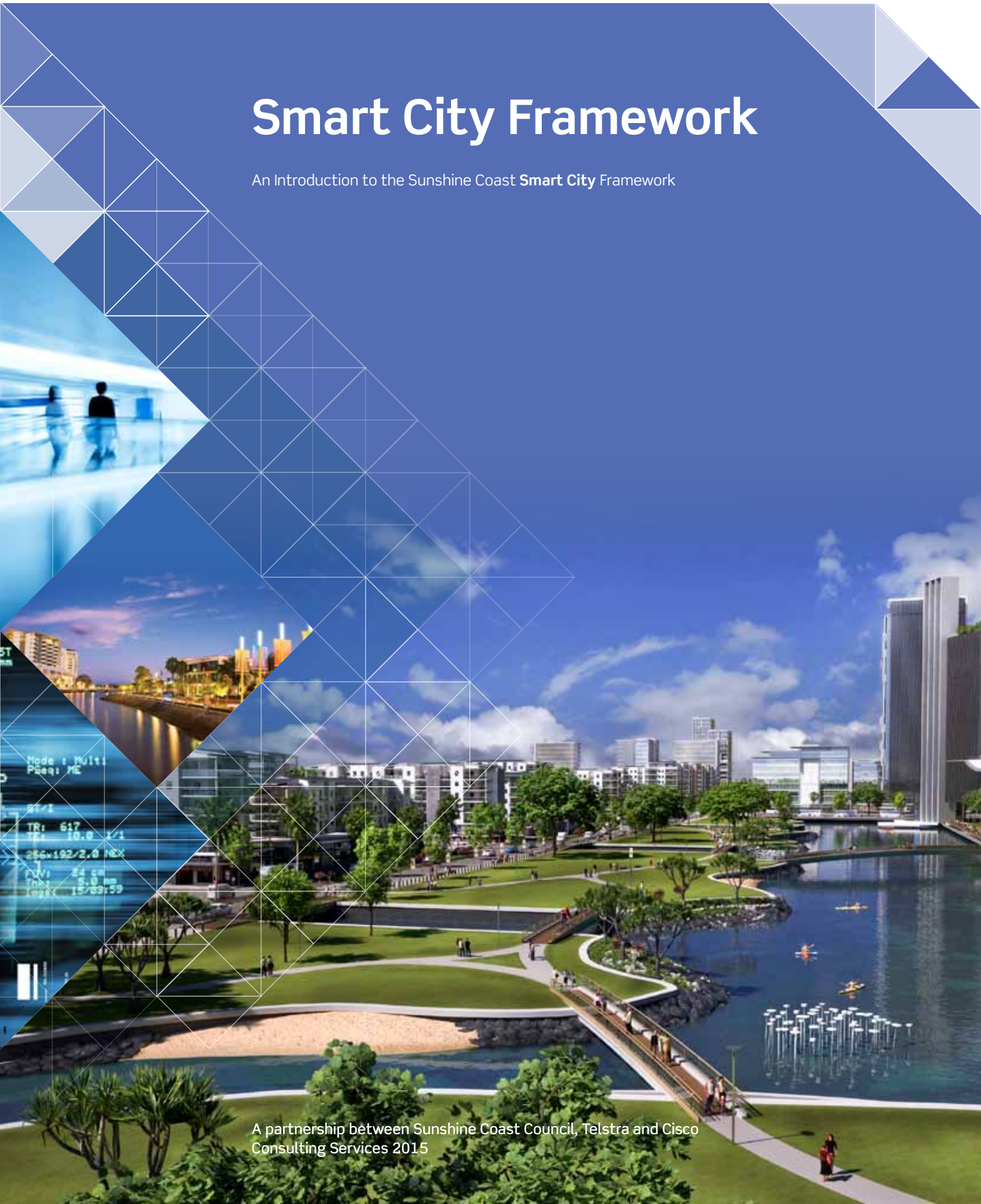
Sunshine Coast™ COUNCIL

Smart City Framework

An Introduction to the Sunshine Coast **Smart City** Framework



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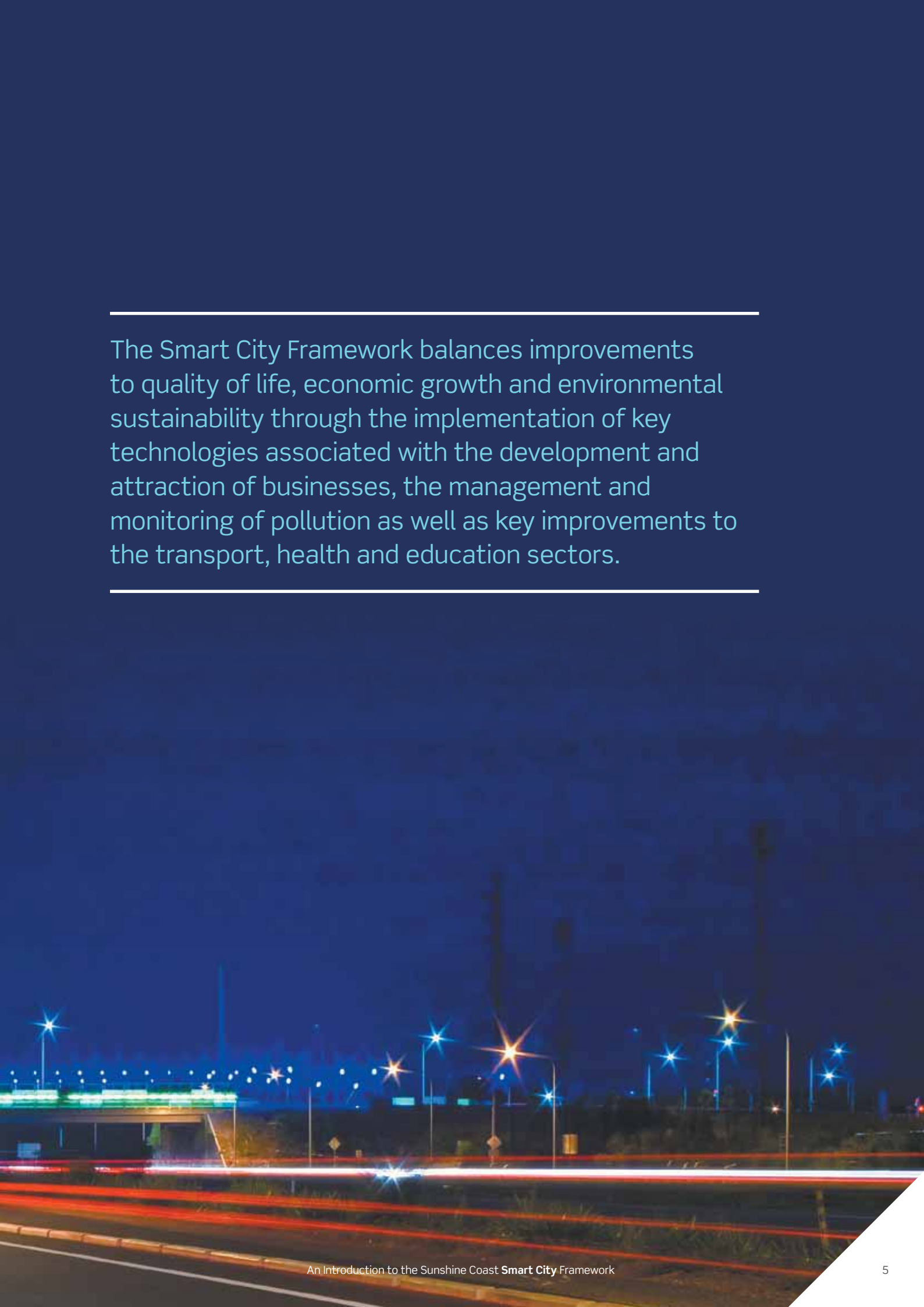
Introduction

In late 2014, the Sunshine Coast Council partnered with Cisco and Telstra to develop a Smart City Framework for the Maroochydore City Centre Priority Development Area (PDA), and the wider Sunshine Coast region.

The Smart City Framework was developed through consultation with key stakeholders and is designed to help make the Sunshine Coast even more liveable, workable and sustainable.

Seen as a key competitive advantage for the region, the Smart City Framework illustrates how smart, integrated technologies can promote synergies and growth within the region.

The Smart City Framework balances improvements to quality of life, economic growth and environmental sustainability through the implementation of key technologies associated with the development and attraction of businesses, the management and monitoring of pollution as well as key improvements to the transport, health and education sectors.



The Smart City Framework

The Sunshine Coast Regional Economic Development Strategy 2013-2033 identified the new Maroochydore City Centre Priority Development Area (PDA) as a game-changing project that will contribute to reshaping the region's economy in the decades to come.

When combined with investments elsewhere along the Enterprise Corridor, and a population set to grow by more than 40% over the next two decades, **Smart City** investments can help advance Council's five corporate-plan goals and make the region an even better place to work, play, live and learn.

Not withstanding its ambition, as the Sunshine Coast Council moves forward, it must contend with real challenges: limited revenue growth, environmental impacts of development (locally and elsewhere), aging infrastructure, growing international competition, and expectations of citizens for 'Google-like' services. In short, people expect their governments to provide better service, while minimising costs, and to respond to them through multiple channels.

Using traditional approaches, governments will be unable to meet their responsibilities

Governments can no longer rely on traditional approaches to meet their responsibilities for the built environment, energy, telecommunications, transportation, water and waste management, health and human service, public safety and payments and finance. The Smart Cities Framework offers the Sunshine Coast a way to think differently about how services can be delivered. A **Smart City** Framework guides the creation of a Smart City and Smart Region by identifying the elements necessary to achieve a successful and integrated program of smart and connected services.

What is a Smart City and what benefits does it offer?

The banner **Smart City** describes the portfolio of services that can be implemented to transform and improve the way residents, visitors, businesses and governments interact with their environment in the course of their lives. Smart Cities uses information and communications technology to connect people, processes, data and things in ways that make cities more...

LIVEABLE	WORKABLE	SUSTAINABLE
A better quality of life for city residents	Accelerated economic development	Responsible resource use, in harmony with the environment

Cities pursuing **Smart City** services embark on their journey from many different places, but do so with the aim of capturing some of the tangible benefits Smart Cities offer:

- Reducing carbon emissions, and energy consumption by 25% and 50% respectively
- Revolutionizing the government's relationship to people
- Enabling real-time alerts and real-time monitoring to create citywide situational awareness
- Reducing costs through platform development and infrastructure sharing

- Reducing crime by 20%
- Enabling better financial forecasting
- Simulating and visualising designs to enable more precise planning
- Creating world-class infrastructure
- Extracting the maximum value from city assets

- Reducing traffic jams by 20%
- Attracting new business investment
- Supporting skills development
- Unleashing innovation
- Creating a "recruiting tool" for attracting talent and jobs
- Reducing resource use through optimization
- Increasing economies of scale

What is a Smart City and what benefits does it offer?

Songdo, Chicago, London, Amsterdam and Barcelona have all attracted international attention for their **Smart City** projects, but hundreds of other regions like the Sunshine Coast are also using **Smart City** services to diversify their economies, attract new businesses and visitors, and improve the quality of life for residents.

What they all have in common is that they began with a critical examination of the capabilities Smart Cities could deliver. By linking those capabilities to their own goals and desires, each region was able to create a solution fit for their particular needs.

Approach and methodology

Smart Cities can take many shapes, and not all solutions make sense in all districts. Using a framework helps municipalities understand how to deliver the greatest impact per dollar invested, and makes Smart Cities more sustainable, viable and robust. The Sunshine Coast Smart City Framework was co-created by the Telstra, Cisco and Sunshine Coast Council teams based on a methodology that Cisco developed and refined through numerous global projects.

By engaging more than 20 stakeholder groups on the Sunshine Coast, the team was able to develop a phase-based portfolio of Smart City services that recognise the greenfield nature of the PDA and consequent cost efficiencies with delivery in the Maroochydore PDA, and the Sunshine Coast Enterprise Corridor.

Although these two areas were the focus of this project, the findings, recommendations, and the process employed provide reusable assets that readily support extending the analysis and the associated benefits to the broader Sunshine Coast region as a whole.

The Smart City Framework

Regions that deploy **Smart City** solutions according to a strategic framework achieve the greatest benefit per dollar invested, and avoid creating a new series of digital silos that are difficult to integrate, manage and evolve. Informed by the input of stakeholders, and guided by the Sunshine Coast Council vision and corporate-plan goals, the team designed a framework that delivers tangible benefits during every phase, and allowing sufficient time for everyone to adopt the new solutions, learn along the way, and extract maximum value from the **Smart City** investments.

The Smart City Framework is represented by a portfolio of 13 value-added services that are supported by two core layers: a Smart Region Management Platform, and a communications layer provided by Foundational Fibre-optic and Other Telecom (wireless) Networks. Together, the services that comprise the Smart City Framework provide the capability to build and support the economy, develop a stronger community, improve services to residents, businesses and visitors, and credibly claim leadership as Australia's most sustainable region.

Each of the **Smart City** services in the Framework offers key benefits to the Sunshine Coast, and, based on Cisco research and global experience with other municipalities, can make substantive direct and indirect contributions to the region. Cisco's research related to Smart Cities suggests that regions delivering a fully-integrated program can earn significant dollar per square metre premiums. Further, Cisco's economic analysis estimates a value at stake of US$14.4 trillion for the private sector and US$4.6 trillion for the public sector globally, with investments generally returning $3.30 for every $1 contributed. Between business attraction, revenue generation, cost avoidance, environmental protection, and quality of life improvement, this represents a $755 million opportunity for the Sunshine Coast.

There are a number of key drivers that influence the benefits delivered by **Smart City** services. For example, the scale, phasing and timing of the deployments; the sophistication and maturity of the service providers and the service-delivery ecosystem; and, adoption rates by consumers and businesses all directly impact the magnitude and timing of benefits. In order to help the Sunshine Coast refine the estimated benefits realised by implementing **Smart City** services, we have modelled a 10-year view of the potential macro-economic benefit for the services. The range of potential benefits is based on a number of assumptions based on our global experience, a number of Australian and Sunshine Coast data sources, and interviews with Sunshine Coast Council representatives.

It should be noted that these numbers are indicative and are provided to demonstrate the relative financial benefits achievable based on Cisco and Telstra's global experience. Further work will be required by the Sunshine Coast Council and its partners to validate and test the assumptions, develop specific requirements, understand supplier capabilities and costs, and agree operating model constructs.

KEY BENEFITS OF SMART CITY SERVICE	10-YEAR MACRO-ECONOMIC BENEFIT
Foundational Fibre-optic Network • Enables convergence of all networked services (voice, video, data, machine, etc.) on to a single network, reducing infrastructure duplication and cost • Can accelerate innovation due to the ability to obtain high-speed access to network assets	Essential enabling technology core to delivering and creating value from other Smart City services
Smart Region Management Platform • Simplifies management of municipal services, consolidates control into one place • Facilitates integration of multi-vendor Smart City solutions, and enables analytics that can enable data-driven decision making and planning	Essential enabling technology core to delivering and creating value from other Smart City services
Smart Lighting • Lowers electricity and maintenance expenses 60+% freeing funds for other investments • Improved lighting can yield a 20% reduction in crime	**$57M-$99M** Due to reductions in electrical expenses, improved employee productivity, a smaller maintenance vehicle fleet, lower crime and higher property values
Smart City WiFi • Provides a platform for efficient delivery of other services (public safety, municipal services) • Helps lower IT costs through infrastructure rationalisation • Delivers a services that residents and visitors are coming to expect in city centres	**$6M-$15M** Based on travel avoidance, time saved by people, increased people engagement, and the ability to collect people flow analytics from the solution and drive better investment decisions

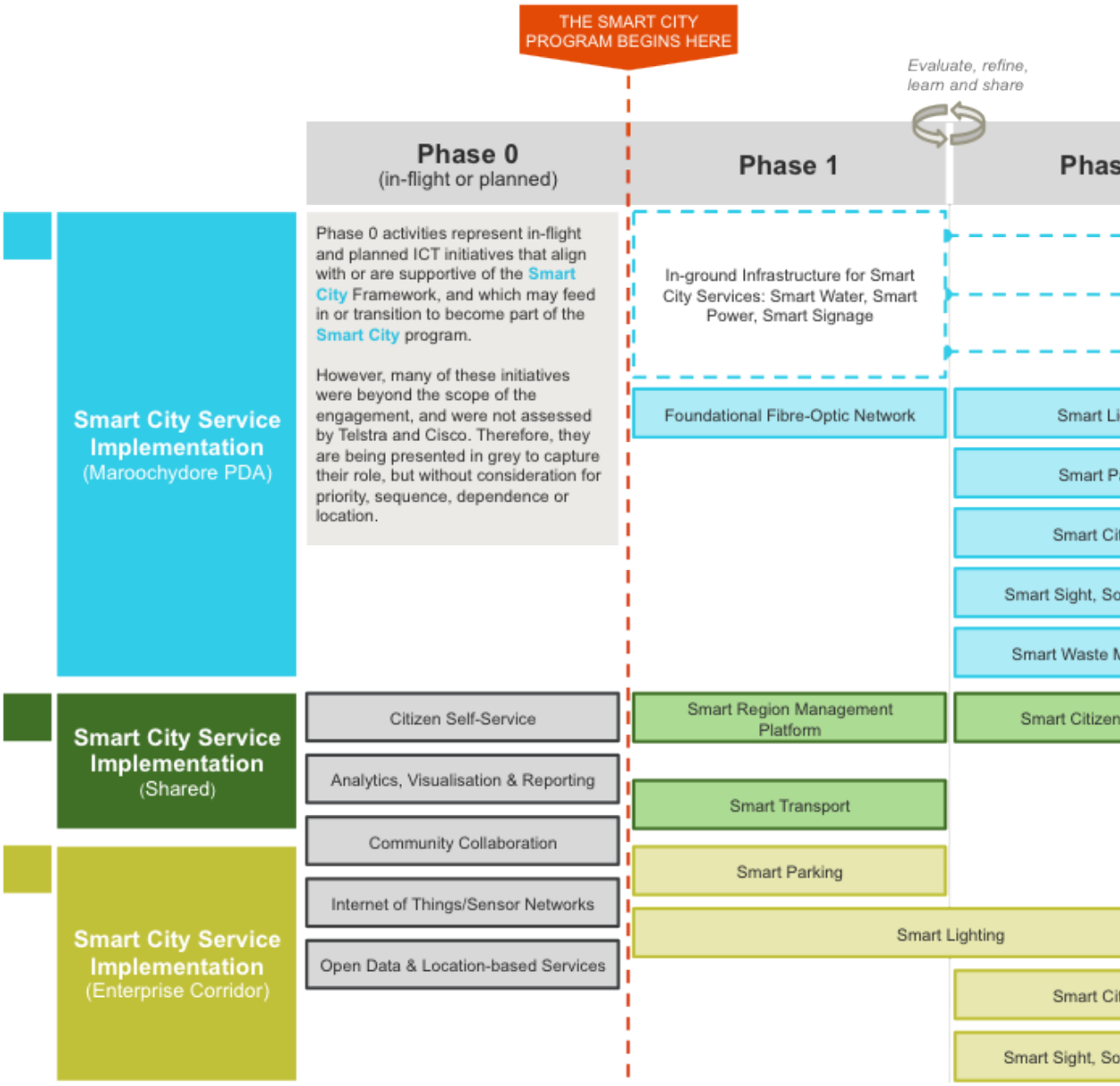
The Smart City Framework

KEY BENEFITS OF SMART CITY SERVICE	10-YEAR MACRO-ECONOMIC BENEFIT
Smart Sight, Sound and Sense (audio-equipped IP cameras, and sensors) • Improves public safety, and allows monitoring in conditions where it may not be practical/safe for people, and longitudinal study of environmental conditions, which supports future prediction and response • Can reduce municipal maintenance costs by allowing remote diagnosis before a truck roll, and lower environmental impact by tailoring resource consumption (e.g., water) based on needs rather than a fixed schedule	**$35M-$55M** Due to at least a 2% reduction in crime, improvements to resource use (e.g., park consumables, water), productivity improvements to the police force, Council staff, and other maintenance staff, and a reduction in the vehicle fleet
Smart Waste Management • Lowers cost of waste management through collection-point consolidation and reduced fleet size • Provides a convenient amenity to visitors and tenants • Contributes to greater urban cleanliness and creates a point of distinction by mirroring solutions embraced by sustainability leaders	**$2M-$3M** Based on adoption only in the Maroochydore PDA, with contributions due to productivity improvements, reduction in maintenance fleet size, and optimised routing/collection
Smart Water • Can accelerate identification and repair of leaks, lowering water loss (which can reach 30% in some regions) • Reduces treatment costs leading to better water being delivered to residents and fewer chemicals entering the environment • Helps people and businesses make informed choices about how they consume water (often reducing consumption by up to 10%) • Reduces manual meter reading improving workforce efficiency and reducing carbon emissions from vehicles	**$1.5M-$80M** Lower range is related to rollout of Smart Water meters to the Maroochydore PDA and sensors to the Sunshine Coast, a 10% reduction in water use by residents, and fewer maintenance employees and vehicles to read meters. Higher figure depends on rollout of Smart Water meters to the whole Sunshine Coast Region
Smart Power • Helps people and businesses make informed choices about how they consume electricity (often reducing consumption by up to 10%) • Supports tracking and visualising consumption patterns to help identify anomalies • Reduces manual meter reading improving workforce efficiency and reducing carbon emissions from vehicles	**$2.2M-$150M** Lower range is related to rollout of Smart Power meters to the Maroochydore, a 10% reduction in power use by residents, and fewer maintenance employees and vehicles to read meters. Higher figure depends on rollout of Smart Power meters to the whole Sunshine Coast Region
Smart Parking • Reduces time spent searching for a spot, thereby lowering carbon emissions and reducing congestion • Improves municipal finances by simplifying payment and maintenance, and improving enforcement	**$36M-$40M** Due to optimised parking infrastructure, improved revenue from collections, higher enforcement, and less time by drivers spent looking for parking spots

KEY BENEFITS OF SMART CITY SERVICE	10-YEAR MACRO-ECONOMIC BENEFIT
Smart Transport • Real-time tracking and in-bus services improve travel experience, which can help increase ridership • Route optimisation can lower operating costs	**$8M-$10M** Due to improved infrastructure investments given traffic analytics, higher bus ridership (higher revenues), lower wait times for riders and the emergence of supplemental private-public transportation services (e.g. Bridj.com)
Smart Citizen Services • Provides convenient access through smartphones and the web to Council information and services • Reduces cost to serve, improves citizen engagement, simplifies interaction with government • Produces (and supplies) data that supports information-driven decisions	**$30M-$40M** Based on employee productivity improvements, time saved by residents in dealing with government, and reduction in administrative costs associated with managing simple in-person requests
Smart Signage • Artistic campaigns can create a 'Wow!" factor • Digital canvas provides a platform to sell advertising space that can be centrally controlled and personalised based on location, and (potentially) triggered by individual behaviour	**$5M-$7M** Due to revenue from advertising, improvements in way-finding for residents and visitors, and increased tourist spending as a result of more efficient navigation
Smart Health • Collaboration between the health and education sectors can help create a 'Competency Cluster' in the region focused on high-value industries of education and healthcare • Can provides citizens a higher-quality, independent life by facilitating a focus on predictive medicine, significantly lowering costs of health care, and improving treatment outcomes	**$8M-$12M** Due to improved health outcomes, better management of chronic conditions, and reduced travel time for patients and physicians
Smart Education • Capitalises on Deloitte's prediction that International Education is one of the new growth sectors for Australia by combining multiple strengths and recognising regional advantages • Supports development of an Education+Health competency cluster focused on bio-informatics, wearables and aged care	**$13M-$18M** Due to improved educational experiences, greater attraction of foreign students, and ability to retain students in the area after graduation
Smart Lab & Hub • Allows Council to showcase some of the hidden and visible elements of the Smart City to foster support for the vision • Provides a space to evaluate new ideas, enable attraction of high-value talent through the concept of a Digital Work Hub, and double as a site for emergency / disaster response	**$5M-$8M** Based on reduction in travel due to Digital Work hub, improved investment attraction in employees and reduced maintenance fleet size, and optimised routing for remaining fleet

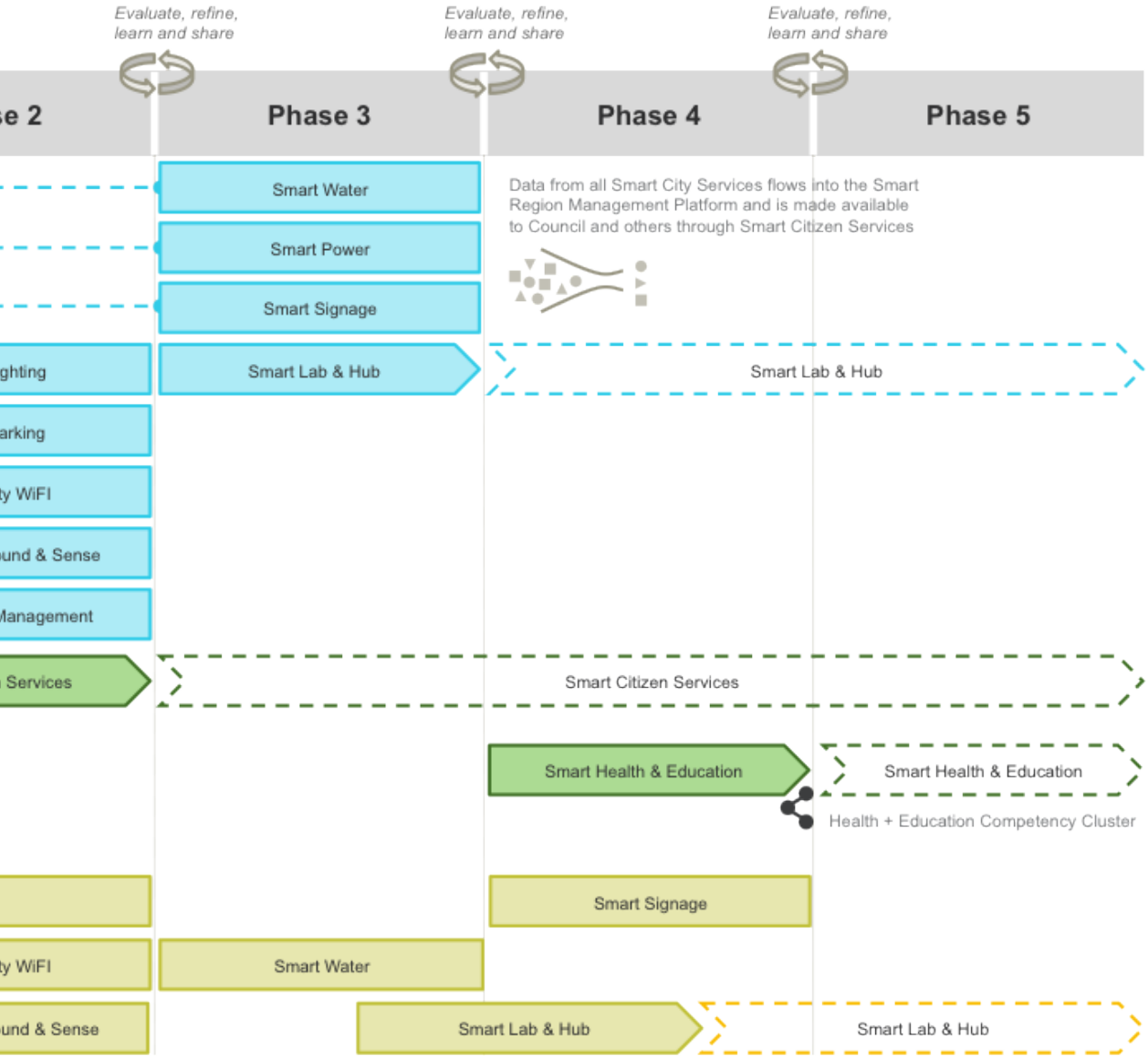
The Smart City Framework

There is often a temptation to do everything quickly, but doing so foregoes the opportunity to take advantage of both falling costs, and regular technological advances (e.g. during the previous 24 months, LED prices have fallen by approximately 50%, and the lights have gotten much brighter).



Moreover, rapid deployment of Smart City solutions can eclipse the capacity of councils to effectively support them, and of residents to embrace them.

Accordingly, the implementation roadmap is based on delivering a set of capabilities over time expanding from early-stage cost savings and revenue-generating services to those that enrich the lives of citizens, attract and enable businesses and provide a platform for ongoing evolution of the Smart City.



The Smart City Framework

As noted earlier, not all services should be introduced to all areas, so the framework-development team weighed the benefits and costs of deploying each solution in various precincts.

The recommended deployment sequence is illustrated by the Smart City services roadmap above, and summarised in the table below. Although not included in the scope of this project, we have also included a deployment summary for the broader Sunshine Coast region to demonstrate where Smart City service can be extended beyond the initial zones to deliver greater value.

Smart City Solution	Maroochydore PDA	Enterprise Corridor	Broader Region
Foundational Fibre-optic Network	●	◌	◌
Smart Region Management Platform	One Platform		
Smart Lighting	●	●	●
Smart City WiFi	●	◒	◒
Smart Sight, Sound and Sense	●	◒	◒
Smart Waste Management	●	◌	◌
Smart Water	●	◒	◒
Smart Power	●	◌	◌
Smart Parking	●	◒	◒
Smart Transport	Smart Buses & Data		
Smart Citizen Services	Mobile Apps & Open Data		
Smart Signage	●	◒	◒
Smart Health	Sensor-Driven & Remote Health		
Smart Education	Connected & Flexible Education		
Smart Lab & Hut	●	◒	◒

Legend	Deploy in Area	In Area	Consider for Future Employment	Areas	Across Areas

RECOMMENDATIONS

Recommendations

The economic, environmental, demographic and contextual challenges faced by cities in the 21st century are significant.

For city leaders, building their economies and communities, delivering services aligned with the new patterns of behaviour, and being good custodians of the environment can seem overwhelming especially when competition for many high-value, information-centric jobs is not limited to neighbouring communities. While there are various paths to success, governments focused on traditional approaches will not be able to meet their responsibilities to the people they serve.

Innovation-driven approaches to problem solving have helped companies such as Amazon change retailing, Square change mobile payments, Zipcar change automotive, and AirBnB change accommodation. Organisations that employ more types of innovation are consistently able to outperform their peers. At the heart of many types of innovation especially those exploited by firms mentioned earlier is information and communications technology.

Cloud, social and mobile technologies can help cities transform urban centres into sustainable Smart Cities. However, **Smart City** transformation is not about implementing the latest smart grid, or building an operations centre to rival Rio de Janeiro's. It is focused on responding to a changing context, and using technology to evolve the way services are delivered to improve the liveability, workability, and sustainability of cities.

Developing the Sunshine Coast **Smart City** Framework meant listening to and incorporating feedback from a diverse team representing different areas of Council responsibility. From a catalogue of options, the team then identified **Smart City** services that make sense for the Sunshine Coast. The prioritisation and sequencing of these solutions builds progressive capability maturity as part of the **Smart City** journey, and does so in a way that is financially sustainable, and paced to allow Council and residents to learn how to fully benefit from these innovations.

As cities around the world—and those just down the road—move to deliver their **Smart City** visions, a desire to lead should encourage Sunshine Coast Council to take six pragmatic steps to capture the value of Smart Cities, and realise its vision of being Australia's most sustainable region.

After socialising the **Smart City** Framework with Council and obtaining their crucial support, you should:

1	Establish an internal governance and operating model
2	Conduct detailed portfolio analysis to refine the services and better develop benefits and costs
3	Define an external governance and operating model
4	Define and build the Smart Region Management Platform to support aggregation and analysis of data
5	Engage the broader stakeholder community to build support for the program, and interest from partners
6	Start the first Smart City projects

The Smart City is more a journey than a destination, and embarking requires conviction to develop the necessary foundations that demonstrate benefits, and to build support for the next step. Nonetheless, for those who chose to lead, Smart Cities provide real opportunities to build a new economy, develop a stronger community, improve services to residents, businesses and visitors, and credibly claim leadership in the areas of sustainability, and public-sector policy and execution.

Next steps

Council will progress the **Smart City** Framework through the formation of a small Implementation Team as well as a Project Control Group. In the short term, Council will undertake the following key activities:

- Implement a living lab/pilot test area at Caloundra to practically and realistically evaluate the technologies being considered for broader adoption
- Select the priority technologies to be deployed in the Maroochydore City Centre, enterprise corridor and the wider region
- Ensure that the SunCentral management team are appraised of Council's **Smart City** infrastructure requirements so that the engineering designs for the initial stages of the Maroochydore City Centre facilitate the easy connectivity of smart city technology solutions at the time of installation
- In partnership with the SunCentral management team select the priority technologies to be deployed in the Maroochydore City Centre, enterprise corridor and the wider region
- Fold-in the existing standalone projects to ensure the holistic and integrated use of council resources. Examples of existing standalone projects include:
  - Two Smart Parking projects - Birtinya and Nambour
  - Testing of WiFi and Analytics - as part of the Living Lab at Caloundra
- Engage the community through consultation around the benefits of the **Smart City** for the region, Council and the community

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