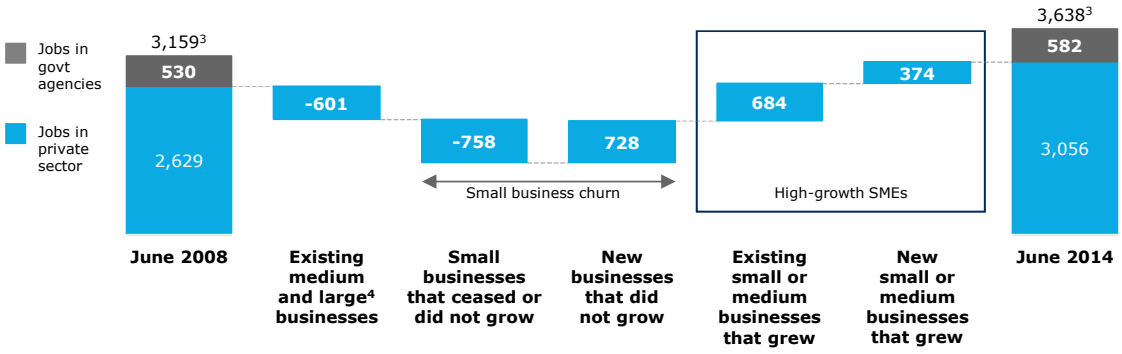
As we have seen, high-growth small and medium enterprises have been the silent engine room of NSW's net jobs growth. Between 2008 to 2014, over 1 million new jobs came from just 6% of businesses: new or growing SMEs (Figure 14). Around 60% of these jobs came from existing firms that grew from less than 20 people to up to 199 people.[44] Notable among these high-growth businesses are the 3.2% of businesses known as gazelles (not shown on this chart), defined as enterprises having payroll of at least $750,000 and that grow at least 20% annually for three consecutive years.[45]

Meanwhile, we see that 12,778 higher-profile medium and large businesses shed around 600,000 jobs in the same period, largely due to productivity improvements in their very large workforce. In the remaining small businesses which make up 93% of all companies in NSW, jobs in new businesses simply replaced those in shrinking ones.

NSW's experience is similar to that observed in Europe and the US. A 20-year analysis of net job growth in the US revealed that firms less than five years old were the only cohort of firms that were net job creators. Every other cohort shed more jobs than they created.[46]

Figure 14. All net jobs growth comes from the 6% of NSW firms: the SMEs that scale

Contribution to jobs growth (June 2008–2014), NSW[1]
Jobs, Thousands



Share of total businesses Jun 2008–14[2]	1%	50%	43%	4%	2%
Total businesses	12,778	630,220	548,847	46,286	30,651

SOURCE: Calculations based on bespoke data provided by Australian Bureau of Statistics, based on Counts of Australian Businesses database, public sector employment from ABS Cat 6428

The challenge of building an entrepreneurial culture and ecosystem

Most of the 6% of our SMEs that are generating so many jobs are still modest in size. What if they could grow even faster, and if more emerging SMEs could join them? Our research confirms there are real barriers of intent, capability and support.

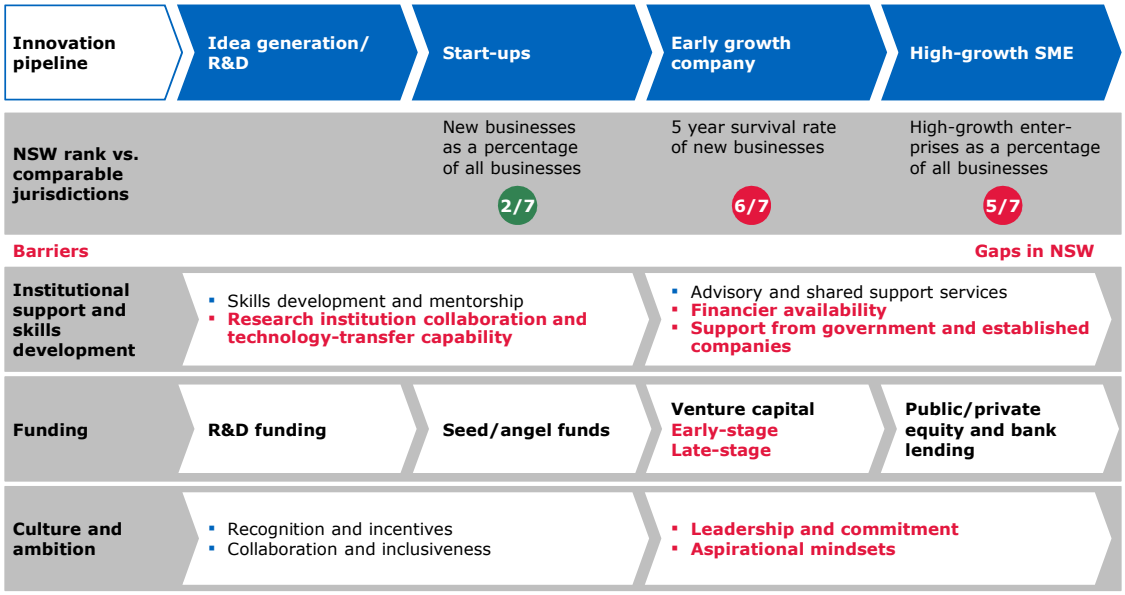
NSW does well in setting up new businesses: 11.8% of all our businesses are new, against the OECD average of 9.7%.[47] Against a peer set of the US, UK, Germany, Israel, Sweden, and New Zealand, we rank second in starting new businesses (see Figure 15). Yet that early promise soon starts to fade. We rank second-last in that cohort on the five-year new business survival rate, and third-last in our proportion of high-growth businesses.[48]

Having a healthy number of start-ups is needed for an entrepreneurial ecosystem, but it is not enough to drive serious jobs growth. More of our start-ups must continue beyond five years, and more of them must become high-growth SMEs or even gazelles. The barriers to their doing so are cultural and institutional:

- our ecosystem is still emerging, not yet providing the support that entrepreneurs need to build their skills and confidence,
- there is relatively little funding at the critical growth stages for emerging, potentially high-growth, firms, and
- our culture of entrepreneurialism is still relatively weak, with too few talented people seeking a career in helping to build a high-growth firm.

If more SMEs in NSW are to become our high-growth jobs engines, they will need to overcome these barriers. More business owners must want to go for growth. A stronger ecosystem and more reliable sources of funding are needed for them to develop their skills and businesses (see Figure 15). Of course, these three needs are intertwined and each is a strategic priority. In addition, making NSW the easiest state to start and grow a business will ensure entrepreneurs have every opportunity to fulfil their ambitions and create jobs in NSW.

Figure 15. NSW starts well in the innovation pipeline, then fades in the face of three barriers



SOURCE: Detailed input benchmarking, Interviews with key individuals involved in Australian start-up ecosystem (n = 22), World Economic Forum Ecosystems Report, OECD Entrepreneurship at a Glance Report (2015), Calculations based on bespoke data provided by Australian Bureau of Statistics, based on Counts of Australian Businesses database, and by Office of State Revenues

Priority 2.1: Build a supportive ecosystem for entrepreneurs

Build a supportive ecosystem for entrepreneurs that nurtures networks, mentorship, skills and business opportunities.

Compared to other countries, NSW does not have a strong ecosystem of institutions and mentors to help build entrepreneurial skills and performance. In a recent international study, only 54% of Australian entrepreneurs said they have the support systems in place to help them, compared to 79% in the US and 69% in the UK.[49] These support systems comprise research institutions, corporations, government departments, advisory services, shared support services, financiers, mentors and affordable access to shared physical space.

Tertiary institutions are an integral part of an entrepreneurial ecosystem, as they are a springboard for skill-building, research and networking—as depicted in the film of Facebook's early rise, *The Social Network*. Several US and European universities have a strong focus on entrepreneurial ecosystems. For example, Colorado University has a tech-transfer office that helps deliver more than 220 patented inventions for every $1 million in federal research funding. This is well ahead of NSW and other Australian universities.

On the Global Competitiveness Index, industry-university collaboration in Australia is rated at 4.84 out of 7, compared to 5.85 in the US. Only 4% of our firms actively engage with higher education. By comparison, 48% of larger innovators do so in Sweden, and up to 17% of innovating SMEs do so in the UK and Israel.[50]

Catapult centres are a network of world-leading centres designed to transform the UK's capability for innovation in specific areas and help drive future economic growth. They provide a physical setting for the UK's top businesses, scientists and engineers to work side by side on late-stage research and development, transforming high-potential ideas into valuable new products and services. Each Catapult focuses on an area in which the UK has genuine potential to generate growth in strategically important global markets.

The Catapult vision is to bring ambitious businesses closer to the country's world-class research communities. Catapults also help reduce the risks associated with innovation, accelerate business development, create sustainable jobs and growth, and develop the UK's skills and knowledge base and its global competitiveness.

Our entrepreneurial ecosystems are still developing in other ways. Interviews with our reference group revealed that entrepreneurs find little guidance and few experienced mentors. The impression was that large corporations as well as government could do more. On the whole, Australian companies do not have the venture arms that their US equivalents do, and government departments are cumbersome to deal with for potential customers or partners.

As a result, our entrepreneurs are not showing the skill levels expected by those who might fund them. Young people working in larger organisations see their skills being applied daily by peers and mentors, and have the opportunity to practice and learn. Entrepreneurs must have access to a similar learning environment to speed up their learning cycle.

Building a high-growth business requires a mix of entrepreneurial and general skills: product development skills, commercial and promotional skills, technical skills to develop a product or service, social-emotional skills to enthuse its stakeholders, and problem-solving skills to identify and manage its issues. Industry experts warn that these skills are weaker in our entrepreneurial ranks than they should be.[51] In Australia, these skills are not sufficiently directed to new high-growth businesses, and not sufficiently mentored for those businesses.

The Stockholm School of Entrepreneurship (SESS) is recognised around the world as a leader in innovation and entrepreneurship. The school taps into the exciting and diverse academic environments of its five member institutions (KI, KTH, SSE, Stockholm University and Konstfack), gathering their innovative and entrepreneurial competencies all under one roof in a joint education programme. The Sydney School of Entrepreneurship would be modelled after the SSES.

Initial actions for Priority 2.1

To advance this strategic priority, the NSW Government should initially:

- **Promote the Sydney School of Entrepreneurship (*Action*).** The Sydney School of Entrepreneurship (SSE) was announced by the NSW Government on 20 June 2016. When launched in 2017, the school will provide cross-institutional and cross-disciplinary education in entrepreneurship, modelled on the successful Stockholm School. The SSE is a joint venture between NSW universities and TAFE NSW, designed to promote innovation and develop more skilled entrepreneurs in NSW.

  In at least three clear ways, it will complement entrepreneurship programs already established at tertiary institutions. Students may count subjects in applied entrepreneurship towards their chosen undergraduate or postgraduate degree. Those subjects will be offered in a dedicated SSE facility that will foster Sydney's entrepreneurial ecosystem, providing space for learning, mentoring, networking and start-up planning. Regardless of the facility's physical location, all subjects will be accredited by other member institutions, so that entrepreneurial pathways are better laid and promoted for students.

- **Expand the network of shared-space accelerators for entrepreneurs (*Action*).** While not exploring individual shared spaces in detail, a constant theme in our research was the need to establish shared, connected workspaces for entrepreneurial individuals and teams to prepare their businesses. These accelerators provide not just a space to work from, but access to people with similar aspirations and linked businesses. Introductions to mentors, suppliers, customers and investors flow much more readily here than in stand-apart offices. At present, many such spaces are in inner Sydney and are already crowded or oversubscribed. To create more spaces across NSW, Jobs for NSW has allocated $10 million of the Jobs for NSW Fund to provide grants, lease guarantees or loans to accelerators and incubators.

- **Encourage governments and large corporates to be first customers of high-growth SMEs (*Explore*).** Government departments and large corporates could make it easier for potential high-growth SMEs to get significant initial contracts. (Doing so would also bring them the benefits of emerging talent.) They may favour an aspirational quantum, proportion or type of goods and services, for which potential high-growth SMEs are suitable suppliers.

  The NSW Government should consider streamlining its procurement processes. Complex procurement processes tend to favour those larger or more established businesses with the resources and experience to meet them, putting smaller firms at a distinct disadvantage. Global experience has shown that procurement simplification also improves outcomes for governments (as well as large corporates).

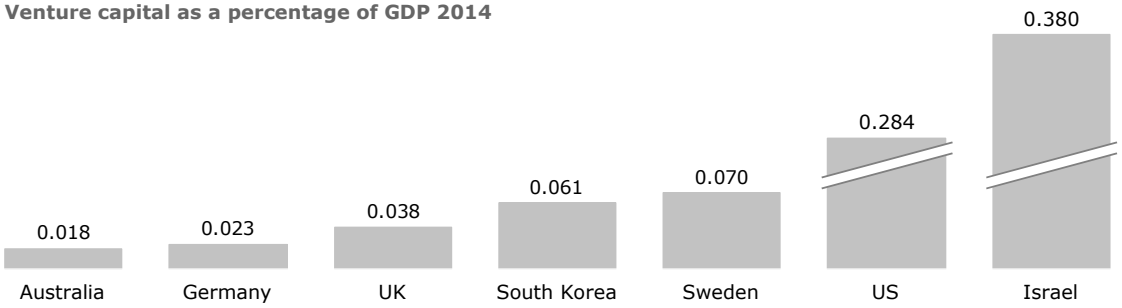
As part of our efforts to provide concierges for priority segments, we may use clusters and existing networks to introduce high-growth SMEs to large corporations, drawing on their expertise as first customers and also as potential mentors.

Priority 2.2: Stimulate early-stage investment in future gazelles

Many conditions in the NSW economy would suggest the time is ripe for investment in emerging businesses. Corporate balance sheets are strong, bank capital is high, interest rates are low, property returns are slowing, and share market indices have been flat. Australia also has $2.65 trillion under management,[52] the third-largest pool of investment funds in the world.[53]

Little of this funding pool appears to be available for early-stage or growth-stage SMEs. The lack of venture capital funding for our emerging businesses is known as 'the valley of death'. Internationally, Australia ranks at or near the bottom for the number of deals and the amount invested in both early-stage and late-stage start-ups. In 2014, the latest available OECD data, Australia's total venture capital investment was less than US$262 million[54] or 0.018% of GDP. As a proportion of GDP that is very low: less than 1/20th that of Israel's 0.380%, about 1/16th of the 0.284% in the US, and less than half that in the UK and many other peer countries (see Figure 16).[55]

Figure 16. Australia does not invest enough in early-stage growth



SOURCE: OECD, *Entrepreneurship at a glance*, 2015

While our reference group suggests early-stage venture capital is now growing in NSW, entrepreneurs still face difficulties in raising later-stage venture capital funds, where $5-20 million is needed to build a firm before it can either go public or obtain bank lending. This is forcing some entrepreneurs to raise funds overseas, often taking their business (and NSW's potential jobs) with them. NSW must explore additional avenues to raise investment capital in the State.

Initial actions for Priority 2.2

To advance this strategic priority, the NSW Government should initially:

- **Launch regional funding and networking events (*Action*).** A feature of venture capital markets in the US is the opportunity for investors and potential high-growth firms to come together at showcase events or 'pitch weeks'. Jobs for NSW will host or facilitate such events in Sydney and regional NSW, invite investors and a shortlist of potential gazelles, and provide a proportion of funding to encourage deals to be formalised at the events.

- **Launch business gazelle financing programs (*Action*).** Jobs for NSW will push ahead with programs to provide both direct and indirect financing, with introductions to support high-growth SME financing. Rather than invest equity directly, a fund of funds will pursue an investment strategy that supports the growth platforms of potential gazelles. A debt strategy will fund capacity expansion in existing accelerators that are supporting future gazelles, and/or a loan guarantee program in partnership with financial institutions. An equity strategy will pursue co-investments with external partners.

Priority 2.3: Support and signal a strong culture of entrepreneurship

People in NSW aren't averse to starting their own business, ranking second in our peer group on that metric (see Figure 15). The issue is that in NSW, as in Australia, we don't seem to have high aspirations for those businesses. Of Australians surveyed in early entrepreneurial activity, only 1.5% expect their business to grow to more than 20 people within five years, half the rate of the US. Only 12% expect to generate a quarter of their revenue overseas, compared to 37% in Singapore and over 20% in European countries.

Fear of failure appears to be an inhibiting factor: 39% of those surveyed indicate that fear would prevent them starting their own new business, compared to 30% in the US.[56] Perhaps we are more likely than our international peers to see running a small company as a lifestyle choice rather than a wealth-creating choice. Perhaps fewer Australian entrepreneurs believe they have an acceptably high status in our community.[57]

In any case, the result is that the best of our educated talent don't see small firms as their way ahead. As discussed earlier, young Australians are only half as likely to join a start-up as their global peers.[58] And, for a host of reasons that include the next two barriers, we are less likely to hold onto our top talent than other countries, lagging the likes of Singapore and the US by 13% to 18%.[59]

Initial actions for Priority 2.3

High-growth SMEs and their leadership must be more openly valued for the jobs growth they generate, and government can play a role in communicating this supportive stance. One way is to better target high-growth SMEs with revenue-neutral relief or incentives.

To advance this strategic priority, the NSW Government should initially:

- **Explore focused relief or incentives for high-growth SMEs (*Explore*).** The actions suggested above, to stimulate our entrepreneurial ecosystems and funding, will do much to foster an entrepreneurial culture and ambition in NSW. As well, the Government should explore policies that signal their support to high-growth SMEs. For example, payroll tax relief is offered to qualifying companies under the NSW Jobs Action Plan. There may be opportunity to better target potential high-growth SMEs, without increasing the overall relief offered by the NSW Jobs Action Plan.

Priority 2.4: Make NSW the easiest state to start and grow a business

Starting a new small business in NSW can take up to 18 months. Even a café must complete 45 electronic and physical forms, carrying hundreds of data points, many of which are duplicated. This is to comply with 75 local, state and national regulations.

As part of its intensifying efforts to cut red tape, the NSW Government's Easy to do Business project is aiming to cut that 18 months to just three, primarily through a single online form that shares information across all three tiers of government. This seeks to promote a regulatory environment that is attractive to business, investors and promotes productivity.

However, the program's initial five sectors are largely in our non-traded economy: cafés, restaurants and small bars; housing construction; road freight; clothing retail; and print. Much more can be done to assist the launch and growth of promising SMEs in our targeted globally competitive growth sectors.

As well, regulation of business activity is ultimately only as strong as the institutional arrangements that underpin regulatory policy. Stakeholders have drawn attention to the need for the NSW Government to improve its regulatory oversight arrangements.

Of Australians surveyed in early entrepreneurial activity, only 1.5% expect their business to grow to more than 20 people within five years

To advance this strategic priority, the NSW Government should initially:

- **Reinforce existing NSW State Priority: 'Strong Budget and Economy (*Action*).** Through the Easy to do Business initiative and in many other ways, the Government is continuing to focus on reducing or removing barriers, costs and complexity and making regulatory obligations easier to understand and implement. It is also continuing the comprehensive financial management strategies to maintain our strong fiscal position and credit ratings.
- **Review NSW's regulatory management system (*Action*).** The Government should examine the current NSW regulatory review framework and management system, and develop recommendations for enhancing the policies, institutions and tools that underpin efficient regulation.

3. Skill up for the knowledge economy

Ensure people of all ages have the interactive skills they need for the digital future—by supporting both the integration of those skills in schools and a responsive, outcomes-based vocational education and training (VET) system.

Strategy summary

Machines have displaced human labour for centuries, and the automation of tasks and jobs may become even more pronounced. Existing technology has the potential to replace 42% of the overall time taken for workplace tasks in NSW, to an equal or greater standard. Automation now applies not just to routine and physical tasks, but also in highly skilled technical roles. Digital machines are acquitting themselves extremely well in the operating theatre, music theatre and financial markets, to name a few.

Over the past 20 years, we have adapted well to the opportunities and challenges of this early digital revolution. Fewer of us are needed in large-scale physical production and, as we saw in reviewing NSW's 20-year track record, more of us are working in the service and creative industries. More of us are completing higher levels of education to prepare us for that work. In fact, three-quarters of new jobs created require at least diploma-level skills.

With a generation now being raised with a digital powerhouse in their pocket, digital technology will only spread faster and further. As it does, more of our jobs will be automatable—able to be done by smarter and more dexterous machines. More jobs will also be unbundled—their different tasks being performed by the most competitive specialist businesses, wherever they are in the world, linked by digital connectivity.

These processes have already begun and will continue to do so gradually, allowing time for societies to prepare and adjust if they do so sensibly and proactively. The key is to give people opportunities to develop the skills for the job resilience they will need in the future, whatever that future might bring.

Jobs that rely on these skills will be more resilient in the age of digital machines, will pay more, and are needed for our target tradeable segments. We must offer people the opportunities to learn these skills. We see two priorities for this strategy:

- **Priority 3.1: Accelerate reform of the K-12 curriculum, delivery models and teacher professional learning to be more focused on building interactive skills to prepare the next generation.** STEM skills have seen a welcome revival in Australian schools. We now need to prepare our next generation to apply specialist and interactive skills at the same time. Initial actions may include exploring pilots of integrative skills learning through the school curricula, and pilots in transitioning to the workforce and to higher learning. These could follow examples such as California's High Tech High (see page 55).

- **Priority 3.2: Ensure the VET system is stackable, agile, outcomes-based and responsive for a lifetime of effective learning and re-skilling.** Routine and physical jobs are the most at risk from automation and unbundling, and are more prevalent in regional NSW. Our existing workforce must build its readiness for more interactive tasks in all jobs. VET learning can leverage its stackable nature to offer different modules within a course to add the specific skills a person needs for job readiness. Our initial actions will focus on more flexible qualifications and apprenticeship models for students, and outcome-based management of the VET system: qualifications and funding based on demonstrated competency (and actual employment).

Enriching our workforce with the skills it needs is perhaps the hardest of all our strategies, for it requires the support and change of the widest span of our community. However, this challenge has already been accepted at the national level, and is achievable. We can see new funding paths and curricula emerging in response to educational needs, and have begun the task of deliberate yet careful transition.

Strategy	Enduring priorities (over 20 years)	Proposed initial actions (~3–4 years)	Status
3. Skill up for the knowledge economy	3.1 Accelerate reforms for integrating interactive-skills learning in schools	▪ Interactive skills pilots for K-12 ▪ School leaver readiness and networking pilots	Explore
	3.2 Promote a more flexible, outcomes-based VET system	▪ More flexible qualifications and apprenticeship models ▪ Stronger outcomes-based management of VET sector	Action

What skills are needed in the jobs of the future?

In the age of digital machines, we need not only the science, technology, engineering and mathematics (STEM) capabilities that are rightly being emphasised in our schools. We also need to strengthen the social-emotional and problem-solving skills, and become better at applying those skills to our specialised knowledge and roles.

Those who have studied the issue have a solid, shared idea of what those skills are: digital literacy, communication skills, critical thinking, problem-solving skills, creative thinking, entrepreneurial skills, team work, intercultural competence and the like. But few can agree on the best adjective to describe them collectively.

'Interactive skills' is the term proposed, given that all the skills involve an interaction of some sort, but the term is criticised for lacking resonance. 'Knowledge skills' implies a closer link with the knowledge economy, but critics say that it is too close to 'knowledge' itself, and so implies almost the opposite to what is meant. The term 'enterprise skills' is also proposed, but arguably has a strong business or entrepreneurial connotation, when these skills are needed in all forms of work.

Recognising that there is no perfect answer, this report has adopted 'interactive skills', as it is closest in meaning to the skills that complement the specialist, knowledge-based skills that people also need.

The shift to knowledge-intensive jobs

Over the past 20 years, the NSW jobs market has adapted well to its opportunities and challenges. Almost all workers now use digital machines. A useful way to understand how our jobs have changed is to consider three job archetypes, distinguished by the type of thought and action they demand:

- **Knowledge-intensive** jobs involve both specialist and interactive skills, and draw on our experience and context as well as specialist knowledge. Almost half the workforce (48%) have knowledge-intensive jobs, including senior managers; child, aged and disabled carers; nurses; scientists; and accountants; and their number is rising.

- **Routine** jobs are less knowledge-intensive, and are defined by regular exchanges, with either people or information, that can often be scripted or automated. Almost a quarter of the workforce (23%) are in routine jobs, including bookkeepers, bank tellers and sales assistants.

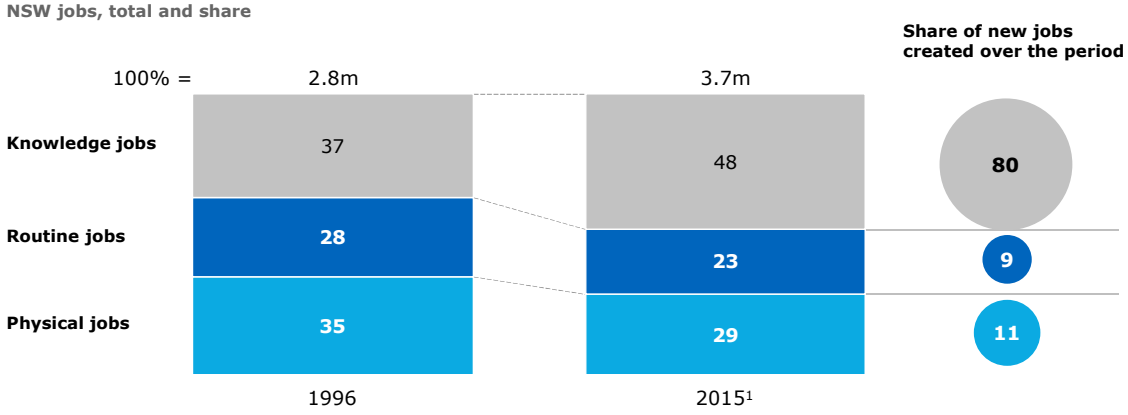
- **Physical** jobs are defined by their work with physical materials, movement and space, though they could otherwise seem knowledge-intensive or routine. Drivers, machinists, chefs and carpenters are among the 29% of us in physical jobs.

All jobs may have knowledge, routine and physical components—we are considering their relative intensity—and the terms themselves are less important than the trends they represent. Understanding these trends is essential for preparing for the skills transition through our next 20 years.

For these three archetypes, the biggest trend over the last 20 years has been the tectonic shift towards knowledge-intensive jobs. That is due to the same forces that have driven the shift in our economy from products to services—affluence, globalisation and digitisation. Eighty percent of all new jobs over the past 20 years have been knowledge-intensive jobs, which now make up 48% of our total workforce, up from 37% in 1996 (see Figure 17). Put another way, 400,000 more people have knowledge-intensive jobs than would have been the case if the archetype shares had remained constant over the past 20 years. The rising demand for interactive skills has coincided with the dramatic increase in graduates from higher education, whose focus is to develop those skills.

Figure 17. Knowledge-intensive jobs have accounted for 80% of jobs growth

NSW jobs, total and share



SOURCE: ABS 1220, ABS 6129 table EQ08 (employed persons by ANZSCO[2] —data excludes non-matching categories between 1996 and 2015), McKinsey Global institute (MGI)

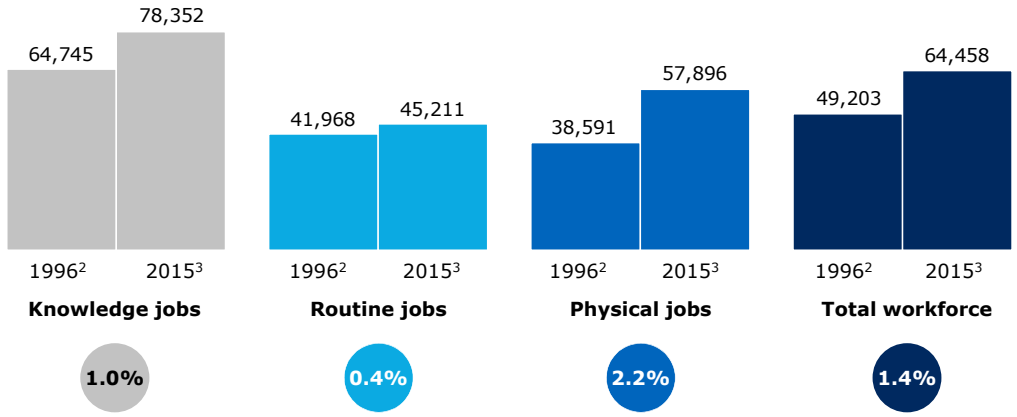
That shift has been a very positive one. Interactive skills and knowledge-intensive jobs are more resilient to displacement, either by automation or by being unbundled, in whole or part, to specialist businesses in Australia or overseas. Like core social-emotional skills, knowledge-intensive jobs require judgement based on context and experience. This is not easily replicated by machines.

As well, the average wage of knowledge-intensive jobs is 22% higher than the state average (see Figure 18). The shift to the highest-paying archetype has added about $2,600 in real terms to our average annual wage. In other words, about one-fifth of our real wages growth was a result of people doing different types of work, not just doing the same types better. These jobs usually also require a higher skill level, with over two-thirds of them requiring a bachelors' degree or higher.

Finally, in a developed economy like NSW, knowledge-intensive jobs and interactive skills are the foundation for our globally competitive segments; those that will contribute most to our future State income (see Strategy 1).

Figure 18. Knowledge-intensive and physical jobs have both raised our average wage

Average wage of the NSW workforce[1]
2015, A$ CPI adjusted



SOURCE: ABS 81150, ABS 6306, ABS1220, ABS 6129 table EQ08 (employed persons by ANZSCO—data excludes non-matching categories between 1996 and 2015), McKinsey MGI

The challenges of digital automation and job unbundling

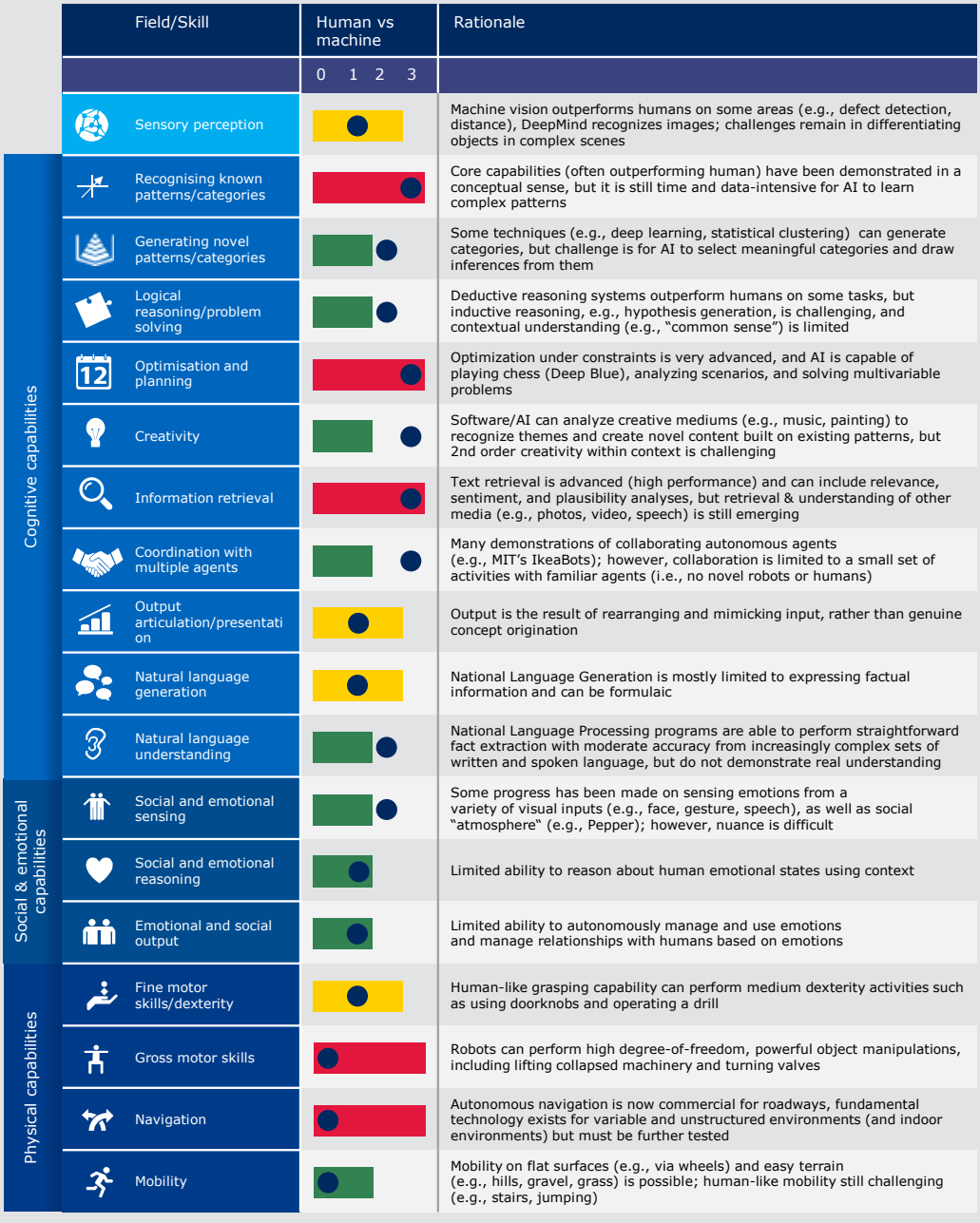
Our work environment is steadily becoming more digitised and automated, and we live with the implications daily. For example, to fly internationally, we can check in online, tag and lodge bags without assistance, and even pass through passport control without talking to a border protection officer. Digital machines with artificial intelligence already excel at pattern recognition, planning, optimisation, information retrieval, navigation and motor skills.

These proven technologies are already capable of replacing 42% of the time taken for tasks currently performed by people in NSW. The full page Figure 19 shows how current machine capabilities stack up against the skill levels required for one of 900 job categories. The impact is likely to be very different for different types of jobs. For example, a CEO may spend 20% of his or her day on tasks that a machine can do just as well, such as recognising known patterns, optimisation and planning, and information retrieval. For a payroll clerk, that figure rises to 87%, with human-like traits such as natural language generation being possible.

The critical point of this example is that everyone's job will be affected by automation. For the most part, automation affects part of the work, rather than the whole job. The shifts are persistent yet gradual, and people in jobs typically have the time and support to adapt to, and benefit from, the digital technologies. Very few are affected as radically as the payroll clerk: just 6% of jobs might see 80% or more of their tasks performed by proven technology. Yet the skills required are changing with the nature of the work, and the most vulnerable are those re-entering the workforce, or those working in jobs, firms or industries that have not adapted as fast as new technologies have been introduced.

This chart considers the skills needed for a typical routine job, and compares them against the current demonstrated abilities of a machine. The McKinsey Global Institute considered 18 types of sensory, cognitive, social-emotional and physical skills, listed in the blue columns at left. It then analysed the level of those skills that a person would need to complete tasks in the example routine job. The skill level needed is shown by the blue dots in the middle column, on a scale of 0 to 3. The coloured bars are the currently proven machine capabilities for that task and skill. If the machine capability exceeds the skill level needed, then that task is automatable. The rationale for each assessment is given in the right-hand column.

Figure 19. Current technologies can handle many common work tasks

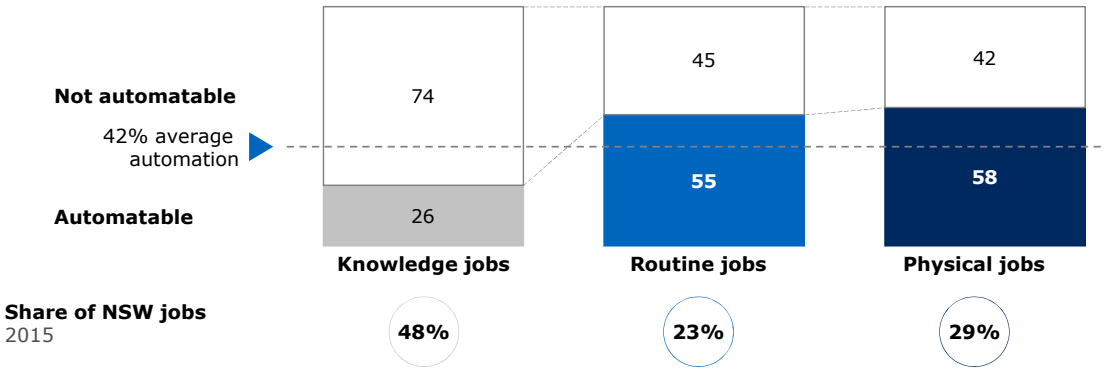


SOURCE: Company websites; academic journals; McKinsey and external expert interviews

As implied, automation will impact some job types more than others. Knowledge-intensive jobs are the most resilient, with only 26% of their aggregate time currently at risk. More than half of the time spent in routine jobs (55%) and physical jobs (58%) are at risk (see Figure 20). While the correlation is not absolute, the routine and physical jobs that are most vulnerable to machines are currently more likely to be in Sydney's western suburbs and regional NSW.[60]

Figure 20. Knowledge-intensive jobs and skills are more resilient

Technical automatability[1] in NSW by job type
2015, Percent of time[2]



SOURCE: ABS 6306, ABS1220, ABS 6129 table EQ08 (employed persons by ANZSCO—data excludes non-matching categories between 1996 and 2015), McKinsey Global Institute (MGI)

This increasing shift to automation is likely to have two major effects. First, demand for interactive skills in all jobs will continue to grow, though it will be difficult to predict either the jobs that will be created, or the exact skills required. Second, the proportion of routine and physical jobs in our economy is expected to continue to decline—falling to 17% and 21% respectively of total jobs by 2036.[61] These are the jobs more at risk of automation, and less in demand in the growing services sector.

Routine jobs in particular, and some physical jobs,[62] will also be subject to unbundling—their different tasks being performed by the most competitive specialist businesses, regardless of their location. In 2014, over 360 million people took part in cross-border e-commerce, using 45 times the bandwidth that they used in 2005.[63] Large and small businesses can get the quality and cost mix they need from suppliers anywhere, and easily knit their output together. Where previously they may have relied on one person to do a series of consecutive tasks, now they can unbundle those tasks and get them done from discrete suppliers, wherever they are.

The need to build the skills of the digital age

The shift to automation and unbundling is both exciting and concerning. An optimist may see job numbers rising with automation, with more work being in higher-paid and more resilient knowledge-intensive jobs. They would cite the increased focus on our uniquely human social and creative capabilities—the very capabilities needed for the eleven target segments identified in Strategy 1. The glass half-empty view may see the pace of automation as being too great, too disruptive, with too many people unable to adapt their skills quickly enough. They would point to a potential division between highly skilled tech-enabled workers and a low-paid, underemployed underclass.

The proper response to both of these possibilities is the same: NSW and its people must build the capabilities they need in the digital age. Whether to take advantage of the economic opportunities, or to avoid being trapped in an underappreciated world, people must have the opportunity to develop their problem-solving and social-emotional skills. They must have the chance to accumulate and adapt their skills over time—it is no longer enough to study once then settle in for a lifetime job. These are the skills that will offer them the greatest job security, resilience and growth. Finally, they must be part of a flexible and dynamic labour market that recognises those skills, and creates opportunities for them.

All parts of our education sector—child, youth and adult learning—have roles to play in developing those skills, so that their students can take best advantage of emerging opportunities. This paper focuses on areas where state governments have the most influence. Universities will continue to focus on both interactive and specialist skills under the guidance of federal policies and their own independent strategies. Private education providers will continue to set their policies and practices to best meet their perceived customer needs. As a state government, we will continue to advocate for the needs of our industry and workforce. However, our greatest leverage will be in the school and the VET sectors.

Priority 3.1: Accelerate reforms for integrating interactive-skills learning in schools

Accelerate reform of the K-12 curriculum, delivery models and teacher professional learning to be more focused on building interactive skills to prepare the next generation.

To participate fully in the workforce of the 2030s, our children need greater interactive skills (problem-solving and social-emotional skills), as well as keener specialist skills (including STEM skills). To build those interactive skills at school, we will need to support and accelerate our schools' current reforms of what children learn at school, and the way they learn it.

School curriculums are too full to allocate additional time to interactive skills—instead, they should be integrated with specialist skills in the same learning experience. This is relatively new ground for our education systems, but has proven to be far more effective than separate training in soft skills. It would require changes to the curriculum, new classroom learning techniques, and revisions to teacher professional learning. Incentives and funding can encourage school-level experimentation and bottom-up innovation to find the right solutions.

One pilot project is the Global Scope Program of StudyNSW.[64] The program's focus on live business projects draws on innovations at schools such as California's High Tech High (see breakout, 'High marks for High Tech High'). In that program, project-based learning has spread from one to 13 networked schools, with one result being that 64% of its students are entering college as the first in their families to do so. In another area of change, groups as diverse as the US Navy Seals and high-tech Silicon Valley firms have used play to add thinking skills, communication skills and motivation to their subject training.

Global Scope is an innovative pilot project managed by Intersective for StudyNSW. It engages teams of multicultural high-school students to deliver six-week business projects to clients including NSW government departments. During the 2016 pilot, approximately 200 international students from five NSW schools are completing 40 projects for nine government departments.

Support for school-leavers who may be entering the workforce directly also needs to be substantially rethought. Currently, much career guidance for school leavers is geared to those assumed to be going to higher education. However, recent efforts in NSW and Tasmania have shown that a more hands-on approach taken by schools and communities can successfully transition school leavers directly into the workplace. These programs give school leavers direct introductions to local employers, as well as individual coaching and support on personal capabilities they need to succeed in the workplace: time management, dress confidence and essential paperwork. They also provide transition and introduction to the vocational educational and training system and alternate forms of education. Such programs are globally valued, for both school leavers and unemployed youth.

Productivity Bootcamp in Mt Druitt NSW is an eight-week course that gets young people work-ready, arming them with foundation skills to enter the infrastructure industry. These include skills in formwork, steel, concrete and general groundworks. Although the program is run in an infrastructure setting, the training offers students what they need to work in any sector: safety, injury prevention, attitude, work ethic, communication skills, dealing with different personalities, punctuality, nutrition and more.

Initial actions for Priority 3.1

To advance this strategic priority, the NSW Government should initially:

- **Explore pilot projects for including interactive skills in schools (*Explore*).** The Government should launch new pilots and support emerging programs to drive learning of future-critical interactive skills at school. It may fund and promote innovations to deliver the content of the national curriculum in ways that develop interactive skills, learning from global examples. It may also redesign professional learning so that teachers are well prepared to integrate interactive skills in their teaching. To give greater clarity to these objectives, NSW may lead a national effort to design a standardised measure of the attainment of interactive skills.

- **Explore additional school-leaver readiness and networking pilots (*Explore*).** Whether or not school-leavers are continuing through to higher education, the Government should innovate and scale up existing projects, or explore additional pilots to better prepare school-leavers for the workplace. Programs may network with local employers, concentrate on personal capabilities, or improve communication between schools and businesses of local employment possibilities. In 2016, the Australian Government launched its $322 million Transition to Work program to sponsor local programs nationally. However, only Far West Orana is targeted for assistance in NSW in the near future. Further programs in NSW are needed, including in regional NSW, which tie into other place-based actions on the priority segments (see Priority 4.3).

High marks for High Tech High

The original High Tech High opened in 2000, four years after 40 members of San Diego's civic and high-tech community met to solve the challenge of finding graduates suitably prepared for their businesses. Now, the High Tech High network consists of 13 schools: five high schools, four middle schools and four elementary schools.

Rather than using the textbooks of traditional classrooms, students have workstations in state-of-the-art labs, designed for individual and collaborative work. Students spend most of their time on group projects, with teacher guidance, to research an issue and decide how to present their findings. For example, for the study of history, students make a film about Gettysburg; for science, they hold a public debate on evolution; for business, they write a plan to start up a business. Junior and senior high students also enter internships with local businesses that match their skills and interests.

The results have surprised even the school's prior advocates. Academically, High Tech High is ranked in the top 10% of all California high schools, with SAT scores above San Diego and California averages. By 2015, 98% of High Tech High graduates had gone onto college, with 34% of graduates majoring in STEM subjects (compared to 17% nationally). This strong academic performance is despite a mix of socio-economic backgrounds: 65% of its graduates entering college are the first in their families to attend post-secondary school.

Three factors have been attributable to this success. First, faculty and staff are a mix of experienced teachers, new teachers and industry professionals, and are held accountable for the teams of students they work with. Second, the curriculum is designed around the learning principles of adult-world connection, common intellectual mission and personalisation. Third, High Tech High can make its own choices on finances, facility and academic programs.

Priority 3.2: Promote a more flexible, outcomes-based VET system

Ensure the VET system is stackable, agile, outcome-based and responsive for a lifetime of effective learning and re-skilling.

Our vocational education and training system has a critical role to play for both our existing workforce and for those school leavers not transitioning to university: to build their readiness for more interactive tasks in all of the job archetypes. In addition, routine and physical jobs are the most at risk from automation and unbundling, and are more prevalent in western Sydney and regional NSW, where more reskilling may be required. These areas also host the highest levels of youth unemployment (see Strategy 4). They are also served most by the VET system, so any action to make the VET system more responsive will also benefit youth and mature workers beyond the city centres.

Several characteristics of the VET system suggest potential opportunities in meeting these challenges. VET learning is inherently stackable: that is, different modules within a course add different skills to build a person's readiness for a particular job. By being responsive in the way that it stacks modules within a course, VET learning may be a powerful force for the rapid skilling and re-skilling needed in the future jobs economy. It would better fulfil this promise if its systems were more agile, for example by allowing a module undertaken for one qualification to be credited for another.

As the VET system is competency-based, qualifications should represent that the students have demonstrated specific skills and competencies. However, some training organisations and participating employers do not acknowledge this point, and still use time served as a marker for training outcomes. An agile, responsive system would insist on the demonstration of competencies, however they were attained.

Skills proficiency should also translate into positive employment outcomes for the student—assuming those skills are in demand. VET funding could be more closely linked to those positive outcomes, to help ensure the system is continually offering the skills needed in the workplace. The VET system is more likely to adapt more rapidly to changes in jobs and skills demand if it were managed (and funded) on an outcomes basis: for example, by the students gaining and maintaining employment, rather than on the number or nature of the courses offered.

Finally, the data on automation demonstrates that people will increasingly rely on their interactive skills for the jobs of the future. So, as in schools, VET courses must integrate both interactive and technical skills learning. The global Generation program has shown what can be done by teaching unemployed youth technical and soft skills in tandem, proving remarkably effective in Spain, India, Kenya, Mexico and the US.[65]

Initial actions for Priority 3.2

To advance this strategic priority, the NSW Government should initially:

- **Pilot flexible qualification and apprenticeship models (*Action*).** Any actions to be taken with VET can take advantage of the stackable nature of VET courses, with students being able to select the modules that best match their needs and experience. These would include greater emphasis on interactive skills and soft skills, such as teamwork and feedback conversations, that can assist with future jobs and tertiary learning. Mandatory elements on these soft skills can be integrated into all specialist skill learning modules. By recognising experience and apprenticeships, qualifications might be awarded on the demonstration of competency, no matter how the skill has been acquired, rather than by hours spent attending a course. The range of qualifications might also be streamlined, making the VET system of courses and qualifications easier for students and employers to navigate.

- **Accelerate outcomes-based VET funding and management (*Action*).** A second action would be to fund VET providers not on course enrolments, but on the basis of their students' demonstrated competency. Over time, a provider's access to government VET funding should reflect the success of that provider's students in gaining and maintaining employment (adjusted for the student and qualifications mix of the provider). We should also explore direct or indirect employer input into the allocation of government VET funding. This would better align the incentives of providers and employers, and assist a faster and sharper response to future skill shifts. Action is underway to ensure that the funding for NSW TAFE is matched by a more outcomes-based approach.

4. Draw on all of our people

Make NSW the best state for people to enjoy paid work—by ensuring good livability across NSW and removing barriers for people 65 and over, women with children, and regional youth.

Strategy summary

As we have seen in reviewing our strong jobs track record, NSW has added jobs faster than our population growth over the past two decades, with an increasingly inclusive jobs market. Our aspiration is for these trends to continue: for more people from all family circumstances to enjoy the opportunities of paid work in NSW, contributing to rising per capita income. We are looking to promote jobs that offer flexibility and choice, with more ways of working in traditional and virtual workplaces, offering prosperity to a wide spectrum of people.

However, what were demographic tailwinds are now turning against us. All of the baby-boomer generation will cross over into retirement age over the next 20 years. We risk losing a vast reservoir of experience and talent, and should take actions to access as much of that talent as possible.

If we are to reach our aspiration of adding 1 million high-quality working lives by 2036, we will need to step up on two fronts to make the NSW jobs market as inclusive as possible: encourage more working-age people to stay or come and work in NSW, and encourage more of our current residents into the workforce. Our strategy is to make NSW the best place in Australia for people to enjoy paid work. We see four priorities for this strategy:

- **Priority 4.1: Make NSW the best place to work for people 65 and over.** Many people 65 and over have highly valuable experience and skills, but face systemic, financial and cultural barriers in continuing in paid work. For example, those who have not enrolled in formal learning of any kind since school can find adult education daunting, and our workers' compensation and pensions systems penalise older-age workers. We need to better understand the barriers for people 65 and over and for their employers, and identify areas we can start to address.

- **Priority 4.2: Make NSW the best place to work for women with children.** Women now invest as much or more than men in their education, and make up the majority of students in NSW universities.[66] However, upon becoming a parent or carer, their participation in the workforce falls to approximately 70% of their male counterparts. Surveys find that financial factors are the dominant barrier against women increasing their hours of work. The cost of quality childcare for families is above the OECD average[67] and, after tax and the loss of benefits, going to work may actually cost money. We should thoroughly explore any means to improve access to childcare and lighten any financial disincentives against mothers with children re-joining the paid workforce.

- **Priority 4.3: Promote thriving regional centres that create work opportunities for youth.** Making regional NSW more attractive to employers is the best way to create employment opportunities for regional youth, on top of existing programs to ensure they are job-ready. Accelerating strategic place-based investment may drive regional economic growth and jobs, and so create more opportunities for youth in the regions.

- **Priority 4.4: Make NSW the most liveable state.** NSW has great education and job opportunities, but Sydney in particular is an expensive city to live, with long commutes for those unable to afford housing close to its major job centres. We need to enhance the appeal of NSW as the number-one Australian state for people to live and work. This will take stronger links between policies for planning, infrastructure, affordable housing, jobs and economic growth. Liveability and job-outcome criteria should be added to conventional benefit-cost analysis of planning decisions.

Strategy	Enduring priorities (over 20 years)	Proposed initial actions (~3–4 years)	Status
4. Draw on all of our people	4.1 Make NSW the best place to work for people over 65	▪ Barrier reductions for people over 65	Explore
	4.2 Make NSW the best place to work for women with children	▪ Greater childcare access and reduced disincentives for increasing hours of paid work	
	4.3 Promote thriving regional centres that create work opportunities for youth	▪ Accelerate strategic place-based investment to drive regional economic growth and jobs	
	4.4 Make NSW the most 'liveable' State	▪ Transport/planning project prioritisation based on 'livability' and job outcome metrics	

Greater participation to meet the challenge of ageing demographics

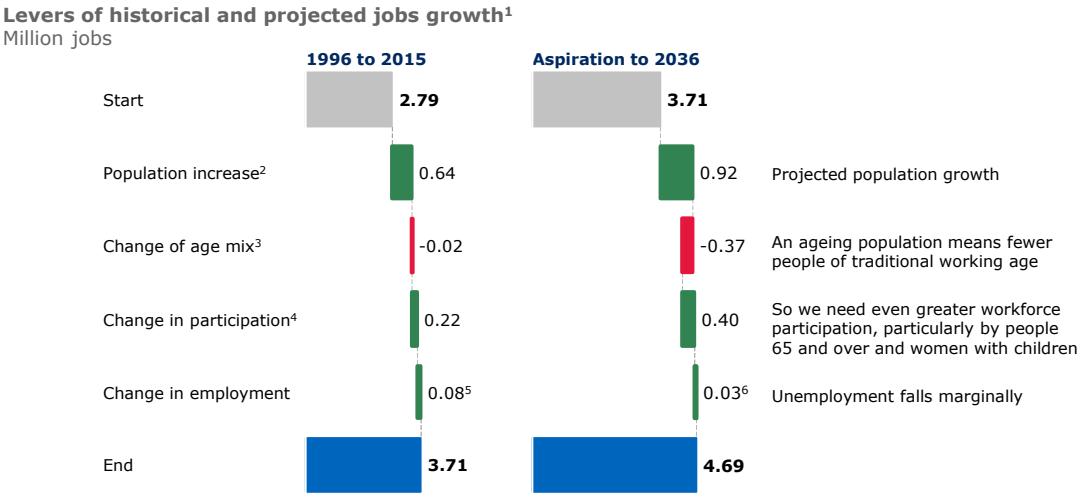
Figure 21 below shows how jobs growth could be achieved through to 2036, and highlights the impact of NSW's demographic headwinds.

The left-hand section breaks down the growth in jobs over the past 20 years into its contributing elements: as also shown in Figure 4. The next section suggests the components in jobs growth over the next 20 years, starting with our current workforce of 3.71 million.

First, NSW population growth is forecast in the *NSW Intergenerational Report* to be 1.05% per year over the next 20 years, slightly less than past rate of 1.09% but much less than the projected 1.47% national rate. The forecast acknowledges that, despite NSW being Australia's biggest economy, with compelling education, job, climate and natural attractions, the post-war migration from NSW to other states will continue. Nonetheless, the *NSW Intergenerational Report* projects a modest decline in migration to other states and a modest increase in the rate of NSW population growth, to the sensible limits of our infrastructure and housing stock.

Second, though more significantly, the baby boomer generation (born 1946–1962) will all reach traditional retirement age, reducing the proportion of people of working age from 65.6% now to 60.2% in 2036.[68] That 5% change is a much bigger shift than it appears. There may be just three working-age people for every two younger or older dependents, not four as there is now. As the population ages, government expenses rise while its revenues fall, creating a fiscal gap that limits its ability to spend on job-creating services.[69] Consumer demand may also fall proportionally. Looking at examples abroad, Japan's ageing population has greatly contributed to its 20-year economic stagnation (along with corporate and public debt, and a shrinking population).[70]

Figure 21. Participation lever essential to reach 2036 ambition



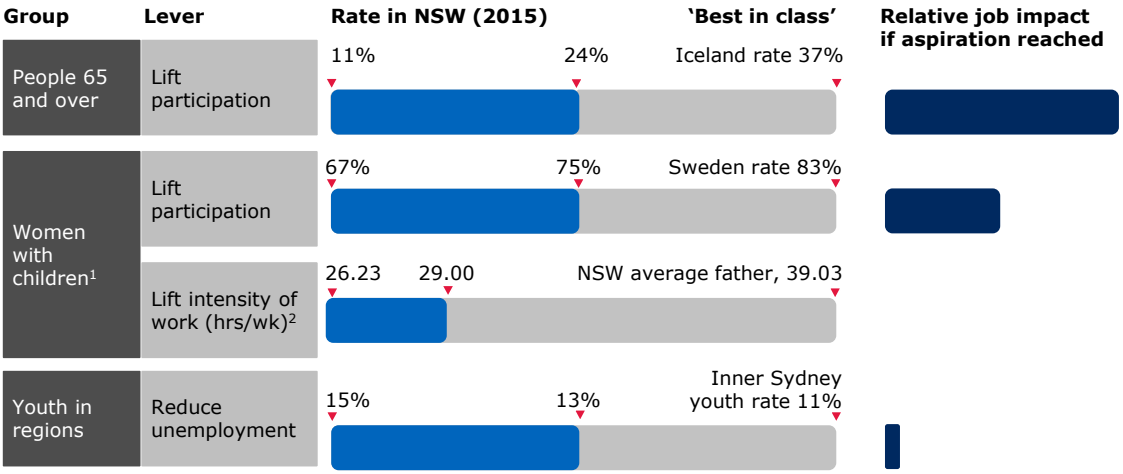
SOURCE: ABS Labour Force Survey, Intergenerational Report, NSW Department of Planning Population Forecasts, OECD

NSW is far from that situation, but proactive policies are needed to keep our workforce participation strong as our population ages. In the last 20 years, the change of age mix has cost us around 20,000 workers, which was easily offset by some 220,000 additional workers from increasing participation in the workforce. In the next 20 years the change of age mix may cost us as much as 370,000 workers. This changed is locked in: the change in age mix is determined by the birth rates of the past two decades—most of the school leavers of the next 20 years are already born.

With population growth already factored in, there are few possible levers left to close the gap in workforce left by the changes of age mix. Our unemployment rate is already at a relatively low 5.8%, though we would like to see it lower. If we want to ensure our workforce matches the demand of our growing industry sectors, the most effective lever we have is to increase participation, across all age groups.

The two demographic groups with the largest potential numerical contribution to our workforce are people of traditional retirement age (65 and above), and women with children. In addition, Jobs for NSW is targeting the continuing issue of regional youth unemployment, consistent with its statutory obligations to align 30% of its funding with regional initiatives. The potential contributions of greater participation by these groups are shown in Figure 22.

Figure 22. Greater participation is achievable in three target demographics



SOURCE: Analysis of data from ABS Labour Force Survey, NSW Intergenerational Report population forecast, OECD participation rates

Within the broad demographics of youth, working-age and older people, there are several specific groups that offer a well of currently under-utilised talent, including people with disability, Aboriginal people and people from linguistically and culturally diverse backgrounds. For example, greater inclusion of people with disability in the Australian workforce through the National Disability Insurance Scheme, may contribute to a 1.4% increase in gross domestic product and 370,000 additional workers nationally through to 2050, according to a 2011 study.[71] Aboriginal people represent 3% of the NSW population, however there remains a significant disparity in rates of participation and unemployment between Aboriginal and non-Aboriginal people in NSW. People from culturally and linguistically diverse communities have been major contributors to the State's innovation and growth for generations and will continue to be invaluable for our globally competitive growth segments, fostering links in international markets.

Greater inclusion of these groups in our workforce is critical to a healthy NSW community. Moreover, the NSW economy can only benefit from more people bringing their full talent to paid work. For that reason, existing government action is targeted at securing that inclusion. Adding to this existing effort, the actions proposed in this report should be sensitive to the needs of these groups, and effective in fostering their greater inclusion in the workforce.

Priority 4.1: Make NSW the best place to work for people 65 and over

In seeking to draw on more of our people, the biggest potential pool is of people aged 65 and over, both those retiring and those who might go back to work. Currently, only 11% of these experienced and often very skilled people are in paid work. That's well short of New Zealand's 21%, let alone Iceland's 37%.

We might reasonably lift the participation rate of people 65 and over to 24%, a little above that in New Zealand. This would exceed the *NSW Intergenerational Report* projection of 18%, but is achievable. Many older workers are willing, yet face systemic, financial and cultural barriers. These include disincentives in our workers' compensation and pensions systems, and the unwillingness of employers and especially recruitment agencies to hire people over a certain age. The unfamiliarity of training is also a silent yet high barrier: only 33% of people aged over 65 have done any training since school, and only 28% completed Year 12. Those recruiting more mature workers are likely much younger, and find it hard to place themselves in the shoes of people who have had little or no training for decades. We need to better understand and address critical barriers such as these, which prevent older workers from working as much as they would like.

Initial action for Priority 4.1

To advance this strategic priority, the NSW Government should initially:

- **Explore how to reduce barriers for workers aged 65 and over (*Explore*).** Further work is needed to understand the critical barriers that prevent older people applying their talent and experience in the workforce. Barriers include financial disincentives related to the aged pension, taxation and superannuation; perceived or real skills barriers (particularly interactive and digital skills); a need for more flexible working arrangements; and cultural biases against older people at work, including workplace discrimination. Initiatives that leverage this research and pilot specific actions would be part of this action.

Priority 4.2: Make NSW the best place to work for women with children

Currently, 67% of women with children do paid work, either part- or full-time. We have scope to increase that participation rate, along with the hours per week that mothers work. We currently lag Sweden, the OECD leader with a participation rate of 83%, and should aspire to increase our rate to 75%. Women with children may also close the gap in hours worked, currently 12.8 hours behind fathers.

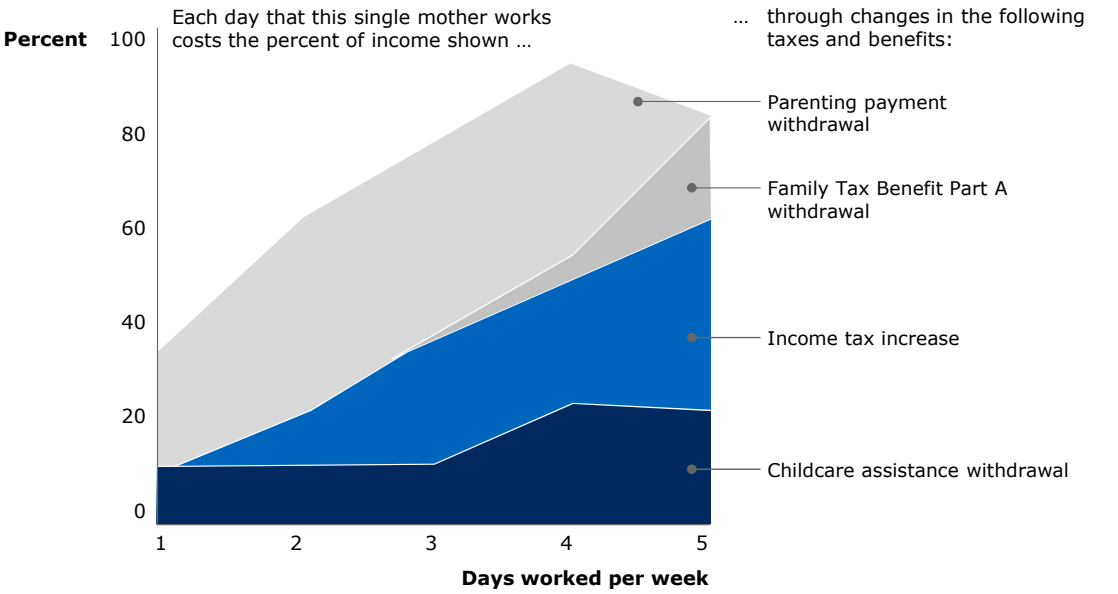
There are countless reasons why one-third of women with children are not in paid work, and why those who are in work do relatively shorter hours. The role of cultural norms and individual preferences cannot be understated, with many families sharing a strong preference for mothers to look after their own children in the early years of life, especially those 4–5% of families with children who have special care needs. Caring for older family members is also an increasing reality.

However, the dominant barrier against women increasing their participation appears to be financial. Childcare cost is nominated by 49% of parents already working part-time[72] as the main reason for not working more, and by 30% as the main reason for not working at all. Workplace flexibility is nominated by only 5% of parents in both categories. As seen by the rise of part-time work generally, cultural and institutional barriers in the workplace are slowly eroding.

The cost of quality childcare for families in NSW is well above the OECD average,[73] and is reflected by a range of other statistics. Across Australia, total childcare expenses absorb 27% of average wages, compared to the OECD average of 17%, and NSW's expenses are the highest in Australia.[74] Australia spends less public money on pre-primary education, as a proportion of GDP, than any other OECD country, just one-sixth of the OECD average (0.08% vs 0.48%).[75]

When mothers participate more in paid work, they may pay more tax, pay more for childcare, lose childcare assistance and lose family tax benefits. For many, choosing to work can mean very little or no take-home financial reward. For some high-income families, "the combination of a drop-off in family tax benefits, progressive income tax rates... and reduced assistance, can result in an effective marginal tax rate approaching 100%, particularly once work exceeds 3 days per week. For low income families, effective marginal tax rates... [also] provide a powerful disincentive" (see Figure 23).[76]

Figure 23. Effective marginal tax rates for a mother[1] with 2 children in long-day care ILLUSTRATIVE



SOURCE: Productivity Commission Childcare and Early Childhood Learning: Overview, 2014, Figure 4.

Initial action for Priority 4.2

To advance this strategic priority, the NSW Government should initially:

- **Explore ways to improve access to childcare and reduce disincentives against women with children increasing their hours of paid work (*Explore*).** The significant skills and talent of NSW's mothers would be better tapped by increasing their access to affordable, quality childcare. This includes ameliorating a clear financial disincentive against their participation: the combination of paying more in tax and childcare costs, and losing childcare assistance and family tax benefits. NSW should explore ways with the Australian Government to achieve more affordable and accessible childcare, perhaps by complementing the federal responsibility for the childcare rebate scheme. NSW could also consider measures on the supply side of childcare, such as skills development for workers in the early childhood care sector, or adjustments in pre-school funding and regulation.

Across Australia, total childcare expenses absorb 27% of average wages, compared to the OECD average of 17%

Priority 4.3: Promote thriving regional centres that create work opportunities for youth

Regional NSW is home to about 40% of the NSW population, and produces about one-third of our gross state product. While there are many stories of success, overall rates of regional youth unemployment have stubbornly stayed about one-third higher than Sydney youth, and twice as high as regional adults. Regional NSW also has the highest proportion of jobs at risk to automation. To improve these disparities, lift the quality of our regional communities, and meet our 2036 jobs target, we need more of our regional youth to join the workforce.

Our aspiration, at a minimum, is to drop the unemployment rate of regional youth from the current 15% to no more than 13%, and preferably closer to the Sydney rate of 11%. To do so, we need to make youth more attractive as employees to regional employers. Cost is one factor, as national wage settings may not fit the lower cost structures and living expenses of our regions , and many regional employers do not believe local youth have the employability or experience they need.

Regional youth face real employment barriers. Compared to their city peers, intergenerational unemployment is limiting educational motivation, support and attainment. These young people have less access to training resources, and in particular to the networks that are used to find and fill unadvertised vacancies.

Initial action for Priority 4.3

To advance this strategic priority, the NSW Government should initially:

- **Explore strategic place-based investment to drive economic growth and jobs (Explore).** This investment should tie in the place-based policy pilots of Priority 1.2 and recent commitments for NSW youth employment, in areas with a clear business case for investment. NSW has recently committed $100 million to a new program to help young people in regional locations get their first job ('Smart Skilled and Hired'). The Government has also set mandatory targets for more new apprenticeships and traineeships in all publicly funded infrastructure projects valued at over $100 million. These programs encourage businesses to trial innovative approaches that combine individual assessments of skills, aspirations and training needs, work placements with partner employers, and coaching and tailored training, to help young people make a sustainable start in the labour market. The programs should be carefully evaluated and nimbly managed, to ensure adaptation based on lessons learned. They should also link to the actions in the school-leaver readiness programs for youth in regions (Priority 3.1) and to the preparations that the Australian Government is making for new work placement programs for young people scheduled to begin in 2018.

Priority 4.4: Make NSW the most 'liveable' state

Over the past 20 years (and earlier), net migration from NSW to other Australian states has put a drag on NSW's population. In the ten years to 2015, NSW lost an average 16,017 people annually to other states, and without action about 19,000 people per year are forecast to migrate to other states.[77] The reasons for these departures are subject to much media speculation. In a 2015 survey of 1,007 Sydney residents,[78] the top five challenges for Sydney-siders were the cost of living, the cost of housing, travel and commute times, employment, and the pace and stress of life. While 34% thought Sydney was better now than it was five years ago, 69% think it will be worse in five years' time. As a result, 23% of respondents suggested that they had 'seriously considered' moving out of Sydney, and another 21% had 'somewhat considered' it. Only half of those considering moving would stay in NSW.

Any strategy to build jobs growth in NSW would be incomplete without actions that continue to address transport and planning bottlenecks. We see the need for potential housing and transport projects to meet clear metrics for outcomes on jobs and quality of life, with government-led projects to be prioritised on those metrics. Many of these initiatives are already incorporated in government policies and population forecasts. This report highlights their need to ensure interstate migration is kept at or below the projections in the *NSW Intergenerational Report 2016*.

Initial action for Priority 4.4

To advance this strategic priority, the NSW Government should initially:

- **Explore liveability and job outcome metrics for new transport and development projects in addition to conventional benefit-cost analysis (*Explore*).** Departments should collaborate to consider and incorporate liveability and job outcomes in transport, planning and infrastructure decisions. Already, the NSW Government is focusing on expanding housing supply in areas with good access to jobs. In addition, this action would see design and policy processes and practical metrics that consider the location and nature of urban and regional developments, and better relate them to job outcomes and liveability. The factors that drive liveability include transport, green space, cultural institutions, infrastructure, amenities and affordable housing. These are the factors that attract high-wage workers and jobs to emerging clusters in the target segments with the potential to be globally competitive. Accordingly, the Greater Sydney Commission and UrbanGrowth would include journey time to work in the set of potential liveability and job-outcome metrics to complement conventional benefit-cost analysis.


3

D. Whole-of-government agenda for action

We have proposed four strategies that respond to the challenges our research has highlighted, and are big enough to take us to our aspiration: 'ensuring everyone in NSW has the opportunity for a meaningful working life, today and in the future, leading to an additional 1 million jobs in NSW by 2036'. These strategies are beyond the remit and capacity of any one department, and so demand whole-of-government action.

Each of the four strategies has priorities that should endure over the full 20 years. These jobs priorities are the real guts of our recommendations. None of them are easy. They are long-term drivers of jobs growth that would engage multiple stakeholders and demand constancy of purpose over two decades.

It is impossible to map out the actions that will be needed to fulfil all these priorities and achieve our strategic goals over 20 years. Instead, we have suggested actions to explore or implement immediately: see Figure 24, replicating Figure 2. These are the start of an agile agenda for action to create jobs in NSW: an agenda that follows a strategy and is fiscally responsible, but that is flexible and responsive to changing economic and social conditions. The agenda must remain agile, with actions changing over time, expanded when successful, adapted to suit conditions, dropped when unsuccessful or having met their objective. The timeframe for implementing, and in many cases completing, these actions would be three to four years.

We nominate two types of actions in this report, as marked on the Agenda for Action (Figure 24):

Figure 24. Jobs for the future strategies, enduring priorities and initial agenda for action

Strategies	Enduring priorities (over 20 years)	Proposed Initial actions (~3–4 years)	Status
1. Nurture our globally competitive growth segments	1.1 Unlock barriers to growth for a small set of target segments	▪ Government Concierge to work with leading employers to identify and remove barriers to growth and competitiveness	Action
	1.2 Promote the development of distinctive geographic clusters	▪ Cluster champions to advance profile and levers for growth ▪ Three place-based policy pilots, one each in inner and Western Sydney and in regional NSW	
2. Open doors for entrepreneurs	2.1 Build a supportive ecosystem for entrepreneurs	▪ Sydney School of Entrepreneurship ▪ Expanded network of entrepreneur shared spaces ▪ Government and Corporates as first customers	Action Explore
	2.2 Stimulate early-stage investment in future gazelles	▪ Sydney and regional funding and networking opportunities ▪ Jobs for NSW Gazelle Financing programs	Action
	2.3 Support and signal a strong culture of entrepreneurship	▪ Targeted reforms to the NSW Jobs Action Plan	Explore
	2.4 Make NSW the easiest state to start and grow a business	▪ Existing NSW State Priority: 'Strong Budget and Economy' ▪ Review of NSW's regulatory management system	Action
3. Skill up for the knowledge economy	3.1 Accelerate reforms for integrating interactive-skills learning in schools	▪ Interactive skills pilots for K-12 ▪ School leaver readiness and networking pilots (also for SP4.3)	Explore
	3.2 Promote a more flexible, outcomes-based VET system	▪ More flexible qualifications and apprenticeship models ▪ Stronger outcomes-based management of VET sector	Action
4. Draw on all of our people	4.1 Make NSW the best place to work for people 65 and over	▪ Barrier reductions for workers aged 65 and over	Explore
	4.2 Make NSW the best place to work for women with children	▪ Greater childcare access and reduced disincentives for increasing hours of paid work	
	4.3 Promote thriving regional centres that create work opportunities for youth	▪ Accelerated strategic place-based investment to drive regional economic growth and jobs	
	4.4 Make NSW the most 'liveable' State	▪ 'Liveability' and job outcome criteria for transport and planning projects	

- **Explore** means that a lead government department should thoroughly investigate the action, with a bias to making it happen. The exploration may also identify other, demonstrably preferable, actions for the same objectives. These may replace potential actions that have unanticipated flow-on effects, or ultimately fail a cost-benefit analysis.

- **Action** means that the lead department should proceed with implementing the action. In some cases, they are already underway.

The actions proposed to advance the strategic priorities are described in detail in their respective sections of this report.

The role of Jobs for NSW

As the NSW agency dedicated to creating jobs, Jobs for NSW proposes that it would take both a lead coordinating role in the Jobs for the Future strategies, as well as direct responsibility for a number of its actions. Responsible for a Jobs for NSW Fund of $190 million, our own business strategy reflects these roles, with actions to deliver our own programs, drive statewide priorities and broker business-government job-creating initiatives.

- **Jobs for NSW programs to fuel jobs growth.** Our focus here is on gazelles and start-ups in all segments and on attracting selected large companies to NSW as significant job creators. In doing so, we must meet our legislative objective of allocating 30% of the Jobs for NSW funds to regional NSW. Our work for gazelles and start-ups matches Strategy 2 in this report. We are actioning a $50 million loan guarantee program for gazelles and a $10 million accelerator and incubator program to support the gazelles of tomorrow. We have also set aside $30 million to attract large companies to site their headquarters in NSW.

- **Advocating and coordinating the *Jobs for the Future* strategies.** Jobs for NSW has an advocacy and coordination role which aims to keep jobs at the forefront of government policy. The whole-of-government agenda for action presented above is our guiding document. For example, to help skill up for the knowledge economy, Jobs for NSW can work with our colleagues in the Department of Industry, Skills and Regional Development to ensure its skills-development programs are aligned with job creation objectives, especially in focus segments. In all strategy areas, we can provide a fact base for debate and policy, and challenge any false assumptions that would otherwise undermine job-creating actions. And, we can help agree on job creation targets with partner agencies to ensure a robust approach to whole-of-government delivery.

- **Brokering solutions with other stakeholders.** For the segments targeted in Strategy 1, we will appoint a government concierge and work with them and other stakeholders to find specific solutions to specific issues. Our starting segments are tourism and international education, for which Destination NSW and Study NSW have the lead responsibility. However, Jobs for NSW can leverage its extensive research and analysis to identify barriers to jobs growth, and work with these agencies to overcome them.

These three areas will be Jobs for NSW's focus for the next five years. We will be agile in pursuing them, reviewing the progress of each action with the relevant government agencies, and adjusting them to ensure that NSW can and will deliver its jobs for the future.

The actions proposed in this report would add to the initiatives currently underway by state and local governments, businesses and community leaders to foster sustainable employment, growth and prosperity in our future. We believe that each is possible, but many need to be thoroughly explored before action, and would rely on the experience and expertise of agencies across government for their successful delivery. Those discussions are already underway.

Together, these actions would initiate a jobs agenda that would be responsive, agile and energising for our state. They would kickstart the enduring priorities that will lead to high-quality jobs growth over the next 20 years and deliver 1 million more jobs in NSW.

Our strong economy and jobs growth will be driven by globally competitive segments and a lively entrepreneurial ecosystem, a growing population well-prepared for the knowledge economy, and an active workforce irrespective of gender, age and location.

The result will be a NSW that offers rewarding working lives for our citizens within a rich cultural mix, with ready access to world-beating locations, in a vibrant, well-balanced and diverse economy.

References

Figure notes

Figure 4. **Notes: 1** CAGR of jobs in 2015 does not equate to adding the component CAGRs due to multiplication effect. **2** Increase in population x Age distribution (1996) x Participation rate (1996) x Employment rate (1996). **3** Shift in age distribution (increase in % of population > 15 years) x Population (2015) x Participation rate (1996) x Employment rate (1996). **4** Increase in participation rate x Age distribution (2015) x Population (2015) x Employment rate (1996). **5** Increase in employment rate x Participation rate (2015) x Age distribution (2015) x Population (2015). **6** The reduction of employment in 2015 if average hours worked per worker was at 1996 levels and total hours worked remained the same.

Figure 9. **Notes: 1** Traditional productivity comparisons in the finance sector are difficult due to complexities measuring sector GVA.

Figure 10. **Notes: 1** Excludes 'nfd' fields for which there was 0 value in 1996. **2** 2015 data uses January–November average. **3** Some domestic industries may have an exportable component (e.g. cafes, restaurants may relate to tourism).

Figure 12. **Notes: 1** Over a four-year horizon. Assumes top 11 target segments reach their 'aspiration' defined in this document, and the rest of the economy grows at trend.

Figure 13. **Notes: 1** Location Quotient (LQ): measures the concentration of a region's employment in a particular industry. **2** The CAGR may be impacted by the availability of data (e.g. change in proportion of persons not defining a region or industry in 2006 vs 2011; gaps resulting from mapping between SLAs in 2006 and SA4s in 2011). For purposes of our calculations, we have ignored all region/industry combinations with an undefined industry or region (including migratory offshore).

Figure 14. **Notes: 1** Categories: small = 1-4 or 5-19 employees, medium = 20-199, large = 200+. "Grew" means moves into next employment bracket. **2** Businesses in each category as a percentage of total businesses in existence Jun 08 plus all new businesses to 2014. **3** Calculated total employment at June 2008 differs to actual by ~250K and June 2014 differs to actual by ~20K. This is likely due to shifts in average number of jobs in each employment bracket through time. **4** The losses by med-large companies may be overstated due to assumptions of the average number of employees used for businesses within different employment brackets. The highest employment bracket is 200+ and any companies that were 200+ at the start of the observation period and stayed 200+ at the end of our observation period are counted as having 0 jobs created.

Figure 17. **Notes: 1** ANZSCO major group of 8 grouping can be divided as follows: Knowledge-intensive jobs: Managers, professionals and community & personal service workers. Routine jobs: Clerical & admin workers and sales workers. Physical jobs: Technicians, labourers and machine operators. **2** 2015 data uses January – November average.

Figure 18. **Notes: 1** Australian wage data at ANZSCO unit group level of 358 weighted for NSW workforce composition. **2** 1996 data CPI adjusted and matched to ANZSCO unit group level of 358 (1996 data not equivalent in terms of granularity provided by ABS for 2015). **3** Job numbers represent November quarter figures for 1996 and 2015, based on latest available wage data as of May 2014.

Figure 20.	**Notes: 1** We define automation potential by the work activities that can be automated by adapting currently demonstrated technology. **2** Only one of 358 ANZSCO occupations is untouched: Ministers of Religion (#2722) are not expected to have an automatable job component. **3** At ANZSCO unit group level of 358. **4** Based on number of jobs in 2015.
Figure 21.	**Notes: 1** Calculated using population and age mix forecasts in 2016, and calculated overall participation and employment rate by applying the participation and employment rates at each age band as in 2015 to the 2016 demographics. **2** Calculated using population forecast in 2036, age mix in 2016, and overall participation and employment rate as in 2016. **3** Calculated using population and age mix forecasts in 2036, and overall participation and employment rate as in 2016. **4** Calculated using population and age forecasts in 2036, calculated overall participation rate in 2036 by applying the participation rates at each age band as in 2015 to the 2036 demographics, and overall employment rate as in 2016. **5** Calculated using population and age forecasts in 2036, overall participation rate in 2036, and calculated overall employment rate in 2036 by applying the employment rates at each age band as in 2015 to the 2036 labour force. **6** Increase due to slight increase in overall employment due to increased labour force of 65+ which have a 99% employment rate, therefore skewing overall average upwards.
Figure 22.	**Notes: 1** Additional intensity increases hours worked, but not number of jobs. **2** Potential hours for women of children shown as two separate effects of increasing participation rate (holding average hours constant) and intensity of work (holding participation rate constant).
Figure 23.	**Notes:** Single mother with 2 children aged 2 and 3 years, working 3 days a week with a gross salary of $37,440 per year, and long-day costs of $80 per day per child.

Endnotes

1. There are many definitions for 'gazelle' in this context. The OECD definition of a 'gazelle' is an enterprise 'up to 5 years old with average annualised growth greater than 20% per annum, over a three-year period': http://www.oecd.org/industry/business-stats/39974588.pdf last accessed 6 July 2016. In the research undertaken by McKinsey & Company for this project, the condition of 'payroll over $750,000' replaced that of the 5-year limit, so that aggregate data from the Office of State Revenue could be used. In this regard, the term 'gazelle' is closer to the OECD definition of 'high-growth enterprise': simply an enterprise 'with average annualised growth greater than 20% per annum over a three-year period', with growth measured either by revenues or number of employees.
2. Paraphrasing the full Australian Bureau of Statistics definition in *Labour Statistics: Concepts, Sources and Methods, 2013* (the latest release) at http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/6102.0.55.001Chapter92013, which defines a job as one or more hours of work per week.
3. McKinsey Global Institute, *Global flows in a digital age*, 2014 p 14.
4. Comparing NSW wage price index (WPI, ABS cat. 6345) against Sydney consumer price index (CPI, ABS Cat. 6401) for 1997–2015.
5. Assumes wages and productivity trends (1996-2015) continue and employment rate remains as it is at 2015.
6. NSW Budget 2016–17, Budget Speech.
7. NSW Budget 2016–17, Budget Speech.
8. Comparing NSW wage price index (WPI, ABS cat. 6345) against Sydney consumer price index (CPI, ABS Cat. 6401) for 1997–2015.
9. ABS Cat 6202 Labour Force, Australia.
10. ABS Cat 6202 Labour Force, Australia.
11. ABS Cat 6202 Labour Force Table LM1b.
12. ABS Cat 6202 Labour Force, Australia.
13. ABS Cat 6202 Labour Force, Australia, Table LM3 Labour force status for 15-24 year olds by Age, Educational attendance (full-time), Sex and Year left school, April 1986 onwards.

14. Department of Employment, Labour Market data; ABS Cat 6202 Labour Force, Australia, Table LM1.
15. Comparing NSW wage price index (WPI, ABS cat. 6345) against Sydney consumer price index (CPI, ABS Cat. 6401) for 1997–2015.
16. ABS Cat 1220, ABS Cat 6129 Table EQ08, McKinsey Global Institute.
17. See Figure 14.
18. Industry sectors mapped by McKinsey and Department of Industry against ANZSIC 86 sub-divisions, with 'domestic, core and enabling industry' classifications as used in McKinsey & Company, *Compete to Prosper: Improving Australia's global competitiveness*, 2014.
19. McKinsey & Company, *Industrial revolutions: capturing the growth potential*, 2014.
20. Analysis from industry and 'place of work' codes in the 2011 Australian Census.
21. McKinsey Global Institute 2014, *Global Flows in a Digital Age: How trade, finance, people and data connect the world economy*.
22. McKinsey & Company, *Compete to Prosper: Improving Australia's global competitiveness*, 2014.
23. McKinsey & Company, *Compete to Prosper: Improving Australia's global competitiveness*, 2014.
24. McKinsey & Company, *Beyond the Boom: Australia's Productivity Imperative*, 2014.
25. To 10.2% by 1995, and then to 12.4% by 2007. Sourced from ABS Cat 5206.0 (Expenditure, Income and Industry Components of Gross State Product, New South Wales, Chain volume measures and current prices).
26. For the complete methodology of the sector selection, see AlphaBeta, *Future Focus: Seizing the opportunity to create high-quality jobs in high-potential industries across NSW*, May 2016.
27. NSW Department of Industry, Report on Industry Employment Projections, 2016.
28. McKinsey & Company, *Compete to Prosper: Improving Australia's global competitiveness*, 2014 p 20.
29. McKinsey & Company, *Compete to Prosper: Improving Australia's global competitiveness*, 2014 p 20. Australian tourism ranks 11th on the WEF Travel and Tourism Competitiveness Index; in 2010 Australia had the third-highest share of international education (behind the US and UK), according to the OECD *Education at a Glance* 2015.
30. Committee for Economic Development of Australia, *Australia's Future Workforce*, 2016; World Economic Forum, *The Future of jobs: Employment, Sills and Workforce Strategy for the Fourth Industrial Revolution*, 2016; *NSW Intergenerational Report 2016*.
31. AlphaBeta, *Future Focus* p 12.
32. AlphaBeta, *Future Focus* p 6.
33. McKinsey & Company, *Industrial revolutions: capturing the growth potential*, 2014.
34. Analysis from industry and 'place of work' codes in the 2011 Australian Census.
35. Analysis from industry and 'place of work' codes in the 2011 Australian Census.
36. Mapping 2011 Australian Census data against AlphaBeta, *Future Focus: Seizing the opportunity to create high-quality jobs in high-potential industries across NSW*, May 2016.
37. A high paying job is one taken to be over $78,000. Analysis from industry and 'place of work' codes in the 2011 Australian Census.
38. McKinsey & Company, *Industrial revolutions: capturing the growth potential*, 2014.
39. http://jobs-ohio.com/images/SF_Aero_Aviation.pdf, last accessed on 6 July 2016.
40. http://www.technologydecisions.com.au/content/gov-tech-review/article/ballarat-training-investment-expands-as-ibm-partnership-pays-off-100219763 last accessed on 6 July 2016.
41. OECD, *Entrepreneurship at a Glance*, 2015.
42. OECD *Science, Technology and Industry Scoreboard* 2013 (date for actual countries varies).
43. 4% compared to 8% of 16-25yos, ranking last in a peer group of 8 developed countries: Infosys 2016, *Amplifying Human Potential: Education and Skills for the Fourth Industrial Revolution*, Figure 10.
44. Calculations based on bespoke data provided by Australian Bureau of Statistics, based on Counts of Australian Businesses database.
45. See Endnote 1.
46. US Census Business dynamics statistics; Business employment dynamics.

47. OECD *Entrepreneurship at a Glance*, 2015, Calculations based on bespoke data provided by Australian Bureau of Statistics, Counts of Australian Businesses database, and by Office of State Revenue.
48. See notes to Figure 15.
49. GEM *Global Entrepreneurship Monitor*, 2014.
50. OECD, *Entrepreneurship at a Glance*, 2015.
51. Interviews conducted with industry experts for the purposes of this report, April 2016.
52. ABS Cat 5655.0, Managed Funds, Australia, 31 December 2015.
53. Financial Services Council and UBS Global Asset Management, *State of the Industry: Financial Services and SMSFs in Australia*, 2014.
54. http://www.tradingeconomics.com/australia/gdp last accessed 30 June 2016.
55. OECD, *Entrepreneurship at a Glance*, 2015.
56. GEM *Global Entrepreneurship Monitor*, 2014.
57. 67%, less than all other surveyed countries except Singapore: GEM Global Entrepreneurship Monitor, 2014.
58. 4% compared to 8% of 16-25yos, according to Infosys, *Amplifying Human Potential*, http://www.experienceinfosys.com/humanpotential.
59. World Economic Forum, *Global Competitive Index*.
60. Analysis from 2011 Census, ABS 1220, ABS 6129 table EQ08 (employed persons by ANZSCO – data excludes non-matching categories between 1996 and 2015), McKinsey Global Institute (MGI).
61. 2011 Census, ABS 6306, ABS1220, ABS 6129 table EQ08 (employed persons by ANZSCO—data excludes non-matching categories between 1996 and 2015), McKinsey Global Institute (MGI). Assumptions 1) Target segment employment impact from AlphaBeta report (low case projections extrapolated to 2036). Additional jobs created are sourced from remaining sectors. 2) 30% realisation of possible automation by 2036 (baseline of current course and speed only) as current course and speed already includes a base level of automation 3) Jobs lost to automation in Routine and Physical jobs are reallocated to Knowledge-intensive jobs (50%), Routine jobs (20%) and Physical jobs (30%). All Knowledge-intensive jobs reallocated within the same category. Baseline: 2036 current course and speed only (excluding target segments).
62. Because physical jobs are often constrained to a time and place, they are less prone to unbundling than routine jobs.
63. McKinsey Global Institute, *Digital Globalization: The new era of global flows*, February 2016.
64. http://www.intersective.com/globalscope/, last accessed 6 July 2016; reference group interviews.
65. 85% of students in Spain now have a job in digital industries; 74% of Indian hospitals acknowledge educational outcomes by combining technical and 'soft' skill training; 100% job offers from the Kenyan program; 83% of graduates received job offers in Mexico; 93% of US program passed nursing exam (50% national average): McKinsey Generation (MSI program).
66. Women make up 65% of students at the University of New England, 57% at the University of Sydney, 56% at the University of Newcastle, 55% at the University of Western Sydney, 50% at the University of Technology Sydney and 46% at the University of NSW: http://www.universityrankings.com.au/gender-balance-ratio.html.
67. Productivity Commission, *Childcare and Early Childhood Learning*, 2015.
68. *NSW Intergenerational Report 2016* p 29.
69. *NSW Intergenerational Report 2016* Chapter 6.
70. World Economic Forum, *Why is Japan's economy shrinking?* 2016.
71. PwC, *Disability expectations: Investing in a better life, a stronger Australia*, 2011 p 10.
72. Productivity Commission, *Childcare and Early Childhood Learning* 2014, Cameo 2, estimates based on ABS (2013c).
73. OECD *Education at a Glance*, 2015, Table C2.3.
74. Productivity Commission, *Childcare and Early Childhood Learning* 2014, Overview p 10.
75. OECD *Education at a Glance*, 2015, Table C2.3.
76. Productivity Commission, *Childcare and Early Childhood Learning* 2014, Overview p 10.
77. ABS *Migration, Australia*, Cat 3412.0; *NSW Intergenerational Report 2016* page 6.