Smart Cities

A snapshot of Australia in 2019

Stronger communities through
smarter cities

The maturity of Australia's Smart Cities landscape continued to develop in 2019, with public sector leaders of our cities and regions continuing to turn talk into action—experimenting with new technologies and collaborating with diverse stakeholders to improve the quality of life for their communities.

Importantly, this year saw a sharpened focus on the human experience of Smart Cities. Governments sought to co-create solutions with communities to address local challenges, celebrate places and empower communities with the skills and tools they need to thrive in an uncertain future.

In this report we present the key trends, insights and case studies captured during the 2019 Smart Cities Series by KPMG and the Public Sector Network.

Foreword

Katherine Tobias
Smart Cities Lead, KPMG Australia

It was my pleasure to chair the Smart Cities Series in September 2019, which travelled across five cities in Australia.

With participants including representatives from all three levels of government, and leaders across industry, academia and community groups, the *Smart Cities Series* held in conjunction with KPMG Australia and the Public Sector Network, once again set the stage for a valuable forum of learning, sharing insights and building new connections.

The macro challenges and opportunities

The 2019 Australian Infrastructure Audit, which was released by Infrastructure Australia a few weeks prior to our events, set the scene for the key challenges cities and regions are facing, but also presented exciting opportunities new technologies and innovations could unlock. By 2047, Australia's population will grow by 11 million, with 80 percent of this growth to happen in our five largest cities. We are all familiar with the pressures accompanying such growth. As cost of road congestion in Australia is predicted to grow from $18.9 billion to $38.8 billion in 2031, Smart Mobility was top of mind during our Series. On the flipside, 90 percent of Australians own a smartphone, a powerful platform for improving service delivery, and there are approximately 20 billion connected devices globally producing 2.5 quintillion bytes of data per day.

Collaborating for communities

Our aim for the Smart Cities Series this year was to make these numbers meaningful. To unpack the true value of these statistics for cities and regions across the country as their governments seek to harness technology to address pressing challenges and deliver a better quality of life for their communities.

The Series is in its third year and it has been exciting to track the trajectory of Australia's Smart Cities movement. This year we saw a concerted shift away from talking about the potential of Smart Cities to getting on with implementation by starting small, experimenting, learning and scaling up.

We also saw government leaders increasingly looking beyond their own jurisdictional boundaries, collaborating with neighbours and a range of other partners to maximise impact for their communities and multiply return on investment. Alignment of priorities and policies with other local governments as well as with state and federal governments was also a key theme.

At each event, we posed three key questions:

1. How can we ensure that the technology we deploy in our cities is a force for good?

2. How do we create initiatives that are inclusive by design and support the most vulnerable?

3. How do we unlock the collective intelligence of our communities, who are the experts of their local contexts, and build an ecosystem based on trust?

These questions were the focus of an agenda of keynote speeches, workshops and panel discussions. Participants shared case studies and experiences of co-creating smart solutions with communities to address local challenges, to celebrate unique local places, environments, cultures and histories, and to empower communities with the skills and tools needed to take advantage of new opportunities and thrive in an unpredictable future.

As we have done for the past two years, we conducted a survey alongside the Series. This year, we had 187 respondents who answered questions regarding their Smart City plans, challenges and priorities. This report presents key results, insights and case studies, both from the Series and from the survey results.

We would like to thank all of the conference participants and survey respondents for sharing their Smart City experiences—both successes and failings—and for contributing to the dynamic, insightful and honest conversations across the country.

We look forward to continuing these conversations with you and to seeing how Australia's Smart Cities journey will further evolve in 2020.
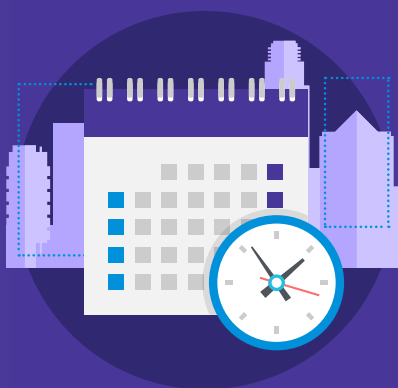
Key findings

Where are you on your Smart City journey?

From page to pilot

While the majority of councils are in the strategy development stage, the number of local governments **piloting projects is notably higher this year at 21 percent**—up from 11 percent in 2018.

What is the top Smart City project?

#1 Platforms

Data platforms are the top projects being planned—integrating and analysing the data starting to flow from the physical and digital environment.

What is your top Smart City challenge?

#1 Finding the funding

Financial constraints are now the leading challenge facing Smart City projects.

Top tips

1. Think big, start small

Align with broader strategic priorities across all levels of government and develop pilot projects to deliver quick wins and prove value.


2. Design for the human experience

Start with the human experience and build solutions that solve real problems.

3. Collaborate with a diverse ecosystem

Whether it's across the council, with other councils, state or federal government, academia or private sector— build a diverse team and cohort of champions to help develop sustainable and scalable solutions.
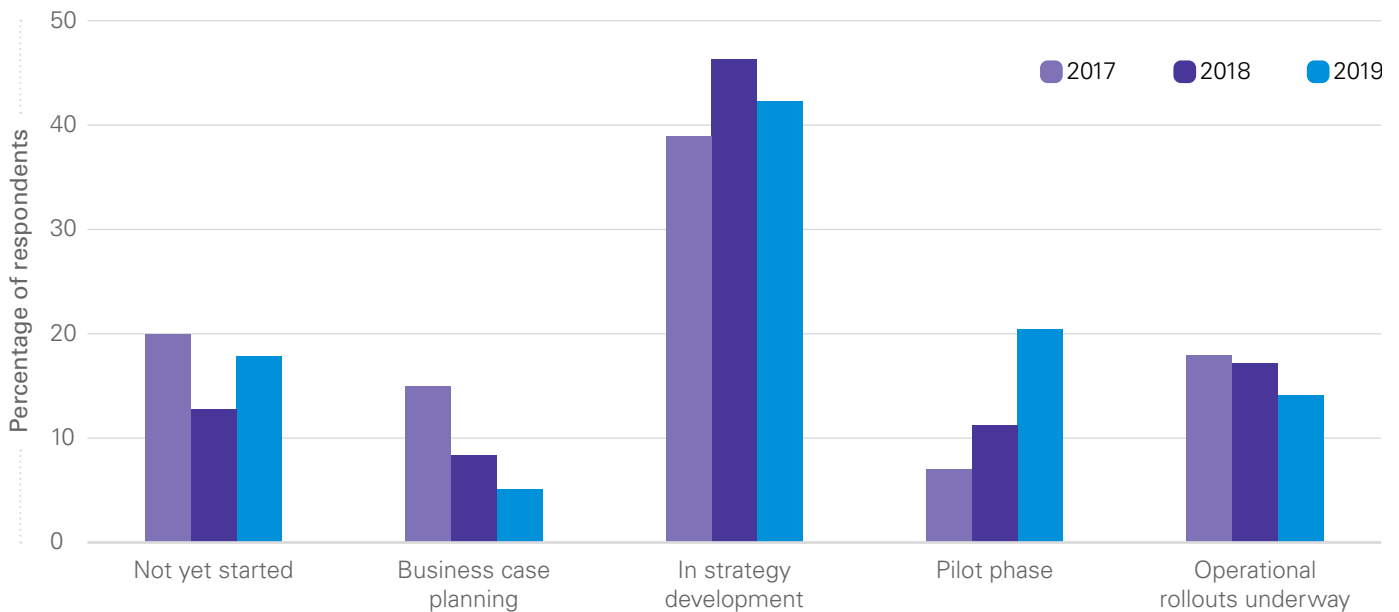
Where are we on the Smart City journey?
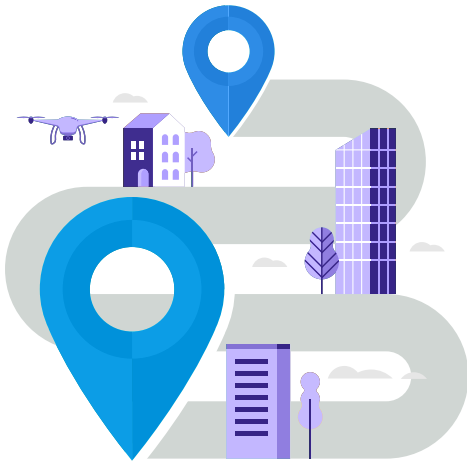
While the majority of councils are in the strategy development stage, the number of local governments **piloting projects is notably higher this year at 21 percent**—up from 11 percent in 2018.
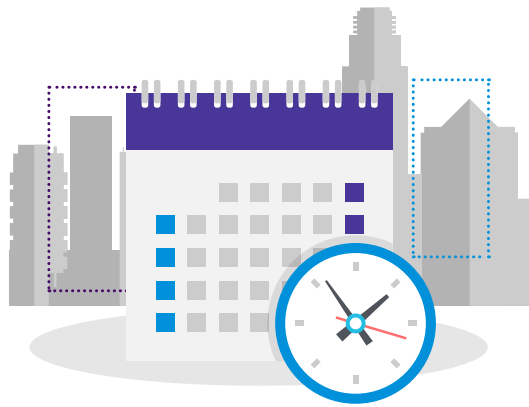
This increase helped to lift the number of local governments implementing projects, either in the form of pilots or in the form of operational roll outs, to over a third.

The growing share of local governments in the implementation phase reflects the increasing maturity of the Smart Cities movement in Australia. In essence, it reflects the shift from talking about Smart Cities to making Smart Cities a reality.

Where are you up to on your Smart City journey?

Percentage of respondents

| | 2017 | 2018 | 2019 |

(Bar chart categories: Not yet started, Business case planning, In strategy development, Pilot phase, Operational rollouts underway)

What are the priorities?

Platform projects claimed top spot this year at 19 percent, followed by smart infrastructure in second place and a tie for third between mobility and communications networks.

This is a positive development, reflecting that the roll out of smart communications networks, such as the Internet of Things, is no longer a novelty. Rather, the focus now is on how to extract maximum value from the data collected across the networks. That's where platforms play a critical role.

If communications networks are the nervous system of cities, platforms are the brain—collecting, integrating, analysing and transforming data into actionable insights.
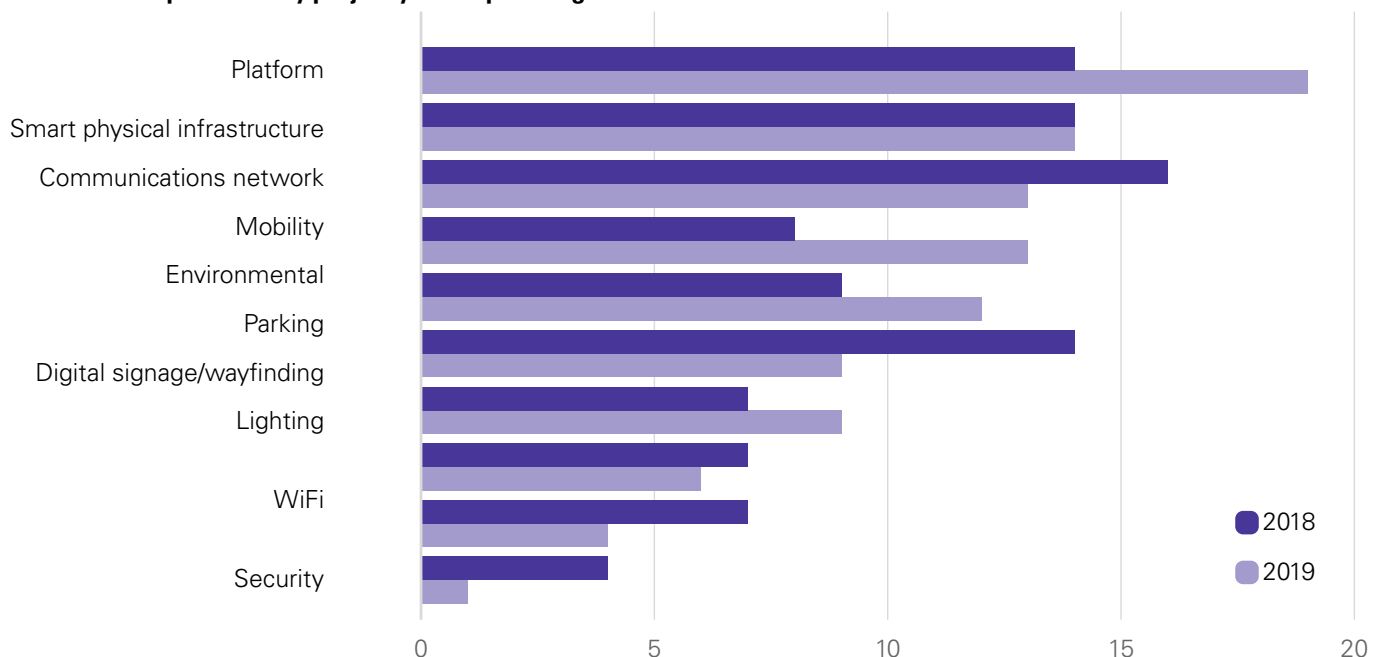
The sharper focus on platforms, up from 14 percent in 2018, is enabling governments to gain a single view of their customers and deliver more efficient, responsive and personalised services. Data platforms also play a significant enabling role for the increasing collaboration we are seeing across regions, sectors and levels of government.

Transport for New South Wales (TfNSW) has been a leader in this respect. Not only has the department recognised the impact of integrating diverse datasets to inform decision-making, but also the value that can be generated by opening up data to third parties.

In 2016, TfNSW launched the Transport Open Data Hub and Developer Portal, enabling developers and start-ups to access transport data through static datasets and real-time APIs. Since then, over 2.2 billion API hits have been tallied and apps using the portal have been downloaded over seven million times. Today, 2,500 developers form an active collaborative community, transforming the Open Transport Data to create solutions that improve the customer experience of NSW's mobility landscape.

What is the top Smart City project you are planning over the next 12–18 months?

Category	2018	2019
Platform	14	19
Smart physical infrastructure	14	14
Communications network	16	13
Mobility	8	13
Environmental	9	12
Parking	14	9
Digital signage/wayfinding	7	9
Lighting	7	6
WiFi	7	4
Security	4	1

Spotlight: Smart Mobility

Mobility related projects jumped from 6th on the priority list in 2018 to 3rd this year, reflecting the surge in interest from all levels of government as leaders seek to manage the growth in demand for easier ways to navigate the urban landscape and get from A to B.

In conjunction with the Smart Cities Series 2019, KPMG and Public Sector Network ran a series of events focused on Smart Mobility. This highlighted that many state and local governments are currently concentrating attention and resources on developing Mobility as a Service strategies and initiatives.

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State and local governments are developing responses to Mobility as a Service. Getting the right data and modelling, and collaborating with communities and the private sector is key to enabling a safe transition."
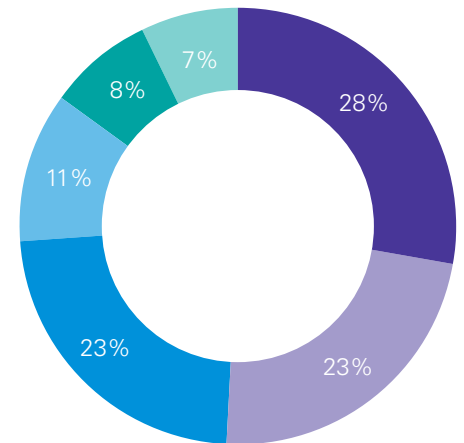
Praveen Thakur, Future Mobility Lead Partner, KPMG Australia

Where are you on your Smart Mobility strategy?

- 1% — Delivered and monitoring
- 22% — Not started
- 52% — In planning
- 23% — Executing
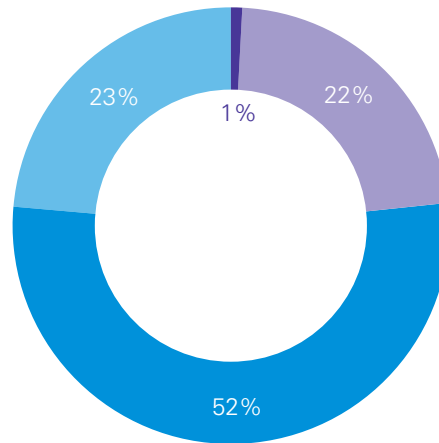
Legend:
- Delivered and monitoring
- Not started
- In planning
- Executing

Top project priority

- 28% — Mobility as a Service Strategy
- 23% — Congestion management
- 23% — Other
- 11% — Electric vehicle infrastructure
- 8% — New payments systems/platforms
- 7%

Legend:
- Mobility as a Service Strategy
- Congestion management
- Other
- Electric vehicle infrastructure
- New payments systems/platforms

What are the key challenges?

'Finding the funding' topped the chart this year of challenges facing governments around Smart City initiatives, closely followed by a 'lack of clear leadership' and 'availability of resources'. These were the same top three challenges in 2018.

As technology rapidly evolves, the availability of people with the required skills to execute Smart City transformations is becoming a critical obstacle for local governments. According to the *Local Government Workforce and Future Skills Report* published in 2018 by LGNSW, '86 percent of councils in NSW were experiencing a skill shortage and 69 percent were experiencing skills gaps'[1]. Many conference participants spoke of the need for greater investment in upskilling programs to enable staff to leverage new technologies and deliver better outcomes.

This need for more mature digital skills was also reflected in the Public Sector Network and *KPMG Australia's Future of Work Series 2019*, from being able to pilot a drone to creating virtual reality tools. These are no longer fanciful skills of a far off future but rather examples of baseline skills and knowledge that many public servants will need over the coming years.

Table 1. Top challenges to Smart City initiatives

Top challenge to Smart City initiatives	2018 Rank
Lack of clear leadership	1
Financial	2
Availability of resources	3
Procurement	4
Collaboration	5
Adequately skilled resourced	6
Unclear where to start	7
Other policy challenges (e.g. privacy)	8
Cyber Security	9

Top challenge to Smart City initiatives		2019 Rank
Financial	↑	1
Lack of clear leadership	↓	2
Availability of resources	↔	3
Unclear where to start	↑	4
Collaboration	↔	5
Adequately skilled resourced	↔	6
Procurement	↓	7
Other policy challenges (e.g. privacy)	↔	8
Cyber Security	↔	9

Case studies
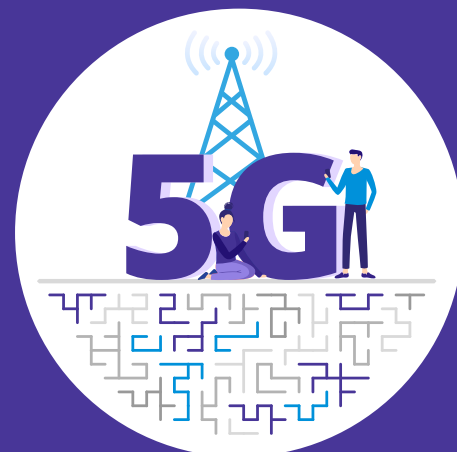
Planning for disruption—the 5G opportunity and challenge

Australians expect to interact with government in the same way as they do in every part of their life. Digital—anytime, anywhere. But technology is changing rapidly and while no one can predict which technologies will emerge next, local governments are preparing for disruption by strengthening their ability to respond and adapt to new technologies in order to deliver impactful outcomes for citizens.

We will certainly see this in the case of 5G. Faster download speeds, larger data transfers, virtual and augmented reality— these are just some of the promises of 5G which goes live in Australia from March 2020 onwards.

However, it's not merely a matter of flicking the switch on a shiny new network. Deploying a 5G network comes with new challenges. For example, the physical infrastructure requirements of 5G in the urban realm—think small cells on top of light poles and buildings—are estimated to be much greater than 4G.

"

5G will create great opportunities for our local businesses and citizens to connect with faster and more innovative services. City of Melbourne's 5G and IOT Testbed allows us to work with local businesses and residents to ensure that these benefits are delivered in a way that is inclusive and respects city amenity".

Michelle Fitzgerald, Chief Digital Officer, City of Melbourne

The City of Melbourne established Australia's first local government led 5G and IoT Test-bed in March 2019 to trial emerging technologies and how they can benefit Melbourne and its local businesses and residents. 26 partners have joined the Testbed, which will examine three challenges:

1. **Infrastructure placement and design:** Designing 5G and IoT infrastructure that develops connectivity without the clutter, minimising the impact on the public realm.

2. **Data collection, sharing and storage:** Establishing protocols that enable data sharing between private and public stakeholders.

3. **Governance:** Defining the framework of rules, relationships and systems for the test-bed, with the intention to inform future test-beds as well as longer term municipality planning. This is critical to effectively balance industry, city and community needs in the rollout of future technologies.

Case study: City of Joondalup—Service Efficiency and Effectiveness Review Program

The City of Joondalup has seen the return on investment that can be reaped by adopting a connected approach to transformation. The City's Service Efficiency and Effectiveness Review Program has resulted in benefits and cost savings exceeding $4 million since implementation in 2013. A key component of the Program has been the Joondalup

Enterprise Management (JEM) which has served to increase the accuracy of tracking works and expenditures against all infrastructure assets to drive decision making and identify efficiency gains. The system has subsequently been integrated into existing processes across the organisation, including timesheets, purchasing and financial reporting.

In addition, the City has rolled out mobile devices for field staff, which are connected to the JEM platform, in order to reduce reliance on paper-based processes and leverage the data captured. In the first year of roll-out, this initiative realised savings of $126,000.

Think big, start small

In the early days of Smart Cities, vendors tended to sell 'smart city in a box' solutions which were typically marketed as having large-scale, municipality-wide applicability as soon as they were switched on. However, as the Smart Cities landscape has matured, local governments are recognising the value of setting out a clear vision, aligning with overarching Council strategy, starting small with pilot solutions, iterating, learning and scaling up.

"

Starting small, starting simple and just getting on with it."

Jennifer Bednar, Director Customer and Business Transformation, City of Casey

Aligning with the broader strategic context

Local government participants at this year's Smart Cities Series spoke of the risk of pilot projects being seen as a 'nice to have', rather than as a key part of a council's broader strategic plan for the city or region.
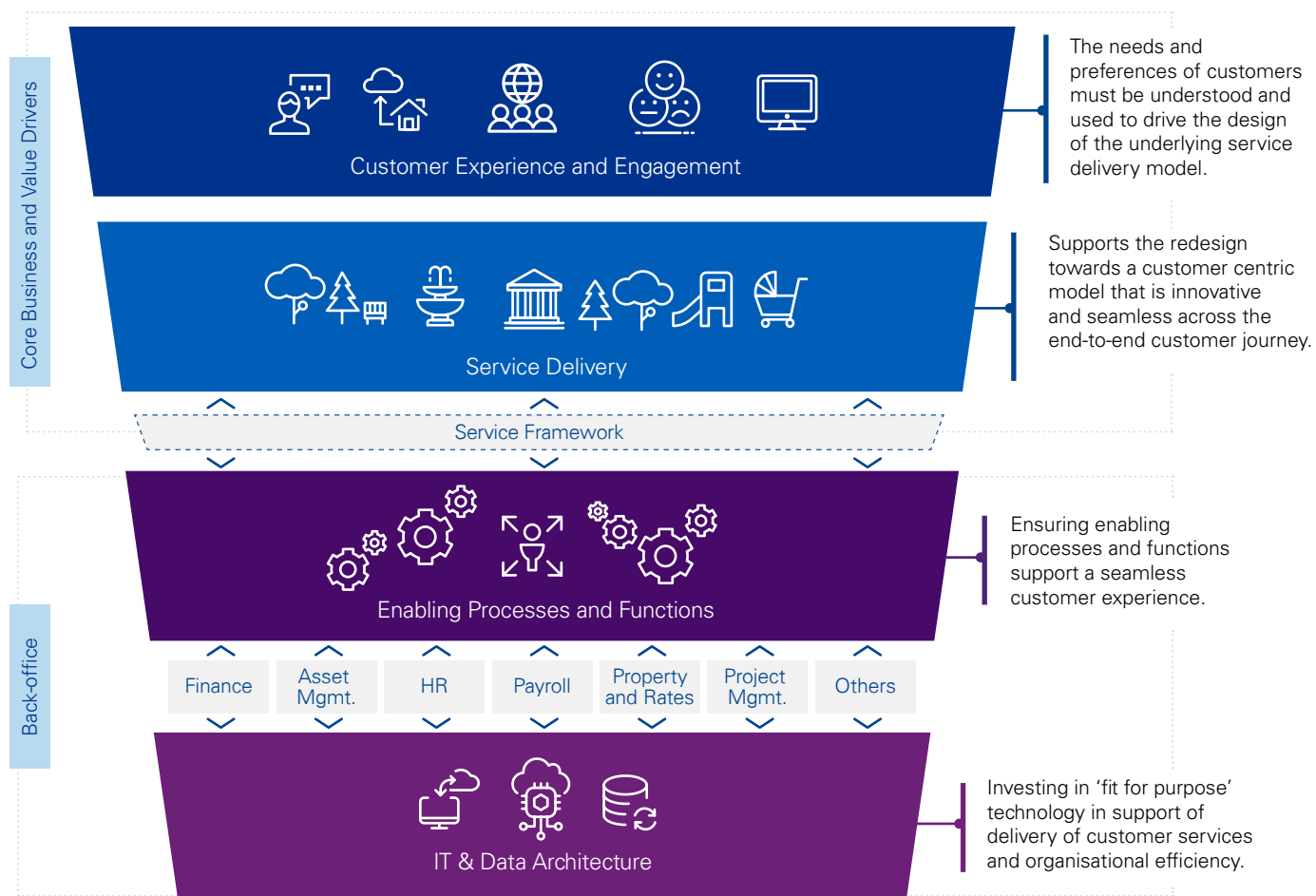
Aligning projects with the broader strategic plan will help gain support for projects, and help leaders maximise limited resources to deliver on strategic priorities.

"

We need to embed Smart City thinking into everything we do, so it's not seen as an add-on."

Rebecca McKenzie, CEO, City of Glen Eira

Smart City projects can play a key part in building a 'Connected Council'—helping to pool data, meet citizen needs and improve efficiencies the council. A 'Connected Council' from front to back that places focus on community outcomes, better customer engagement and improved experience.

Core Business and Value Drivers

Customer Experience and Engagement

The needs and preferences of customers must be understood and used to drive the design of the underlying service delivery model.

Service Delivery

Supports the redesign towards a customer centric model that is innovative and seamless across the end-to-end customer journey.

Service Framework

Enabling Processes and Functions

Ensuring enabling processes and functions support a seamless customer experience.

Back-office

| Finance | Asset Mgmt. | HR | Payroll | Property and Rates | Project Mgmt. | Others |

IT & Data Architecture

Investing in 'fit for purpose' technology in support of delivery of customer services and organisational efficiency.

CASE STUDY: City of Casey

In 2017 the City of Casey in Victoria started with a one-page Smart City strategy with three main goals—to improve quality of life, increase the competitiveness of local business and set the city on a sustainable path.

Since then, the city has focused on deploying a number of demonstration projects to test the impact and scalability of Smart City ideas and solutions. These include a Low-power wide-area network (LoRaWAN) and a virtual cognitive assistant called Amelia providing 24/7 customer assistance. In addition, the City formed a Smart Cities Advisory

Committee, comprising community members, councillors and staff, in order to ensure demonstration projects are grounded in evidence and geared to the opportunities and challenges unique to the City of Casey.

❝

Through this approach we hoped to cultivate a mindset for innovation and an appetite for change, so we could get past the perception that this is just a cost."

Jennifer Bednar, Director Customer and Business Transformation, City of Casey

The approach proved effective for the municipality, with pilots aligned to three distinct propositions:

1 Reducing operational costs

2 Investing in local expertise and business

3 Redressing the digital divide

Importantly, these laid the groundwork for a new, long-term strategy and have demonstrated the value of Smart City transformation for Casey.

Design for the human experience

The days of operating under the assumption of 'build it and they will come' are gone. Instead, government leaders are adopting a people-first approach to Smart City transformation. They are increasingly consulting with their communities, to understand the human experience of their cities from diverse perspectives of the people who live, work, learn and play there each day.

Employing this human-centred design approach enables cities to define problems and gather evidence in order to inform choices of technology solutions, rather than starting with a technology product and searching for a problem to solve.

"

An outcomes-focused approach is essential in the Smart Cities space. If we want people to embrace, own and implement smart solutions it is essential to make sure what we are delivering is relevant to their identified needs."

Ally Dench, Executive Director Community and Corporate, Wollondilly Shire Council

This approach shifts the focus from 'being an expert' to one of facilitating a shared understanding of people's needs and preferences. Humanising the experience of Smart Cities is also critical to redress the growing digital divide and ensure we create inclusive, equitable cities.

Celebrate People and Place

Boyd Cohen is famous for identifying three distinct phases to track the evolution of Smart Cities globally[2]:

Smart Cities 1.0:
Technology driven

This phase is characterised by technology providers encouraging the adoption of solutions for cities who are not equipped to understand the implications of the technology or its impact on quality of life.

Smart Cities 2.0:
Technology enabled, city-led

In this phase, cities drive the Smart City agenda and technology solutions are seen as enablers to improve quality of life.

Smart Cities 3.0:
Citizen co-creation

This most recent phase of the Smart City evolution is grounded in citizen co-creation models which focus on addressing local issues and unlocking local opportunities.

While it would be unrealistic to claim that Australia's cities and regions are all adopting the third generation approach to Smart City creation, it is encouraging to see a growing focus on adapting the Smart City paradigm to meet the unique challenges in a local context. This approach is being pursued by co-creating solutions with local communities, who are the experts of their contexts, rather than seeing the Smart City paradigm as a one-size-fits-all solution.

As part of this approach, many cities are looking at how they can embed smart thinking into what they already have, instead of looking to undertake major overhauls.

"

Being smart means doing things differently with existing infrastructure and assets."

Marion Fulker, CEO, Committee for Perth

The Smart City agenda has also become a mechanism for renewed celebration of local places, environments, cultures and people. During the Melbourne leg of our conference, Matthew Swards, Manager Business Improvement at Ballarat City Council, laid out the City of Ballarat's Smart City journey which focused on deploying technology to celebrate the region's indigenous heritage, culture, nature and identity.

The City has deployed a number of smart pilots. For example, Visualising Ballarat is an interactive mapping platform that enables anyone to virtually explore the 'DNA' of the region, including its topography, historic and contemporary built environment, open spaces and gardens as well as intangible dimensions such as social and cultural practices and historic sites[3].

We're excited to see this trend continue as new technologies are applied to enable cities and regions to celebrate their unique identities, address local challenges and empower their communities to thrive.

Sustain community trust
A cybersecurity blind spot?

As we connect a greater number of elements of the physical environment to data platforms, the value of the data will increase as will the need for more robust cybersecurity protocols and safeguards.

Despite the serious risks posed by expanding the surface area for a cyber-breach, cybersecurity considerations have largely remained an afterthought. This is reflected by the fact that cybersecurity was ranked as the lowest challenge facing government leaders this year, as was the case last year—see Table 1—with only 1 percent of the respondents citing cyber as a challenge.

The increasing complexity and sophistication of cyber-attacks call for far greater attention and resources to be invested in building cyber-resilient environments that support the secure, trusted delivery of Smart City outcomes.

> "To truly understand the potential attack vectors, you first need to have total visibility of all the assets on your network and their current status. The disturbing fact is that very few organisations have such a detailed understanding of their networks. In planning a cyber defence, assume the castle walls will be breached and plan for it."

Mike Stone, Global Chair of Defence and National Security & Global Head of Technology Transformation, KPMG

Keep an eye on AI and ethics

Cities around the world are also grappling with the ethics of using data to drive Artificial Intelligence (AI) in ways that do not invade privacy nor create unfair bias. **Nesta**, an innovation foundation based in the UK, developed a set of questions to guide responsible AI in the public sector.

In Australia the Commonwealth Government has published the AI Ethics Framework to guide businesses and governments looking to design, develop and implement AI.

At the State level, the NSW Government is currently developing an AI Ethics Framework to govern the use of AI in order to improve customer service and public trust.

Find out more

KPMG.com/au/AIEthics

Collaborate with a diverse ecosystem

The value of adopting an integrated, collaborative approach to Smart City transformation was a key theme which wove through the entire Smart Cities Series, again reflecting the growing maturity of the landscape in Australia.

Overcoming silos within an organisation by adopting a systems approach is fundamental to realising the outcomes promised by Smart Cities.

"

Smart City thinking needs a whole-of-organisation mindset. We need to pivot our thinking and shift from operating in silos to 'infuse' innovation horizontally across an organisation."

Andrew Chesterman, CEO, Redland City Council

The complexity involved in developing a Smart City can only be effectively tackled when a diverse range of stakeholders collaborate and share their expertise, experience and resources. Standards play a critical role in enabling the interoperability required for co-creation and exchange of data between these diverse stakeholders and their systems. While we still lack consensus regarding a single nationally or globally recognised Smart City standard, the standard 'ISO 37106: Sustainable cities and communities—Guidance on establishing smart city operating models for sustainable communities', created by the International Organisation for Standardisation provides a framework and is being increasingly adopted as a guide to Smart City strategic development.

Spotlight: Western Sydney City Deal

As the single largest planning, investment and delivery partnership in Australia's history, the Western Sydney City Deal presents a unique opportunity to showcase the significant impact, global competitiveness and return on investment that can be gained from successful collaboration. The City Deal brings together the eight local councils in the Western Parkland City, the New South Wales State Government and the Australian Federal Government under the common 20 year vision for 'A thriving future-focused city that is highly connected, innovative and liveable'.

A key component of the City Deal is the Smart Western City Program which aims to embed interoperable smart and secure technology into new infrastructure as it is rolled out, ensuring that digital smarts are built in by design.
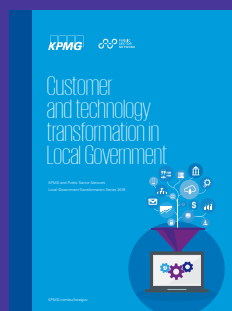
"

The City Deal is a vehicle that creates the opportunity for meaningful partnerships between all three tiers of government."

Simon Hunter, Executive Director Smart Places & Cluster Infrastructure Priorities, NSW Department of Planning, Industry and Environment
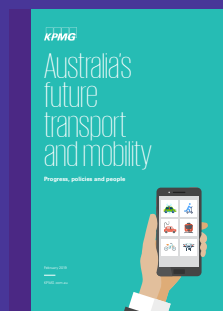
Find out more

KPMG Digital Delta

KPMG.com/au/DigitalDelta

Customer and technology transformation in Local Government

Australia's future transport and mobility

KPMG Smart City Framework

Public Sector Network

www.publicsectornetwork.co

Public Sector Network's mission is to better connect government, helping executives to network, benchmark and establish global best practice (Join for free today!)

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