SMART CITY REPORT

2018 SMART CITY SNAPSHOT

Commissioned by the Local Government Council Association to the Adelaide University Smart City Consortium Group
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Foreword

Adelaide is a remarkable city. The fifth largest city in Australia, geographically constrained by hills and ocean, it does not have the age or wealth of some of the larger cities, nor the trade advantages of being a seaport on the Northern or Western coasts. And yet it is regularly rated as one of the most liveable cities in the world, with recent large-scale technological and industrial successes. Given its size and location, Adelaide must be innovative, agile, and forward-looking if it is to thrive, economically and socially. The Australian Smart Cities Consortium was founded to drive engagement between University, all levels of Government, industry and entrepreneurs, because we have a strong belief that Adelaide’s structure, history, and character can all contribute to South Australia becoming a significant innovator in the smart cities space.

This report is based on a snapshot of councils from the Metropolitan Local Government Group, commissioned by the Local Government Association of South Australia, developed through survey and interview. While much of what is in here is not overly surprising, there are details that resonate and give guidance for the strategies that could be used to develop more smart cities initiatives and provide better support to those already in play.

The researchers were impressed by the knowledge, passion, and commitment of the employees that they spoke to across the councils and it is clear that Adelaide’s Metropolitan Councils have been investing into this exciting new opportunity, with some excellent results.

Adelaide is far more advanced in this initiative than most people realise and we are producing world class work in many smart cities-related areas. All that remains is to move pilots to production, widen our levels of collaboration and data sharing, and to openly talk about the excellent things that are already taking place, if we are to take a place on the World stage.

Associate Professor Nickolas Falkner
Director of the Australian smart cities Consortium at the University of Adelaide
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A SMART CITY IS A CITY THAT USES TECHNOLOGIES TO MAKE LIFE EASIER FOR ITS CITIZENS.

Smart City Perspective

1. Introduction

Cities around the world face a number of challenges linked to worldwide trends, such as growing competition, budget constraints and climate changes, to name a few. According to the Australian Bureau of Statistics (ABS), as of 2016, 67% of Australians live in Australia’s eight capital cities. The ABS predicts that this will increase to 72% by 2053. This rapid and often unplanned urbanisation coupled with the abovementioned challenges poses risks to critical infrastructures and social stability. Even where citizens are not actively moving into cities, they are often required to interact with city services, effectively becoming virtual inhabitants and placing increasing demands upon the infrastructure of government. At a time when public service workforces are often shrinking, this increase in work and demand can present challenges to even the most efficient and effective council.

To tackle the challenges faced by our cities, it’s clear that smarter ways need to be developed to manage the situation. Urban planning and management has evolved to a comprehensive vision, embracing these new technological innovations. As a result, the concept of a smart city has emerged as a complementary approach to contemporary urban planning and management. Today, the smart city is a phrase seen frequently on the urban strategy agendas of governments across the world, and smart cities are being piloted across the world.

This report provides a snapshot of the smart city activities across the Metropolitan councils of Adelaide to help local government authorities make informed decisions for smart city implementation strategies.

2. Smart City Definitions

The term “smart city” can be interpreted in different ways and there is no universally accepted definition of a smart city, although many are currently in use. The following are some examples.

- A smart city is a city that adopts Information and Communications Technology (ICT) in order to enhance its liveability, workability and sustainability (smart cities Council, 2013).
- A smart city is a city where the conditions of all its critical infrastructures are monitored and integrated (US Office of Scientific and Technical Information).
- A smart city is an instrumented, interconnected and intelligent city (IBM, 2010).
- A smart city is a city seeking to address public issues via ICT-based solutions on the basis of multi-stakeholder and municipality-based partnership (European Parliament, 2014).
3.1. Growing urbanisation

According to a 2014 UN study of global residency, 54% of the world population lives in urban areas. This is anticipated to increase to 66% by 2050. This can be ascribed to the many benefits that cities can provide, including greater access to health care and education, greater employment opportunities and greater access to entertainment, culture and art.

3.2. Low risk living

The concentration of more people in an area means that localised threat can have greater impact. People living in cities are vulnerable to life threatening events such as floods and storms, bushfires, air and water pollution, and recently terrorist attacks. Smart city solutions can provide continuous access to relevant data and therefore create early warning systems which in turn enables a timely administration intervention to reduce these risks.

3.3. Citizens’ empowerment and engagement

Through smart cities approaches, leaders and representatives can provide citizens with opportunities and access to information. This, in turn, allows citizens to participate meaningfully in the development of and decision-making about the city. The smart city can offer an integrated, personalised citizen portal for urban services which helps to develop a continuous, two-way communication with citizens, and thereby empower them to engage in city governance.

3.4. Growing expectations

Citizens’ expectations are steadily rising as their personalised access to information and services increases. They expect the same pattern to occur for urban services, including more efficient government services, high-bandwidth communications, and efficient transportation.

3.5. Growing economic competition

The world is witnessing a new era of economic competition, where cities are competing with each other to achieve greater quality of life for
their citizens. This competition is based on a number of platforms: securing investments, jobs, businesses and talent for economic success. This highly competitive economics necessitates a favourable infrastructure and liveability platform.

3.6. Budget constraints

The current economic climate places significant budgetary constraints on cities. The smart city solution minimises the cost of urban services and provides benefits for citizens.

3.7. Increased greenhouse gas emission

Greenhouse gas emission is the most significant driver of observed climate change. Developing sustainability strategies for energy consumption, transportation, urban planning and eco-friendly buildings plays a pivotal role in reducing greenhouse gases.

4. Smart City Objectives

The overarching objective of the smart city solution is to provide the best quality of life for all citizens, while minimising the consumption of energy and resources. Economic factors have to be considered as part of this, given the focus on resource optimisation. Specific objectives of the smart city initiative are as follows:

- Giving citizens an active role by involving them in community decision-making and promoting health and safety.
- Increasing the efficiency of transportation system.
- Increasing government-to-citizen and government-to-government digital communication.
- Creating a sustainable and greener city.

5. Smart City Dimensions

In this section, we present the specific aspects of a city upon which the smart city initiative can be developed.

5.1. Smart mobility

While many use the term “transport” in this context, transport assumes a vehicle of some sort and many cities can be navigated on foot or are associated with initiatives to increase foot traffic. Smart mobility, enhanced urban movement of any kind, fosters faster, cleaner, greener, cheaper and more efficient transportation of people, goods and data. It reshapes traditional urban mobility by adopting what is already available and also making use of new technologies to gather and provide information and services to citizens and planners. Smart mobility changes the way people travel within cities and improves a city’s liveability, workability and sustainability.

5.1.1. Smart parking

Smart parking solutions leverage car parking technology hardware, software and associated products and services in order to provide a more efficient parking system. It can facilitate identifying free parking spaces, sending signals when the car park spaces are available, thereby enabling sustainable transportation.
Smart parking also offers a wide range of technology services such as cashless payment and smart permit parking.

5.1.2. **Smart traffic lights**

Smart traffic lights eliminate structural traffic problems and enable cars to travel with minimum delays. This reduces traffic and congestion, improving public safety.

5.1.3. **Smart bike path**

A smart bike path provides cyclists with “intelligent” assistance, resulting in better safety, convenience and fun on any trail or bike.

5.1.4. **Driverless bus/car**

Autonomous vehicles (buses/cars) navigate using sensors, lasers and GPS systems. Driverless buses are able to pick up passengers upon request from their location through an app. The self-driving system significantly minimises costs in low density suburbs where public transport providers struggle to supply regular services.

5.1.5. **Smart electric and hybrid cars**

Smart electric and hybrid cars are being recognised as an exciting green advancement for sustainable development of cities. Driving these cars increases fuel efficiency and reduces the environmental impact.

5.1.6. **Smart active transport**

Smart active transport reinforces cities with safer, faster and more efficient means of travel and offers more travel options such as cycling, walking, scootering and public transport.

5.2. **Smart urban services**

Emerging technologies are changing the way urban services are delivered. Smart city solutions create a movement in urban services that will make these services instant, sustainable and conveniently available anytime, anywhere.

5.2.1. **Smart waste**

A smart waste collection solution provides waste bins with intelligent monitoring, allowing rubbish level in containers to be measured. This in turn has a positive effect on collection frequency, reduced labour costs and optimised collection routes for workers.

5.2.2. **Smart lighting**

Intelligent, weather adaptive street lights reduce power consumption and carbon footprint and increases citizens’ safety and security.

5.2.3. **Smart parks and gardens**

Parks management can benefit from smart city technology by increasing efficiencies, because the same number of staff can look after more parks. Smart parks and gardens solutions also decrease lighting expenditure by implementing smart floodlight control systems. It also saves on water consumption through the use of a smart park irrigation controller.
5.3. Smart government

Smart government creates a platform with more communication channels between different stakeholders, citizens and city councils in the sub-dimensions of smart administrative services, smart payments and smart data sharing.

5.3.1. Smart administrative services

Smart administrative services create new streams of data that reduce the operational costs and administrative overheads, speeding up the process of serving citizens. The implementation of smart administrative services results in more transparency and trust.

5.3.2. Smart payment

Smart payment serves as a bridge between payers (citizens) and the payee (city council) to address security, interoperability and speed issues. By leveraging new technologies, councils can offer many potential benefits for urban services such as: automated payment systems in the case of pay-by-weight waste collection, getting real-time access to suppliers’ database, and historical price comparison through the use of an e-procurement platform.

5.3.3. Smart data sharing

Collaboration between city councils can provide important benefits to councils and citizens by way of additional expertise, support, greater efficiency and less duplicated effort. Smart data sharing facilitates collaboration among different city councils, government entities, private sector companies and citizens.

5.3.4. Smart Business Services

Smart business services, such as business incubators, focus on early stage companies and provides them with the opportunity to commercialise their ideas. Smart business services enable a new company to connect with other businesses and governments by means of providing access to programs and grants.

5.4. Smart citizens

The central pillar of each smart city is its citizens. The successful future of smart cities requires a citizen-centred approach in which all decisions and services are designed with citizens in mind. Therefore, understanding citizens’ needs and challenges is the first step in developing smart city solutions.

5.4.1. Smart access to community services

Councils provide a range of support services and facilities to assist individuals and groups in their municipality. Smart access to these services promotes a fair, transparent and an open city council for residents.

5.4.2. Tourism and major events

When a city pursues a smart city approach, visitors can benefit from lower costs for visiting the city, as well as improved mobility. Smart cities can offer visitors an enhanced experience by suggesting itineraries and providing interactive maps and audio guides, and creating a welcoming atmosphere.

5.4.3. A civic app

Leveraging mobile apps enriches the quality and interactivity of urban services. Mobile apps empower communities in more intelligent ways and provide the ideal foundation for many smart city solutions by offering a high level of engagement and real-time interaction. Some important considerations to support possible applications include:
Cities can use social media to connect visitors and residents with the city, offering a wide range of services such as finding community events, real-time reporting of issues, offline navigation, and delivering traffic and weather alerts. In essence, using social media platforms improves communication and speeds up the services provided by city councils.

5.4.4. Digital hub

A digital hub offers a social environment where residents can develop the skills needed to survive in the digital age. A digital hub provides an opportunity for citizens to learn how to use ICT and work on digital media.

5.4.5. Smart library

Reading is considered to be the most important gateway to gain knowledge and information and it is the cornerstone of civilization. The smart library enables users to conduct searches on various subscriptions and online resources and access full text articles.

5.4.6. Citizen involvement

Citizen involvement is a key element of most of the definitions of smart cities presented earlier. On one hand, citizen involvement ensures citizen satisfaction. On the other hand, it entails the efficiency of the smart city initiative.

5.4.7. Smart lab

A smart lab is a space to prototype and test city services with the community, providing citizens with an opportunity to explore creativity through a wide variety of experiences and technologies. Additionally, smart labs can host community events and workshops aimed at sharing and exploring ideas.

5.4.8. Promotional marketing

Technology is at the forefront of marketing and promotions. Smart promotional marketing can create a new income stream for city councils through the mechanism of public-private partnership and the use of smart city facilities. It is important for councils to work in partnership with local businesses to encourage greater innovation and creativity to assist existing businesses to expand and to encourage new business ventures to relocate in the city.

5.5. Smart buildings

There are many benefits in establishing and enforcing new requirements for making buildings “smarter” by using sensors, meters, systems and software to monitor a wide range of building functions. Such benefits include improving occupant comfort, energy efficiency and carbon footprint reduction, yielding a return on investment for owners, increased security, and reduced maintenance costs.
5.5.1. Smart infrastructure

The growing population is putting increased pressure on ageing infrastructure such as drainage systems and roads. Smart solutions facilitate the effective management and maintenance of core infrastructure, and enhances asset management practices.

5.6. Smart environment

Concerns about the environment are often central in the quest for developing smarter cities. Cities are the main consumers of energy and producers of greenhouse gas, thereby facing enormous environmental challenges. Even the use and management of water is an enormous challenge by itself. Using new technology and innovations in smart cities will enable them to meet legislated environmental targets.

5.6.1. Environmental signage

A smart city with embedded sensors, displays and computing devices enables citizens to control their environment. Intelligent environmental warning systems, such as real-time display of UV index and real-time air-pollution levels, alert the public of impending environmental threats.

5.6.2. Electric car charging stations

In a smart city, every electric vehicle must have access to a charging station within its driving range. Installing electric car charging stations in the city maximises convenience for electrical car drivers, which powers the future of sustainable mobility.

5.6.3. Renewable energy

Buildings and transport are the two largest energy consumers in cities. Thus, deploying renewable energy technology is pivotal for sustainable development. In the last few years, many Australian city councils have initiated programs that can be classed as focussed on “Renewable Energy” in order to reduce carbon emissions and save energy. Renewable energy is available in the form of solar panels for council owned buildings as well as commercial and residential buildings.

5.7. Smart public health and safety

Public health and city safety is at the core of every smart city deployment. The aim of smart public health and safety is to protect and promote healthy life choices for its citizens.

5.7.1. Incident management

Establishing a city-wide approach to enable the whole community to work together to manage all threats and hazards is a prime objective of an incident management system. In recent years, integrated real-time emergency events models and warning information management systems have been leveraged by city councils across the world, for incidents such as bushfires, flooding, and malicious attacks.

5.7.2. Security services

Security is an integral part of developing smart city initiatives. The aim of security services is to monitor and manage physical assets, infrastructure, connectivity, and information services that affect citizens on a daily basis. The overall priority must be to build the residents’ trust and confidence in their security as well as accepting services provided by smart cities. Surveillance systems and equipment, video analytics, cybersecurity, data and command centres are all components of a safe smart city.

5.7.3. Smart health and human services

Smart health and human services attempt to leverage new technologies to create a more
inclusive and skilled community. This helps to improve citizens’ quality of life by focusing on vulnerable people including senior residents and homeless people.

Smart aged care

As Adelaide is experiencing a demographic shift, the need for an aged-friendly city is now more pronounced. The overarching aim of smart aged care is to improve city accessibility by taking into account a number of initiatives such as a streamlined approach to upgrade residential care facilities, social inclusion and wellbeing programs, occupational therapy, assistance at home and so forth.

Smart homeless reduction

A smart homeless reduction solution aims to combat homelessness at its root causes rather than trying to remove the homeless. Earlier this year, the city of Adelaide, in collaboration with the state government and community partners, initiated the functional zero homelessness solution. Incorporating technological innovations and data-driven strategies to complement the traditional shelter solution has been rolled out by many municipalities to reduce homelessness in many smart city projects across the world.

5.8. Smart city development planning

Citizens would benefit from new technologies applied to urban planning processes and systems which increase access to information and regulations.

5.8.1. Smart growth and public realm

Smart growth and public realm refers to taking a long-term approach for developing a high quality public realm which facilitates public life and social interactions. A high quality public realm attracts people and activities which in turn boosts economic growth and improves cultural activities.
6. Proposed Framework

Based on the literature review presented in the previous section, we developed a framework (please see figure 1) which was used to assess the smart city activities from the Metropolitan Local Councils.

7. Scope of the Smart City Snapshot and Methodology

The aim of the Metropolitan Local Council smart cities snapshot is to provide information about the level of maturity that the MLGG councils have reached, with regards to smart cities activities.

The snapshot highlights key projects proposed, in pilot phases, or underway, and potential collaboration opportunities for Local Councils, based on the smart city dimensions rather than on individual projects.

The major objective of this report is to provide a starting point for Local Councils to develop strategies to improve and benefit from other smart city projects.

7.1. Evaluation method

The Metropolitan Local Government Group (MLGG), a forum of the Local Government Association (LGA), is comprised of 19 Local Councils and we were able to contact 17 of those from the contact details for smart city
representative leaders provided by the LGA. Information was collected through telephone and e-mail interviews, and on-line surveys. These were used to collect information on the stages that councils have reached in the smart cities process, and the identified dimensions in which they have significant projects, investment and potential collaboration interest. Secondary data was collected by scanning Council websites, other websites and newspaper articles.

8. Insights for the Smart City Local Governments Projects

In this section, we present the information collected via the on-line survey, complemented with some secondary data in some cases (where 87 smart city activities/projects were identified). We received responses from 10 Local Councils (from a potential 17 Councils for which we had contacts) which means that 59% of all Councils responded to the questionnaire.

The diversity of Local Council representatives who responded to the survey indicates that there is no specific area responsible for “smart cities Projects” across any of the respondent Councils. Titles included Director, Strategic Manager, Business Analyst, Manager Business Enterprises and Communications, Systems and Services Information Manager, smart city Lead and Major Projects Leader.

Figure 2 – smart cities Journey

The smart city initiative is a new and ongoing process for the Metropolitan Local Councils. The Councils are all at different stages of the process and no Council reported that they were fully transformed or had a detailed road map. Twenty percent of the respondents haven’t started yet, 50% are in the strategy development or pilot phase, while 30% of the Councils are underway, as can be seen in figure 2.

The number of projects undertaken by the Councils vary between 4 and 61. Some Councils were able to report on projects in great detail while others provided very general information. For the purpose of the snapshot, only information about the smart cities dimensions will be presented, without introducing detailed information about the specific projects or required investment.

Through the responses, it is clear that there are very different perceptions about the stages of the smart city Journey.

8.1. Key trends and Projects

8.1.1. Smart Mobility

The smart mobility dimension is well underway in many Councils. There are many projects which address smart parking (21%), smart active transport (14%), smart bike paths (7%) and so on (please refer to figure 3). Other projects were identified through the use of secondary data (for two councils which did not complete the survey) in the dimensions of smart parking, driverless busses or cars and smart electric and hybrid cars. However, there is one dimension that has not been introduced by any Councils: smart traffic lights.

Figure 3 – Smart Mobility
8.1.2. Smart Urban Services

Councils reported that they have undertaken or plan to undertake projects which cover all the sub-dimensions of Smart Urban Services. The most relevant projects in this area are Smart Waste and Smart Parks and Gardens, which represent 33% of all projects, (see figure 4). One of the local councils is working on a project which uses technology from other smart city dimensions and re-adapts it to the parks and gardens area. Via secondary data, we have also identified projects in the Smart Urban Services being undertaken by two Councils that did not participate in the survey.

It must be noted that smart lighting projects had a broad definition, potentially including the replacement of traditional lights with LED-based light sources. While it is understandable why this could be labelled as a smart cities improvement, there needs to be a justifying rationale to count it as a smart cities project.

Figure 4 - Smart Urban Services

8.1.3. Smart Government

The use of technology for administrative purpose and to facilitate citizen-government interaction is not new and many of the councils have implemented projects in this dimension. From the total number of projects (see figure 5), administrative services represent 44%, followed by smart payments and smart data sharing projects (representing 22% of the projects). In the Smart Business Services category, three projects were underway and Councils indicated there was potential for much more growth.

Figure 5 - Smart Government

More specifications are required in this dimension for further assessment as digital transformation was mentioned by multiple Councils as a broad concept (classified under “Other 11 %”). This objective should be more thoroughly defined in any follow up audit or survey. No additional projects were identified through secondary data in the sub-dimensions.

8.1.4. Smart Citizens

In the smart citizens’ dimension, digital hubs and smart libraries each represent 27% of all projects. Citizens’ involvement and promotional marketing both represent 13% of projects, while access to community services and a civic App each represent 7%. The two sub-dimensions that were not directly reported were Tourism/major events and Smart labs. However, one of the councils is working on a smart project which can be linked to enhancing local tourism. Secondary data from other councils not in-survey identified projects in the sub-dimension of a civic app, and a smart lab project.
8.1.5. Smart Buildings
Fifty percent of the respondents reported having projects in the sub-dimension of smart infrastructure (five projects).

8.1.6. Smart Environment
Much has been done in the dimension of smart environment: 55% of projects are in renewable energy, followed by projects in environmental monitoring and electric car charging stations (22% each) (see figure 7).

Additionally, projects in the dimension of environmental monitoring and renewable energy were identified from the secondary data from Councils that did not participate in the survey.

8.1.7. Smart Public Health and Safety
Five projects distributed across three working sub-dimensions were reported in the smart environment dimension. Incident management and smart Health and human services each represents 40% of projects, and security services represent 20% (see figure 8).

8.1.8. Smart City Development and Planning
Only two Local Councils reported working on smart city Development and planning. Three projects were identified in the dimension of smart growth and public realm.

9. Summary of the Smart City Framework
From the collected data, both primary and secondary, it is clear that Local Councils have been working on the majority of the dimensions assessed in the literature review. One additional sub-dimension was added (for Smart Urban Services, ‘Other’).
There were no projects identified in three sub-dimensions: **Smart Traffic Lights, Tourism and Major Events, and Smart Labs** (these sub-dimensions are lighter in figure 9). In the case of Tourism and major events, one project was identified even though it was not reported, because, although it wasn’t directly linked, it could have impact on this sub-dimension. Secondary data revealed a project in the sub-dimension of Smart Labs, however as the Local Council did not respond to the survey or participate in an interview it was not possible to confirm the information. The only sub-dimension without any projects identified via either primary or secondary data analysis was **smart traffic lights**.

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**Figure 9 – Reviewed Smart City Framework**
10. **Smart City potential collaborative Projects**

The councils responded to the question about their interest in collaborating with other Local Council by identifying smart city dimensions where they would like to collaborate. Five of the eight Smart cities dimensions are relevant for potential projects.

Councils identified only 10 out of the potential 30 sub-groups in which they would be interested in collaboration. These potential projects are presented in table 1 below.

**Table 1 – Potential smart city Projects**

<table>
<thead>
<tr>
<th>smart city Dimension</th>
<th>smart city Sub-Dimension</th>
<th>Projects Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart Citizens</td>
<td>Smart Library</td>
<td>Digital Libraries - One Card Network improvements and enhancements</td>
</tr>
</tbody>
</table>
| Smart Government     | Administrative Services  | Customer services - Comprehensive and proactive customer service offerings, request handling, tracking and reporting  
|                      |                          | Asset Management – Sensor-fitted Waste Vehicles providing data regarding local assets - Administrative services |
| Smart Business Services | Business Innovation - Tech Start-up - Incubators |
| Smart Data Sharing   | Open Data - Identifying, Capturing, Cleansing, Extracting and Publishing data from Council operations, sensors and archives  
|                      | Connected Cities - Parks and Main Streets  
|                      | Smart Wayfinding  
|                      | Digital Transformation |
| Smart Mobility       | Smart Active Transport   | Real-time pedestrian, bike and car counters |
|                      | Smart Electric & Hybrid Cars | Electric Car Charging Stations |
|                      | Smart Parking            | Car Parking |
| Smart Urban Services | Smart Lighting            | Smart lighting / lighting controls |
|                      | Smart Parks and Gardens  | Smart Parks |
| smart city Development Planning | Smart Growth and Public Realm | 3D Modelling - Growth and Development |
11. Deeper Discussions (Interview Analysis)

Interviews were undertaken with 70% of the Councils (the questions used are attached as Appendix A). The purpose of this analysis was to further explore smart city themes (presented here in italics).

11.1. Framing: (Framing Progress, and Framing Smart Cities)

The majority of responding councils consider themselves to be in the “Strategy Development” phase. Other councils were equally distributed across “Not yet started”, “In pilot phase”, and “Underway”.

It became clear very early, however, that there were very different understandings of what is involved in the smart city Journey. When describing what had and had not already been undertaken, discussed, or engaged, councils that determined themselves as “In Strategic Development” – and even “Not yet started” described some of the same activities and discussions as councils who considered themselves already in “Pilot phase” or “Underway”.

This lack of clarity in terms of what can be considered progress in smart cities Development begins with lack of clarity of definition, and therefore lack of clarity around the concepts, strategies, activities, scale and scope of smart cities approaches and initiatives.

This was clearly understood, with all participating councils referring to the need for better understanding and development of this concept. The two major themes dominating this topic were:

- Awareness, Culture, and Attitude (including the need for education on these)
- Finding or having an appropriate Starting Place for developing as a smart city

And the third dominant theme was:

- The need for a common / agreed-upon Definition
- Several respondents mentioned the challenge of finding a starting place but this seemed to relate specifically to the need to find an operational starting place, or to prioritise the multiple possibilities and needs, since most were adamant that the core place to start is strategy development.

11.2. Awareness, culture and a positive attitude

Most councils also stated the need to develop awareness, culture, and a positive attitude to smart city development (mostly referring to within their own council, not to the broader community), and different councils are in various stages along that development journey.

11.2.1. Leadership and sponsorship

A critical aspect of developing awareness and culture and of progressing the smart city journey would seem to be the sponsorship of executive leadership and senior management. Each of the councils who have progressed significantly refer to support and sponsorship by their leadership, or of having “brought management in”. Several specifically gave the credit for their progress to the active sponsorship of visionary and active leadership.
11.2.2. Definition

This theme is discussed elsewhere in this report, but it is important to recognise that it is an impeding factor, particularly in terms of the ability to collaborate.

11.3. Drivers and Critical Elements

There was also considerable overlap in language in describing “Key Drivers”, “Critical Elements”, “Strategic Objectives”, and “Vision”.

The two dominant themes emerging in response to these questions were:

- Concept and Broader Understanding
- Money and Resources

These themes were closely followed by

- Strategy Development
- Citizen-Centric and Community Development
- Strategy and Decision-Making

Concept and Broader Understanding are discussed above.

Money and Resources were almost as significant in terms of focus, and mostly raised in response to the question “What do you believe has been the greatest impediment to becoming a smart city?” The three strongest areas specifically nominated as critical resources were:

- Agility, and keeping up with technological advances and opportunities
- People as resources
- Budget constraints

There were some positive aspects to the theme Money and Resources, in that some councils have been awarded, or are aiming to acquire, Federal funding. For the most part, however, lack of finances and other resources are seen as the greatest impediment to progress and to collaboration.

11.4. Collaboration

Another positive that arose from the resourcing issue was the recognition that limited resources could best be dealt with by pooling them. Collaboration is seen by most councils as critical to their ability to develop effectively as smart cities.

Nor was this attitude solely – or even principally – about dealing with limited resources. It was strongly recognised that collaboration is critical for effectiveness as well as Efficiencies (another key theme that arose through several of the questions). Open data was mentioned as a key resource that has potential to be an enabler for collaborative leveraging to address resourcing issues.

The ability to work with the University was seen as one valuable and critical collaboration. And several councils are already meeting and working together in different combinations – sometimes to leverage proximity, and other times because of important similarities in council profile and demographics.

However, one key collaboration necessity was seen as the critical need of the citizen-centric view. That the experience of a citizen / members of the community should be seamless as they cross council boundaries. Examples given included driving from city to beach or city to hills, and the very different road and lighting experiences that a citizen passes through in what – from the citizen point of view – is “one trip through one city”. Another example was the difference of next door neighbours in different council areas paying radically different fees for significantly
different experiences in, for instance, waste disposal.

It was recognised, however, that although the need to be able to collaborate to provide a seamless experience to citizens and tourists is a high priority, it is also a significant challenge, as each council area has its own priorities, strategies and budget.

11.5. Citizen-centric and Community-building
A common theme was that councils have developed far beyond the traditional areas of “roads, rates, and rubbish” and are now responsible for developing community, culture and environment, as well as providing amenities and services that are now seen as fundamental to daily living as roads and rubbish used to be. These amenity- and service-based themes are discussed more extensively below, but it is notable that most of the councils gave community-building and culture a very high priority as drivers for smart city development.

11.6. Embedded and Integrated: Smart is Normal
A predominant attitude was that it is necessary to ensure that smart city Initiatives not be an “add-on” or supplement to the normal business of council, and equally that it not be a matter of grabbing technology and using it just because it’s available. The majority of respondents were emphatic that smart city approaches should be integrated and embedded into delivery of the strategic plans and vision of council. Several also mentioned that they had begun to recognise that they were already implementing what could be considered to be smart city approaches or initiatives, but hadn’t recognised them as such, simply because they were just leveraging available technology to address their ordinary needs; in other words, “smart is normal”.

11.7. Strategic Development, Strategy and Decision-Making
There were distinct differences in the communications made about the role, process, and current status of Strategic Development and the identifiable theme of Strategy and Decision-Making. The concepts of Embedding and Integrating, and Smart is Normal were key items in Strategy Development, as were references to Consultations with various stakeholders, Workshops for strategy development, use of Working Groups, and the need for embedding Fundamental Principles as a bedrock foundation for direction before moving into operations. Another theme that arose in discussions about being in the Strategy Development Phase of becoming a smart city, was the criticality of IT and Technology Competence (or lack of it), working with Legacy Systems, and being able to Leverage specific technologies as early as possible, and quick “wins”. Examples included NBN, Public Wi-Fi, libraries, QR Codes, CCTV, and Smart Parking.

The theme of Strategy and Decision-Making, however, was focused much more on leveraging smart city approaches to accomplish “The Business of Council”, including better decision-making and solutions, delivering strategic outcomes, efficiencies, and being able to use metrics to ensure outcomes are measurable. Data and data management were themes that arose as critical to a number of different issues, but particularly to the ability of council to develop strategy and make better, more informed decisions.

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1 Several councils stated that tourism and tourists are a vital demographic for their considerations
decisions. Technology and the human resources to leverage data and data management better are seen as fundamental.

11.8. Operations
Several councils emphasised that it was these less tangible outcomes, listed under the theme of Strategy and Decision-making that were considerably more important than the more highly visible operational outcomes such as Smart Parking. There was, however, recognition that it is also important to be agile and keep up with technology to the degree expected by stakeholders, including citizens, business, and industry. One of the most obvious noted was the “there’s an app for that” mentality – that most citizens can manage their finances on their mobile phones, and expect to be able to manage their local council needs just as easily.

The one dominant theme in terms of operationalising smart city approaches – particularly in terms of early developments – is that of connectivity. This refers to connectivity in terms of roads and parks, but also in terms of connectivity between citizens and council, council amenities and council services. Equally emphasised is connectivity in terms of community-building.

11.9. Future-Proofing
A concept that arose frequently was Future-proofing. Some of the core ideas that seem to be encompassed within this concept were sustainability and environment, health and safety, providing adequate services and amenities to rapidly expanding population, providing for the aging demographic, and digital literacy. Low-risk living was a particularly critical aspect mentioned, particularly considering cyber security and safety, but also encompassing physical safety.

Multiple themes existed under concepts such as “More liveable”, many of these also coinciding with future-proofing themes. Low-risk living, urban greening, reduction of homelessness, smart waste management and road management, public transport, and urban design. These topics, however, were mostly mentioned in passing, as the focused core for all the councils was very much more on building principles and strategies as foundations upon which such operational matters can be developed.

11.10. Research and Benchmarking
Most of the councils have invested, to some degree, in research and/or benchmarking, with varied approaches. These included outsourcing to professionals such as Gartner, extensive Internet-based research looking at other smart city operations nationally and internationally, using personal links to gain insider insights into organisations like San Francisco’s Motor Transport Authority, and the most common of all – collaboration with local universities, particularly the University of Adelaide.

11.11. Other external resources
Other collaborations and outreach externally were considered to be more useful for addressing specific problems rather than undertaking base research, include tapping into the Code for Australia program, and also approaching and working with the local hacker community.
smart city Projects have been increasing in importance all over the world as population density in cities grows. Technology can be used to improve liveability, sustainability, security, communication and development. Local Councils in Adelaide may play a very relevant role in the development of smart city strategies and projects which can benefit the local population in many different ways. The purpose of the snapshot was to identify the current situation and to propose ways for moving forward.

The snapshot shows diversity in the depth and breadth of Councils projects as well as diversity in the interpretations/perceptions of what it means to be a smart city.

Despite different approaches to smart city development between various councils, the similarities are much stronger than the differences. All the councils are committed to citizen empowerment, community-building, and improved liveability; most are committed to ensuring that smart city development is integrated into strategic development and not treated as a technology grab-bag or add-on. The need for greater awareness and the development of smart city initiatives is also a unifying theme throughout.

From the data collected through the survey process we identify that comparing Councils is a complex issue, showing the difficulty of measuring or assessing them because of the lack of unified concepts and definitions. This was also pointed out as an impediment for collaboration.

This suggests that common ground for reporting processes would allow better comparison between Councils and increase awareness of smart city dimensions which requires more attention. A possible Collaborative smart city project was identified in the snapshot – a local Council proposed sharing smart city Projects information to benefit all the metropolitan Council areas. We recommend not only sharing the information but also creating a system to capture relevant and comparable data which allows for comparability between the councils.

We also suggest an additional project in this area – a Smart City Dashboard database, using data homogenisation and creation of clear measurements and standards. The data and information availability would not only allow Councils to be on the same page but also allow citizens access to news on projects and information on projects, creating awareness and a positive attitude towards Smart city projects. A further step could include performance indicators from each Council to inform citizens on how they’re benefiting from technological applications.

12. Policy considerations for growing the Smart City Projects

**Key Points**

- Common grounds for data collection and measurement (homogenisation of data). Sharing information – lessons learned/dashboard
- Creation of working groups (industry, academia and government) to facilitate smart city projects / Increase innovation process through idea cross-fertilisation
- Identify South Australian strengths in order to become a leader in smart city projects around the world. Creation of a South Australian Smart City Strategy.
- Share resources to increase smart city project performance (economies of scale and scope)
Once agreement on measurements, concepts and data homogenisation is reached, we also recommend the creation of an industry/academia advisory group. The industry/academia advisory group should involve relevant representatives from areas such as energy, water, health, education and technology (10 to 12 members is recommended). This will help create a collaborative environment between industry, government and academia for idea cross-fertilisation, allowing innovation enhancement which is imperative for the development of the South Australian smart city Strategy.

Establishing ways of sharing information between councils could stimulate new synergies and increase Adelaide’s ability to compete at an international level and be recognised as an outstanding example of a smart city.

The advisory group could also help them to achieve economies of scale or economies of scope to save cost in the collaborative smart city Projects portfolios. Economies of scale could help Councils to save money. The cross-fertilisation of ideas could also create economies of scope by using existing technology in other smart city project areas.

Another starting point is to work on projects identified by Council representatives for collaboration purpose. They have identified ten sub-categories including 14 projects where they would like to find partners with which to collaborate. The proposed projects have been presented in this report and they are ready for the next step.

With regard to the project portfolios, some Councils are working very well and have a great portfolio of projects. The smart cities Dashboard (including performance measurements) would identify clear roles in the smart cities areas, such as leaders or followers.

Leaders could leverage the work that they are doing in their councils and share their experiences with the rest of the councils. It is also relevant to create a “lessons learned” information dataset which can be used as an instrument to improve the performance of smart city projects over time.

This study identifies four key points for further work and proposes potential pathways to improve Adelaide’s impact and visibility in the world smart city landscape.


Appendix A: interview questions

The on-line questionnaire asks where you think you are on your smart city Journey: Not yet started, In strategy development, Detailed roadmap, Pilot phase, Underway, Fully transformed.

1. Why did you give the answer that you did?

2. What do you believe are the key drivers for adopting smart cities approaches?

3. If you are not yet fully transformed, what is required to take you to the next stage? If you are fully transformed, what is required to hold you at that level?

4. Which national or international benchmarks (if any) have you used on your journey towards full transformation?

5. Do you have a mentoring organisation or exemplar in the Australian or International local government community that you have sought to model or consult with regularly?

6. What do you believe has been the greatest positive factor in achieving your goals in this area?

7. What do you believe has been the greatest impediment?

8. Is there anything else that you’d like to discuss or mention?