

# Infrastructure Communiqué

2013 Australia 3.0 Infrastructure stream examined obstacles to digital transformation across key areas of the economy.



The immense opportunity for digital economy-style value increase in Australia's Infrastructure sector requires a new paradigm of decision making engaged with technology innovation, ubiquitous information and insightful fact-based optimisation.

The value-for-money, cost savings and infrastructure solutions Australia is looking for will be enhanced through leadership to spur the uptake of **existing and new technologies, methods and skills**, and the development of an uptake-ready environment for the future.

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## Discussion & Opportunities

Significant technological innovations have taken place in recent years in fields such as planning and optimisation, machine learning, algorithms, and sensor technology, which, intelligently combined, allow for significantly reduced planning cycles, reduced maintenance costs, prevention of incidents and sometimes catastrophic failure, and better asset/resource usage.

We believe that Australia can establish processes that will lead to a better articulation of existing and planned critical infrastructure in this country. This requires the infrastructure stakeholders in government, industry and the research community to collaborate more closely. Better insights into the current and forecasted critical infrastructure are needed to accelerate planning, optimise their usage, maintenance, lifespan, and replacement. We need to articulate forecasts of demand growth and pressure points being placed on critical infrastructure during the next 5-50 years as we seek to achieve national productivity goals. This can ultimately lead to prioritisation of investment to ensure infrastructure is in place to meet forecasts.

A collaborative effort is required by all stakeholders to understand and communicate the socio-economic drivers, productivity goals and apply the technological innovations to accelerate planning, improve usage, reduce maintenance, increase asset life, and plan for growth and renewal.

Infrastructure ICT proponents need to truly understand stakeholders and their drivers and develop a narrative to demonstrate compelling ICT value propositions that demonstrate business & community benefits. Scalable point solutions with early adopters will lead the way to building collaboration and partnerships that will further leverage & influence the ecosystem. At the foundation, however, will be the education of future leaders who embrace ICT.

## Examples & Insights

We believe it is worthwhile and necessary to support the progression of smart infrastructure with concrete examples of projects. These examples could focus on:

- a) **Smart Infrastructure**, such as structural health monitoring of critical infrastructure, and predictive maintenance. Bridges, Roads, Rail, Water Pipes, Electricity Grids
- b) **Intelligent Fleet Logistics**: Optimising transport to ultimately increase customer satisfaction and inclusion in remote and rural areas. Traffic and CO2 reduction.
- c) **Intelligent Transport Systems**. Better use of existing infrastructure. Traffic forecasting, faster reaction to incidents, understanding of freight movement, reduction of traffic jams.
- d) **Immersive modelling, virtualisation, simulation and optimisation**, to inform infrastructure and resilience planning & testing (e.g. water flow, emergency response) incidents, understanding of freight movement, reduction of traffic jams.
- e) **Immersive modelling, virtualisation, simulation and optimisation**, to inform infrastructure and resilience planning & testing (e.g. water flow, emergency response)

## Interesting Facts and Insights



### **Water Pipes**

*Australia has 140,000 km of water pipes in operation and around 7,000 critical breaks per year. Critical ( $\geq 300$  mm) main failures typically have significant social and economic consequences in the order of \$1.4Bn per year with communities impacted by flooding and traffic disruption*

### **Container Control**

*Container Control can remove up to 1/3 of targeted truck movements thus reducing congestion and CO2 emissions in urban areas. The result is less congestion on the roads and more capacity available for trucks that move containers with content (rather than empty containers), which ultimately leads to increased productivity.*



### **Water Flow**

*Real-time water information networks and water-flow modeling at irrigation channel, catchment and basin levels, have been deployed in VIC in field tests for which the results showed a 27% improvement in water productivity and 38% improvement in gross margin for dairy and pasture. Victoria's water users showed a 74% improvement in economic water use efficiency and 73% improvement in gross returns, arising largely from market quality improvements in the fruit produced, in horticulture*

### **Roads**

*A change in the traffic flow algorithm on the M1 in Melbourne had the capacity effect of adding the equivalent of three lanes to the road. Vehicle flow increased from 6,400 vehicles/hour to 10,400 vehicles/hour. Accidents reduced by 40%.*



# 2013 Infrastructure Recommendations

## 1. Lighthouse projects

To establish and promote lighthouse projects (see some initial examples above) to promote the art of the possible in smart infrastructures across Australia to inform the relevant stakeholders.

## 2. Open dialogue

To enter into a dialogue with relevant bodies, such as Infrastructure Australia, to explore ICT opportunities in infrastructure projects

## 3. System-thinking approach to tackle problems

## 4. “Computers, not concrete”

- 1) Ensure prior to construction that existing infrastructure is being optimally used
- 2) Recognise that ICT can improve new infrastructure and make it part of the original design consideration

## 5. Future infrastructure leaders digitally aware

Equip government infrastructure bodies with adequate ICT knowledge. Develop future leaders to embrace ICT.

## 6. Open Data

We would like to encourage all stakeholders to continue and accelerate their open data initiatives AND actively follow the insights and solutions that industry and academia will produce to incorporate the new state of the art as a requirement into planning processes, and where applicable into building codes and private/public procurement.

## 7. Public Private Partnerships

We recommend pursuing public-private partnerships in multi-stakeholder challenges, such as port optimisation, which require for a collective to co-operatively optimise. Specifically, we recommend to:-

- a. Create a national Port Community System to allow visibility into the port supply chains and reduce costs for 80% of the economy that imports/exports goods & services,
- b. Create urban mobility models for each capital city, allowing better urban planning to support growth, interaction of transport (people) and logistics (freight),
- c. Execute on backlog of articulated productivity initiatives



Karsten Schulz 2013 Australia 3.0  
Infrastructure Stream Leader

## What is the Australia 3.0 Communiqué

Australia 3.0 leverages the collective wisdom of an invitation only grouping of some of Australia's leading Technology and Innovation thinkers and most experienced professionals to develop insight into the pivotal issues that will impact Australia's ability to succeed in the global digital economy.

A three month long dialogue focussed around the opportunities, threats and systemic barriers for Australia's digital economic future culminates in the endorsement of a series of targeted communiqués by a plenary gathering of over 300 of Australia's most eminent IT industry leaders.

Australia 3.0 is one of the Industry's peak thought leadership events hosted by the Pearcey Foundation, the Australian Computer Society (ACS), the Australian Information Industry Association (AIIA), CSIRO, NICTA, and the Federal Department of Innovation.

The Australia 3.0 2013 communiqué has been developed, refined and formally endorsed through the Australia 3.0 process online and offline culminating in endorsement and formal launch at a plenary forum operating as part of the 2013 iAwards ceremonies held at Crown Casino, Melbourne on August 8th.

## Australian Success in the Digital Economy

The advent of the global Digital Economy should be seen as nothing less significant than the Industrial Revolution or the introduction of electricity. Australia is comparatively well placed to excel in the Digital Economy as a result of our knowledge capable workforce, natural innovative mindset, and relative economic strengths coming out of the GFC.

The Digital Economy can be seen in terms of economic efficiencies, in terms of trade, or in productivity terms.

It has been said that, rounded for error, 100% of humanity's productivity increases have come from Innovation, and 0% from regulation. The rate of adoption - embracing or missing - this opportunity for Digital Innovation will set up Australia's wealth for the next major wave of global economic development.

Anything that can be done should be done to lift the rate of Digital Innovation across the whole economy.



*Now is the most cost effective time to embrace innovation!*

## Acknowledgements

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### Steering Committee

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### Partners

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### Australia 3.0 Forum Guest Speakers

Dr David Williams – Group Executive, Information Sciences, CSIRO  
Dr Hugh Durrant-Whyte – Chief Executive Officer, NICTA  
Rosemary Sinclair – Board Member, Telecommunications Universal Service Management Agency (TUSMA)  
Dr Ted Pretty – Managing Director & CEO, Hills Holdings Limited  
Forum MC – Peter Cebon

### Stream Leaders, Speakers and Moderators

Mining: Colin Farrelly, Jonathan Law, Paul Heithersay, Paul Lucey  
Health: Suzanne Roche, George Magelis, Dennis Tebbitt, Mal Thatcher  
Infrastructure: Karsten Schultz, Hugh Durrant- Whyte  
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#### Further Information

*If you would like to get involved in Australia 3.0 please visit the website and subscribe for updates or email us*

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2013 Australia 3.0 Report

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