



Response

to the Queensland Government's  
Review of the  
Smart State Strategy

November 2004

## **GRIFFITH UNIVERSITY RESPONSE TO THE DISCUSSION PAPER:**

### **“Queensland’s future – building on the Smart State”**

25 November 2004

Griffith University is pleased to provide a response to the Queensland Government’s discussion paper on the future of the Smart State Strategy: “Queensland’s future – building on the Smart State”. We have used the prescribed pro-forma for our response, and have addressed those issues on which we believe the University’s activities and experience allow us to make significant comment. As can be seen, Griffith University is strongly committed to the Smart State Strategy and wishes to see it develop to enable it to deliver the best outcomes for Queensland’s future.

#### **Our performance so far**

1. What do you consider to be the key challenges Queensland will face over the next 10 years?

At the outset it needs to be said that Griffith University strongly endorses the Queensland Government’s Smart State Strategy. However, the initiative risks losing momentum and eventually going backwards over the next 10 years unless the right steps are put in place.

The Smart State should rest on 3 Foundations:

1. smart research
2. smart people
3. a smart physical, social and political environment

Policies, strategies and programs are therefore needed to:

1. attract more hi-tech industry to Qld, to create the high productivity jobs for our children,
2. enhance our R&D capacity in terms of people as well as infrastructures,
3. boost tertiary education, to ensure the skills are there to capitalise,
4. strengthen our communities,

5. build a culture that actually wants and appreciates a Smart State,
6. protect our environment so the conditions are there to allow Queenslanders to enjoy and continue to support the growth of Queensland as a Smart State, and
7. build an attractive, vibrant cultural life that helps draw people to Queensland

#### Attracting more hi-tech industry to Queensland

Queensland must have an edge over other states to draw biotechnology and other hi-tech industries to locate here and to develop new products and markets from within our state. We propose a new Higher Education and Industry Growth Scheme, explained below under item 9, which will address what we believe are now the two key requirements to maintain and increase growth:

1. Provision of recurrent funding carefully targeted at the very highest quality research teams, to allow them to break out in entirely new directions that will build exciting new commercialisation opportunities along with new teams to sustain them.
2. Creation of real incentives to industry, simultaneously offering them ground-breaking Qld R&D teams and matching cash returns once set thresholds of cash investment in Queensland R&D are reached.

#### Using People Support to enhance our R&D capacity

Queensland needs to establish a mechanism for recurrent funding for its top researchers, such as a Senior Research Fellowship scheme, as explained under item 10 below. This will give Queensland an edge to attract the best researchers and keep them in the state long enough to build new research teams and seed the next major R&D projects that can build future industries.

#### Boosting tertiary education

Queensland's skill levels need an urgent boost. Currently the focus has been on enhancing school-level skills and vocational training, and now much more effort must be made to skill up the emerging population to participate in, and benefit from, the growth in hi-tech industry and the R&D that must continue to seed new industry opportunities. This means wider participation in higher education, both in numbers and in spread across regions. We will only succeed in attracting the industries we need, and in keeping them in Queensland, if the sophisticated workforce is here to support them. And, we need that workforce in place in the regions that Queensland wants to develop. Abolition of payroll tax for Queensland's universities is a necessary step to maximise the returns from both tertiary education and R&D in the universities. Under items 3 and 4 below, these points are further discussed.

#### Smart people - adopting the culture of the Smart State

For Queensland to be and to remain the Smart State, its people need to be able to think, manage their resources and organise themselves in Smart ways. The

boosting of education needs to be over comprehensive areas of understanding, cultural awareness and social responsibility, over and above the necessary technical skills. Social justice, responsible planning, sustainable development, multi-cultural awareness and other key concepts embodied in the humanities and social sciences need to be valued and the knowledge acquired to put them into practice. Only such an educated population will successfully design and build a truly Smart State.

Further, we need to develop implementation strategies to ensure that the benefits of new technologies and new community-building programs are understood and adopted throughout the state. In industry, this may mean demonstration plants akin to the extension services previously used to good effect in agriculture whereby demonstration farms and extension officers were used to make sure that farmers saw and gained enthusiasm for the benefits of new and better practices. With community-building initiatives such as evidence-based early intervention programs in schools and families, relevant practitioners and regulators need to be systematically exposed to exemplars in practice, and extension services developed for community education.

Once the momentum of the Smart State has been maintained over the next 20 years, Queenslanders will feel the benefits in the longer term. However, we need much more belief in the Smart State now so the Government will have the people behind it in making the changes that will lead eventually to those tangible improvements in everyday life. In an era of media-directed public awareness, strong support must be given to the creative and performing arts and to nurturing genuine collaborations between creative industries and science that can bring the nature and potentials of a Smart State right out into the open.

#### Stronger, healthier communities in the context of rapid growth and aging

Managing population changes – primarily population growth and aging – will challenge Queensland very significantly over the next 10-20 years. Keys to success will be:

- Urban and Regional Planning
- Smart aging
- Prevention and early intervention for children, young people and families
- Sustainable environmental management, including water resources management (see below)

Queensland's rapid population growth and disproportionate increase in the aged demographic make it imperative to develop new skills in population health and management of the diseases of aging. The Gold Coast corridor offers an ideal setting to study developing urbanisation and its impact on community health, and to grow cutting edge research with a clinical focus on major public health issues. This would augment the current predominance of fundamental biomedical R&D in Queensland universities and medical research institutes by providing the missing translational research and applications. This theme is pursued further under item 8 below.

To deliver the Smart State, and to ensure its sustainability into the future, social issues and public policy development need greater focus. Population growth and productivity gains will be reversed if we allow quality of life to slip back so that Queensland loses its edge in appeal over other states. Physical infrastructure, health care, water and energy, and cultural and leisure resources need the best management and governance to ensure the confidence of the public. Recent events have shaken the public's faith and generated concern about future trends. Protection of children and enhancement of family life and community connectedness are also vital underpinnings of a confident people who will remain loyal to the interests of their state.

This means a strong recommendation for Queensland to invest in *public health, translational medical research*, addressing social issues through advances in the *social sciences*, including *urban and regional planning*, and *public policy development*. Our response under Item 8 below reflects this recommendation.

#### An environment that sustains growth and keeps Queensland the envy of others

One of the most vital areas for research and development is sustainable environmental management. Our environment gives the underpinning to the health, vitality and attractiveness of our communities.

Queensland's biodiversity is one of its greatest assets, but is endangered by our population growth, the byproducts of industry, and increasing urbanisation, as well as the impacts of tourism if poorly planned.

The limits on water supply for agriculture, industry and residential consumption mean that we must lead Australia in water quality maintenance, recycling and the health of our waterways. The same imperative applies to preserving the drivers of tourism and migration to Queensland – the coasts, the forests and waterways, and our biodiversity.

As referred to under item 8 below, R&D infrastructure for sustainable environmental management must take a higher priority alongside the current emphasis on biomedical R&D.

#### An attractive, vibrant cultural life for Queensland

It is vital for Queensland to have a vibrant cultural scene to attract members of the global executive and professional classes. The importance of this influence cannot be underestimated if we are serious about attracting and holding the world's best innovators, managers and venture capitalists. Queensland is emerging strongly from its erstwhile image as a "cultural desert" much touted by southern states in past decades, but this development needs to be further accelerated. High level support of creative arts and industries in Queensland must become an even stronger feature of the Government's commitment to building and sustaining the Smart State.

2. How do you think the success of the Smart State should be measured?

- Standard economic indicators including employment, investment, productivity, export earnings
- Return on investment
- Community well-being measures, such as the *Total Quality of Life Index*
- Environmental health measures
- Levels of tertiary qualifications in Queensland population, and regional distribution
- Mental health and family relationships measures
- The Australian Bureau of Statistics' *Measures of a knowledge-based economy and society*

## **A vision for the future**

### **Skilling the Smart State**

3. Are the Government's education and training policies and programs targeting the right areas?

We need to move beyond the current focus on VET at school level. The Smart State must have a major boost in tertiary graduates including research higher degree graduates (Masters and PhDs). For best results we must target high quality potential research students from interstate and overseas, as well as encouraging young educated Queenslanders to follow this path.

4. What additional programs are needed?

To achieve this, one useful strategy would be to introduce Queensland Research Higher Degree scholarships and Coursework Postgraduate scholarships. These could be introduced on the basis of co-contributions from universities or fee-paying students. Coursework Higher Degrees could include for instance MBAs in biotechnology, to enhance Queensland's skill base for technology transfer and the commercialisation of R&D in biotechnology. They could be akin to Churchill Fellowships, granted to outstanding people in the field, with perhaps 50% offset in fees with the individual or their emerging enterprise picking up the balance.

Queensland at present has a relatively low level of average income, and this correlates with low educational / skill levels. Queensland needs to establish state targets for graduates and RHDs and put in place incentives to help realize these targets.

To boost the ability of Queensland's universities to deliver the essential outcomes for the Smart State, payroll tax for universities needs to be abolished. The Australian National University and the University of Canberra are exempt payroll tax, and this significantly advantages them. The abolition of payroll tax on

Queensland universities would support the Smart State strategy by increasing our capacity to invest in research staff and enhance the quality of education.

### **Building Queensland's scientific, research and innovation facilities**

8. Over 60% of the Government funding committed to date supports projects in medical research. What do you consider to be the future priority areas for scientific and research facilities funding?

While it is important to maintain investment in medical R&D to continue to build one of the strongest areas of hi-tech industry, we recommend that greater emphasis now be given to projects in:

- Translational health and medical research
- Small-scale technologies (nano- and microtechnology)
- Service industries R&D
- Creative arts
- Social policy initiatives for stronger communities
- Urban and regional planning
- Sustainable environmental management

9. How can we promote investment in R&D in existing and emerging industries?

We wish to make four proposals for boosting investment in Queensland R&D:

#### A new Higher Education and Industry Growth Scheme

While the Smart State strategy has so far provided infrastructure funding to support productive research teams who are turning existing top R&D projects into commercial returns and the establishment of local industries, this is not enough to ensure that Queensland continues to grow as a Smart State.

The crucial question is: who will develop the next new research themes that will lead to new industries? The answer in most cases will be the same top-level researchers – but only if they can find resources to commence and follow up entirely new lines of enquiry, and build new R&D teams, alongside their current projects.

To do this, they need recurrent funding. The Queensland Government needs to put priority now on a new stream of Smart State recurrent R&D funding. Of course, it is vital to ensure the optimal use of taxpayer funds, and this means very defensible targeting of researchers to receive this support. They must have proven ability to innovate, to attract very substantial industry investment, and to operate successfully in the open commercial marketplace.

We propose therefore that the Queensland Government introduces a scheme involving matching funds to industry cash investment in Queensland R&D. Such a scheme would target the best research teams, being based on market forces driving industry investment. It would simultaneously provide the necessary recurrent funding to these teams to support their new initiatives, and also give financial

reward to companies for making such investments in Queensland. It must of course be based on matching only cash contributions by industry, not in-kind contributions, since the latter are a much weaker indicator of industry commitment. It must also operate with clearly set thresholds of investment to protect against dissipation of State funds in anything other than the most high-level prospects.

Under the hypothetical name of the Smart State Higher Education and Industry Collaboration Scheme, it might operate on principles akin to the following:

- Minimum industry cash investment in Queensland higher education institution R&D to activate matching Smart State funds: \$5.0 million
- Recipient of first \$5.0 million of matching funds: The HE institution
- Above \$5.0 million threshold for industry investment, and below \$20.0 million, matching Smart State funds to go equally to the HE institution and the industry investor
- Above a threshold of \$20.0 million industry investment, 100% of matching funds go to the industry investor.
- Smart State funds will only be provided to companies who have established a Queensland branch, and will only be paid to that Queensland branch.

Given, for instance, a \$25.0 million investment by industry, this would mean the following application of Smart State funds:

Threshold	Industry Investment	Smart State funds recipient(s)	University share of Smart State funds	Industry share of Smart State funds
1	\$5.0 M	100% to University	\$5.0 M	-
2	\$5.0 - \$20.0 M	50:50	\$7.5 M	\$7.5 M
3	Above \$20.0 M	100% to Industry	-	\$5.0 M
<b>TOTALS</b>	<b>\$25.0 M</b>		<b>\$12.5 M</b>	<b>\$12.5 M</b>

This structure would ensure that the R&D team in the HE institution would get the initial benefit, putting the resources where they are most needed to secure research outcomes. Industry is incentivised to choose carefully and then invest strongly, to obtain the maximum leverage out of State Government support. The multiple benefits to the company create a strong impetus for them to spend in Queensland on new knowledge aimed at commercial outcomes. Queensland gets maximum benefit through the knowledge creation resources, the financial leverage of industry investment, and new jobs, status, cashflow within the state, and ideal placement for other initiatives to be developed through the local branch of the industry investor.

#### Boosting pharmaceutical industry development using the Commonwealth's P3 Scheme

One of the prime resources to support R&D development is in the pharmaceutical industry, namely the Commonwealth Government's P3 scheme. Queensland industries have not yet had a successful proposal to this scheme. To achieve

success, we propose that the State offer matching funding with the Commonwealth for Queensland applications under the P3 Scheme.

#### Gaining more leverage through the ARC Linkage Scheme

Another effective strategy would be to incentivise existing corporations, especially SMEs, to collaborate with universities on applied research under the ARC Linkage Projects scheme. High returns could be gained by the State expending modest funds to promote Linkage collaborations to industry rather than leaving it only to university researchers to identify and persuade companies and government agencies to participate. Moreover, many small emerging enterprises which would flourish with the support and direction given by Linkage research, are also those least able to free up resources to make the cash contributions required. Grants from State Government or recoverable loans similar in structure to the Smart State Research Facilities Fund should be given to such emerging industry collaborators to take up Linkage Projects, with offsetting agreements for share of IP rights. This is a way to give Queensland SMEs an edge over other states in gaining the leverage afforded by the Commonwealth Linkage scheme.

#### A distributed system of innovative R&D + Commercialisation precincts

International experience suggests that great innovative precincts are based on significant government investment in competing organizations and institutions. Efforts should not therefore be targeted at centralising or concentrating R&D and industry development.

Moreover, proximity matters when it comes to business collaboration, especially for small and medium-sized enterprises (SMEs). Regional distribution of industry development precincts near universities will maximize innovations and diversity of industrial outcomes in our large, developing state. Richard Lambert, author of the influential *Lambert Review of Business-University Collaboration* delivered to the UK Government in December 2003, stressed that informal networks cannot easily be sustained over long distances, and even large companies find it more efficient to work with research departments in their own locality. If SMEs are distributed across the state, and recognizing that regional development imperatives make it important to ensure that they are, we need to ensure that universities with relevant research infrastructure are also well distributed and flourish in many regions of the State as well as throughout Brisbane.

Regional focus is essential to broaden Queensland's economy beyond the immediate environs of the Brisbane CBD. It has to be recognized that higher educational levels and socio-economic status are very locality-sensitive. If the Smart CBD is to become genuinely the Smart State we need to increase both the breadth and depth of the skills base in key regional growth centres such as the Logan / Gold Coast corridor. The South East Queensland Regional Plan points in the same direction. We need therefore to link geographic location of higher education facilities and research infrastructure to where this development must occur. This will lead to jobs where the people are, increased skill levels, value adding and productivity, and therefore to sustainable industries and communities.

## 10. How do we attract and retain research specialists in Queensland?

Queensland needs to expand its provision of research fellowships to attract and retain the best researchers including the most promising young researchers. This means augmenting the current Smart State Fellowships to target advanced researchers as well as promising early career researchers. Queensland needs a scheme more akin to the Commonwealth's ARC Federation Fellowships scheme. To ensure best choices, universities would be required to make a co-contribution to Fellows' salaries and on-costs.

This would give very good leverage in R&D outcomes for the State's funds, through the universities' co-contributions and possibly further leverage with Commonwealth funds where Fellows are successful concurrently in ARC fellowship programs. The top-up funds will ensure that top researchers can be attracted by the availability of funds to support their research as well as salary. Eminent researchers such as are attracted through the ARC Federation Fellowship scheme frequently bring substantial project grant funds with them, and often draw a top team of more junior collaborators with them to form the basis of their new research team. This is what Queensland needs.

At a more fundamental level, Queensland needs to look at how to support its existing best and brightest researchers, to ensure that the maximum outcomes be generated out of their efforts. This means a hard look at the level of "People Support" provided by the State.

In Queensland, it is tempting to want to leave it to the Commonwealth Government and the universities to find the recurrent funding for top scientists. But what is going to draw them to come and stay in Queensland rather than other states and overseas, long enough to invent / discover the next big thing, if they can get the same or better funding elsewhere?

While Queensland does need to encourage budding researchers on the one hand, it is vital that we also capitalise on the very best researchers so they will stay to lead the way, draw in others to join with their excellence, and foster brand new industries in the process.

Note that such senior research fellowships would aim at providing with recurrent funding, individual top researchers who are in a more general category than those leading teams which have already won substantial industry funding and might therefore be able to obtain recurrent support from the Queensland Government through the suggested Smart State Higher Education and Industry Collaboration Scheme.

We recommend that the Queensland Government set up a planning team including senior representatives of Queensland's universities and research institutes, to consider how best to track the strongest research performers, and to develop a model for funding their research to keep them in Queensland. The existence of such a senior research Fellowship scheme will further enhance Queensland's Smart State leadership reputation as a preferred destination for the top international researchers.

## **Commercialising and applying discovery and innovation**

### 11. What are the existing barriers to commercialisation of our R&D in Queensland?

General impediments to the progress of commercialisation of R&D in Queensland are:

1. Lack of people experienced in commercialisation of R&D
2. Lack of Australian companies with the resources and will to invest in the commercialisation of R&D
3. Lack of venture capitalists, restrained by Commonwealth taxation policies, especially Capital Gains Tax incurred on even the earliest returns on investment. This risks the viability of venture capitalists investing in the very early, high-risk stages of R&D proof of concept and commercialisation.

### 12. What further systems and programs are required in Queensland to assist in the commercialisation and application processes?

It is the very early stage between lodging a provisional patent and gaining adequate proof of concept and market analysis results to support a full patent application that is the most risky and most difficult to fund. The Queensland Government recognises this through its Industry Start Up Scheme (ISUS), and it is vital to continue and even expand this scheme. At present the funds available are too limited, and provide for only some 10 grants per annum. Realising that at best 1 in 20 such early stage projects can reasonably be expected to progress beyond this stage, and yet all successful commercialisations must pass through the process, it should be obvious that the scheme needs to be expanded to give Queensland the edge.

To expand upon the point made in item 9 above, Queensland needs University-led technology parks in every major region, akin to the Sunshine Coast Innovation Centre. Clearly, the Knowledge Precinct mooted for the Gold Coast, adjacent to Griffith University's campus on Smith Street Southport is important to accelerate with this in mind.

## **Sustainable development which protects our unique environment**

### 13. Are there other areas where we should use knowledge to protect the environment?

Queensland must lead the way on ecologically sustainable water management that focuses on conservation and good stewardship. We need water management practices and prevailing cultures in relation to water use that will provide high quality water resources to local communities at reasonable cost rather than purely technical solutions.

14. Are there other areas in which Queensland can develop sustainable industries based on our unique environment?

It is important to recognize the success of tourism and education as major industries within the service sector in Queensland, and the State's unique resources and knowledge in such areas which can be used to create new markets and expand existing markets overseas.

In addition to tourism and education, Queensland would be well advised to investigate other service sector initiatives such as the provision of design and delivery aspects of public health services and health care systems in the Asia-Pacific region, the Middle East, and Eastern Europe, and provision of ecologically sustainable water management approaches trialled in Queensland and then exported to developing economies.