

City of Melbourne Submission



**House of Representatives Standing Committee on Infrastructure and
Communications: inquiry into the role of smart ICT in the design and planning of
infrastructure**

City of Melbourne response

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1. Overview

The City of Melbourne welcomes the opportunity to provide a response to the House of Representatives Standing Committee on Infrastructure and Communications' inquiry into the role of smart information and communication technology (ICT) in the design and planning of infrastructure.

We recognise the critical importance of smart ICT in all facets of our services and operations. Indeed, our vision is that Melbourne function as a smart city in which ICT enhances liveability in order to achieve economic, social and sustainability goals.

The City of Melbourne has global recognition a leader in both civic engagement and urban innovation. Our citizens are proactively encouraged to participate in city governance through effectively leveraging ICT in order to maintain our status as one of the world's most liveable cities. Our aspiration is to acquire global recognition for our ability to capitalise on opportunities presented by smart ICT.

However we consider ICT does much more than simply enable infrastructure management. Most importantly ICT enables our community and stakeholders to collaboratively address problematic issues which face the city and to create new ways to meet business needs.

The City of Melbourne stance is based upon an acknowledgement that in order to successfully address all types of urban management issues (such as traffic, water and energy management and improving, health, safety and business activity) solutions are likely to emerge from both inside and outside the organisation.

In addition, we will use the development of our products, services and procurement processes to help accelerate innovation and facilitate opportunities for local start-up businesses in gaining exposure in the fast growing global '*Smart City*' sector.

2. About Melbourne

The City of Melbourne is the capital city and the business, administrative, cultural and recreational hub of Victoria. Our municipality covers 37.6 sq. km and has a residential population of around 125,000, with an additional 730,000 people working, studying in or visiting the city each day. The City of Melbourne encompasses the Melbourne CBD, Southbank, Docklands and eleven of Melbourne's inner-city suburbs. The City of Melbourne serves its municipality through five service streams, as outlined in Figure 1.

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Figure 1: City of Melbourne service areas

DELIVER COMMUNITY SERVICES	ACTIVATE CITY	ADVANCE MELBOURNE	DESIGN, BUILD AND MANAGE ASSETS	REGULATE
Care for the older, vulnerable and people with disabilities	Events	Urban planning and design	New infrastructure	Building regulation
Waste collection	Arts and Culture Programs	Sustainability initiatives	New parks and gardens	Car space management
Child care, maternal and child health, family and youth services	Tourist services	City Research	New buildings and developments	Planning regulation
Library services and community centres	City Marketing	Business support and development	Renewal and maintenance of existing buildings	Food and public health regulation
Recreations services and facilities		International relationships	Renewal and maintenance of infrastructure	Event regulation
City safety			Renewal and maintenance of parks and gardens.	Local Law regulation
Community support groups			Street and public place cleaning	

In 2013 the Gross Local Product of the City of Melbourne economy was \$86.7 billion including 438,972 local jobs, 7.49 million sq. metres of office space and 1.39 million sq. metres of retail space.

The City of Melbourne is a major contributor to the Victorian and Australian economies, accounting for 27% of Victoria’s Gross State Product, and 6% of Australian Gross Domestic Product. Melbourne is a centre for global business, research, education and cultural institutions.

The Grattan Institute’s *Mapping Australia’s Economy 2014* Report, states that cities are the ‘backbone’ of the Australian economy and that CBDs and inner city areas are of critical importance to the prosperity of the nation. The report states that national policy and infrastructure interventions need to “respond to our economy’s spatial dimension, including by minimising barriers to highly productive activity in inner city areas” suggesting that the public investment in infrastructure in these areas delivers greatest dividends.

3. General Response to the Inquiry

A number of powerful trends shaping the innovation landscape for cities have emerged over the last two decades. Rapid developments in ICT, smart and mobile devices, sensing, cloud computing and other technologies, along with the growth in the requisite human capital necessary to exploit these advances, have enabled possibilities for collaborative action. Complex urban challenges can now be addressed collaboratively via Smart communities comprising hyper-connected, technologically agile and often entrepreneurial innovators. These Smart communities are the new agents of change and the generators of knowledge.

The City of Melbourne’s Smart City policies recognise and prioritise the potential benefits flowing from collaborations enabled by technologies and the opportunities for collaboration. We have established a “Smart City Office” incorporating the component municipal functions of research, innovation and geographic information systems, working with external stakeholders in industry, the tertiary education and research and community sectors. This

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serves to encourage cross-sectoral experimentation and innovation with a view to creating solutions to municipal infrastructure and other municipal management issues.

City of Melbourne priorities include using ICT to enhance:

- Open data and information governance and technology systems to provide contemporary customer service and operational excellence
- Engagement and collaborative involvement with external players
- Development of urban spaces
- Wired and wireless high bandwidth connectivity
- Our ability to proactively respond to both positive and negative impacts of new business models on the city, and
- Co-ordination and shared service delivery between levels of government.

In light of these priorities, we request that the Committee consider the following suggestions, which are specific to needs of local government:

- Develop interoperability and standardisation arrangements
- Resolve legal and regulatory uncertainties arising from new applications of smart ICT in the public domain, which also address the security and privacy demands of citizens
- Support the implementation of pilot projects and other forms of innovation or experimentation
- Support investigations into lowering costs and developing different business models for ICT implementation for cities
- Support initiatives that facilitate knowledge transfer between cities and external ICT stakeholders
- Support for initiatives that build public awareness of the emerging benefits of ICT in the public domain
- Develop strategies which ensure that the deployment of ICT technology does not distract from the *'look and feel'* of cities

4. Detailed Response to the Inquiry - Current and Anticipated Use of ICT in the City of Melbourne

The City of Melbourne employs a range of ICT applications for multiple functions and purposes, including asset management, integrated parking, design, mapping, modelling, and public tools for way finding and community engagement.

The following case studies present an indication of the extent to which smart ICT initiatives are currently utilised.

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4.1. CityLab

City of Melbourne established *CityLab*, an internal innovative 'practice', in 2013 with the broad general objective of enabling the city to be faster, leaner, more productive, more innovative, more collaborative and more agile. Our *CityLab* team works with internal and external partners to provide a means by which new approaches and technologies can be prototyped and trialled within creative, yet risk-controlled environment.

CityLab has successfully designed and delivered a number of projects with corporate, government and academic partners including:

- 'Open data' with the developer and academic communities,
- sensor deployment for the Internet of Things project with Arup and Melbourne University,
- Maker exploration project with Second Muse and the Melbourne maker community, and more recently the
- Accessible Navigation Project with Studio Thick and members of the accessibility community.

CityLab has developed strong working relationships with the higher education sector in Melbourne. For example PhD students from Melbourne University are working on developing a framework for assessing the likely impacts (both positive and negative) of applying new technology to solve city problems. In collaboration with RMIT, *CityLab* has facilitated a number of 'Design Studios' within MA programs in Design, Innovation and Technology working with Dr Carlo Ratti's the "*Turning Basin*" (2014) and "*Accessibility at QVM*" (2015).

CityLab will also be collaborating with RMIT School of Communication Design convening a 'Design Studio' focussing upon '*Future of Local Government*' in the near future.

4.2. Pedestrian Counting

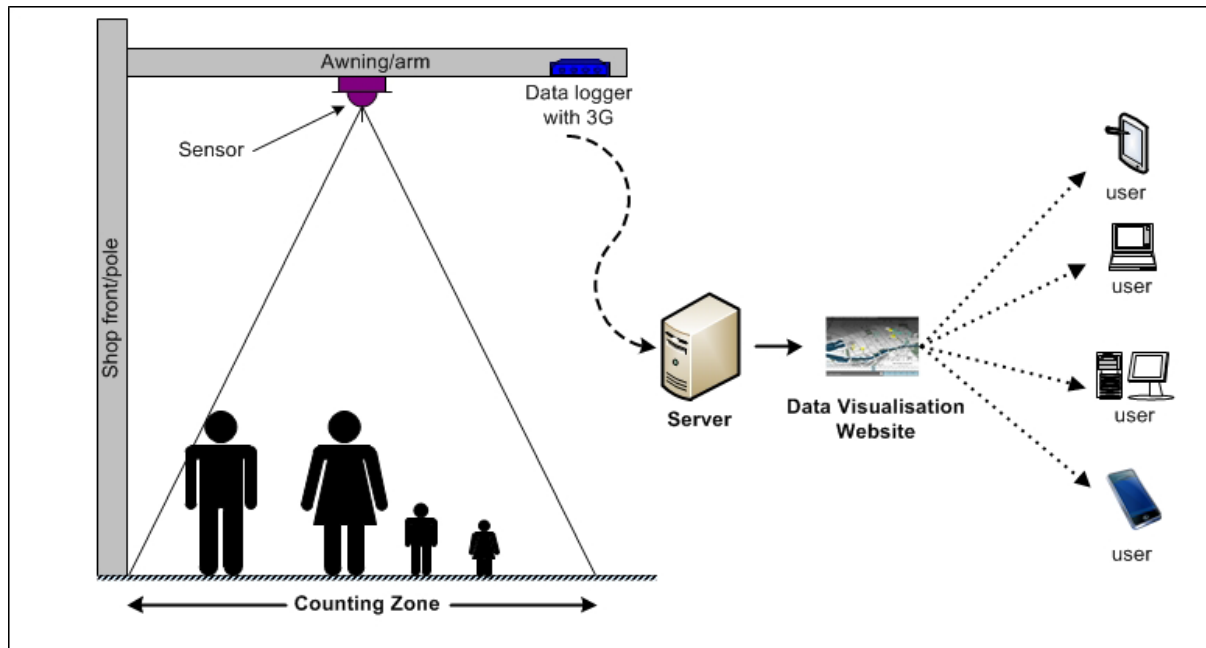
The City of Melbourne's pedestrian counting system measures pedestrian activity by transmitting data from 42 wireless pedestrian counting sensors (as depicted in Figure 2) across the Central Business District to a central server and a visualisation website. This web-based tool is specifically designed to allow external stakeholders as well as the public to visualise pedestrian patterns at all locations at any given time and day. It is a valuable tool for a range of data users. Retailers, for example, might use the data to identify or anticipate staffing and resource requirements or to develop marketing strategies to maximise their exposure.

Future development of the pedestrian counting system will also enable more precise planning of infrastructure such as footpath capacity, by mapping people movements and concentrations throughout the city.

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Figure 2: The City of Melbourne’s Pedestrian Counting System



4.3. Open Data Portal

The City of Melbourne has developed an Open Data Portal, which allows municipal data to be publicly available. This initiative has the general objective of encouraging wider dissemination of data and encouraging its wider re-use. While demonstrating greater transparency and fostering accountability, it may also drive innovation and economic opportunities and lead to a more cost effective, efficient and responsive local government.

A range of data collected and stored by the municipality is made available to the public in machine-readable formats while safeguarding sensitive information and rigorously protecting privacy. Appropriate open licensing is in place to facilitate data use.

4.4. Free Wi-Fi coverage within the municipality

Free WIFI coverage is expected of a global city and the City of Melbourne has partnered with the Victorian Government to launch a five year pilot program of free public Wi-Fi in the city aimed at further supporting tourism and the education sector as well as increasing social inclusion and encouraging new business models.

This development aims to achieve the objective of being “connected and have access to information anywhere, anytime”.

4.5. The ‘Internet of Things’ Research Project

The City of Melbourne has partnered with external stakeholders, ARUP and University of Melbourne School of Electrical and Electronic Engineering, on a three-year Australian Research Council (ARC) project “*Creating a Smart City through the Internet of Things*”. The City of Melbourne is collaborating with the research team to install solar powered sensors to collect real-time data on temperature, light and humidity in the Fitzroy Gardens and in the Docklands precinct

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4.6. IBM Smarter Cities Challenge

The City of Melbourne has recently been awarded a grant from the IBM Smarter Cities Program to assist in developing our understanding of community engagement processes, specifically related to anticipation and coordination of municipal responses before, during, and after, extreme events in order to minimize adverse impacts on health and safety, infrastructure and economy.

IBM will contribute the skills and expertise to address these critical challenges within the organisation and its key stakeholders. Alongside the Smarter Cities Challenge award, the City of Melbourne is one of two cities selected to receive 'Twitter Data'. This project will complement City of Melbourne's participation in the '100 Resilient Cities Challenge' funded by the Rockefeller Organisation.

4.7. Future ICT applications

The City of Melbourne anticipates continued benefits will flow from ICT investment and is currently seeking new ways of better exploiting ICT, including:

- undertaking community engagement and digital democracy campaigns
- developing a digital council prototype that guides our online and social media presence
- building a more secure online account system for residents and ratepayers
- moving high volume work to digital platforms

5. Response to the Inquiry's Seven Terms of Reference

5.1. Identifying innovative technology for the mapping, modelling, design and operation of infrastructure

The City of Melbourne continues to utilise a range of applications to meet its mapping, modelling, design and infrastructure maintenance needs. We employ applications, which spatially and temporally, model, objects, behaviours, relationships and dependencies. We employ applications that permit designs to be scalable, agile, interactive, immersive and web-enabled.

The City of Melbourne encourages further research, collaboration and other forms of support for the use of technologies that serve the infrastructure management needs of local government.

ICT can enable more accurate and timely delivery of community infrastructure. The use of technology to gather data on individuals' movements and use of a city, including residential and employment patterns, leads to intelligent modelling of future infrastructure needs.

It would be extremely valuable to know the actual number of people in a given location at a given time and their movements across the city. We can only estimate this approximately at present using our pedestrian monitoring system and other less frequent data sources.

In addition smart use of ICT provides the opportunity to cleverly convey information to individuals and groups alike so they can take action to minimise their impact on congestion and energy use in the city.

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5.2. Identifying the new capabilities smart ICT will provide

Smart ICT is an essential component in successful municipal management. Incorporating elements of smart ICT strengthens the City of Melbourne's response to a range of contemporary urban challenges and we are looking to expand the use of smart ICT to new areas of service delivery and operations.

Our interest in expanding the coverage of smart ICT is driven by an appreciation of the benefits it offers. These include the ability to:

- transmit, record and present data in real time
- respond rapidly to and develop applications to issues
- undertake predictive modelling
- undertake parametric modelling
- visualise and simulate data
- optimise systems and process performance
- self-repair infrastructure

5.3. Examining the productivity benefits of smart ICT

The City of Melbourne recognises that smart ICT drives and increases municipal productivity both internally and externally. Internally it benefits City of Melbourne infrastructure managers and externally it benefits partners pursuing solutions to city problems and businesses pursuing enterprise solutions.

Smart ICT is a resource that drives:

- faster development and deployment of plans and projects
- enhanced collaboration platforms
- better public accessibility to information
- better archiving and co-ordination of information for infrastructure managers
- optimisation of resources
- establishment of new ways to deliver and consume services

Though still in its early development phase Artificial Intelligence has the potential to significantly impact on how cities function and are managed in the future. These impacts range from changes in jobs and work practices and reduced risks in hazardous situations through to the very purpose of cities.

The City of Melbourne encourages further analysis, discussion and dissemination of the productivity benefits available through the deployment of ICT.

5.4. Harmonising data formats and creating nationally consistent arrangements for data storage and access

The City of Melbourne strives to ensure that its data systems are integrated with existing systems used by all levels of government and the private sector.

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Aligning with City of Melbourne priorities in relation to open government, open innovation and collaboration, the City of Melbourne encourages further research and other forms of support into developing models that harmonise data formats and the adoption of arrangements that ensure consistency, interoperability, security and openness at all levels of government.

A serious concern for the City of Melbourne is that although there is a wealth of multi-dimensional municipal information becoming available through urban planning and land development processes, it cannot be readily integrated with the existing statutory land administration systems (e.g. land registry). Consequently, we are currently unable to provide the broad, accurate and accessible integrated knowledge base necessary to support multi-faceted decision-making.

5.5. Identifying international best practice in the use of smart ICT in the design and planning of infrastructure

The City of Melbourne encourages further exploratory work to be undertaken to investigate and evaluate international best-practices, particularly from Europe, North East Asian, and North American cities advancing the deployment of smart ICT in municipal infrastructure design and management.

We would also encourage the Committee to note exemplar cities Barcelona and Helsinki and exemplar innovation models such as the UK's Horizon 2020 Program.

The City of Melbourne would welcome the opportunity to work with like-minded Australian and international cities.

5.6. Considering the use of smart ICT in related fields, such as disaster planning and remediation

As discussed in section 5.2, the City of Melbourne anticipates the coverage of smart ICT to expand to new areas of local government influence. For fields such as disaster planning and remediation, we fully expect to benefit from a range of ICT attributes, including scenario modelling, assumption testing and instant, real-time and anywhere communication. Importantly, smart ICT will allow us to be better prepared for emergency management and to better connect with the community during emergencies.

5.7. Considering means, including legislative and administrative action, by which government can promote this technology to increase economic productivity

The City of Melbourne promotes the adoption of smart ICT in a number of ways. We lead by example and we consciously 'showcase' municipal innovation. We proactively welcome partnerships in ICT related initiatives including with small and start-up businesses, and we actively disseminate and encourage the re-use of municipal data by adopting the guiding principles in their release and presentation with a focus upon accessibility and ease of use.

We also support initiatives such as Hackathons and Hubs. We proactively promote external ICT events and our own "Knowledge Week", which enable public engagement with new technologies and emphasise the benefits and opportunities presented by harnessing Open data and utilising ICT infrastructure.

ICT is expensive, particularly when it's at the "cutting edge". Local governments do not have the financial resources to implement many of these ICT initiatives or systems. The Federal Government should play the lead role in both R&D and capital funding of these new ICT initiatives and then make them available to other levels of Government to be nationally implemented, achieving a national standard in systems used and data sharing.