

June 1st and 2nd 2016



# Smart Cities and Urban Innovation Symposium



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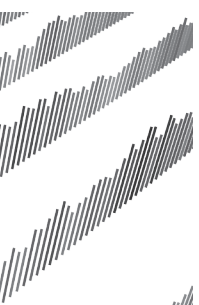
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## How can smart technology and urban design enhance the innovative potential of urban places?

Explore cutting-edge smart city concepts from around the world and their relevance to Sydney, Australia's innovation capital, when international and local smart city experts and leaders will meet on June 1st and 2nd. The event brings together architects, designers, scholars, civic and industry leaders to discuss the opportunities for future smart cities. The conference is a unique professional development and networking opportunity to learn about international smart city innovations and local moves to construct hi-tech urban precincts.



## LETTER OF ENDORSEMENT



**PROFESSOR HELEN LOCHHEAD**

***Dean, Faculty of the Built Environment, UNSW, Australia***

Urbanisation is one of the grand challenges of our times. How technology is used to address this challenge is a pressing concern for us all. Technology might be developing at a rapid pace but unless it is used for cutting-edge social, environmental and economic applications, our cities will not benefit. Smart technology will contribute the greatest value to cities if it enhances and supports urban spaces that are a pleasure to work, live and collaborate in. To achieve this, research into both technology, and its application, needs to come together. UNSW is a world leading research organisation committed to generating new knowledge and applying this knowledge to solve complex problems, deliver social benefits, and drive economic prosperity. It is therefore well placed to support the smart city challenge and engage with the various stakeholders involved with the symposium.

I'm therefore extremely pleased to endorse the smart cities focus of this event and the kinds of partnerships it seeks to develop and promote such as those with UrbanGrowth NSW and with ARUP Digital. The best kind of partnerships can be described as transformative. In the context of smart cities such partnerships are all about translating research and technology so that it brings about positive change that benefits society. The international focus, and industry and academic links brought together at the symposium, should facilitate the exchange of a fascinating array of new ideas and urban applications. It is my hope that some promising partnerships and ideas will emerge from this event. UNSW is committed to supporting the Smart Cities and Urban Innovation Symposium, and the kind of transformation that is its central aim.

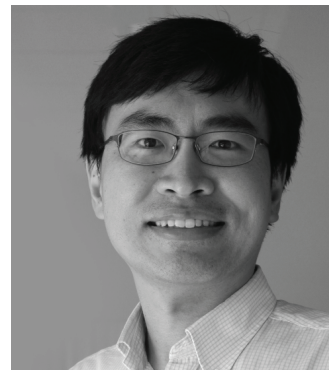
## WELCOME BY CHAIRS

**SCOTT HAWKEN**

**HOON HAN**

*Smart Cities Research Cluster Convenors, UNSW, Australia*

As the world embarks on a “Smart City Boom” digital technology is being promoted as the answer to a multitude of urban challenges and wicked problems. How such technology is invented, evolves and diffuses, within and between cities, is not a linear process but demonstrates a wide range of approaches and results emblematic of the complexity and diversity of urban systems globally. The Smart Cities Research Cluster UNSW aims to bring together the diverse stakeholders that are part of the complex smart cities conversation and to deepen this conversation through thoughtful public events, industry and academic workshops, keynote addresses and high impact publications. The events on June 1st and 2nd, 2016 seek to do this. We are extremely grateful to the Faculty of the Built Environment UNSW for making this conversation possible through collegial, intellectual and financial support. We would also like to thank our sponsors Urban Growth NSW and the Department of Foreign Affairs and Trade for being genuinely interested in the outcomes of the Workshop and Symposium and for committing substantial resources to making sure of the event success. Lastly, thank you to everyone taking part in the event. We hope that you will stay in touch with the Cluster via social media and continue to participate in the future shaping smart cities conversation.



## SPONSOR ADDRESS BY URBAN GROWTH NSW

**DAVID TOW**

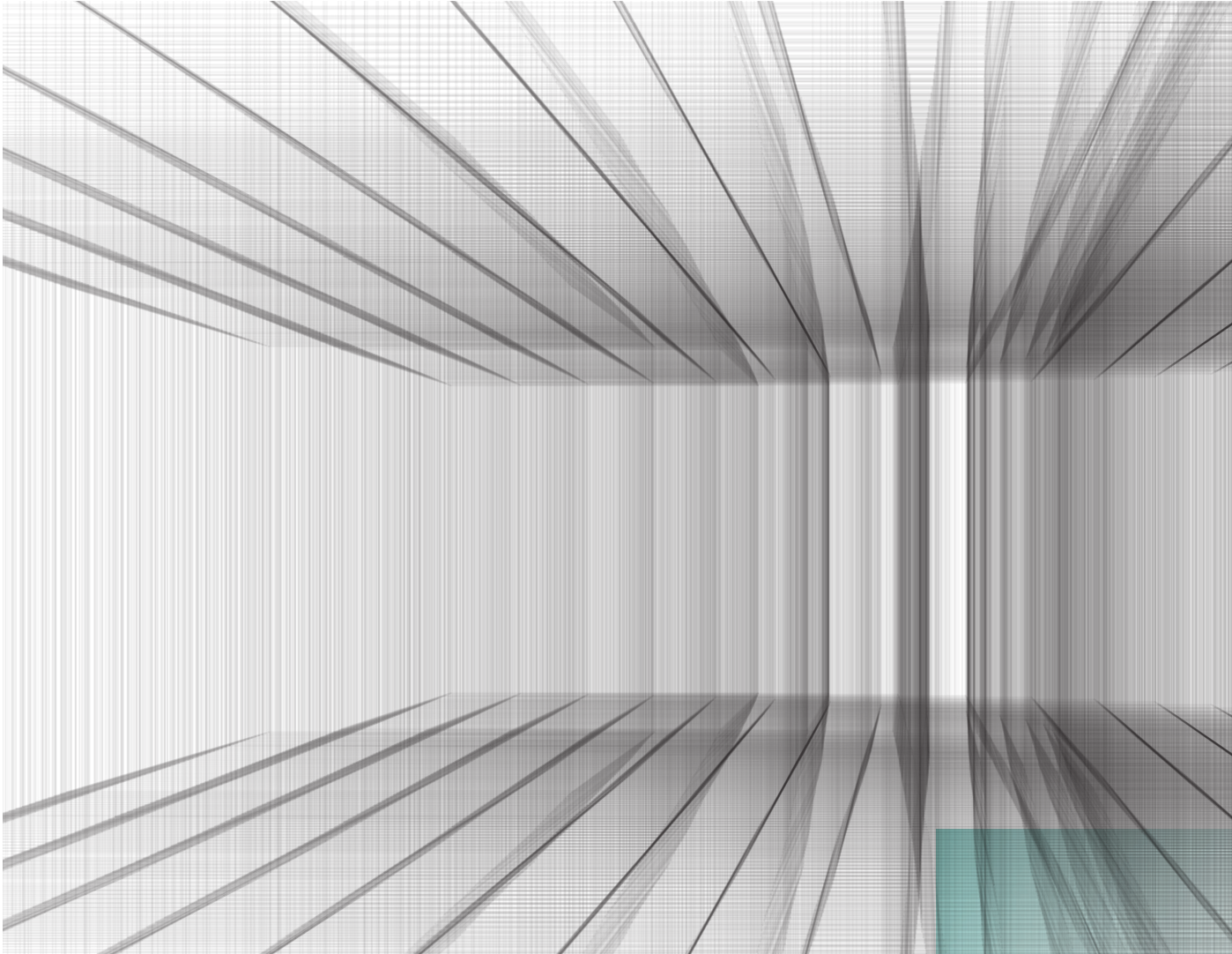
*Head of Strategy, UrbanGrowth NSW*

David has a Bachelor of Town Planning and a Masters of Public Policy and over 25 years experience in the implementation of major urban development and infrastructure projects in Australia and Asia.

Prior to commencing as Head of Strategy for UrbanGrowth NSW, he was Executive Director – Cities for the NSW Department of Premier & Cabinet and prior to that Asia Pacific COO for Snowy Mountains Engineering Corporation, overseeing the delivery of major urban development, transport and environmental infrastructure projects for agencies including the World Bank and Asian Development Bank.

David is presently leading the planning for an Innovation District at White Bay Power Station and Glebe Island, including review of opportunities for smart city infrastructure.











## SMART CITIES AND URBAN INNOVATION WORKSHOP

### *Morning Session / Industry Workshop*

#### *Digital Disruption: Futures for Sydney's Silicon Harbour and Tech Precincts*

Welcome

**Workshop Chairs: Dr Scott Hawken and Dr Hoon Han**

Workshop Launch

**Professor Helen Lochhead, Dean Faculty of the Built Environment UNSW**

Industry Workshop covering emerging mega-trends in workplaces, wellbeing and urban authenticity.

Hosted by ARUP and Smart Cities RC UNSW

**GREG STONE**, Head of Digital Services Australasia, ARUP

*Digital Megatrends and Tech Precincts*

**JEREMY GILL**, SCG Economics and Planning

*Silicon Harbour, Place and the Digital Economy*

**DIANNE VELLA-BRODRICK**, Associate Professor and Director of the Master of Applied Positive Psychology Program at the University of Melbourne

*Wellbeing, Resilience and Digital Disruption*

**ANDREW LOW**, Architect and Principal, Hassell

*Digital Economy and the Public Domain*

**DOMINO RISCH**, Architect and Workplace Director, BVN

*Workplace Innovation and the Digital Economy*

**JONATHAN EMERY**, Managing Director, Urban Regeneration at Lend Lease

*Urban Regeneration and Digital Disruption*

**SARAH REILLY**, Director of CRED Consulting

*Inclusive Innovation and Technology*

Panel Discussion 1

**Digital Disruption, Urban Megatrends and Place**

Panel Discussion 2

**Digital Technologies for Wellbeing and Urban Authenticity**

**Afternoon Session / Academic Workshop**  
**Smart Cities and Urban Innovation**

**SEKHAR KONDEPUDI**, Director of the Smart Cities and IoT Lab, NUS, Singapore

*Essential Ingredients in Creating a “Tech” District or Hub – An Asian Perspective*

**SARBESWAR PRAHARAJ**, Urban Planner, Smart Cities RC UNSW

*A Comparison of Smart City Policies across Nations and Cities with Specific Reference to 100 Smart Cities Mission in India*

**QUEENIE TRAN / SCOTT HAWKEN**, Director Wall to Wall Design & Consulting / Smart Cities RC UNSW

*Digital Disruption, Vulnerable Demographics and Urban Resilience: New Narratives for Technological Empowerment and Inclusion*

**JACK BARTON**, Urban Data and e-Research Facilitator, Australian Urban Research and Infrastructure Network

*Australian Urban Research Infrastructure Network (AURIN): Enabling Research in Urban Development*

**HOMA RAHMAT**, Architect and Social Media Analyst, Smart Cities RC UNSW

*Networked Citizens and Diffusion of Urban Innovations: the Role of Web 2.0 Technologies in Fostering Citizens’ Creativity*

Panel Discussion

**Inclusive Innovation and Citizen Engagement**

**KEAN HUAT SOON**, Principal Surveyor, Land Survey Division, Regulatory Cluster, Singapore Land Authority, Singapore

*Open and Semantic Interoperable Framework for Smart Nation*

**SHANAKA HERATH**, Faculty of Business / SMART Infrastructure Facility, University of Wollongong, Australia

*Digital Innovations, Open Data and New Urban Research Directions: An Australian Case Study*

**JIM PLUME**, Senior Research Fellow, Smart Cities RC UNSW

*Information Modelling Standards: Straightjacket or Platform for Innovation*

**OTTO NEWHOUSE**, Architect, Smart Cities RC UNSW

*Linking Land Use Planning to Energy Performance: the LEP-bsDD Partial Ontology*

**LESLIE LEAHY**, Operations Director at Urbanise.com Limited

*The Urbanise Platform: smart services for buildings & communities*

Panel Discussion

**Technology Standards and Innovation**

**Keynote Speaker – DR SARAH BARNES**, Research Fellow, Institute for Culture and Society, Western Sydney University

*Cities in the Age of the Platform: Getting the Deal Right on City Data*

## MORNING SESSION: SILICON HARBOUR PANEL

### Digital Disruption:

#### Futures for Sydney's Silicon Harbour and Tech Precincts

Smart Cities can be thought of as a “system of systems” creating an ecosystem of digital products, ICT services, creative individuals and businesses and civic networks that interact to creatively foster urban innovation. Although Smart Cities should not necessarily be interpreted as a top-down vision delivered solely through government investment they nevertheless require a set of conditions and leadership to stimulate innovation. This panel considers recent government proposals for a “Silicon Harbour” within Sydney's Bays district and focused on the obsolete White Bay PowerStation - a remnant of 20th century technology. The adaptively re-used power station is imagined as a future hub for knowledge-intensive and advanced technological industries. This distinctive part of the city presents many challenges and the design of tech districts more broadly requires a careful diversity of perspectives and expertise to ensure such districts enhance existing knowledge networks and introduce a new quality of innovation. Urban Growth NSW, development authority for the site and sponsors of the workshop suggest that “By creating a new landmark for Sydney that draws on the whole precinct's working heritage, we can enshrine the area's history while demonstrating a resilience and flexibility to adapt for the future.”

The morning of presentations and discussions will cover a range of important issues for future tech districts such as digital disruption, urban megatrends, place design, digital technologies for collaboration and wellbeing, face-to-face collaboration, information marketplaces and urban authenticity.

## GREG STONE

Head of Digital Services Australasia, ARUP PTY

### *Digital Megatrends and Tech Precincts*

Greg Stone is a Principal of Arup, and leads the digital business of Arup Australasia. At Arup he is engaged with smart city initiatives locally and throughout the region. Greg has previously held roles as chief technology officer of Microsoft as well as being founder of the ODI “Open Data Institute” in Australia. In his present role, Greg Stone provides design, strategy, insight and operational efficiency for Arups’ clients across the built environments throughout Australasia. Greg’s digital practice enables clients to prepare for, and prosper in a data-driven future where people meet the built environment. Greg brings expertise from across the built environment, human centred practice and global scale technology design and deployment. This enables Arup to provide existing and new digital offerings ranging from digital master planning, data modelling, analysis and machine learning through next generation identity, access design and human interaction design.



## JEREMY GILL

Associate and Sydney Practice Leader at SGS Economics and Planning

### *Silicon Harbour, Place and the Digital Economy*

Jeremy is an urban planner with ten years of experience in strategic planning and policy development. He has worked in Australia and the United Kingdom across the private, public and tertiary education sectors. With a background in landscape architecture, Jeremy has worked on a number of metropolitan planning issues.

He has advised state and local government on urban renewal best practice, approaches to industrial land use planning and has provided economic development strategies for urban transformation precincts. Jeremy has also worked closely with the NSW Department of Planning and Environment to help develop Sydney’s subregional strategies.





**DIANNE VELLA-BRODRICK**

Associate Professor and Director of the Master of Applied Positive Psychology program, University of Melbourne

***Wellbeing, Resilience and Digital Disruption***

Dianne Vella-Brodrick (PhD) is an Associate Professor and Deputy Director (Research) at the Centre for Positive Psychology at the Melbourne Graduate School of Education, University of Melbourne. Dianne is the inaugural Director of the Master of Applied Positive Psychology program (2013 – 2015), an Editor in Chief of the Psychology of Well-Being journal and Secretary of the International Positive Psychology Association. Dianne founded the Australian Positive Psychology Network and has co-directed three Australian Positive Psychology and Well-being conferences. Her work is well published in scientific journals and she has received over 2.5 million dollars of funding for her research on evaluating well-being programs using the latest innovations and methods. She has a special interest in studying how time use and technology relate to physical health and psychological well-being.



## ANDREW LOW

Architect and Principal at Hassell

### *Digital Economy and the Public Domain*

Andrew is a Principal of HASSELL with responsibilities across architecture, commercial design and master planning. He is based in Melbourne and is the leader of the Commercial and Workplace sector at HASSELL. Andrew has recent experience on a broad range of hospitality, mixed-use, commercial, workplace and master planning projects spanning Perth, Sydney, Melbourne and South East Asia (Kuala Lumpur and Singapore).

Andrew combines his expertise in high-rise commercial architecture, high performance workplaces, hospitality and urban design to lead teams to create people focused spaces. Andrew has worked extensively on interplay between architecture, urban design and workplace to create great activated city places that match the needs of contemporary cities and their occupants. Recent experience includes the redevelopment of some of Australia's newest mixed-use places, most recently, Brookfield Place in Perth. At a time when changing expectations and economic imperatives see the citizens of all Australian cities demanding a richer variety of experience and opportunity from their central city areas, Andrew brings a clear understanding of how the drivers of successful commercial architecture and workplace can be combined with a dynamic place making approach to create meaningful, authentic city spaces that connect people with place.

This experience is now being combined with a focus on the role technology will have in reshaping the way space is both designed and used in the future as the disruption process continues to shift paradigms at an extraordinary rate.



## DOMINO RISCH

Architect and Workplace Director at BVN

### *Workplace Innovation and the Digital Economy*

Domino Risch is BVN's Workplace Director and a highly experienced Interior Designer. For almost two decades Domino has worked with clients from a diverse portfolio of industry sectors and locations around Australia delivering highly innovative and effective workplaces. She has a passion for projects that are fundamentally aligned with strategic business drivers and that involve complex cultural change agendas. Domino enjoys deeply collaborative and engaged partnerships with her clients that deliver lasting benefit to all that experience them.





### **JONATHAN EMERY**

Managing Director, Urban Regeneration at Lend Lease

#### ***Urban Regeneration and Digital Disruption***

Jonathan joined Lendlease as Managing Director of Urban Regeneration in 2014 bringing a wealth of knowledge and experience to the role having worked in the industry for 25 years in the UK, Europe and The Middle East. Jonathan's expertise is in conceptualising and delivering major award winning complex projects across all asset classes in developed and developing countries.

Previous to Lendlease, Jonathan worked for Majid Al Futtaim Properties and was responsible for major real estate developments. Jonathan chaired MAF Properties' corporate social responsibility committee and was a member of the Executive Board. Jonathan managed a land portfolio of 7 million square metres across 7 countries within the Middle East, with projects across multiple sectors including infrastructure, residential, retail, hotels, commercial and other amenity uses.



### **SARAH REILLY**

Director of CRED Consulting

#### ***Inclusive Innovation and Technology***

Sarah Reilly is the Director of Cred Consulting, a social planning and community engagement consultancy she established in 2003. Sarah has more than 20 years' experience in community and strategic planning and community engagement. Sarah is highly skilled working within culturally, socially and economically diverse communities for clients such as City of Sydney, Bridge Housing, and NSW Government. She is an advocate for building strong communities through collaboration, capacity building and innovation.

**KEYNOTE SPEECH:**  
**SARAH BARNS**

***Cities in the Age of the Platform: getting the deal right on city data***

Today's cities are full of data. As the majority of our interactions become in some way mediated by digital platforms, cities are becoming places of data abundance. It is the abundance of data that inspires the possibilities of smart cities and data-driven economies, in which data becomes the 'new oil' of the twenty-first century, a fundamental infrastructure underpinning a new era of urban innovation. But how accessible, really, is this data, and to whom? Despite the possibilities of new services and efficiencies resulting from big data value chains, there remain profound challenges in putting city data to use in ways that support key urban challenges. This presentation discusses the rise of the smart city and looks at how digital platform strategies are shaping our cities' data ecologies, and puts forward a call for a new deal on city data to support city innovation through productive collaborations between government, the private sector and citizens.

**SARAH BARNS** (Bio)

Research Fellow at the Institute for Culture and Society  
Western Sydney University

Sarah Barns is a research fellow, digital producer and strategist whose work focuses on the disruptive potentials of the digital transformation on cities and place-making. Awarded an Urban Studies Foundation Postdoctoral Research Fellowship in 2013 through Western Sydney University, her current research addresses the governance and technology frameworks needed to support effective urban data programs. She currently supports CSIRO / Data61 Future Cities program development on data-driven city indicator development, and has established digital place-making studio Esem Projects. She brings to her work on digital cities extensive experience as a producer & strategist working across the digital creative industries, and a passion for cities that build resilient communities & support future generations.



## AFTERNOON SESSION: SMART CITIES AND URBAN INNOVATION ACADEMIC WORKSHOP



**SEKHAR KONDEPUDI**

### *Essential Ingredients in Creating a “Tech” District or Hub – An Asian Perspective*

There is a strong movement globally to try and replicate the innovation and entrepreneurship that is seen in Silicon Valley, California. Some of the terms which come to mind are companies, people, skills, talent, networking, risk, reward, education, vision, and finance. A number of Asian countries are aspiring to adopt the above ingredient mix to foster innovation and a risk taking culture. This presentation will provide an east-west perspective and discuss the different interpretations of the tech districts in these diverse cultural contexts. Insights into Silicon Valley and some examples of current developments in Asia will be used to illustrate the discussion.

### **SEKHAR KONDEPUDI (Bio)**

Director of the Smart Cities and IoT Lab, NUS, Singapore

Dr. Kondepudi has over 25 years of global business and product experience in a variety of technology verticals including smart cities, smart buildings and Internet of Things (IoT). Currently an Associate Professor of Smart Buildings and Smart Cities at the National University of Singapore, he directs the Smart Cities, Smart Buildings and IoT Lab @ NUS. In the past he has led global teams on smart cities at Cisco Systems, Motorola, Sprint and also the Electric Utility Industry in the United States. He is active in providing strategic advisory and consulting services to both public (BCA, NEA, and ICCS in Singapore) and private sectors (from Fortune 500 companies to Start-Ups) related to smart cities in Singapore, India and North Africa, as well as on Internet of Things (IoT) and energy efficiency. He has also been a Vice-Chair for the focus group on Smart Sustainable Cities at the International Telecommunications Union (ITU), a specialised agency of the United Nations who developed 14 technical reports related to smart sustainable cities.

## SARBESWAR PRAHARAJ

### *A Comparison of Smart City Policies across nations and cities with specific reference to 100 Smart Cities Mission in India*

Smart city policies adopted by various countries and cities address specific cultural goals and national ambitions. The success of smart city initiatives in places such as Barcelona and Amsterdam in Europe, Smart Nation Singapore, Tianjin eco city and Shenzhen in China, Songdo city in Korea and Yokohama smart city and Toyota city in Japan, were highly dependent upon clear visions and roadmaps developed by the various cities. India is the latest participant in the smart cities movement initiating smart city projects across 100 cities. The Smart Cities Mission Statement from Government of India acknowledges the definitional limitations, goals, convergence mechanisms and philosophical directions of the smart cities movement emphasising that there is no globally accepted definition of the term smart city. And rather than clarifying these aspects the Indian Government has proposed a flexible strategy and a more evolutionary approach. This research paper aims to evaluate the agenda behind this flexible strategy at this critical moment in time as well as the diverse visions and models being promoted by local Indian leaders in planning for the smart transformation of urban precincts. The smart city policy adopted in India will be benchmarked against frameworks implemented by countries and cities in Europe and Asia-Pacific. Investigation along these lines will allow the identification of underlying patterns, contested perceptions and intended visions of smart city developments between India and other nations.



### **SARBESWAR PRAHARAJ** (Bio)

Urban Planner, Smart Cities RC UNSW

Sarbeswar is a PhD candidate at the University of New South Wales. His research emphasises the smart transformation of cities in emerging economies. He holds a double Master's Degree in City Planning and Geography and served as Project Manager and Assistant Professor in CEPT University and LP University in India. With a keen interest in building industry links between Australia and India, Sarbeswar's current research explores India's 100 smart cities mission.





**QUEENIE TRAN** (Presenter), **DR SCOTT HAWKEN**

***Digital Disruption, Vulnerable Demographics and Urban Resilience:  
new narratives for technological empowerment and inclusion***

Digital disruption is a phrase that has rapidly become main-stream, epitomising the make or break experience companies and corporations face with the new digital economy. However beyond the economics of risk for corporates and entrepreneurs, a greater magnitude of personal challenges and opportunity is faced by those on the periphery of the digital economy. In natural or manmade disasters it is not the business community that most feels such shocks but those which are most vulnerable. Similarly, the massive industrial scaled transformation brought on by digital technology will disproportionately affect the vulnerable members of society. This paper reviews four “vulnerable demographics” and “make-or-break” opportunities faced by them in the digital age. Contrary to advertised images of the rich and successful dominating the uptake and use of smart technologies, a wide variety of vulnerable groups makes extensive use of digital technologies. For various reasons, such groups are often more intensive users of technology. Despite such realities there is no coherent framework or initiative to address marginal and vulnerable demographics in the push towards smart cities and urban innovation. This paper charts the current thinking surrounding key vulnerable demographics and their relations with digital technologies and urbanism: the homeless, the very young, the elderly and those with disability. Through discussion and analysis of the key issues for each of these demographics an initial framework for smart inclusive cities is put forward.

**QUEENIE TRAN** (Bio)

Access Consultant, Director at Wall to Wall Design & Consulting

Having worked full-time in access consulting, Queenie’s interest in research and property has led her to work with a number of Not-for-Profit organisations. Her experience working with disability service providers and commercial developers and builders, has provided her with greater insight into designing cities for people of all abilities.

With a background in building design and architecture, Queenie has developed a unique perspective on building compliance providing informed performance based solutions for accessibility. Queenie has provided expert guidance to many architects, specialising in accessible residential design as well as hospitals, educational facilities, shopping centres and commercial developments.

## JACK BARTON

### ***Australian Urban Research Infrastructure Network (AURIN): enabling research in urban development***

This presentation explores data describing Melbourne and Sydney's suburbs and Australia's cities using the sophisticated tools contained within the Australian Urban Research Infrastructure Network (AURIN) web portal which has been designed to empower the Australian research community. Until now, much of this information has remained behind closed doors. AURIN enables access to this data for built environment professionals across all fields, letting users discover and mash-up data, information and knowledge. Health data, visualising walkability of neighbourhoods and more are possible via the portal. Knowledge of these issues is essential to understanding patterns of urban development, to form and model urban growth for a sustainable future.



### **JACK BARTON (Bio)**

Urban Data and e-Research Facilitator, Australian Urban Research and Infrastructure Network

Dr John Barton (Jack) is a Senior Research Associate leading the AURIN team to facilitate Urban Data and eResearch uptake across the broader urban research community in Australia. Jack has a PhD in Architecture from the University of New South Wales and has previously worked as a Research Fellow at the City Futures Research Centre, as well as running his own consultancy for over a decade specialising in three-dimensional geospatial Spatial Decision Support Systems.



## HOMA RAHMAT

### *Networked Citizens and Diffusion of Urban Innovations: the role of Web 2.0 technologies in fostering citizens' creativity*

The interactive environment of Web 2.0 as a many-to-many communication medium facilitates not only the spread of ideas but also the development and cross-fertilisation of new ones. Building upon the potential of Web 2.0 to foster social creativity, this paper explores the diffusion of urban innovations through social networks. It also investigates the process of "innovation adoption" by individual citizens and local communities. This illustrates how an urban innovation turns into a contagious solution that is applied to recurring problems. It is argued that by facilitating the diffusion of innovations, Web 2.0 technologies bring alive social creativity in city-making processes, which in turn gives rise to citizens' participation in shaping the city from the bottom up. This informs better use of Web 2.0 applications as an effective system of communication that enables individuals "to act spontaneously and to self-organize in response to need (or aspiration), from the bottom up" (Hamdi 2013) that lessen the burdens of a prior planning. This carries forward the discussion on the role of technology to promote social participation in urban practices by integrating self-organised activities and planning processes.

### HOMA RAHMAT (Bio)

Architect and Social Media Analyst, Smart Cities RC UNSW

Homa Rahmat is a PhD student at the Faculty of the Built Environment, UNSW since February 2014. Her research as a data-driven analysis of urban processes using twitter data, investigates the impact of online social networks on bottom-up processes by studying usergenerated content and urban intervention trends. She has a Bachelor of architecture with first class honours and Master of architecture from University of Tehran, Iran. She has delivered a number of guest lectures at the Faculty of the Built Environment, UNSW and worked as an academic tutor in the field of data visualisation through the use of Processing programming language.

## KEAN HUAT SOON

### ***Semantic Intelligent Framework with Domain Ontology for Land Administration***

In land administration, many systems such as web portals have been developed to support various customers on property transactions, submissions of plans for authority's approval, registration of land titles, etc. To meet challenges ahead for a smart nation, it is important to ensure these land administration systems being able to serve customers more intelligently and integrate land administration data more seamlessly. This presentation will look into two aspects. The first aspect will outline an approach to develop a domain ontology that emphasizes on user roles. This ontology will allow computer systems to reason about the role of a user through inference. The ability to intelligently inferencing user roles enables systems to serve customers more proactively. The second aspect will discuss the integration of mapping and cadastral data with the domain ontology. As mapping and cadastral data are collected based on different domain knowledge, conceptual differences exist even with the same terminology. The domain ontology will facilitate the semantic integration between the data sources. Using domain ontology to develop smart systems is not novel in medicine and library sciences. The framework aims to improve communications between people and system, and between systems in land administration to support smart nation.



### **KEAN HUAT SOON (Bio)**

3D Cities Expert, Principal Surveyor of Singapore 3D National Mapping Project

Kean Huat Soon is a land surveyor by training from University of Technology Malaysia. Kean previously worked as a geo-informaticist and geographer in Germany and the United States before joining the Land Survey Division of the Singapore Land Authority (SLA). He is now the principal surveyor of the Division and the technical lead in the Whole-of-Government 3D National Mapping project and the development of the new cadastral system at the Division to support 3D Cadastres and automated cadastral processing. For the past 5 years, he has been extensively involved in the development of 3D Cadastres and 3D Mapping locally and internationally. He won the Best Paper Award for his paper on formalising domain ontology for land administration at the 5th International Workshop on Land Administration Domain Model (LADM).



## SHANAKA HERATH

### *Digital Innovations, Open Data and New Urban Research Directions: an Australian case study*

Recent digital innovations have enabled Governments around the world to congregate, store and retrieve more accurate urban data. These new and complex datasets are increasingly becoming available through public data programs as part of state initiatives on transparent and innovative cities. This paper presents an Australian case study that uses open data and innovative research methodologies to generate new knowledge about the operation of urban housing markets. The spatial patterns of amenities and disamenities in Sydney are analysed based on a hedonic house price model that controls for property size and quality. The dataset comprises house price data sourced through an open data initiative as well as openly available point of interest data. The estimates of marginal values of bundles of amenities in specific areas can confirm or invalidate a priori knowledge on desirable residential locations of the city and hence shed light on potential directions of urban growth processes. Though there are many studies explaining local spatial disparities within housing markets based on 'global' hedonic models, local regression methods are intuitively preferred particularly when location specific information is required for planning purposes. These local estimates mapped demonstrate detailed small-area differences of amenities. This research could thus inform urban policy by identifying areas with amenities and capacity for increased population, and areas with disamenities needing improvements, leading to efficient housing allocation and urban planning. This research thus showcases how digital innovations and open data contributes to building a knowledge base for understanding and implementing better functioning cities.

### SHANAKA HERATH (Bio)

Faculty of Business / SMART Infrastructure Facility  
University of Wollongong, Australia

Shanaka Herath is a Vice-Chancellor's Postdoctoral Research Fellow in the Faculty of Business / SMART Infrastructure Facility at University of Wollongong. His research interests include housing economics, urban economics and urban planning, and his research has been published in leading international academic journals in regional science, urban planning and real estate economics. He regularly teaches microeconomics, and occasionally urban economics. Between 2012 and 2016, he was a Postdoctoral Research Associate at City Futures Research Centre, Faculty of Built Environment, University of New South Wales. He holds a PhD from Vienna University of Economics and Business.



**JIM PLUME** (Presenter), **JOHN MITCHELL**, **DAVID MARCHANT**  
**AND OTTO NEWHOUSE**

***Information Modelling Standards: straightjacket or platform for innovation***

In this presentation, we will briefly outline the range of work in which the Precinct Information Modelling (PIM) project team is currently engaged, ranging from the development of the PIM data schema and exemplar precinct models, through a range of open technologies currently under development by both buildingSMART International (bSI) and the Open Geospatial Consortium (OGC) and last but not least, the doctoral work being undertaken within the PIM project. We will argue that the PIM project stands as a significant contribution to the challenge of integrating information across the built environment and spatial modelling sectors.

Against that backdrop, the presentation will review the importance and significance of open standards that facilitate and encourage innovation in the evolution of Smart Cities. Current collaborative efforts across the globe will be discussed, all targeted at achieving the smooth flow of data and information that becomes the core enabler for a smart built environment.

Some of the themes to be discussed include: structured data schemas (IFC, CityGML, LandInfra, etc.); standardised terminology libraries (buildingSMART Data Dictionary, OWL databases, etc.); information delivery specifications (mvdXML and Information Delivery Manuals); object libraries that hold reference data; information containers to facilitate transmission of disparate model data; linked data technologies (OWL); web-based inference engines that enable complex queries; and sensor technologies that capture real-time data.

**JIM PLUME** (Bio)

Senior Reserach Fellow, Smart Cities RC UNSW

After completing a BArch in 1976, Jim Plume continued for a further year as a full-time research student developing one of the first prototypical CAD systems to explore the notion of constructing digital models of buildings represented as assemblages of objects with embedded knowledge about materiality and relationships between the building parts, a technology now known as building information modelling (BIM). Jim's areas of special interest and expertise is information modelling as applied in the professional design disciplines associated with the built environment. An on-going focus of that work is in the development of the UrbanIT project, which is concerned with urban scale information models and the use of object database technologies to support design collaboration across all the built environment disciplines.





**OTTO NEWHOUSE** (Presenter), **JIM PLUME, DAVID MARCHANT AND JOHN MITCHELL**

***Linking Land Use Planning to Energy Performance:  
the LEP-bsDD partial ontology***

The challenge of integrating urban planning knowledge with information technology requires cross-domain communication. Ontologies are being thought of as responding to this need by enabling various disciplines and models to interoperate. This work focuses on linking an urban planning ontology to energy information and is part of a broader effort by the Precinct Information Modelling (PIM) research group working on interoperable urban information models embracing open international and local standards. The presentation will describe the integration of the UNSW Local Environmental Plans classification and the buildingSMART Data Dictionary (LEP-bsDD) in a partial ontology using the PIM framework for establishing a multi-model platform and linking spatial units to different data sources.

For a broader classification to also include built structure and ownership at an urban scale, we take inspiration from both the multi-dimensional concept of the US Land Based Classification Standards (LBCS) system and the semantic linked data approach of buildingSMART International. Accordingly, we allow the distribution of some of the LBCS taxonomy across several urban models and ontologies. We propose that with such a linked schema we allow for potential future adoption of an LBCS-type classification within the PIM framework offering the following advantages: An LBCS taxonomy distributed into linked models allows for data update in the actual format that data is represented. Within a coherent model of PIM we establish a flexible platform for linking into the different formats and scales of the various urban data sources such as that used by urban planners and energy service providers to map energy intensity in the City of Sydney.

**OTTO NEWHOUSE** (Bio)  
Architect, Smart Cities RC UNSW

Otto is a member of the Precinct Information Modelling research group founded by the Cooperative Research Centres (CRC) for Low Carbon Living (LCL). His interest is in applying life cycle information technology beyond the building scale. As a consultant to the CSIRO and later co-founder of LCADesign he substantially contributed to the research and development of what has been dubbed the first green calculator for the built environment. He holds a Master's in Science from TU Budapest and in Architecture from the University of Melbourne.

## LESLIE LEAHY

Operations Director, Urbanise.com Limited

### *The Urbanise Platform: smart services for buildings & communities*

Leslie is a technologist, consultant, public speaker and director of an international, publicly listed technology firm. For more than a decade Leslie spearheaded the operational aspects of Mystrata, a software company catering for the financial and legal management of real-estate assets which hosts in excess of 191,000 free-hold properties globally.

In 2009 Leslie lead an IT team that developed an online “self-service” property registration system for the Dubai Land Department including an integration to the Department’s Oracle database of property owners and developers. He also developed and delivered training courses to educate senior members of Dubai’s wider property industry on upcoming changes in line with Dubai’s new (at the time) Law 27 (often referred to as the “Strata Law”). Leslie also lectured for the Dubai Real Estate Institute, speaks at conferences and consults for master developers and Government departments.

Since joining Urbanise, Leslie has worked very closely with the IoT division assisting in the testing, implementation and operational role out of the company’s remote monitoring technology. Leslie has an excellent understanding of technology design and implementation in an international and financial context.



## SMART CITIES AND URBAN INNOVATION SYMPOSIUM

Sponsor Address

**David Tow, Head of Strategy, UrbanGrowth NSW**

### **Session 1**

#### **Sydney's "Silicon Harbour" and the Design of Tech Districts**

**CHAIR SCOTT HAWKEN**, Smart Cities Research Cluster, UNSW, Australia

**CRAIG ALLCHIN**, Director Six Degrees Urban , Australia and Ad Prof Architecture UTS

*Design Led Approaches to Innovation Districts and Topographic Complexity: scenarios and strategies for Sydney's Silicon Harbour*

**Chris Pettit**, Professor of Urban Science, Associate Director of City Futures, UNSW

*A Data Driven Approach for Understanding the 30 Minute City*

### **Session 2**

#### **The Digital Agenda and Urban Innovation in Asia-Pacific**

**CHAIR SCOTT HAWKEN**, Smart Cities Research Cluster, UNSW, Australia

**SEKHAR KONDEPUDI**, Director of the Smart Cities and IoT Lab, NUS, Singapore

*Singapore as a Smart Nation in the Context of Innovation, IoT and Big Data*

**BRETT CASSON**, Infrastructure Development & Strategic Innovation Asia Pacific, Autodesk

*The Future of Making Things – Intelligent Disruption*

**KEAN HUAT SOON**, 3D Cities Expert and Principal Surveyor of Singapore 3D

National Mapping Project

*A Singapore Journey to Smart Nation: a 3D mapping and cadastre perspective*

### **Session 3**

#### **Asian Smart Cities: ubiquitous technology**

**CHAIR DR HOON HAN**, Smart Cities Research Cluster UNSW, Australia

**PROFESSOR YOUN TAIK LEEM**, Director Ubiquitous City Research Cluster, Hanbat National University, Korea

*Designing the Urban Future: ubiquitous city planning & design in Sejong City*

**DAE-JUN LEE**, Manager IoT Business Solutions, SK Telekom, Korea

*Digital Strategies for Megacities: Korean approaches to the Internet of Things*

**MANOJIT BOSE**, Senior Director IT and eGovernance, NASSCOM, India

*Positioning the role of ICT in context to Smart Cities Mission in India*

### **Session 4**

#### **Proptech Startups and Sydney's Innovation Ecosystem**

**CHAIR SU-LIN TAN**, Asian business, emerging markets, real estate, foreign capital and news writer. Australian Financial Review

**HARRY LEHMANN**, CEO Vendorable

**MARK MENDEL**, CEO IBuyNew

**NICK AUSTIN**, CEO Divvy Parking

**JEREMY HARKINS**, Director Ineni Realtime

**TRENT CLEWS-DE CASTELLA**, CEO SCANN3D

**ANTHONY MILLET**, CEO BrickX

**MARK BERNBERG**, CEO Whizz

## SESSION ONE: SYDNEY'S "SILICON HARBOUR" AND TECH DISTRICTS

AD PROF CRAIG ALLCHIN

### *Design Led Approaches to Innovation Districts and Topographic Complexity: scenarios and strategies for Sydney's Silicon Harbour*

Sydney's complex landscape of headlands and bays, of communities, commercial clusters and industrial remnants, forms a fascinating & unique mosaic that contributes to its global appeal. However spatially it presents a challenge for face to face learning and exchange that is at the heart of today's best tech districts and digital startup ecosystems. Sydney must ask itself how to best integrate islands of opportunity and obsolescence across space and time given this challenging context. In the city where every development is a deal, a broad conceptual framework is more important than ever to ensure we create a flexible framework for growth and change, rather than singular projects that lock out future innovative potential. Economic and spatial strategies at the scales of the city, the district, the block and the floorplate are necessary to maintain flexibility and potential into the future.

This talk draws on Allchin's extensive urban design work including as director of Urban Design on Sydney's Metropolitan Strategy and a wealth of projects by his own firm Six Degrees Urban. Until recently Craig was living next to and working in the Brooklyn Tech Triangle in New York which will be examined to illustrate opportunities for Sydney's innovation landscape.

### **CRAIG ALLCHIN (Bio)**

Director Six Degrees Urban, Australia and Ad Prof Architecture UTS

Craig Allchin is an architect, urban planner, director of Six Degrees Urban and Adjunct Professor of Architecture at UTS. Craig has worked on cities across a range of scales including metropolitan strategies, city extensions and masterplans in China and the Middle East, large urban renewal projects, and fine grain strategies and projects. This range of experience puts him in a unique position to understand the process of development and change within cities and their component parts.





**CHRIS PETTIT** (Presenter), **SIMONE ZARPELON-LEAO**, **SCOTT LIEKSE**

***A Data Driven Approach for Understanding the 30 Minute City***

Congestion is a critical issue for our cities, from the perspective of liveability, sustainability and productivity. People want to be able to get from A to B in a reasonable time, yet as our cities continue to grow the movement of people is increasingly difficult. The concept of the 30 minute city is one which is not new but is being considered as an important metric as we plan for the future of Sydney and other cities across Australia.

There are a number of datasets which we can use to measure and monitor the performance of our cities in the context of travel time. In this presentation we will illustrate the work of City Futures, UNSW in mapping, monitoring and modelling the movement of people through the built environment. The data we are using for this work includes traditional household travel survey and journey to work data, along with bike data acquired through a Smart Phone application known as RiderLog, and Opal Card data acquired from Sydney Commuters. In this presentation I will discuss how we are using this data for understanding the 30 minute city.

**CHRIS PETTIT** (Bio)

Professor of Urban Science, Associate Director of City Futures, UNSW

Professor Pettit is the inaugural Chair of Urban Science at the University of New South Wales (2015), being previously at the University of Melbourne (2011-2015), The State Government of Victoria, (2004-2011) and RMIT University (2002-2004). He is responsible for the Digital Cities course at UNSW. He previously developed the Urban Informatics course at the University of Melbourne and was the lead author on the ESRI online virtual campus course in GIS and planning which attracted more than 3,000 students between 2000 and 2010. His educational background has been focussed specifically on the fields of spatial planning and GIS at the undergraduate and postgraduate level. His Ph.D. examined the use of GIS and mapping technologies for undertaking scenario planning at the land parcel level across municipalities. Professor Pettit is closely involved with a number of professional organisations. He is a member of the Surveying and Spatial Sciences Institute (SSSI) and the Planning Institute of Australia (PIA).

## SESSION TWO: THE DIGITAL AGENDA AND URBAN INNOVATION

### SEKHAR KONDEPUDI

#### *Singapore as a Smart Nation in the context of Innovation, IoT and Big Data*

Singapore has embarked on a vision to build a “Smart Nation” by leveraging technology to the fullest with the goal to improve the quality of life of its citizens, create more opportunities and build a stronger society. Many arms of the government have started programs to align themselves with this national mission of becoming the world’s first truly “Smart Nation”. This presentation will provide a perspective of the “Smart Nation” program in the context of worldwide trends in innovation, the Internet of Things (IoT) and big data. Key challenges facing Singapore such as urban density, aging population and mobility will be discussed along with the pro-active view that innovation is a prime mover for Singapore to transition into a “Smart Nation”. (Disclaimer: This presentation provides the view of the author and does not represent the Government of Singapore’s view in any way, shape or form).



#### **SEKHAR KONDEPUDI (Bio)**

Director of the Smart Cities and IoT Lab, NUS, Singapore

Dr. Kondepudi has over 25 years of global business and product experience in a variety of technology verticals including smart cities, smart buildings and Internet of Things (IoT). Currently an Associate Professor of Smart Buildings and Smart Cities at the National University of Singapore, he directs the Smart Cities, Smart Buildings and IoT Lab @ NUS. In the past he has led global teams on smart cities at Cisco Systems, Motorola, Sprint and also the Electric Utility Industry in the United States. He is active in providing strategic advisory and consulting services to both public (BCA, NEA, and ICCS in Singapore) and private sectors (from Fortune 500 companies to Start-Ups) related to smart cities in Singapore, India and North Africa, as well as on Internet of Things (IoT) and energy efficiency. He has also been a Vice-Chair for the focus group on Smart Sustainable Cities at the International Telecommunications Union (ITU), a specialised agency of the United Nations who developed 14 technical reports related to smart sustainable cities.





## BRETT CASSON

### *The Future of Making Things – Intelligent Disruption*

A wave of new digital tools are poised to disrupt designers and engineers from around the world. Underpinning all of these new digital tools is data, and the importance of living and working in a connected environment. Disruption, virtual design, generative design and robotics are all going to change the landscape for the delivery, construction and operations of more intelligent buildings and infrastructure. Brett Casson will present Autodesk's perspective on the digital tools that are available now and a look into the future of how buildings, cities and infrastructure will be imagined, designed and created.

### **BRETT CASSON** (Bio)

Infrastructure Development and Strategic Innovation Asia Pacific Autodesk

Brett Casson is responsible for Infrastructure Development and Strategic Innovation across the Asia Pacific region for Autodesk. Brett works with Autodesk to deliver infrastructure, construction and reality capture solutions on the largest and most complex projects in the region. In addition, he is actively involved with government digital advisory. Brett has spent over 20 years in industry working in the construction and transportation sector.

## KEAN HUAT SOON

### *A Singapore Journey to Smart Nation: a 3D mapping and cadastre perspective*

In June 2014, the government of Singapore decided to make Singapore the world's first Smart Nation. In this presentation, I describe my own involvement in two initiatives designed to help Singapore on its journey to becoming a Smart Nation. The first initiative is a Whole-of-Government project called 3D National Mapping. The project, which is led by the Singapore Land Authority, aims to map the entire nation in 3D. The resulting 3D map will create a "Virtual Singapore", and serve as a smart 3D platform which will enable the government and research institutions to develop applications for planning and decision-making. I will present the motivations, developments and potential applications of the 3D National Mapping project. The second initiative will address the cadastral challenges in creating a Smart Nation. By recognising that a smart nation should be governed by a smart legal framework, innovation in cadastres is paramount. The Singapore Land Authority plans to automate existing cadastral processes and to manage parcels which demarcate legal ownerships in two and possibly in three dimensions. Towards the end of the presentation, I will conclude with some outstanding efforts currently being carried out in Europe and Australia in regards to these two initiatives.



### KEAN HUAT SOON (Bio)

3D Cities Expert and Principal Surveyor of Singapore 3D National Mapping Project

Kean Huat Soon is a land surveyor by training from University of Technology Malaysia. Kean previously worked as a geo-informaticist and geographer in Germany and the United States before joining the Land Survey Division of the Singapore Land Authority (SLA). He is now the principal surveyor of the Division and the technical lead in the Whole-of-Government 3D National Mapping project and the development of the new cadastral system at the Division to support 3D Cadastres and automated cadastral processing. For the past 5 years, he has been extensively involved in the development of 3D Cadastres and 3D Mapping locally and internationally. He won the Best Paper Award for his paper on formalising domain ontology for land administration at the 5th International Workshop on Land Administration Domain Model (LADM). The paper attempts to develop a formal ontology that enables computer systems to integrate land administration information automatically. The 3D National Mapping project, which is led by SLA, received the 2015 Be Inspired Award for Innovation in Government by Bentley Systems. Kean Huat holds a MSc in Geography from the Pennsylvania State University, a MSc in Geoinformatics and Bachelor of Surveying (Land) from University of Technology Malaysia.

## SESSION THREE: ASIAN SMART CITIES: UBIQUITOUS TECHNOLOGY



**YOUN TAIK LEEM**

*Designing the Urban Future:  
ubiquitous city planning and design in Sejong City*

In recent decades the Korean economy experienced spectacular growth which has been guided by a series of national economic development plans. Early plans focused on large scale government investment in heavy industrial sectors such as chemical engineering and steel production. More recent plans have sought to achieve productivity through an intense single-minded approach to IT innovation and industry. Today Korea is a world leader in urban digital and urban technologies surpassing more established urban and technological urban centres. The Korean approach to ICT urban services development has focused on new master planned cities with high-tech IT infrastructure rather than the redevelopment of existing cities. The most famous of these is Songdo City designed by OMA and KPF and powered by CISCO technology. This presentation explores a lesser known but equally important example called Sejong City, which assumes many of Korea's administrative functions and is a model "future" city. Sejong City is designed to be a testbed for new technologies and innovations which promote 'communication,' 'sharing' and 'balance'. The ubiquitous city planning and design of Sejong uses a contents scenario analysis to allow detail design and digital hardware like U-pole and community O/S in a service content development process.

**YOUN TAIK LEEM (Bio)**

Professor and Head of the Ubiquitous City Research Cluster, Hanbat National University, Korea

Korea is the originator of the ubiquitous city movement and a forerunner in today's internet of things (IoT) revolution. Dr Youn Taik Leem is the Operating Head of Ubiquitous City Research Cluster (UCRC) and a Professor at the Department of Urban Planning and Engineering, Hanbat National University, Korea. Professor Leem's research focuses on the analysis and planning of urban regions on the basis of information technologies, such as geographic information systems and ubiquitous city.

Before joining academia, Dr Leem worked for more than 10 years in various global private conglomerates and research institutes. He published a textbook on geographic information systems for urban engineers and has edited a book on the use of geographic information systems for urban planning. He has also contributed to the book 'Knowledge- Based Urban Development: Planning and Applications in the Information Era'.

## DAE-JUN LEE

### *Digital Strategies for Megacities: Korean approaches to the Internet of Things*

Like many Asian countries, Korea has had to deal with the pressures of rapidly growing mega cities and their accompanying urban problems and challenges such as urban sprawl, pollution, congestion and stress. To address these problems, Korea was amongst the first nation to pursue the smart cities concept. In Korean smart cities digital services are omnipresent or ubiquitous thanks to high quality network technology and the early adoption of the “Internet of Things” (IoT). In particular Korean smart cities focus on major issues such as: 1.) digitally enhanced city infrastructure enabling IoT, 2.) Scalability through open platforms, 3.) Value-driven & citizen participation city services, 4) Open Innovation through startup incubators and 5) Create new revenue and business reference models for the future city.

SK Telecom, has been behind many of Korea’s smart city developments. It is the largest broadband network provider in South Korea. Since it was founded back in 1984, SK Telecom has been a leader in the global mobile telecom market and is the largest carrier in Korea with 50% market share and more than 27million subscribers in the country. Recently SK Telecom has announced a company strategy based on the development of various new digital platforms such as lifestyle platform, media platform, IoT platform. These platforms are based on business models which are subscriber based, expandable, and generate recurring revenue.

#### DAE-JUN LEE (Bio)

Manager IoT Business Solutions, SK Telekom, Korea

SK Telecom is one of the giants of Korean telecommunication companies with a major role in establishing Korea as an international smart cities leader. Dae-jun Lee is a key member of the organisation as a senior manager for IoT Solutions Business Office and leads the Public IoT (including smart cities) in SK Telecom (SKT), Korea. As chief architect, he was responsible for enterprise IT architecture and has extensive business experience working in the Smart City Division including the running of the integrated city operation system, smart building, and city energy management. He also has experience in the public sector, where he was in charge of providing public safety services based on data/video by establishing the next generation network (LTE). Recently, he is responsible for various services and business development tasks applying IoT in the public sector. Before joining SKT, at Accenture he enjoyed various ICT consulting experiences in South Korea, the UK and Taiwan.





## MANOJIT BOSE

### *Positioning the Role of ICT in Context to Smart Cities Mission in India*

Urbanisation has been a major challenge globally and especially in developing countries. The rapid urbanisation and migration of rural population in India has not seen a commensurate increase in urban infrastructure and service delivery capabilities, which are now facing significant stress. This will only worsen with time if remedial measures are not put into place. Effective functioning of cities is critical to economic growth, more so considering their GDP contribution. In light of the above, Ministry of Urban Development, Government of India has launched the Smart Cities Mission in 2015. Accordingly, the purpose of the Smart Cities Mission is to drive economic growth and improve the quality of life of people by enabling local area development and harnessing the power of technology.

NASSCOM, the apex trade body representing the IT-BPM Industry in India, has been closely involved with the government in this mission, both at the centre and in the states. This talk aspires to provide 1) a coherent background to India's 100 Smart Cities Mission, 2) to discuss possible areas of ICT application in various city domains/subdomains, and 3) to discuss the opportunities it presents as well as challenges as cities prepare to execute their smart city plan, and proposals on the basis of which they have been selected for the 100 Smart Cities Mission.

### **MANOJIT BOSE (Bio)**

Senior Director IT and eGovernance, NASSCOM, India

In 2015 India announced the launch of an ambitious 100 smart cities movement which aims to develop 100 cities to facilitate India's formidable urbanisation challenge and economic transformation. Manojit Bose is closely involved with this initiative with previous and current roles within the government and private sectors. He is co-author of the NASSCOM report entitled "Integrated ICT and Geospatial Technologies Framework for the 100 Smart Cities Mission". Manojit, currently, Senior Director- Domestic IT and eGovernance for NASSCOM in India is an industry veteran with over 15 years of experience in IT, having worked with companies like Tata Consultancy Services and Cognizant Technology Solutions in global client facing roles. In his current role, Manojit is driving the Smart Cities initiative, amongst his other engagements in eGovernance. Manojit holds a Bachelor's degree in Engineering from National Institute of Technology (NIT), Silchar and has done his MBA from Indian School of Business, Hyderabad.

## SESSION FOUR: PROPTech STARTUPS & SYDNEY'S INNOVATION ECOSYSTEM

### CHAIR: SU-LIN TAN

Australian Financial Review

Over the last few years new tech entrepreneurs have rapidly recognised opportunities for growth and greater efficiency in property, which has been identified as the next market for disruption. Property is a traditionally slow-moving asset and a source of untapped and often hidden value within cities. The tech entrepreneurs featured in this panel discussion have identified ways that space can be used more efficiently (Divvy Parking), ways to encourage better human interactions with space (Space Connect), ways to imagine future unbuilt spaces (3DConnect), ways to better manage and visualise the maintenance and care of space (Ineni Realtime and Whizz) ways to make space a more liquid asset through the creation of transaction efficiencies (Vendorable and IBuyNew) and even ways to democratise the conservative property investment market (BrickX). Each of these innovations represents a form of digital disruption that seeks to challenge the status quo and make urban property more flexible and accessible. In other words these companies are about better customising cities and markets for urban inhabitants and investors through new digital tech.

The panel discussion will be chaired by journalist, Su-Lin Tan. Su-Lin writes on Asian business, emerging markets, real estate, foreign capital and news for the Australian Financial Review



## **HARRY LEHMANN**

CEO Vendorable

Harry Lehmann is a co-founder and chairman of Vendorable. He conceived of the idea for a more instantaneous and transparent real estate services model in mid-2013 and thereafter began researching and writing the specification for what Vendorable has become today. Since 2006 Harry has worked in private law firms, first as a clerk and then as a solicitor. He started his own practice Lehmann & Co in 2013. Harry has been involved in thousands of real estate transactions covering the spectrum of legal practice in this area. In 2011, Harry successfully defended proceedings in the Federal Court of Australia claiming relief under independent contractors legislation in the context of a commercial arrangement. The case became one of the first judicial interpretations of the statute.

Since 2012 Harry has been a part-time member of staff at the Australian National University tutoring in succession law. He holds a Bachelor of Science in genetics and molecular biology and a Bachelor of Laws. Harry is a subeditor at Quillette Magazine.

## **Vendorable**

Sydney-based startup Vendorable is trying to fix what its founders describe as the biggest problem facing property sellers – finding the right agent. Vendorable is a platform for sellers to appoint and work with real estate agents. We believe that the future of real estate services lies in greater efficiency. We are focused on assisting enterprise class property sellers with procurement and contract management in this area. However, we welcome anyone who wants to experience a smarter way to sell real estate onto the platform. By participating in a market for listing opportunities, agents will be able to transform the way they work. Agents choose what jobs they are willing to take on and benefit from technology-enabled work processes.



## MATT POPE

CEO and Founder SpaceConnect

Matt is the founder of SpaceConnect, an IoT based workplace utilisation & collaboration platform specialising in artificial intelligence and algorithmic machine learning. Matt has over 12 years experience in the public and private sector with both business strategy & enterprise software development. SpaceConnect's vision is to enable natural office collaboration through intelligence space management. Working with the top 50 ASX listed companies, Matt and the team support organisations in the transition to activity-based working environments and enabling office space automation using ambient intelligence.





**NICK AUSTIN**

CEO Divvy Parking

Nick Austin is founder and CEO of Divvy Parking, the transport-tech startup that connects commuters with underutilised parking spaces in CBD commercial office towers in Australia. Before founding Divvy Parking, Nick began his career designing integrated finance portfolio management products at CBA. He then moved into portfolio management and investment. Nick is an advocate for Smart Cities and is passionate about using technology to create smarter, more efficient, and more connected cities.

**Divvy Parking**

Divvy Parking is a transport-tech startup that connects commuters with underutilised parking spaces in CBD commercial office towers. Divvy's industry changing mobile access technology unlocks these hidden spaces and makes better use of existing infrastructure in our cities, cutting down congestion and increasing connectivity.

## JEREMY HARKINS

Director Ineni Realtime

Jeremy Harkins is the Director and co-founder of “ineni Realtime”, an innovative technology company focused on the development of the Realtime Visualisation Industry. Jeremy is at the leading edge of real-time virtual technologies and has spoken internationally about 3D immersive environments, VR (Virtual Reality) and AR (Augmented Reality) for architecture, infrastructure and smart cities. Jeremy is aimed at commercialising and integrating new technologies into the architecture, planning, infrastructure and construction industries. His company has partnered with world leaders in building automation, integrated systems and business process management and is providing cutting edge visual solutions for some of the largest and most complex developments in the world. With over 15 years of experience in Architectural Technologies, Jeremy has been a lecturer at an international university (UNSW) helping to educate industry in what can be possible, and is currently focussed on the rapid growth and positioning of “ineni Realtime” as market leaders.



### Ineni Realtime

ineni Realtime is a market leader in the development of realtime rendering visualisations and virtual reality applications for the built environment and related industries. Operating out of Surry Hills, Sydney, ineni Realtime produces interactive 3D software with a strong focus on the built environment. With a constant drive to break down knowledge barriers, their applications have saved company reputations, reduced critical decision times, educated and entertained stakeholders, challenged ideas and engaged users. Within the property development industry, detailed site plans, electrical diagrams, FM dashboards and integrated workflow platforms typically have one critical point in common; where they refer to the real world, they do it in code. Code such as a symbol on a plan drawing that indicates an important architectural concept or the Asset ID of a VAV Box in a BMS interface. Ineni's team works with clients to recognise the barriers to knowledge in a project and can develop bespoke workflows to minimise their impact or break them down entirely. At ineni Realtime, we love open data. By incorporating 3D building information models (BIM), which are used to construct and commission a building, ineni ensure their representations are extremely accurate, whilst consistently retaining the asset naming structures and embedded data. The accurate retention of the BIM data then allows individual 3D assets to be matched with live data readings from the same real world assets via integration with an Integrated Systems Platform. Helping to simplify the communication of engineering and architectural complexities, the innovative 3D content engages stakeholders whilst drastically saving time and money throughout the building lifecycle.



## **ANTHONY MILLET**

CEO BrickX

Anthony has over 12 years' professional experience across eCommerce, technology and investment banking industries. Anthony has a passion for property and technology and extensive experience working in innovative environments. Formerly, Director & Chief Operating Officer of ActivInstinct.com Anthony was responsible for building one of Europe's largest eCommerce businesses. Prior to this, Anthony was an Associate Director at UBS Investment Bank, London, focusing on Technology and Business Services transactions.

### **BrickX**

BrickX is the first online residential property investment platform of its kind, with a mission to make investing in property simple and accessible to all Australians. The BrickX platform allows its users to own 'Bricks' (units) in quality residential properties across capital cities in Australia, and benefit from their share of the rental yield and potential capital returns, without the hassle of leasing and managing those properties. Investors can diversify their investment portfolio across multiple properties, with greater freedom to control the decision of when to invest and exit that investment. We saw the opportunity within the existing real estate market to transform the way consumers buy and sell investment property in Australia, and are passionate about Australia's ability to provide innovative technology solutions to property investing that disrupt the status quo, many of which are no longer relevant to consumers today.

## TRENT CLEWS-DE CASTELLA

CEO SCANN3D

Trent founded, previously owned and ran a 3D tech consultancy which connected consumers and business with new and emerging immersive technologies. His unique position and understanding afforded him the insight and network to build Scann3d, a creative 3D company that gives you the ability to virtually experience a property as if you were physically there. Trent is committed to weaving in multiple human senses into the experiences he creates and continues to leverage the latest tools and technologies that continue to build on our sense of spatial awareness.



### SCANN3D

Scann3D uses 3D lidar scanning and visualisation technologies to give potential real-estate buyers an immersive understanding of potential purchases. Humans understand physical space in three dimensions. However, the only information available online when inspecting a property is passive 2D content; B&W blueprints, photos & video. These forms of media fail to accurately depict what a home, office or venue is physically like and as a consequence, homebuyers heavily rely on time consuming physical inspections.

Scann3d create highly detailed and realistic 3D models of interior spaces, allowing users to gain an accurate and immersive impression of what any interior space is truly like. This will help agents provide a superior service when selling property and will help buyers refine which properties they would like to physically inspect. Primarily, Scann3Ds customers are real estate agents who pass the cost on to homeowners as a marketing expense when selling their property. Secondly, we provide these services to venues and businesses that wish to promote their space or take measurements using our software tools.



## **MARK BERNBERG**

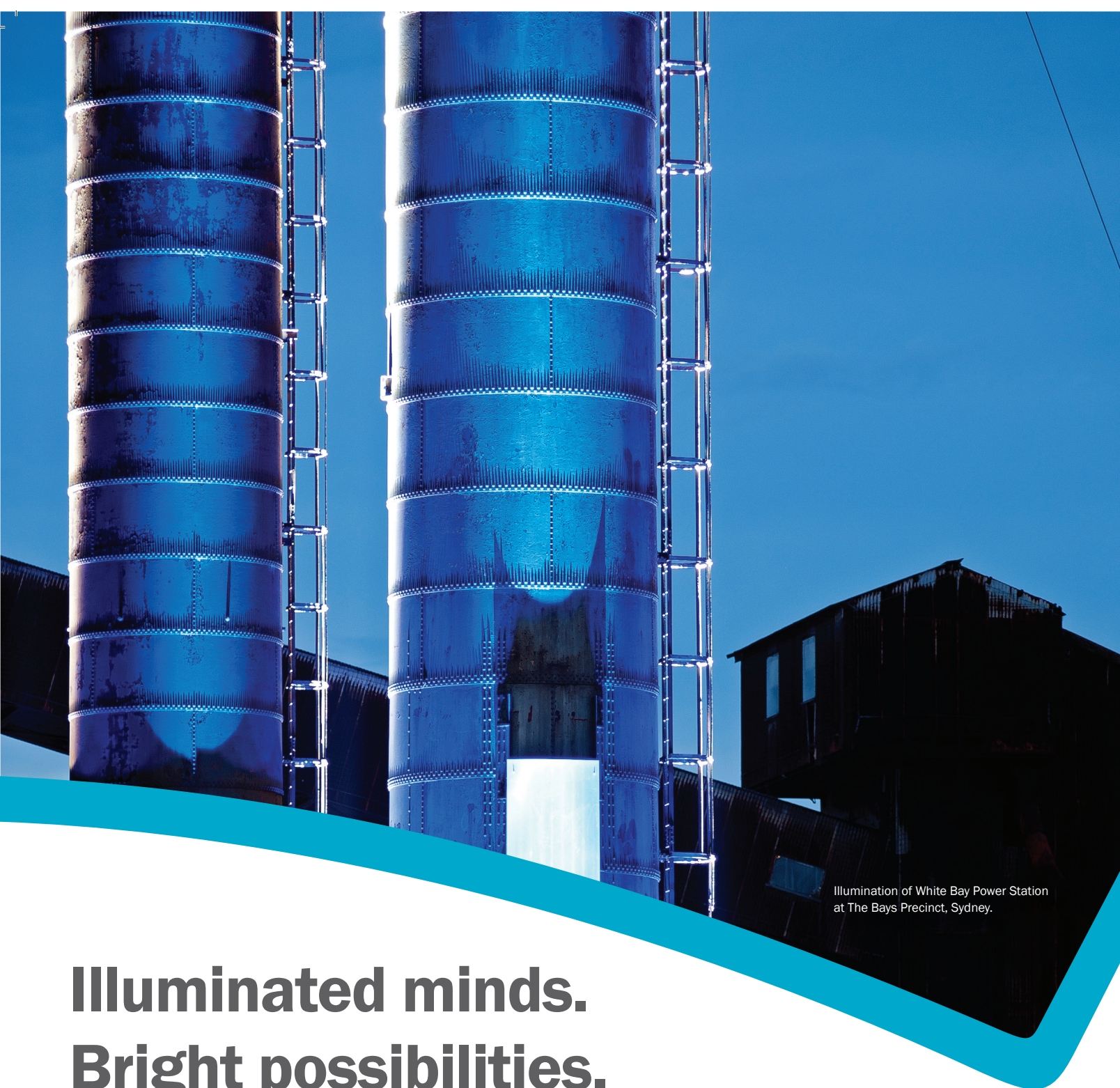
CEO WHIZZ

Mark Bernberg is considered a serial entrepreneur and investor. He has been lucky enough to have worked on 3 continents and successfully founded, run (and sometimes sold) companies in a diverse range of industries including; Diamonds, Sales Training & Change Management, and Cloud technology solutions. In 2011 he founded a Salesforce.com Cloud Consulting company - InstantCloud. Providing strategic consultation and creative solutions to SMB's, InstantCloud assisted companies in maximizing the power of their Salesforce.com deployment – through optimized and correctly architected cloud solutions. In 2012 he sold InstantCloud to Cloud Builders - a registered Salesforce.com Consulting and ISV partner. Mark next took an investment in a Wi-Fi tech startup - Skyfii, a revolutionary business that is changing the face of big-data WiFi analytics in Australia. In November 2014, SkyFii listed on the ASX. In 2015 Mark founded and launched WHIZZ. WHIZZ is a technology company that has developed Australia's first on-demand cleaning app that connects individuals looking for home cleaning services with top-quality, pre-screened independent cleaners. WHIZZ - an uber-fresh approach to cleaning - delivers a five-star, hotel style clean.

## **WHIZZ**

WHIZZ is the leading platform for connecting individuals looking for home cleaning services with top-quality, pre-screened independent cleaners. With a seamless 60-second booking process, secure payment, and a 100% happiness guarantee, WHIZZ is the easiest, most convenient way to book a clean. Our cleaners must pass a 7-step qualification process and test clean before they can call themselves...a WHIZZard. If you're not completely satisfied with our magic, then we'll send a WHIZZard back to finish the job properly – at no expense to you. Guaranteed. And with an Easy, on-demand booking platform. Booking a clean has never been easier!





Illumination of White Bay Power Station  
at The Bays Precinct, Sydney.

# Illuminated minds. Bright possibilities.

UrbanGrowth NSW is proud to support the UNSW Smart Cities and Urban Innovation Symposium. Our projects are unique, challenging, and provide once in a lifetime opportunities to deliver world class urban transformation outcomes for Sydney and New South Wales.

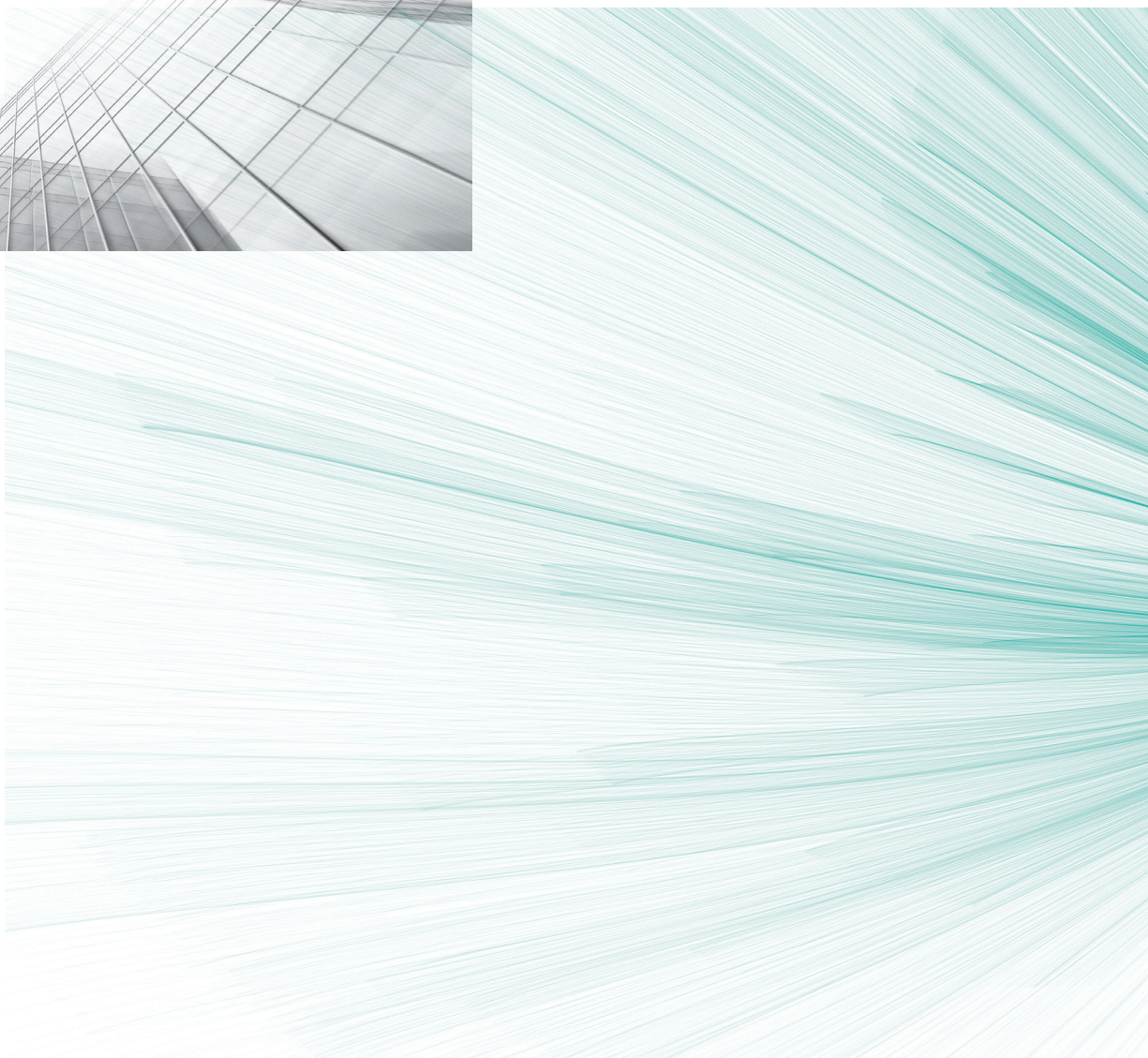
We champion innovation, creativity, clever thinking, technology and design excellence. We work collaboratively with a range of leading universities to harness the brightest minds and best research to help shape Sydney's future as a globally competitive city.

[urbangrowth.nsw.gov.au](http://urbangrowth.nsw.gov.au)



**Urban  
Growth**  
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PROGRAM DAY 1

Wednesday, June 1st, 2016 – 9.00am – 6.30pm

SMART CITIES AND URBAN INNOVATION WORKSHOP

MICHAEL CROUCH INNOVATION CENTRE UNSW

9:00 – 10:00am	Coffee and Registration
10:00 – 10:30am	<b>Welcome</b> Workshop Chairs: Dr Scott Hawken and Dr Hoon Han
	<b>Workshop Launch</b> Professor Helen Lochhead, Dean Faculty of the Built Environment, UNSW
	<b>Sponsor Acknowledgments</b>
10:30 – 1:00pm	<b>Morning Session / Industry Workshop</b> <i>Digital Disruption:</i> <i>Futures for Sydney’s Silicon Harbour and Tech Precincts</i> <b>GREG STONE</b> , Head of Digital Services – Australasia, ARUP <i>Digital Megatrends and Tech Precincts</i> <b>JEREMY GILL</b> , SCG Economics and Planning <i>Silicon Harbour, Place and the Digital Economy</i> <b>DIANNE VELLA-BRODRICK</b> Associate Professor University of Melbourne <i>Wellbeing, Resilience and Digital Disruption</i> <b>ANDREW LOW</b> , Architect and Principal, Hassell <i>Digital Economy and the Public Domain</i> <b>DOMINO RISCH</b> , Architect and Workplace Director, BVN <i>Workplace Innovation and the Digital Economy</i> <b>JONATHAN EMERY</b> Managing Director, Urban Regeneration at Lend Lease <i>Urban Regeneration and Digital Disruption</i> <b>SARAH REILLY</b> , Director of CRED Consulting <i>Inclusive Innovation and Technology</i> Panel Discussion 1 <b>Digital Disruption, Urban Megatrends and Place</b> Panel Discussion 2 <b>Digital Technologies for Wellbeing and Urban Authenticity</b>
1:00 – 2:00pm	Lunch

2:00 – 5:00pm

Afternoon Session / Academic Workshop  
*Smart Cities and Urban Innovation*

**SEKHAR KONDEPUDI**  
Director of the Smart Cities and IoT Lab, NUS, Singapore  
*Essential Ingredients for Creating a “Tech” District or Hub – An Asian Perspective*

**SARBESWAR PRAHARAJ**  
Urban Planner, Smart Cities RC UNSW  
*A Comparison of Smart City Policies across Nations and Cities with Specific Reference to 100 Smart Cities Mission in India*

**QUEENIE TRAN / SCOTT HAWKEN**  
Director Wall to Wall Design & Consulting / Smart Cities RC UNSW  
*Digital Disruption, Vulnerable Demographics and Urban Resilience*

**JACK BARTON**  
Urban Data and e-Research Facilitator  
*Australian Urban Research Infrastructure Network (AURIN)*

**HOMA RAHMAT**  
Architect & Social Media Analyst, Smart Cities RC UNSW  
*Networked Citizens & Diffusion of Urban Innovations*

Panel Discussion  
**Inclusive Innovation and Citizen Engagement**

**KEAN HUAT SOON**  
Principal Surveyor of Singapore 3D National Mapping Project  
*Open and Semantic Interoperable Framework for Smart Nation*

**SHANAKA HERATH**  
SMART Infrastructure Facility, University of Wollongong, Australia  
*Digital Innovations, Open Data and New Urban Research Directions: An Australian Case Study*

**JIM PLUME**  
Senior Reserach Fellow, Smart Cities RC UNSW  
*Information Modelling Standards*

**OTTO NEWHOUSE**, Architect, Smart Cities RC UNSW  
*Linking Land Use Planning to Energy Performance: the LEP-bsDD partial ontology*

**LESLIE LEAHY**, Operations Director at Urbanise.com Limited  
*The Urbanise Platform: smart services for buildings & communities*

Panel Discussion  
**Technology Standards and Innovation**

**Keynote Speaker – DR SARAH BARNS**  
Research Fellow, Western Sydney University  
*Cities in the Age of the Platform: getting the deal right on city data*

5:30 – 6:30pm

6:30 - 7:00pm

Networking drinks

## PROGRAM DAY 2

Thursday, June 2nd, 2016 – 8.00am – 5.00pm

### SMART CITIES AND URBAN INNOVATION SYMPOSIUM THE CONCOURSE, CHATSWOOD

8:00 – 9:00am

9:00 – 9:30am

9:30 – 10:30am

10:30 – 11:00am

11:00 – 12:30pm

12:30 – 1:30pm

#### Coffee and Registration

##### Welcome

Symposium Chairs: Dr Scott Hawken and Dr Hoon Han

##### Sponsor Address

David Tow, Head of Strategy, UrbanGrowth NSW

##### Session 1

##### *Sydney's 'Silicon Harbour' and the Design of Tech Districts*

##### CRAIG ALLCHIN

Director Six Degrees Urban , Australia and Ad Prof Architecture UTS

*Design Led Approaches to Innovation Districts & Topographic Complexity*

##### CHRIS PETTIT

Professor of Urban Science, Associate Director of City Futures, UNSW

*A Data Driven Approach for Understanding the 30 Minute City*

##### Morning Break

##### Session 2

##### *The Digital Agenda and Urban Innovation in Asia-Pacific*

##### Chair Scott Hawken

Smart Cities Research Cluster, UNSW, Australia

##### SEKHAR KONDEPUDI

Director of the Smart Cities and IoT Lab, NUS, Singapore

*Singapore as a Smart Nation in the Context of Innovation, IoT & Big Data*

##### BRETT CASSON

Infrastructure Development & Strategic Innovation Asia Pacific, Autodesk

*The Future of Making Things – Intelligent Disruption*

##### KEAN HUAT SOON

3D Cities Expert and Principal Surveyor of Singapore 3D National Mapping Project

*A Singapore Journey to Smart Nation: a 3D mapping and cadastre perspective*

##### Lunch



1:30 – 3:00pm

**Session 3**  
***Asian Smart Cities: ubiquitous technology***

**Chair Hoon Han**  
Smart Cities Research Cluster UNSW, Australia

**YOUN TAIK LEEM**  
Director Ubiquitous City Research Cluster, Hanbat National University,  
Korea

*Designing the Urban Future: Ubiquitous City Planning & Design in  
Sejong City*

**DAE-JUN LEE**  
Manager IoT Business Solutions, SK Telekom, Korea  
*Digital Strategies for Megacities: Korean Approaches to the Internet  
of Things*

**MANOJIT BOSE**  
Senior Director IT and eGovernance, NASSCOM, India  
*Positioning the Role of ICT in Relation to the Smart Cities Mission in India*

3:00 – 4:30pm

**Session 4**  
***Proptech Startups and Sydney's Innovation Ecosystem***

**Chair Su-Lin Tan**  
Asian business, emerging markets, real estate, foreign capital and news  
writer. Australian Financial Review

**HARRY LEHMANN**  
CEO Vendorable

**MARK MENDEL**  
CEO IBuyNew

**NICK AUSTIN**  
CEO Divvy Parking

**JEREMY HARKINS**  
Director Ineni Realtime

**TRENT CLEWS-DE CASTELLA**  
CEO SCANN3D

**ANTHONY MILLET**  
CEO BrickX

**MARK BERNBERG**  
CEO Whizz

4:30 – 5:00pm

**Closing Address and Thankyous**  
Dr Scott Hawken and Dr Hoon Han

#smartcitiesrc  
#siliconharbour

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