Smart City

Program



# **Smart City Implementation Program** (DRAFT)

Towards a Smarter Sunshine Coast



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# **Terms and Abbreviations**

Terms & Abbreviation	Definition or in full
AWCS	Automated Waste Collection System
Council	Sunshine Coast Council
LED	Light-emitting diode
SC	Smart City
SCC	Sunshine Coast Council
Smart City Framework	Smart City Framework
Smart City Implementation Program (SCIP)	Smart City Implementation Program
Maroochydore City Centre (developer SunCentral Maroochydore)	Council's wholly owned private development company created to oversee the development of the former Horton Golf Course into the region's premier CBD
Telecommunications Carrier Licence	Council has acquired a Carrier Licence from the Australian Communications Media Authority to protect our communications infrastructure
USC	University of the Sunshine Coast

## **Executive Summary**

The Smart City Framework was officially launched in September 2015. Following the appointment of a Smart City Coordinator, substantial progress has been made to bring the Smart City Framework to life for the benefit of the community and Council. The Smart City program is far reaching, and incorporates:

- Substantial investment in the solar farm at Valdora,
- Procurement of Australia's first Automated Waste Collection System in Maroochydore
- Successfully achieved a telecommunications carrier licence.

In addition to these demonstrable deliveries to the Smart City agenda, considerable work and effort has gone into its planning, testing and trialling of the Solution Systems in the Smart Centre. This has been captured with the Smart City Implementation Program which is presented for Council's support and adoption.

The desire to create a smart and digitally connected Maroochydore City Centre was the catalyst for the development of the Smart City Framework which is now embedded into Council's Corporate Plan. By expanding the smart program to include the wider Sunshine Coast region, it delivers the benefits of implementation at scale. Smart outcomes can be delivered sooner and with higher value results by incorporating the delivery of these solutions within existing capital works programs and organisation-wide operations.

The Smart City Implementation Program lays out a structure, program of works, and deliverables for the implementation of the Smart City Framework into Council projects, systems and processes and gives the organisation the visibility of this strategic project.

The Smart City Implementation Program outlines the program of activities over the next three years, including:

- Delivery of the Smart City Solar Farm, June 2017
- Bulcock Street Streetscape completion by 31 December 2016, the first streetscape incorporating smart lights, waste, parking, signage and water solutions
- Mooloolaba Foreshore Smart City portfolio
- Development of our Smart Centre Living Lab Caloundra 'tested' for Solution Systems
- Smart solutions designed into projects such as Kawana Stadium mounds, Palmwoods Streetscape
- Development of key regional and natural Smart City partnerships
- Capital Works Program projects selected and identified for future Smart City solutions
- Automatic Waste Collection System installed and commissioned
- Smart Region Management Platform tested and implemented.

The rapid progress of initial implementation of the Smart City Framework has highlighted the critical need to guide the next three years with a detailed Smart City Implementation Program structured around how Council operates, and designed to position the region strongly as opportunities arise.

The Smart City Implementation Program is structured to logically achieve these priorities by incorporating strategy, operations, programs and projects. These elements are delivered using the following structure:

- 1. Leadership
- 2. Governance
- 3. Development of organisational capacity and capability
- Engagement with internal and external stakeholders and partners

- 5. Smart City Foundations and Solution Systems
- 6. Smart City projects

# Introduction

The Smart City Framework (Smart City Framework) was developed by Council, Cisco and Telstra and launched by Mayor Mark Jamieson on 15 September 2015. The catalyst for the development of the

Smart City Framework was the desire to create a smart and digitally connected Maroochydore City Centre. At the time the global value at stake (in the public sector) was estimated at US\$4.6 trillion and a \$755 million opportunity for the Sunshine Coast. The Smart City Framework recognises the value of a Smart City and identifies smart solution systems for the entire region.

#### Progress

Significant progress has been made with implementation for all core Foundation Systems over the last 12 months:

- The first whole of region Solution System Smart WiFi was activated in March 2016 and has continued to expand. This system replaces the three-year trial WiFi and includes the valuable business intelligence capability to drive savings and potential revenue streams, and has now been rolled out to 26 sites
- The Smart Centre (interactive experience demonstration centre, testing and trialling lab) is functioning with the first trials already delivering savings and community benefits
- The Smart Region Management Platform (three under evaluation) is delivering the integrations that elevate the Smart City Framework to a higher standard than just a silo based approach
- The Smart Citizen App is now available in Android and Apple and links to the Smart City projects, including parking space availability in real time
- Communications network (underground and wireless), electrical and smart poles have been developed and designed for Maroochydore City Centre and a number of other regional locations to provide the above ground solutions to be added when ready
- The Bulcock Street Streetscaping project has been modified to include the Foundation Systems to become Australia's first Smart Urban Streetscape Demonstration and Testing Facility, with completion expected in early 2017
- Council now has a Telecommunication Carrier Licence to protect our Smart City communications network.

### Smart City in the Council Corporate Plan

Council's Corporate Plan refers to the Smart City principles under the new economy goal as an initiative to bring new capital investment to the region:

#### New capital investment in the region

Commencing implementation of Smart City principles across the Maroochydore PDA and the Sunshine Coast Enterprise Corridor to build connectivity, improve accessibility to information and services and build the value proposition of the region.

The Smart City Implementation Program details the three-year implementation program to achieve the transition of "smart" from new to business as usual. The Smart City Implementation Program is a Council policy.

#### Smarter city definition

Worldwide, there are many different definitions of smart or smarter. For the Sunshine Coast it is not about using technology for the sake of technology. Smarter cities and regions are defined by the improved citizen experience delivered by a combination of relevant technologies and cost effective services and redefined systems.

#### The Smarter City as a regional program

The Sunshine Coast has many urban areas and towns, and identifies as a regional community. The Smart City Implementation Program focuses on the urban areas, strategic nodes, key natural areas with high user traffic and all areas where there is a viable business case. Already, the waste bin sensor project

will potentially apply to remote locations and urban areas. The water flow sensors have potential to save costs in remote off grid sites. River and creek system monitoring is becoming smarter with the use of real time connectivity to improve disaster management in time of flood and storms. As such the Smart City Implementation Program is a regional program.

### Financing the Smart City

The Smart City Implementation Program financing models the cost of the program (in capital and operational terms) together with its financial benefits, which include potential revenue, savings and capital works reduced investment as they are expected to apply across the organisation.

There are a number of key considerations and assumptions that underpin the three-year budget:

• The Smart City Implementation Program will have a financial cost to Council, but that cost will deliver savings, revenue and community benefits that will potentially, in financial and non-financial terms, outweigh the actual dollar costs:

- Several grant programs have been identified that will potentially increase available funds without requiring additional budget (aside from the existing Smart City Implementation Program budget). These grant programs include Advance Queensland (Innovation Hubs) and the Federal Smart Cities and Suburbs Programs
- The operational cost of the Smart Centre (including testing and trialling laboratory and demonstration facilities such as Bulcock Street Urban Smart Street) will be reduced by the contribution of vendors through hardware, software and cash through the Smart Centre Partnership Program
- As a result of the Smart City Implementation Program, and in particular Council's Carrier Licence, at least one vendor has increased its discount – representing a significant saving to the relevant Council area
- The solution systems (e.g. smart waste bin sensors to regulate emptying based on actual realtime demand) will initially involve a small introduction cost, but whole of life cycle costs will significantly reduce, and community benefit (user experience) will improve
- The collective business intelligence arising from the smart WiFi, solution system sensors (all)
  processed through the Smart Region Management Platform will provide revenue, savings and
  community benefits. For example:
  - Chambers, businesses and investors the ability to provide existing and potential investors with real time and time series information, similar to that used by major commercial shopping centres, will enable informed decision making and lead to improved sustainability
  - Council capital works and service delivery the ability to use accurate user numbers and seasonal variables is already informing design and investment scale decisions. Requests for infrastructure can be independently assessed and evaluated with a stronger evidence base.

# Smart City Implementation Program

The Smart City Implementation Program is a three-year transition program during which time working "smarter" will become the new 'business as usual' for Council and the region.

The Smart City Implementation Program will achieve the whole of organisation outcomes by using the following framework of activity areas:

- 1. Leadership
- 2. Governance
- 3. Develop organisational capacity and capability
- 4. Engagement with stakeholders and partners
- 5. Smart City Solution Systems
- 6. Smart City Projects.

# Leadership

Globally, successful Smart City initiatives are driven by Mayors and the city's or the region's political leadership. These programs are usually aligned with the economic vitality and long term sustainability of the city and its community. The Smart City Framework highlights the need for a strong organisational and political leadership to drive the changes required to achieve the maximum benefits.

The Sunshine Coast has been recognised for our leadership in the development of our Smart City program as an international Smart 21 city for 2017 (see below). This award comes from the world wide Intelligent Community Forum and short lists the Sunshine Coast to be in the 21 smart cities from a list of over 400. The Smart 21 2017 is the third time the Sunshine Coast has received this recognition out of the last 4 years and will assist the region in recognition and reputation. This will form part of our investment attraction collateral.



The four key hallmarks of the Sunshine Coast Smart City Program are:

#### 1. A Fully Integrated System

Using a systems based approach avoids the creation of siloed solutions and serves as the catalyst to deliver outcomes that combine multiple systems to achieve higher value results. For example, a silo system would be an irrigation system that uses soil moisture to activate it. Through a networked system, it would rely on the bureau of meteorology to determine forecast rain and other elements such as events to know to irrigate before, not during an event. The Sunshine Coast Smart City Integrated System includes seven core elements:

- Smart Region Management Platform at its core
- A Communications Network (optic fibre and wireless)
- Electrical services for the Smart City
- Living Lab to test solutions at small scale before wider deployment
- A Smart Centre to showcase the Smart City and Living Lab trials
- A Council Smart App for community access Smart City Citizen App
- Supporting the wider 15 Smart City Solution Systems

### 2. User/People Focussed

Our Smart City Solutions Systems start with the individual user first then build a system focused to deliver user orientated outcomes. There are many different user perspectives to consider:

- The public
- Community Groups
- Business & Industry (including chambers of commerce)
- Local Innovation system app developers and local entrepreneurial groups and growing employment in a digital age
- Council and contractor teams delivering services for the region
- Strategic planning and policy



#### 3. Performance Focussed

To qualify for wide scale implementation, new solutions will need to meet performance criteria such as:

- Improved operational costs e.g. waste bin sensors and environmental water sensors delivering real-time information
- Informed capital works design driving reallocation of resources to priority areas e.g. number of BBQs or path routes and sizing
- Enhanced community benefits through the delivery of smart solutions e.g. free public WiFi and parking space availability
- Revenue generating opportunities e.g. carrier licence provides revenue potential through duct and fibre lease with other carriers.

#### 4. Sunshine Coast Focused

Community perception of "smart" implies that something which is not smart is dumb. The Smart City Implementation Program addresses this by defining what we do as working towards creating a smarter Sunshine Coast. The Smart City Implementation Program builds on this by seeking to enhance the region's reputation as a smarter location for investment and providing a region wide smart system rather than just a local government focus.

Moving towards a region wide program, the Smart City Implementation Program identifies the need to create a region wide partnership to deliver a smarter Sunshine Coast through a public, private, people based partnership (4P) model:

- Governance through the Futures Board or similar whole of region entity
- Driving investment in the region by existing and new investors
- Service a way to connect, community, business, innovations system, Research and Development groups, vendors together with Council and other levels of government
- Coordinating the smarter region program initially through council's website and later through approval through a single region platform.

The this approach has the potential to create a single location for region wide Smart City projects and activities to be hosted, plus create a virtual partnership connection to the public, private sector, community groups to benefit the whole region.

#### Foundation systems for all new developments

The most cost effective way to create a robust region wide Smart City is to ensure the foundation infrastructure is provided up front during the civil works phase of the original development. The Smart City Implementation Program team have been approached by Stockland and Pelican Waters development teams with a view to including the new foundation infrastructure in their respective development fronts that are currently in the civil works phases on the basis that it enables some Smart City Solutions to be provided from the beginning of development and other Smart City Implementation Programs over time.

In the absence of any statutory power to require Smart City foundation infrastructure in new developments, the Smart City Implementation Program recommends that an overarching head of power within the planning scheme such as a planning scheme policy or design manual be investigated and if found to be reasonable be incorporated into the planning scheme over time.

In the meantime, to move forward and provide certainty to the likes of Stockland and Pelican Waters individual agreements are considered the most appropriate mechanism to ensure all parties are aware their obligations. Individual agreements, once negotiated will provide developers with required certainty and the confidence to place the foundation infrastructure in their developments during the civil works phase.

#### Smart City Solution Systems technical documentation

To support the implementation of the Smart City Implementation Program, a Smart City Solution Systems technical document will be developed. It would provide a consistent set of technical specifications

organisation wide, identification of relevant standards and where available a pricing guide for budgeting purposes. This documentation will be prepared in consultation with relevant Council areas and is intended to be integrated into the organisation's normal operational systems.

### Governance

The proposed Smart City Implementation Program Governance Structure (see below) will see the formation of a dedicated team to serve as a Coordination Group to oversee the day to day implementation. This group will report on progress to a Smart City Steering Group who will report through to a Project Control Group. The governance groups will have representation for each of the departments and other relevant staff as required. Modelled on the successful Sunshine Coast Council Gateway process, the project teams will use the Project Management Office to drive and deliver specific projects resourced across the organisation.

#### Smart City Implementation Program Governance Structure



#### Performance Metrics and Annual Report Card

A system of performance metrics will be developed to inform an annual report card system. During the development phase a set of one, three and five year targets will be identified.

The performance metrics will review the progress of the Smart City Implementation Program 3 year implementation program against the schedule and individually measure the benefits of the Smart City Implementation Program projects.

The following Smart WiFi performance metric will be used as a model for the development of other active Smart City Implementation Program projects. Smart WiFi was the first complete solution system switched on following the adoption of the Smart City Framework. The Smart WiFi network contains three discrete elements:

- Sunshine Coast Free Public WiFi
- Internet of Things devices
- Data analytics system (informing Busines Intelligence)

The typical performance metrics for Smart WiFi will be available daily but for the purposes of reporting, will be measured on a quarterly basis:

#### Sunshine Coast Free Public WiFi

- Number of WiFi Access points
- Number of locations services
- Number of weekly users
- Data usage per week

#### Internet of Things devices

- Number of Smart City Internet of Things devices connected permanently
- Number of Smart City Smart City Internet of Things devices connected for short periods i.e. Caloundra Music Festival)

#### Data analytics system

- Number of Smart phones sensed per week
- Number of rules engines influenced by the Smart WiFi network
- Number of Smart City Implementation Program projects influenced by Smart WiFi
- Specific community benefits achieved, operational savings, capital project design influenced by Smart WiFi
- Specific revenue achieved through the Smart WiFi network

Each of the Smart City Implementation Program areas contained in the performance metrics will begin with an audit of the existing benefited area and identify measures that demonstrate the extent of change that has occurred over the 12 months. Where relevant benchmarking will be done with comparable locations nationally. Qualitative and quantitative measures will be used to highlight different aspects of the individual and combined Smart City Implementation Program

A report card system will be developed to demonstrate how the Sunshine Coast is tracking towards becoming a smarter region. The report card will use the performance metrics highlighted above and following adoption by Council, be published in a full report and single page format. The report card will be completed following the end of each financial year.

A budget for the performance metrics and annual report card will be included to the FY16/17 BR2 budget process to fully develop the initial performance metrics. Another budget allocation will be added to the FY17/18 budget to prepare the annual report card and develop the adopted document to a publishable standard.

Any changes or revisions to the Smart City Implementation Program will also be presented to Council at the same time.

#### Smart City principles

Team members from many areas of Council and across the region will be involved in the identification, selection and transition to delivery of smart solutions. In many cases being smart is as simple as taking traditional systems and approaches (often referred to as analogue) and introducing digital programs and solutions.

To help guide individual areas to mobilise towards the digital transformation, a series of smart principles have been developed and will continue to mature as the program progresses, including the following technology principles (detailed in the Smart City Technical Specifications and Standards document):

- 1. Quality of life
- 2. Environmental sustainability
- 3. Interoperability
- 4. Aesthetics
- 5. Longevity
- 6. Intuitive

- 7. Adaptable
- 8. Secure
- 9. Continuity
- 10. Supported
- 11. Contextual data
- 12. Ownership

#### Policy exclusion zones for test and trial areas

Council has a number of local laws and policies in place to manage the implementation of permanent solutions, i.e. CCTV. Deployments require a formal report to Council seeking approval. To facilitate the efficient evaluation of new technologies (prior to commitment to use as permanent solutions) policy exclusion zones should be created. Typical evaluations in the Living Lab will be between 3-6 months with occasional deployment lasting 12 months (to provide a full year cycle evaluation).

Identification of these testing and trial areas as policy exclusion zones will facilitate the implementation by reducing establishment timeframes and reduce the cost of evaluation.

# **Develop organisational capacity and capability**

Smart City concepts are new and unfamiliar territory for local government (other industries have been using smart technologies and systems efficiency programming for some time). Council will need to develop and build organisational capacity and capability to ensure departments are aware of and understand the opportunities available for implementing Smart City solutions. This area focuses on:

- Training and developing staff capabilities
- · Supporting departments to identify and implement Smart City projects and solutions
- In order to deliver an organisational capacity and capability development program, the Smart City Implementation Team will:
  - Attend individual branch and group meetings to socialize the Smart City Program and actively seek the organisation's collective involvement in the transition to a Smarter Sunshine Coast
  - Encourage groups and individuals to visit the Smart Centre (Shop 3, 63 Bulcock Street Caloundra) and tour the Living Lab
  - Participate in organisation events such as Ignite to provide an interactive learning environment
  - Develop and run 3-4 workshops per year to develop awareness and skill team members to be able to identify smart solutions within their own work areas or across the organisation.

### Engagement with stakeholders and partners

The Smarter Sunshine Coast concept is more than a series of technologies used to improve the public's user experience. Council will need to actively engage with the region and further afield to fully activate these benefits. The key outcomes from engagement are:

- Raised awareness of the Smart City Implementation Program and communicate our activities over the next three years
- A single platform for all Smarter Sunshine Coast activities to be collectively located
- Activation and involvement of key regional stakeholders (traditional and emerging)
- Acquisition of knowledge and increased awareness both nationally and internationally of the Smarter Sunshine Coast initiatives, leading to increased investment in our region.
- Team members are able to identify smart solutions within their own work areas or across the organisation.

#### **Regional partnerships**

Council will achieve many of the externally focused outcomes of the Smart City Implementation Program through its regional partnerships with:

- Regional Development Australia Sunshine Coast
- University of the Sunshine Coast
- Combined Chambers of Commerce
- Industry sector associations or not for profit companies (Spark Bureau, Innovation Centre and Silicon Coast).

#### National partnerships

Council will maintain existing partnerships with national organisations (such as the Australian Smart Communities Association) and identify other strategic alliances/partnership to build our regional profile.

#### International partnerships

Globally, Smart Cities are collaborating to learn from each other, develop solutions and identify innovative funding mechanisms. The Global Smart City and Community Coalition (GS3C - <u>www.gsc3.city</u>). This group is a not for profit organisation that provides an international platform for civic collaboration by sharing challenges, best practices and verified solutions. Their international membership includes (as examples): Chicago, Genoa, Amsterdam, Austin, Bandung, Charlotte and Rotterdam.

Together with the Australian Smart Communities Assn, GS3C has formed a local chapter of the international group. This local Australian chapter has five Australian cities and organisations members now. They are:

- ACT Government
- Australian Smart Communities Association (ASCA),
- City of Ipswich,
- Greater Sydney Committee
- Lake Macquarie City Council.

Adelaide City Council and the City of Newcastle are progressing their memberships in anticipation of a signing ceremony in February 2017.

Through this group, the Sunshine Coast through its array of initiatives identified through the Smart City Framework, including the Smart Centre and Living Lab, would potentially be able to achieve a level of international recognition and contribute to our reputation as an international leader as a smart region. It is considered that these opportunities should be examined and quantified to inform a decision to join this group.

#### Smarter engagement

Two key Smart City Implementation Program elements are the Smart Centre and Citizen Apps, which enable improved engagement with the regional community.

#### Smart Centre

The Smart City Framework described the need for a Smart Lab and Hub to provide community access to the testing and trialling and open access to wider business and innovation community involvement. The Smart Centre opened at Shop 3, 63 Bulcock Street Caloundra in May 2016 and has generated significant interest from the community, vendors and other Australian regions.

- Today the experience centres provide community consultation, business investment and supplier demonstration facilities in an environment that allows the Sunshine Coast to showcase the Smart City as it comes alive
- It also creates a place for people to experience the emerging technology, understand the benefits, and to also stimulate feedback and ideas from the community on how we can all make use of the new technologies for the social wellbeing of our community
- A Smart Centre Officer position has been created to cover opening hours and build the regional reputation nationally and internationally.

#### Smart Citizen Services

Users can access information about the Sunshine Coast Smart City activities through our Sunshine Coast Council App available through both Apple and Android which services over 92% of the smart device market. The app helps by:

- Providing community/citizen access to our smart systems in real time. Where possible real time
  pilot/trial data will be pushed to Sunshine Coast Council App for community use This is
  currently available with the parking space availability trial
- Expanding and developing over time as the smart foundations and smart solutions are developed and deployed
- Harnessing existing apps and app capability to increase user experiences at a lower cost profile to Council.

# **Smart City Solution Systems**

The original Framework identified 15 action areas ranging from Smart WiFi to Smart Parking and Smart Health. As the initial program of works has been developed and refined, it is clear that there will be many areas of focus over time. Instead, the solution systems have been grouped under five themes:

- Foundation Systems
- Transport
- Energy, water and wast
- Built and natural environment
- Smart citizens and living

Benefits of implementation at scale can be achieved by expanding the Smart City Implementation Program to include the wider Sunshine Coast region. Smart outcomes can be delivered sooner and with higher value results by incorporating the delivery of these solutions within existing capital works and organisation-wide operations.

#### Foundation systems

The Smart City foundation systems include:
Smart Region Management Platform at the core to collect, crunch and communicate system information and automated decisions
<ul> <li>Communications network connectivity (including fixed underground, wireless and WiFi) supported by Council's Telecommunications Carrier licence.</li> </ul>

Electrical systems (normal supply) Comm Solution designed to support smart connected Connect devices including smart urban infrastructure (smart poles and other pieces of (connected) urban elements). Living Lab - testing and trialling new . 3 Solutions Systems Smart Centre - an interactive environment art to provide community access and a Services ne App demonstration facility for the Living Lab trials Smart Apps - proving real time information Q SCC App iving Lab to the community and businesses

#### Transport

Transport fits within the wider mobility theme. Transport is also an area where the state government has the lead role and responsibility for the policy environment within the broader state wide context. Initial work within Council will focus on aspects of transport that we are able to directly influence. The initial sub theme categories are:

- Public transport specifically bus stop smart services
- Transport infrastructure planning
- Parking
- Cycling & walking

Parking and transport Smart City Solutions have both been identified as priority solution system areas to be developed in FY16/17.

#### Energy, water and waste

Council has innovative and smart projects already underway in this theme:

- First Automated Waste Collection System (AWCS) in Australia
- Solar farm at Valdora
- Public street lighting project

Three waste and water solutions are currently under trial in the Smart Centre:

- Public Waste Bin Sensor Project five sensors are already delivering significant operational savings with more to come as this is extended across the 3,000 bins in the network
- Digital water meters (designed by a Sunshine Coast company) are now under trial in five locations
- Environmental water sensors (generating real time results) are informing additional operational savings in the Pelican Waters canal system. With application across the Sunshine Coast, significant operational savings are achievable.

#### Smart citizens and living

This theme responds to the community aspirations for high quality community spaces and our Sunshine Coast environment. It includes the following initial sub categories:

Smart apps

- Tourism and major events
- Education and health
- Smart Centres and Living Labs.

#### Built and natural environment

This theme captures the balance of areas not included above. Private developments are increasingly including smart solutions, such as:

- App based power control/venue management for markets/community space.
- Building information modelling to manage day to day operations through maintenance and other full life cycle considerations.
- Digital vision and CCTV is transforming how traditional CCTV has operated, providing far more layers of intelligence and integration without the need for constant human monitoring, e.g. facial recognition cameras.
- Digital signage incorporates way finding, public information and integrates tailored advertising
  of local venues or uses commercial arrangements.
- Sound sensors pick up the myriad of technical solutions that can assist with sensing and triggering automated responses and information recording.

# Smart City Projects

Council capital works projects represent the single greatest benefit realisation area from the Smart City Implementation Program. Council spends more than \$150 million on capital works every year renewing, replacing and enhancing the infrastructure that makes our community and region unique. By designing smart technologies into capital works the number of locations with smarter solutions will increase across the whole Council area.

The Smart City Team will work with our branches, designers and project delivery teams to identify the best solution systems to integrate in each project. Sometimes this will simply involve the foundation systems and where there is sufficient budget, this will extend to the smart solution systems as well.

Examples of how capital works projects will integrate Smart City Implementation Program Solutions Systems are:

The <u>Palmwoods Town Centre project</u> will provide revitalisation to a key part of the town centre in 2017. A number of specific Solution Systems are proposed, including:

- Foundation systems communications and smart electrical systems together with smart poles, Smart WiFi (public WiFi plus business intelligence services)
- Waste bin sensors, street lighting and artistic/park lighting using LED
- Integration of public art with capability of using augmented reality and/or 3D projections
- Parking space availability through sensors and the Smart City Citizen App
- Potential for smart furniture including USB charging
- Potential for smart heritage or sound trail solutions via beacons as per the Maroochy Bushland Botanic Gardens.

In late 2016 / early 2017, the <u>Bulcock Street Streetscape</u> will be completed and achieve an Australian first – the formation of a 250m Smart Street Demonstration and Testing Facility with the following included:

- As for Palmwoods Town Centre above
- Public digital speakers to enhance market days

- LED street lighting aligned with evening LED lighting experiences
- Digital water meters
- Potentially also auto bollards and digital displays for market days.

The <u>Mooloolaba Foreshore project</u> represents an excellent opportunity to integrate smart Solutions Systems outlined above plus additional innovations adapted to this location. The range of services and activities occurring there include:

- Examples as for Bulcock Street above
- Digital signage and bollards to manage pedestrian traffic areas at different times
- Tourism and major events (New Year's Eve, marathons etc.)
- Coastal uses water play and swim zones
- Cultural and artistic events with high energy visual and audio environment capability.

From the 2016/17 financial year, the Smart City Team will continue to work across a range of projects including capital works projects already identified for active integration of Smart City Implementation Program solution systems:

- Development of the Smart Solutions Portfolio
- Bulcock Street Streetscape as the Smart Street Demonstration and Testing Facility
- Mooloolaba Foreshore project
- Palmwoods Town Centre Urban Streetscaping
- Working with Capital Works teams at the early stages for many more projects.
- Major urban development areas such as Stockland Aura (Caloundra South) and Palmview
- Alex Skate Park, Kawana Sports Stadium Solution Portfolio
- Caloundra Honey Road Sports Project
- Nambour Diddillibah Road Sports Complex
- Coolum Library extension
- Mooloolaba Holiday Park works
- Nambour Tram Project
- Resource Recovery Centres
- Bli Bli Streetscape
- Pacific Paradise Streetscape
- Minyama Mooloolaba Cycleway
- Evans St lane / road upgrade
- Sippy Downs Drive lane / road upgrade
- Bus stops
- Consultation on other significant capital works projects.

See Appendix 2 for the full list of projects and timing.

### Conclusion

Over the last two centuries, the world has experienced the steam, electricity and automobile revolutions. Each have brought significant benefits and challenges. Today, a fourth revolution is underway – the digital revolution is bringing about change at a faster rate than any of the three previous revolutions.

The Sunshine Coast Smart City Implementation Program is Council actively seeking to harness the benefits of the digital revolution for our region. Our choice is to be proactive and choose the change that adds value to our region, increases our regional sustainability and drives new investment through an international profile as a leading smart region.

Like all other cities and communities, the Sunshine Coast is seeking to provide world class experiences for its community, a high quality built environment and highly efficient service delivery within a decreasing revenue base. The Smart City Implementation Program has been designed to transform our region towards becoming a Smarter Sunshine Coast.

# Appendices

### **Appendix 1- Solution Systems by themes**

Engagement with	stakeholders and partners
Engagement	Components
Smart Centre	The Sunshine Coast Smart Centre includes a number of components:
	<ul> <li>Our interactive experience space is a former retail location and provides visitors with:</li> <li>An understanding of the Smart City Framework and Implementation Program</li> <li>An overview of the current Living Lab testing and trialling laboratory with real-time information via touch screens</li> <li>A community consultation tool to facilitate community awareness and understanding</li> <li>A presentation space for visiting groups</li> <li>A location for our vendor partners to demonstrate existing and future solution suites</li> <li>A 250m urban street demonstration and testing facility built from the ground up with Smart City as the key focus.</li> <li>A dedicated web hub for local businesses and innovation groups to drive private sector involvement and value adding through app development etc (Proposed).</li> </ul>
Living Lab	The <b>Living Lab</b> is a testing and trialling program allowing Council to evaluate a small number of devices before deployment at scale. The evaluation considers how the device complies with the 12 Smart City principles and integrates the relevant branch of Council, and their business models. Then the solutions can be deployed at scale as budget becomes available (and approvals if needed). A <b>Living Lab self-guided walking tour</b> using Council's app and beacons to highlight the Solution Systems tests where they are installed around the Caloundra CBD. Users simply follow the prompts in the app, walking to Smart City testing and trailing installations. The beacons prompt the user with a range of information and media types highlighting features and outcomes from the trial. This tour will expand and update as new solution system trials occur.
Smart Citizen Services	<ul> <li>To provide community/citizen access to our smart systems in real time.</li> <li>Expand and develop over time as the smart foundations and smart solutions are developed and deployed.</li> <li>Harness existing apps and app capability to increase user experiences at a lower cost profile to Council.</li> <li>Available in Apple and Android to service over 92% of the smart phone market.</li> </ul>

Solution Systems -
Foundations
Smart Communications Connectivity

Foundations	Components
Ц°	<ul> <li>Investigate use of Low Energy Wide Area Networks e.g. LoRaWAN and/or Long Term Evolution (LTE) - 3G, 4G, 5G) as cost effective ways to connect services</li> <li>Seek to generate revenue through subducting agreements with other carriers</li> <li>Provide Maroochydore City Centre with Gigabit plus rates connectivity to create a competitive advantage</li> <li>Support future international connectivity via a submarine cable to US and Asia.</li> <li>Expand Council duct and pit network in all new capital works programs and new developments across the Sunshine Coast.</li> </ul>
Smart WiFi	<ul> <li>Smart WiFi combines three different elements:</li> <li>1- The Sunshine Coast Free Public WiFi network is offered in over 34 locations with 100+ access points. Each week over 7,500 users connect and consume 3Tb of data</li> <li>2- The network also serves as an Internet of Things service. For example, during the Caloundra Music Festival, the WiFi services the EFTPOS transactions for festival goers. After the festival the system reverts to Free Public WiFi.</li> <li>3- WiFi can also serve as a planning and managing tool through the heat mapping and smart phone counting. Using the anonymous data from smart phones foot fall and volumes of people in areas can be determined and can be used to inform the demand for increases in services – i.e. waste bin clearing following a day of high use.</li> <li>Next steps - Expand Smart WiFi deployments to increase user registrations, participation and future commercial opportunities.</li> </ul>
Smart Electrical Services	<ul> <li>Traditional light systems are set in groups of 20-30 with a single photo sensor switching them on and off.</li> <li>Smart infrastructure requires dedicated power supply.</li> <li>Ensure dedicated electrical ducting, pits and cabling is required.</li> <li>Field cabinets managing both electrical and communications equipment is needed to support smart infrastructure.</li> </ul>
Smart Poles	<ul> <li>Deploy smart poles in appropriate locations (e.g. Greenfield development sites and Council funded streetscaping) to provide Council owned infrastructure to support the installation of Smart Solutions.</li> <li>These can be smart multi-function poles, cost effective square or round poles. Spacing height and capacity to add additional smart infrastructure including:         <ul> <li>Smart street and off street lighting</li> <li>Flexible smart lighting for events (e.g. New Year's Eve or Sydney Vivid like events)</li> <li>Low level pathway lighting or under eve lighting</li> <li>Support appropriate power solutions to allow variable 24x7 controls, and multiple sensors.</li> </ul> </li> </ul>
Smart Region Management Platform	<ul> <li>The core component of an integrated Smart City system is the Smart Region Management Platform.</li> <li>Following the trial of three competitive smart operating systems in the Living Lab in 2016 a procurement process will select the initial of the Smart Region Management Platform</li> <li>In the longer term, investigate the potential for partnering with other communities across Australia to create a multi-state and territory standardised operating system</li> </ul>

Foundations	Components
-¥-	<ul> <li>that will be considered for use by state governments and deliver the maximum integrated outcome for the Sunshine Coast.</li> <li>Partner with the Australian Smart Communities Association and CSIRO, and use an investment model where the initial capital outlay will be down paid as other communities purchase licenses.</li> <li>Council to continue discussions with State Government, Council of Mayors, and Universities (e.g. University of the Sunshine Coast / Queensland University of Technology).</li> </ul>

### Smart Solution Systems

Smart Solution	Implementation plan elements
Smart Parking	<ul> <li>Parking spaces available near the destination</li> <li>Availability of red and blue handicapped parking spots</li> <li>Availability of loading zones</li> <li>Availability of non-Council parking in areas behind shops or nearby streets</li> <li>Information about zones with variable hours parking duration and, where relevant, dynamic pricing</li> <li>Parking spot 400m (variable) for users to increase their daily steps (Smart Health)</li> <li>Regulated parking or paid parking users are advised that parking time has almost run out</li> <li>Paid top up options for registered users</li> <li>History of parking take up – use of way signing, bill top-ups</li> </ul>
Smart Lighting	<ul> <li>Street lighting LED and meshed to provide another conductivity layer for Internet of Things sensors and smart solutions</li> <li>Security</li> <li>Lighting up buildings</li> <li>Smart LED lighting for pathways, parks using colour changes and variable intensity</li> <li>Capability to dim and respond to the number of adjacent people, vehicles or movement</li> <li>Specialised lighting installations, e.g. Bulcock Street Streetscaping LED project</li> <li>Note: Smart Street Lighting requires third party (Energex) approvals to proceed.</li> </ul>
Smart Waste	<ul> <li>Automated Waste Collection System – Maroochydore City Centre</li> <li>Connected waste bins with compactors, WiFi sensors and digital signage for advertising</li> <li>Waste collection informed by sensors</li> <li>Building smart into new Council waste contracts</li> </ul>
Smart Sense	<ul> <li>Use wired and wireless sensors to determine public barbecue use to provide feedback</li> <li>Air quality monitoring</li> <li>Water quality monitoring</li> <li>Use Internet of Things (wireless network) to deliver asset management capability through the deployment of sensors with GPS and asset management registration Note: Smart Sensors apply in a wide range of user case scenarios.</li> </ul>

Smart Solution	Implementation plan elements
Smart Sight	<ul> <li>Public safety CCTV</li> <li>Parking solutions using pixel based cameras</li> <li>Parking infringements - number plate recognition</li> <li>Parking management - automated number plate recognition</li> <li>Traffic counts - including vehicle categories, pedestrian, and cyclists – can be combined with Smart WiFi to generate journey to work data or inform digital advertising pricing and duration.</li> <li>Note: Smart Sight involves</li> </ul>
	more than just public safety CCTV.
Smart Sound	<ul> <li>Use of microphones coordinated with cameras for public safety in conjunction with other sensors to generate safety responses e.g. fighting/violence or scream sensors</li> <li>Digital speakers for public safety announcements, musical background for events, market days, New Year's Eve etc. Music coordinated with light installations like the Sydney Vivid Festival</li> </ul>
Digital Signage	<ul> <li>Street sign advertising, potentially including smart technology such as WiFi and cameras as required</li> <li>Combined with WiFi business intelligence, tailored advertising at higher value when needed otherwise providing way-finding</li> </ul>
Smart Power and Energy	<ul> <li>Power demand management, particularly for Council owned services, and linkages to Solar Farm</li> <li>Investigate inclusion for requirements in key commercial development areas, e.g. Maroochydore CBD</li> <li>Solar PV installations - Council Solar Farm</li> <li>Smart grid energy management</li> <li>Electric vehicle charging stations (where and how, local info such as fuel / shops / beach)</li> <li>Electric bicycle charging stations</li> <li>Recharge points – smart phones</li> <li>Investigate products with the potential to broaden and deepen the power generation options for the Sunshine Coast:</li> <li>Pave Gen – www.pavegen.com</li> </ul>
	<ul> <li>Fave och www.porgenicenii</li> <li>Solar Roadways® (SR) is a modular system of specially engineered solar panels that can be walked and driven on www.solarroadways.com/</li> <li>Solar Roof tiles used instead of solar panels www.solarcentury.com/uk/our-products/ and www.monier.com.au/RoofTiles/SOLARtile/</li> <li>Dog poo power generating energy from dog faeces www.poopower.com.au/index.html.</li> </ul>

Smart Solution	Implementation plan elements
Smart Transport	<ul> <li>Smart bus stops with real-time information, WiFi Smart Sight, advertising, interactive screens, USB charging</li> <li>Bollards to close off entrances for market days</li> <li>Sensors</li> <li>Street level information</li> <li>Beacons/proximity for information</li> <li>Traffic flow</li> <li>Autonomous Vehicle Technology (private and as on-demand mobility)</li> <li>Self-driving cars - augment current two-dollar cab fare service with self-driving cars (CSIRO proposed partnership)</li> <li>Mapping and mobility apps</li> <li>Mobile ticketing</li> <li>All public transport to be designed and built with Smart WiFi (all three layers), device charging (USB), CCTV (including screens showing CCTV views scrolling), digital advertising (for revenue generation)</li> <li>Note: Many Smart Transport initiatives require third party involvement, agreement and investment.</li> </ul>
Smart Water	<ul> <li>Smart water meters to provide near real-time information about water consumption to implement once user consumption level reached</li> <li>Alert to malfunctions in the user's network (e.g. crack in pipe created by tradesman or landscaper identified and rectified. Responsible person pays for damage rather than a high cost water bill and fixed some months after the incident).</li> </ul>
Smart Health	<ul> <li>Partner with the University of the Sunshine Coast and other health-related educational groups to develop the region into a smart health laboratory investigating the connection between health, digital and our Solutions Systems</li> <li>Work with relevant groups and install sensors to help those with allergies to pollens and other triggers for Asthma to be able to access current real time information</li> <li>Fitness sites with beacons for additional information / pace / competition data</li> <li>Connect transport solutions to enable people of all abilities to achieve improved health through fitness – use sensors, beacons, tracking, physical design and app connectivity with real time information.</li> </ul>
Smart Education	<ul> <li>Tailor smart outputs in aggregate form for wider use or through secure access to registered user's individual information relevant to their circumstances (e.g. Smart water meter and electricity meter consumption for their own unit or premises)</li> <li>Guided walks (using beacons) for education, cultural and history assisted interactive experiences for visitors and residents</li> <li>Gamification of smart statistics for use in schools to promote sustainability - compare suburb and locality results for water consumption electricity and other indicators</li> <li>Continued development of self-guided walking tours through the Sunshine Coast Council app using beacons and other technologies to enhance visitor, student, business and resident experiences         <ul> <li>cultural heritage based</li> <li>Smart installation and information</li> </ul> </li> </ul>

Smart Solution	Implementation plan elements
	<ul> <li>Partner with University of the Sunshine Coast, TAFE, and local educational institutions using the Smart City eco-system/solutions to improve local educational outcomes.</li> </ul>
Smart Business Intelligence	<ul> <li>Use business intelligence from Smart WiFi to help businesses tailor their opening and closing hours to respond to event opportunities</li> <li>Provide capability for businesses to advertise to a specific geographic area or in times when an incident/accident has caused delay, e.g. Bruce Highway offer: discounted meals and accommodation to improve visitor experiences (builds on existing disaster hub capability)</li> <li>Provide existing businesses, potential investors, banking and commercial real estate agents with time series and real-time information about people movements</li> <li>Use the Sunshine Coast Council app to drive people to active and open businesses following events using Smart WiFi identification of how busy and active that location is</li> <li>Enhance Council's open data platform with real-time data to help local app developers create relevant apps, and generate income from app sales</li> <li>Provide access to local innovation and entrepreneurial groups (i.e. Spark Bureau, Innovation Centre, Silicon Coast etc.) to the Sunshine Coast smart platform and ecosystem to drive further innovation, growth, business and employment opportunities.</li> </ul>
Smart Tourism and Events	<ul> <li>Work with Visit Sunshine Coast to tailor a package of existing and future Smart Solutions to meet the needs of the tourism industry on the Sunshine Coast         <ul> <li>expand the Smart WiFi deployment</li> </ul> </li> <li>Develop event specific WiFi value ads         <ul> <li>e.g. ability to use push messaging such as - sell remaining hot food at venues at the end of the day</li> <li>Manage EFTPOS and other systems like communications without the need for 2-way radios</li> <li>Business intelligence – visitor numbers, real time and time series, returning visitors and other anonymous and unique information</li> <li>Ability to increase event hire charges where the client can access the business intelligence data (or a subset of it) and or other Smart Connectivity services</li> <li>Drive up number of users, number registered and actively participating</li> </ul> </li> </ul>
Smart Building Information Modelling	<ul> <li>Building Information Modelling is a digital representation of a facility's physical and functional characteristics. A Building Information Modelling is a shared (digital) knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition</li> <li>Use Building Information Modelling throughout major new buildings and infrastructure to achieve effective asset management and reduce maintenance costs</li> </ul>

### Appendix 2- Smart City High Level Program

Legend:	✓ Scheduled Activity		Developm	ent	Activ	e	Review & Update						
Smart City Implementation Program FY17 to FY19		FY17 Q1	FY17 Q2	FY17 Q3	FY17 Q4	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY19 Q1	FY19 Q2	FY19 Q3	FY1
1	l Leadership					51							
International reco	ognition and communications										•		
Develop and implem	nent Smart City Communications Program		*										
	e identification system for Smart City Solutions		*	~	~	~	~	~	~	~	~	~	4
2	Governance				-	-						1	
Smart Centre v	vendor partnership program	*	*										
	ations, leases lease – Shop 3, 63 k Street, Caloundra)					5							
3 Development of	f organisational capacity and capability												
Smart City Prog	ram awareness and training		✓	~	~	~	~	✓	~	~	✓	~	
Solutions System of	opportunity identification training			✓		~		✓		~		✓	
4 Engagement wi	th stakeholders and partners												
PPP's with infrastructure providers – Unitywater, Energex etc.			~	~	~	1	~	~	~	~	~	~	
5	Smart Centre												
Sma	rt City Living Lab												
Traditional stakeholders and regional innovation entrepreneurial to drive jobs and business growth								▲					
Leverage partnershi	p and joint funding opportunities,		~	~	~	~	~	~	~	~	~	~	
Work with relevant Council branches to identify forwards program of Smart WiFi deployment			~	~	~	~	~	~	~	~	~	~	
Using Smart Solution Systems to develop Smart City apps in collaboration with innovation and entrepreneurial sectors													
Drive new investme	Drive new investment and job creation opportunities		*	~	✓	✓	✓	✓	✓	✓	✓	✓	

Smart City Implementation Program FY17 to FY19	FY17 Q1	FY17 Q2	FY17 Q3	FY17 Q4	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY19 Q1	FY19 Q2	FY19 Q3	FY1
5 Foundation Systems												
Smart Region Management Platform	~	~	~								<b>A</b>	
Technical Specification, Standards and Pricing Guide (including Comms, electrical and smart pole systems)		*	*	~							<b>A</b>	
Optic Fibre network for major urban developments and key Council developments			٨			٨						
Carrier Licence Administration	~	4	1	1	1	~	1	×	1	1	~	
Network Audit and future expansion plan		✓	1			▲				▲		
Business Plan Development & Implementation	*	*	1	~	~		1	1	~		~	
Smart Public Waste	1	1	~	1			<b>A</b>					
Smart Business Intelligence		1	1	1	✓							
Smart WiFi		~	~	1	1					▲		
Smart Parking			~	1	✓	1				<b>A</b>		
Transport			~	~	1	~						
Tourism and Events				1	~	~				<b>A</b>		
Smart Lighting						~	~	✓				
Smart Water Program						~	~	✓	✓			
Smart Closed Circuit Television (CCTV) & Vision						~	~	~	✓	~		
Smart Digital Signage								~	~	✓		
Smart Building Information Modelling (BIM)									~	✓		
Smart Power and Energy										~	~	
Smart Sound							~	✓	✓			
Smart Sensors										~	~	
Smart Health											~	
Smart Education											~	
6 Projects												
Smart Urban Demonstration and Testing Facility - Bulcock St Streetscaping – Australian First	*	~	~									
Development of Smart Solution Portfolio		*	*	*								
Palmwoods Town Centre Streetscaping	*	✓	~									

Smart City Implementation Program FY17 to FY19	FY17 Q1	FY17 Q2	FY17 Q3	FY17 Q4	FY18 Q1	FY18 Q2	FY18 Q3	FY18 Q4	FY19 Q1	FY19 Q2	FY19 Q3	FY1
Mooloolaba Foreshore	*	*	~	~	~							
Stockland Aura (Caloundra South) & Palmview	*	~	✓									
Alex Skate Park 16/17 – 17/18			*	*	✓	✓	✓	✓				
Kawana Sports Stadium Solution Portfolio		*	*	~	✓	✓	✓	✓	✓	✓	✓	
Caloundra – Honey Road Sports Project				*	*	*	✓	~	✓	✓	✓	
Nambour – Diddilibah Road Sports Complex					*	*	*	*	✓	✓	$\checkmark$	
Coolum Library Extension			*	*	$\checkmark$	✓						
Mooloolaba Holiday Park works				*	~							
Nambour Tram Project				*	$\checkmark$	✓						
Nambour Resource Recovery Centre				*	✓							
Bli Bli Streetscape				*	✓	×	✓	✓	✓	✓		
Pacific Paradise Streetscape 16/17 – 17/18		*	*	~	✓							
Minyama > Mooloolaba Cycleway				*	✓	×						
Evans St Lane / Road Upgrade			*	*	✓	✓						
Sippy Downs Drive Lane / Road Upgrade			*	*	✓	×						
Bus Stops				*	✓	✓	✓	✓	✓	✓	✓	
Consultation on other significant capital works projects				*	✓	✓	✓	✓	✓	✓	✓	
Planning Scheme requirements for Smart City				*	~	~						

