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Dear Dr Bill Pender,

IBM is pleased to submit its submission to the Inquiry into Smart ICT and its role in the design, planning and delivery of infrastructure. IBM is a global leader in the provision of smarter cities and infrastructure solutions and is currently engaged in a number of initiatives here in Australia supporting the use of Smart ICT for major infrastructure projects.

We are sharing some case studies for your consideration as to how nations and cities are currently using digital technologies and platforms to achieve greater efficiencies of existing assets as well as building resilience into proposed infrastructure.

IBM is a member of the peak industry infrastructure body – Infrastructure Partnerships Australia as well as the peak technology and services industry body, Australian Information Industry Association. We understand both organisations will be forwarding a submission to the Inquiry with the support of IBM and copies have been shared with IBM.

IBM supports the work that Infrastructure Australia has completed with the Australian Infrastructure Audit and the Northern Australian Audit and believe the information contained in the attached submission is relevant in terms of future proofing our nation's infrastructure and improving our cities productivity.

For any further details as to this submission please do not hesitate to contact Catherine Caruana-McManus, Director for Industries and Smarter Cities or Judy Anderson, Government Relations Executive

Yours sincerely,

Catherine Caruana-McManus
Director Industries & Smarter Cities



IBM's Submission for the Role of Smart ICT in the Design, Planning & Delivery of Infrastructure

Overview

Australia is at a pivotal point in its history. In the same way that the creation of our rail, power and telecommunications networks accelerated economic growth and opened up many other opportunities, fast broadband, digital technologies, analytics and machine to machine automation will pave the way for the next era of our nation's city and regional infrastructure development.

This submission by IBM, will highlight how smart technologies can revolutionise the way in which physical infrastructure is delivered in Australia in line with global best practice.

Smart ICT is a term used to describe the broad spectrum of a digital tools, techniques and processes that can be applied across the various stages of the public infrastructure investment & build process and includes data analytics, optimisation, advanced modelling, cloud platforms, software systems including as a service models as well as sensors and new devices.

By deploying new enabling technologies, we can make our age-old existing infrastructure more efficient and reliable and potentially offsetting new investment in the longer term: our power grids; our water networks; our transport systems.

We can make new infrastructure more resilient to climate change and population pressures.

By increasing the amount of instrumentation, we can gather more data about performance. We can then use broadband, LTE and wireless networks to pull the data back to central points for analysis. Then based on that analysis, we can make better operational and investment decisions...in real time.

If we factor the changing nature of work and the rise of mobility then cities and regions can offer greater liveability and provide flexibility in work life balance. Tele-working can also aid traffic congestion by enabling people choice as to whether they take the trip to work during peak hour or use that time to log into their office remotely.

We are now in the era of Smart – which is seeing the migration of traditional ICT services shifting to being provisioned and delivered via the “cloud” and supported by just in time and predictive analytics capabilities. There is also increasing potential for automation of construction processes using ICTA, (Information and Communications Technology and Automation), off-site manufacturing, prefabrication and the use of technologies such as 3D printing.

The infrastructure design and construction industry reluctance to embrace innovation is slowly being overcome by the rapid emergence of disruptive technology such as 3D Building Information Modelling (BIM) that enables all project and asset information, documentation and data being electronic.

In terms of world's best practice, by 2016, the use of BIM for all government funded or procured projects is being mandated in countries including Britain, Sweden, Norway and Finland due to increased cost pressures, timing of completion of projects as well as ensuring greater resiliency of assets over time.



We are also seeing here in Australia, the inclusion of Digital Engineers within the senior management teams of many leading design, engineering and construction organisations as the industry seeks to innovate against global competition and the changing expectations of clients who are seeking more liveable, environmentally sustainable and resilient housing and infrastructure.

However, it is critical that moving forward, in the design and planning for infrastructure, that data and information from across the public and private sectors be integrated to improve the overall efficiency and effectiveness of our nation's housing, healthcare, education, social services, transport, energy, water, emergency response and human capital networks.

Smart ICT

As an industry we define Smart ICT for infrastructure as including:

1. Information Technology including software, hardware, cloud services and computer networks
2. Communications across fast broadband, LTE, fixed, wireless and mobile networks including smart mobile hand held devices and mobile workforce
3. Systems of engagement referring to open data initiatives, smart apps and social networks such as Twitter, Instagram, You Tube, Facebook
4. Analytics including both structured and unstructured data across text, video, real-time and predictive analytics; and
5. The Internet of Things (IoT) meaning machine to machine connections, device instrumentation such as sensors, GPS, RFID and the ways in which they can work together to substantially assist in addressing operational and service delivery requirements for infrastructure.

Use of ICT in Infrastructure Industry

Organisations from the infrastructure design, planning and provisioning sector, use an extensive array of advanced technology solutions to ensure projects are built to the standards required and meet operational service level agreements.

Some of these technologies include (but are not limited to):

- 3D Building Information Modelling (BIM) software for buildings and transport infrastructure that is used for more efficient decision-making and cost-effective delivery of large-scale projects
- Project management, workflow, costing and scheduling tools for effective design and delivery of projects multi-disciplinary teams, complex processes and multiple components.
- Asset management solutions such as IBM Maximo
- Facilities management
- Remote site operations as well as connected vehicles including driverless trucks & trains
- Computer Aided Design (CAD) systems
- Advanced visualisation & modelling systems
- Geo-spatial analysis & geo-technical



- Computational & mathematical modelling solutions
- CCTV & Security systems

Smarter Infrastructure

With the industry becoming widely digitally enabled, there is a significant opportunity to extend out into the customer interfacing infrastructure networks and embed Smarter infrastructure into physical infrastructure assets.

Areas where smart technology can greatly benefit public infrastructure include:

- Breaking down silos between different government agencies and third party operators in holistically managing complex infrastructure systems across multi-modal transport networks with policing, emergency response for extreme weather or incident/event management
- predicting future demand for freight and passenger traffic movements in key transport corridors around Australia;
- informing preventative maintenance on major infrastructure such as bridges, road, rail, water and energy grid networks;
- optimising rail container handling between port quaysides and inland intermodal terminals to improve goods flow both ways and deploying automated systems for container movement and despatch;
- synthesising in real-time crowd-sourced social media and citizen sentiment into traffic management operations, improving incident notification, and reducing clearance times and congestion;
- assisting managed motorways to operate with dynamically-tuned ramp-metering algorithms, lifting throughput in peak periods;
- Using the Internet of things (IoT) or machine to machine automation with smart devices and apps to embed intelligent into the infrastructure and its uses such as train black boxes for GPS positioning and track condition monitoring or water pipe condition detection;
- applying advanced analytics for the enablement of renewable energy grids, battery storage solutions, smart metering and smart; and
- smart buildings and precincts (Greenfield/brownfields) – including automated systems, intelligent building management, adaptive energy systems, assistive technologies, remote monitoring

The key benefits in incorporating Smart ICT solutions into the design, planning and deployment of infrastructure include:



Productivity Gains & Efficiencies

- Deployment of advanced analytics to understand, improve and optimize operations of infrastructure
- Gain predictive insights for ahead of time decision making – e.g. traffic flows linked with weather prediction.
- Predict outages/failures and maintenance and optimize restoration.
- Monitor, maintain and optimise the network and assets.
- Predict demand and better forward planning for usage
- Better plan for extreme weather conditions, security threats or major event

Drive better customer experiences

- Improve retention and customer satisfaction.
- Create new reliability, efficiency, demand response and clean energy options.
- Prioritise a 360-degree view of customer preferences, attitudes and expectations.
- Enabling services for citizens that are highly mobile and diverse
- Improve interaction via social and mobile.

Support New Business Models & Platforms

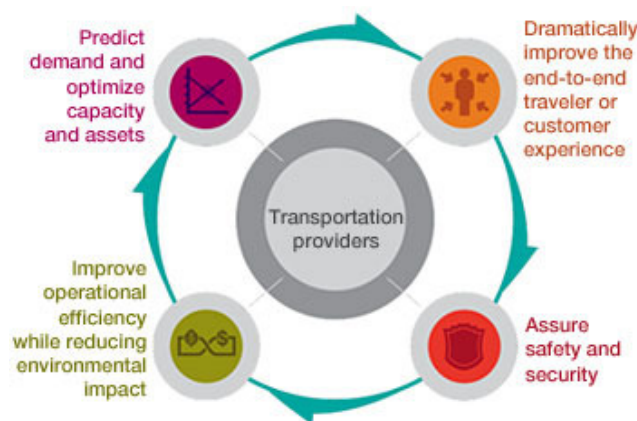
- User pays models e.g. congestion charging, road user charging, smart motorways
- Smart metering & smart grids,
- Renewable energy management
- Electric vehicles & battery storage

Case Studies For Smarter Infrastructure

Smarter Transport

ICT and the Internet of Things (IoT) empowers us to infuse intelligence into our entire transportation system by instrumenting it with sensors, meters, appliances, cameras, smart phones, biometric devices — giving us the ability to measure, sense and see the exact condition of everything. Instrumentation is about sensing what is happening right now, whether it is the temperature of a train wheel bearing, the location of a misplaced suitcase, metal fatigue in a bridge.

At the same time, sophisticated analytic systems can detect patterns and relationships and enable continuous decision making in near-real time. We can better plan routes and schedules, reduce congestion and optimise vehicles, equipment and facilities to expand capacity. These new traffic systems can improve drivers' commutes, give better information to city planners, increase the productivity of businesses and raise citizens' quality of life.



Intelligent Operations & Transport – Next Generation Multi-Model Transport Management

Today's traffic management centres have sophisticated video walls and colour maps of real-time traffic that can integrate different streams of traffic data, but do not provide full situational awareness across the transportation network or associated networks such as public transport or weather monitoring. Intelligent operations centres for transport allows traffic operators to factor current and future traffic patterns into their decision-making process.

The City of Lyon has deployed a new multi-modal predictive traffic management solution for the entire network of roads, buses and trams. The solution uses the IBM Decision Support System Optimiser (DSSO), to combine incident detection, incident impact prediction and propagation, traffic prediction and control plan optimisation and is build into the IBM Intelligent Operations Centre platform. By combining advanced analytics and algorithms to help model predicted conditions under both normal and incident conditions, the system is used to estimate drive times and traffic patterns in a region more accurately and in real-time. Over time, the algorithms "learn" by incorporating best practices and outcomes from successful plans to fine-tune future recommendations. Additionally, the command centre can develop traffic contingency plans for major events such as large sporting events or concerts.

New Jersey Turnpike Authority: Traffic Congestion Management

IBM announced this year a new transportation management solution to help minimize congestion and improve traffic flow for the New Jersey Turnpike Authority (NJTA). The solution, which is part of the NJTA's Advanced Traffic Management Program, provides a centralized, federated command and control system that manages nearly a thousand devices. With this at their command along with the connection of sophisticated systems into a single view, NJTA officials are able to quickly react and respond to real-time information about roadway conditions, which ultimately serves to reduce congestion and delays faced by motorists.

Sydney Airport Congestion Management

Sydney Airport in Australia needed to look deeper inside the massive volumes of data collected every day by baggage, customs, carriers, retailers and numerous other systems to gain insights that would allow it to more precisely orchestrate its vast operations. The airport tested an advanced analytics and reporting platform that allows it to more accurately predict passenger volumes and movements and generate actionable insights for improving customer services and operational efficiencies. For example, an analysis of vehicle traffic patterns outside the airport revealed that drop-off zones experienced heavy congestion whenever major airlines ran low-fare promotions. Airport managers are using the new insights to redesign the airport's parking and traffic management systems.



Yarra Trams Smarter Transportation System

Using Big Data & Analytics, mobile and cloud technology, Yarra Trams is able to improve passenger experience, perform predictive maintenance and increase the efficiency of their network. The IBM software enables access to real-time information about service disruptions, tram performance and tram locations through sensors and new data collection tools. Workers can remotely access work orders and receive up-to-date information about tram service on mobile tablets, thus enabling better management of repairs & quicker response to any disruptions. Yarra Trams is also improving communications with its passengers. Live updates about tram arrival times and service delays are shared with them using the free mobile app tramTRACKER®. Results showed Yarra Trams being able to:

- Consistently exceed its key performance measurements around tram service punctuality
- In 2015, service delivery was at 98.85% and tram punctuality was at 80.6% - achieving higher results than its monthly targets of 98% and 77% respectively.

Smarter Vehicles

The IoT is an applicable reality for the automotive industry, which is poised to redefine its connection to a vehicle's driver and passengers. Today, the real-world focus is on driver-centric technology that is able to configure itself to the drivers' preferences and environment. Already, we're seeing the rapid adoption of basic connected vehicle services and a new generation of consumers that sees the potential for cars that are connected in every way

Connected Services" for the Car of the Future"

PSA Peugeot Citroen working to integrate the massive amounts of data from cars, phones, traffic signals, lights and other sources and analyse it in real-time to deliver on the promise of the connected vehicle. This innovation and collaboration with IBM is expected to offer new and essential services for both drivers and passengers.

Transforming the commute

Analysing a wide variety of data can help cities develop a more holistic approach to improving their transportation systems – from where transit routes should be to bus or train schedules to lowering emissions citywide.

In Singapore, there is a project currently underway with the Singapore Land Transport Authority to create a state of the art public transport system. The project is to create a public transport emergency response blueprint for better crowd management and proactive information services using analytics modelling. By using data to extract actionable insights, transport operators and authorities will be able to provide better information services to their employees and passengers.

Smart Parking & Car Sharing

Car2go Smartphone app

Daimler's moovel's GmbH portfolio represents a new vision in personal mobility including the car2go and the car2go black car sharing services, the Park2gether platform. The moovel Car2go smart app is available in 26 cities in Europe and North America and has more than 800,000 customers. The app analyzes the offerings of transportation services such as railroad, bike rental, taxis and car sharing to find the best way to travel and offers users different suggested routes depending on their preferences of speed, cost and comfort. Daimler is making itself integral to a new model that uses data and customer-focused services to fundamentally change how people and communities experience transportation.

ICT and IoT for water is all about sensor networks, smart metering and advanced computing and analytics to helping ensure the flow of clean, plentiful water around the planet. These sophisticated sensors collect and analyse the tremendous amounts of data generated in complex water systems, from rivers and reservoirs to the pumps and pipes in our homes. We can



give all the organisations, businesses, communities and nations dependent on a continuing supply of freshwater-that is, all of us-a single, reliable, up-to-the minute and actionable view of water use.

Smarter Water

Mobility in water

Using internet to connect real-world sensors and control water management systems from a cloud-based platform, management can pull in streams from any other data source, including weather reports.

Efficient management

We can apply advanced computing and analytics to move beyond "real time" to anticipate potential delivery disruptions, better forecast long-term water demand, support better-informed policy and management decisions. It also enables the coordination of resources and stakeholders to protect water supply and driver conservation and sustainability.

Citizen as the sensor

Consumers will be able to connect to their utilities via their smart phones – enabling the industry to engage with its customers more proactively. We can leverage social media and people to effectively manage water such as leak detection, water usage and drive positive behavioural change.

Townsville Water Pilot: Advanced Analytics and Systems of Engagement

The city has implemented a smart water pilot that is breaking new ground in the way data is collected and analysed in near real-time. At its core, it will help identify and enable ways for the people of Townsville to drive water conservation by empowering residents with smart technology to assist with positive behavioural change. By using IBM's Big Data expertise for the pilot project, Townsville City Council is able to deliver near real-time information about daily water usage from digital water meters to the Council and residents via a web portal and reduce overall consumption as well as offset future infrastructure investment. The results of the pilot showed:

- 50% of consumers changed their behavior after seeing both timely data and insight from their pattern of use on the portal.
- 98% faster notification time on water leaks, from three months to day, potentially saving millions of litres of water, associated treatment and delivery costs, reduction in bill shocks and complaints to the call center.
- 10% reduction achieved in overall average household water consumption by residents accessing the portal.

Yarra Valley Water: Optimisation of assets

To keep essential water and sewerage services flowing to more than 1.8 million customers, Yarra Valley Water wanted to move away from its siloed and disparate systems in order to gain better insight into its distribution network to reduce failures and disruptions. Using an integrated IBM enterprise asset management solution, Maximo, Yarra Valley Water has a system that provides a comprehensive view of all its assets consolidated into a single platform. This enabled them to make insightful decisions about managing and maintaining its water and sewage network. The benefit:

- Improved insight and control of assets
- Easier asset optimization through prioritized and proactive maintenance.
- A platform that enables them to layer analytics for the delivery of business insights

The Netherlands: Smarter Resource Management



The Netherlands partnered with IBM to develop breakthrough cloud-based innovation platform that harnesses insights from big-data to transform flood control and the management of the entire Dutch water system. The solution will provide water experts with a real-time intelligent dashboard to harness information so it can be shared immediately across organizations and agencies. These insights can help prepare for imminent difficulties, enabling authorities to coordinate and manage response efforts and, over the longer term, to enhance the ongoing efficiency of overall water management. This resulted in:

- Up to 15% reduction in the cost of managing water
- Better integration information to aid in disaster prevention and environmental degradation

Northern Territory Power and Water Corporation

Power and Water Corporation is responsible for electricity transmission and distribution and provides water and sewerage services across the Northern Territory, an area of more than 1.3 million square kilometres. An intelligent asset management technology in its water network was installed. This was combined with the use of more sensors and meters in the field, this has revolutionised the way that this utility maintains its infrastructure. Given the size of the Territory, a pipe could leak for some time before it's even found. By increasing intelligence in that system, NT Power and Water is now better able to catch problems as they occur, and to find related issues. Their system is saving time and money, whilst increasing the resilience of the entire system. It is a more technology-driven approach to asset management.

Smarter Energy

As energy and utilities (E&U) companies move forward—balancing supply and demand; ensuring safe, reliable and efficient power delivery; and maximizing assets and investments—ICT and the Internet of Things offers new ways to overcome traditional barriers. By embracing modern, technologically advanced products and delivery strategies, E&U companies can transform the industry and define an exciting future of their own.

New Pressures on the Grid

The grid is under the intense operational pressure with the addition of intermittent renewable resources (such as wind), the increase of distributed generation and the pending retirement of aging fossil-fuel plants as well as new competitive pressures on the industry resulting from new IoT products and locally generated energy in the market place.

Increasing customer demands

Consumers now expect seamless interactivity from service providers and are increasingly turning to third-party IoT-enabled home control devices to manage their energy usage and low-cost solar technologies as an alternative to purchasing power from the grid. Utilities feel competitive pressure to become the energy integrator, placing pressure on utility revenues while increasing costs.

Denmark: Smarter Renewable Energy and Analytics

Danish company, Vestas, is the largest global energy manufacturer dedicated exclusively to wind energy. They partnered with IBM to increase wind power generation through optimal turbine placement by using big data and analytics. This enabled Vestas to reduce data processing times for more accurate turbine placement decision. With an improved precision comes greater business case certainty with customers, increased predictability and reliability in wind generation. This led to benefits of:

- Reduced response time for wind forecasting by approximately 97% - from weeks to hours
- Reduces IT footprint and costs, and decreasing energy consumption by 40%



India: Optimisation of Assets

India-based Bharat Light & Power Private Limited (BLP) generates power from a variety of sources, including wind, solar, biomass and hydro. Through a 10-year engagement with IBM, BLP built an IT infrastructure that integrates key business applications. BLP combines thousands of wind, asset and process data points to continually evaluate the overall health of its power grid. Leveraging predictive analytics on this data has given BLP:

- Unprecedented access into its network,
- The ability to proactively identify defective assets and the root causes for plant load factor (PLF) degradation.
- 5-10% gain in energy versus PLF
- Days to minutes in infrastructure provisioning from hosting the solution on a cloud platform.

Texas: Smart Metering and Asset Optimisation

Oncor, the largest regulated transmission and distribution service provider partnered with IBM and its Business Partners Ecologic Analytics and Landis + Gyr, to deploy a smart meter solution. The solution collects data and operational process messages at fifteen minute intervals from meters throughout the electric grid. Oncor gains greater visibility into power demand and service quality so it can pinpoint service problems and minimise service disruptions. Oncor's smart metering system allows energy consumers to make informed decisions about their electricity usage, minimising energy costs. Ultimately the system provides Oncor with the information it needs to better manage the distribution network down to the meter. The result:

- Consumers become active participants in their power consumption management
- An estimated 5-10% reduction in household electrical consumption

Malta: Smart Metering and Asset optimisation

The Maltese National Electricity and Water Utilities—Enemalta has transformed its key utility processes through the implementation of an integrated utility business solution. The solution is designed to improve operational efficiency and customer service levels by introducing smart meters that allow clients to better manage consumption. 250,000 analog electricity meters will be replaced with new smart electronic devices that will monitor electricity usage in real time, set variable rates, and reward customers who consume less energy and water. Smart metering also enables restructuring of the billing process, improved customer relationship management and the introduction of e-services that further empower clients to serve their own customers. The project is the first step in establishing an end-to-end electricity and water smart utility system.

When complete, the multi-phased engagement is expected to completely transform the relationship between Maltese consumers and utilities suppliers, while enabling more efficient consumption of energy and water.

- Consumer engagement through smarter decision making on power consumption
- Remote management of electricity supply: no local intervention to activate, reduce, increase or terminate supply, thereby reducing connection time.

Emergency Management & Response

Intelligent operations centre platforms work hand-in-hand with specialized tools to serve as the coordination point for a vast array of customizable software and communication media. Mapping software and geographic information systems (GIS) can help you understand and visualize data to make decisions based on the best available information. And situational awareness and decision-making tools such the IBM emergency management centre solution, which includes specialized industry-leading business partner solutions, can help you understand the possible decisions and predict the consequences of various options.

Victorian Bushfire Warning System

CFA (Country Fire Authority) is a volunteer and community based fire and emergency services organisation that helps protect 3.3 million Victorians, and more than one million homes and



properties across the state. Working with IBM, they have developed the One Source One Message (OSOM) warning system for writing and sending bushfire emergency messages. The OSOM system is based on the Whispir platform and allows the CFA and DSE to send timely and accurate alerts that can help save lives and property. This means:

- Increased speed of command
- Improved coordination in incident planning and response

Rio de Janeiro: Natural Disaster Preparedness

Located in Brazil, Rio De Janeiro is a seaside City with a population of about 6 million people. As a result of experiencing natural disasters, Rio de Janeiro needed a centralized operations centre for the city that enables them to better respond to natural disasters, threats and at the same time ensure public safety through disaster prevention. This system integrates data from 30 agencies, enables personnel to analyse weather, energy, building, transportation and water data in real time. It draws on information from collected from multiple sensors integrated into infrastructure such as traffic surveillance, rain meters, and provides near real-time situational awareness in a single view. The result is:

- 80% success rate in predicting downpours and floods 48 hours before they occur.
- A city that can marshal its resources within hours, instead of days.

Major Events: Crowd Tracker

IBM helped Tennis Australia create a utility for the fans who visit Melbourne and Olympic Parks over the course of the Australian Open tournament. Available through the Australian Open website and official apps, IBM CrowdTracker gave fans a birds-eye view of the precinct to see what crowds were doing on site and on line. Using live data from a range of sources, IBM was able to give fans a real-time insight into:

- Where they are - using the GPS enabled on their mobile device, fans could see where they were on site and what was going on nearby
- Where the crowds are - using data obtained via Wi-Fi enabled device signals, fans could see where the biggest crowds were and quickly find the most popular spots
- Social buzz - the same map also provided a view on popular Instagram spots, Twitter stats and sample photos shared via social media. It also included a locator for Aus Open's Selfie Station promotion
- Court by court insights - the map included glowing courts to indicate where matches were currently underway so fans can decide where to go. More importantly, they could click on each court to see real time court data such as scores and stats, social sentiment about that match as well as player bios.

By using social media and GPS enabled devices, this solution is very relevant to major sporting, entertainment or community events as well as dealing with crime spots (eg Kings Cross) or major security threats or catastrophes.

Connected Healthcare

Digital technologies are revolutionising the way personal healthcare systems are being managed. Consider the increase use of personal fitness trackers, connected medical devices, implants and other sensors that collect real-time information. The average person is likely to generate more than one million gigabytes of health-related data over a lifetime. Individual patients and larger health populations alike will benefit as providers share and apply these insights in real time – result in better, faster and less expensive treatments, positive patient outcomes and improved overall health experiences.



Italy: Solutions to an Aging Population

In Bolzano, Italy, almost a quarter of its population is over the age of 65. The city spends 42% of its social program budget on services for the elderly. By partnering with IBM, Bolzano developed a program that aims at managing the city's aging population and stabilise costs while simultaneously allowing it to care for its growing elderly population.

The program equipped a small group of elderly resident' homes with sensors and home health monitoring via mobile devices and touch screens. These would report data back to a central database closely monitored by the city. From there, the city would dispatch care workers to visit their homes. The results:¹

- Savings of up to 31% of our public spending on social programs
- 80% of home personal computer users exhibited significant improvement
- 80% of the elderly felt more secure

Canada: Using Big Data and Analytics to improve quality of care

University of Ontario Institute of Technology and the Hospital for Sick Children teamed with IBM to develop a first-of-a-kind, stream computing platform. The system continuously performs real-time analytics using physiological data from neonatal babies. It enables clinicians to detect subtle changes and provides early warnings that give caregivers the ability to proactively deal with potential complications. The led to benefits of:

- Detecting infections in premature infants up to 24 hours before they exhibit symptoms
- Lower morbidity and improved patient care

Action Plan for Smarter Infrastructure

IBM proposes some key recommendations for Smarter infrastructure for Australian cities and regions being:

- Undertake a nation wide readiness assessment of existing critical assets in terms of their capacity to support digitisation to improve the efficiency of the network and to improve the resiliency of the asset for the long term;
- Embed smart devices, sensors and related digital technologies into existing physical and soft infrastructure assets, i.e., energy, water, transport, healthcare, education, so that these systems can be optimised to respond more efficiently and effectively to economic, environmental and social challenges;
- Deploy a holistic view across city systems and networks with the adoption of next generation intelligent operations on open platforms that enable cross agency data consolidation and advanced analytics for predictive capabilities and work with agencies and the private sector to enable data sharing for publicly used networks;
- Deploy Smart Connected Community and Demonstrator Projects for urban renewal, green field and major precinct projects to encourage integrated energy, water and waste across utilities and seek ways to encourage agencies to share data to build more sustainable and resilient communities e.g. Pilbara, Townsville, Cairns, Mackay, Darwin, Broome, Gold Coast, Sunshine Coast;
- Embed Innovation into City-Related Infrastructure and Services Procurement contracts with the inclusion of "innovation clauses" or value-add proposals, to enable digital technologies (e.g., sensors, devices, smart metering, intelligent operations, communications, asset management software) to be evaluated as part of the planning, provisioning and maintenance of infrastructure related projects;
- Mandate the use of BIM for government procured infrastructure projects as per the European model;

¹ http://www.cwhonors.org/case_studies/2012Finalists/Innovation/2510.pdf



- Seek bi-partisan support for a “smarter Australia” that is inclusive of communities expectations to improve the productivity, liveability and sustainability of our nation’s cities and regions;
- Establish a smart ICT in Infrastructure steering committee lead by Infrastructure Australia with the inclusion of representatives from the state equivalents to seek best practice principles and engage with the smart ICT industry to build a “smart infrastructure” roadmap; and
- Harmonise standards across the different infrastructure domains, and encourage open platforms to more easily integrate industry specific or project “bespoke” solutions as well as provide scalability via hybrid and private cloud environments.

About IBM

IBM is building on experience gained from [Smarter Cities](#) engagements around the world. Working with IBM, city leaders can now monitor, measure and manage a wide range of city services such as water management and intelligent transportation among others. Using advanced technologies, like analytics software, IBM is helping cities of all sizes apply intelligence to their city operations to deliver better services to their citizens.

http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/

IBM is a member of Infrastructure Partnerships Australia and the Australian Information Industry Association and seeks to further industry engagement in initiatives that seek to improve our nation’s productivity and the efficiency of major infrastructure by the use of ICT.

Prepared by Catherine Caruana-McManus – Director IBM Smarter Cities ANZ