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Smart Cities

All-Party Parliamentary Group



Top Tips for City Mayors

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Foreword

How can the new Metro Mayors enable their city regions to work better, with limited resources? How can they bind together the many agencies and authorities to provide citizens with the services they want, in a modern form that works for them?

Emerging smart city technologies are part of the answer to these questions. This booklet provides practical tips from some of our members to the Mayors and their officers, as they grapple with their local problems and challenges.

What does a smart city really mean? There are many definitions. However, as an elected representative I believe that a smarter city must first and foremost be one which works best for its citizens.

That could mean, for example, accessing all the information we need to **plan our journeys**, or control the energy we use. It could mean selecting whatever mode of transport that best suits us, by convenience or price, in real time. It could also mean using **public services in a form and at a time** which suits our busy lives.

More fundamentally, the sharing of data and the opening up of networks could also mean making it easier for citizens to actively participate in decisions which affect their neighbourhoods, both in defining the priorities and devising their solution. Put simply **smarter cities empower their citizens**.

For Mayors in our city-regions, smart technologies could help bind the many different agencies and authorities together, not least through the **sharing of data**. It should help **break down the silos** that large administrations often create. It offers the chance to **use resources more efficiently**, so reduce waste and **save money**.

This booklet was prepared just before the June 2017 election was announced and is designed to stimulate ideas and discussions. It includes contributions from the public and private sector, from city councils and academia. Over the coming year the APPG will be planning a series of further briefings on all aspects of making our cities smarter.

Mark Prisk FRICS MP
Chairman, All Party Parliamentary Group for Smart Cities

ARUP

Arup has developed a methodology using a series of enablers that are key to driving digital transformation in cities. These enablers are all interlinked, emphasising the need for any digital strategy and associated work programme to cut across multiple themes. Arup would encourage cities to seek to adopt and deploy these enablers to help deliver improved outcomes, for example:

1. Create a dedicated department, such as a Digital Office, that would embed digital technology in the operations of departments to deliver better public services, support the development of the city's digital economy, and address the social and ethical issues brought about by digital technology
2. Develop a more intelligent way of procuring services by co-creating smart solutions with citizens, local and global industries, municipal utilities and local public agencies
3. Share knowledge and information across organisations and between departments to help develop a culture of self-learning, enhanced by collaboration with other cities
4. Ensure that citizens and city officials have the right skills to use data effectively
5. Align approaches between city systems; standards can help support industrialisation of solutions and thus provide confidence in the market
6. New market-oriented and sustainable strategies of public-private cooperation must be developed and cities must seek greater levels of external investment

About Arup: Arup is an independent multidisciplinary practice with a global reach of 92 offices in 40 countries. Its proven track record of collaboration with cities around project development and implementation has resulted in Arup becoming one of the most respected global brands working in the urban environment. It has developed powerful collaborations with some of the leading thinkers, lobbyists and drivers of city transformation, including the World Economic Forum, the C40 Cities Climate Leadership Group and the Rockefeller Foundation.



Accenture encourages incoming City Mayors to understand what the key enablers are to deliver on their strategic objectives. This includes building capability in people, attracting investment and investing in new technologies to transform how services are delivered to citizens. All the initiatives proposed need to deliver benefit to the three key parties – City Hall, the employees, and their citizens.

1. **It is important to identify what the ‘no regrets’ actions are to make a substantial difference.** Take this saving/growth and reinvest in the region and the people who work for the city.
2. **It is important to harvest and embrace technology such as AI and Robotics,** which can an enhanced service to the region and work alongside existing services rather than instead of the current service. This will enable high value work and investment into new areas or pressured areas such as social care. Through harnessing Big Data and analytics, it’s possible to generate savings by developing processes and services that have the predictive power to respond to issues before they arise.
3. Finally, **it is important to make sure that the citizen feels part of the change** by finding new ways to engage with the wider population.

About Accenture: Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Accenture has a dedicated UK Local Government and Devolution Practice who work with local authorities and governments to help them to develop new capabilities, improve citizen services, save money and meet their strategic goals.



ACCA recommends a multi-dimensional approach that acknowledges the individual needs of each city, while placing the citizen at the centre of a process of continuous improvement.

1. **Multi-dimensional.** Smart cities are not just about using technology. This must be accompanied by robust financial management and budgeting, efficient delivery processes (e.g. for procurement and monitoring) and organisational structures (e.g. reducing silos) as well as on-going skills training.
2. **Individual needs of each city.** Cities differ in size, complexity, priorities, opportunities and constraints. Learning from best practice is good, but the temptation to 'copy' must be resisted. Solutions must be made fit-for-purpose to the particular needs of each city.
3. **Citizen at the centre.** Smart cities are not about governments or corporates. They're about the users of services – the people living in the city. A city is only smart if the people living in that city see clear outcomes that have improved their quality of life. A technology solution with hidden costs or erratic performance is counter-productive.
4. **Continuous improvement.** Achieving smartness is a journey, not a destination. It's a learning mind-set that involves constantly seeking ways to improve upon the status quo. It is important to avoid fixed notions of what is required, and to be open to change.

About ACCA: The Association of Chartered Certified Accountants (ACCA) is the global body for professional accountants. It aims to offer business-relevant, first-choice qualifications to students around the world who seek a rewarding career in accountancy, finance and management. ACCA has 188,000 members and 480,000 students in 181 countries and works to help them to develop successful careers in accounting and business, with the skills required by employers.



The combination of austerity and better citizen experience is a challenge for all, especially in place-based services. Given this scenario will persist, Amey recommends a spirit of innovation to create new ways to a better environment rather than a slow degradation of service quality as funds dry up.

'Urban labs' can be applied at a single service level but better applied to the entire innovation effort within a city/city region. An 'urban lab' is a term for a collaborative innovation programme involving all key partners in a service ecosystem; Councils, service providers, citizens, technologists, academics.

Whilst bespoke in nature, urban labs follow defined replicable methodologies so that a city can continue to improve and learn. It starts with a strategic challenge which partners or those attracted to the challenge can seek to address. Solutions challenge may be generated in competitions or in joint-working and should be tested, in the specific city environment. Measured improvements can be shared and, better, procured to give incentive to those participating.

Amey and the Ferrovial Services Centre of Excellence for Cities have participated in urban labs applied to environmental services, adult social care, city centre 'vibrancy' and also worked with multiple cities simultaneously for shared learning.

About Amey: Amey's team of 20,000 works across four continents – making us a leading supplier of consulting and infrastructure support services both in the UK and internationally. Amey creates safer, smarter, and sustainable places to live, work and travel. Amey is owned by Ferrovial; one of the world's leading infrastructure management and investment companies. Ferrovial employs 96,000 employees and operates in over 25 countries, and focuses on four business sectors construction, airports, toll roads and services. Amey is part of the Services division.



The sheer volume of data generated every day and the vast range of urban issues makes it hard to know where to begin when looking to adopt a smart approach.

1. **Working with citizens and other stakeholders at the outset**, is key to adopting a smart approach, helping to establish what the priority areas should be, the types of data needed and how and when it should be collected. This ensures that decision makers have the right data at the right time, to identify solutions. It also facilitates greater citizen buy in as it is easier for them to see the correlation between a smarter way of doing things and positive outcomes in the areas that matter the most to them.
2. **Taking a holistic view of the city**, by creating a masterplan design response and a 3D model of the city or neighbourhood, can further assist with data collection and usage, providing a vehicle to store data and a useful tool to help governments and citizens access and visualise real time information. The model can also be used to help stakeholders understand the impact of new developments and policies before they are implemented, so that any risks or concerns can be addressed.

About BAM: BAM began using building information modelling in the 1990s. It have continued to develop this expertise, working with stakeholders to make certain that they have the right data, at the right time throughout the lifecycle of their asset. BAM recently developed an approach to enable governments to adopt the principles of smart, and capture, store and disseminate data to make certain that decisions and solutions address specific issues.

As we enter a new era of urban governance, mayors will have to lead while balancing the blue sky of possibilities and the burden of expectations. The following research from the University of Bradford may help to balance these priorities:

- 1. Real smart cities are where people flourish.** As Aristotle noted a city is excellent by its people. As citizens flourish and lead a healthy and secure life, the city will flourish too.
- 2. Make the city truly inclusive.** Build bridges not walls. Diversity is good for the city's economy and makes the city resilient. Promoting equality and gender sensitive planning are starting steps. While digital technology has focused on 'sharing cities', top cities in well-being index are great because they are also 'caring cities'. They care for the children, the elderly, the minority groups and celebrate ethnic, cultural, linguistic, and sexual differences.
- 3. Innovation is not just for technology and geeks.** The potential for social innovation is truly limitless. However, civil society cannot replace the state overnight. Building medium term partnerships is important. This helps civil society organisations to learn and evolve.
- 4. Even in twenty-first century 'digital Britain', there could be over 5 million people off-line and excluded from the internet.** Often the elderly, the disabled and those in care homes are among those digitally excluded. So when folks like us from smart city research come knocking at your door, ask them how their proposals can benefit those presently excluded.

About the University of Bradford: The University of Bradford is a technology university of the North with commitment to excellence across its three academic themes of innovative engineering, advanced healthcare and sustainable societies. The University of Bradford works closely with the City of Bradford Metropolitan District Council and many international universities as partners.



The scale and complexity of the global and local challenges that cities and regions are wrestling with are out of sync with the simple technological fixes that Smart Cities have historically promised – ‘being’ rather than ‘buying’ a Smart City requires you as the city region Mayor to take a brave, active and nuanced approach, which has at its heart acceptance of the need for disruptive social change. This will never be an easy vote-winner - but building a Smart Society should be a key mission if you are to tackle climate change, improve air quality, congestion, overcome unemployment and plan for future skills.

The only way to achieve this change is to build the eco-system of the willing - once you have sufficient mass the rest will follow. Don't over strategize but instead, take a simple first step - work with your universities to host an open meeting for all interested parties, including citizens, to discuss 'how can I help you to ensure we create a leading digital city region that is fit for the future' - the rest will flow from this!

About Bristol Future Global: After 2 decades of working with city Leaders and Mayors in Bristol, I set up Bristol Futures Global Ltd. to share mine and the city's learning more widely. In Bristol, I led work to become European Green Capital 2015, a Rockefeller Global Resilient City; a Government Super Connected City and Future City Demonstrator. I created Bristol is Open. But no city wants to be an island - whether the mission is to be smart, sustainable, resilient, inclusive, creative, productive - or all of these - collaboration is key. And building collaboration across organisations and sectors is what we are good at. I call it public-private-people partnerships.



Cities that continue to exclude millions of citizens cannot be considered smart! Sadly, 12 million people with disabilities are still unable to participate fully in community life due to public ignorance, poor design and bad service delivery. The interaction between people and their physical or virtual environments should allow them to get around safely and confidently, with minimum fuss and maximum independence.

Advances in digital technologies and open-data are finding new ways to augment and improve the world we live in, but your Smart Cities shouldn't just increase efficiency or economic growth; they also affect citizen wellbeing and the way we interact with our communities in everyday life.

Smart Cities should combine the design of the built environment, transport, retail and entertainment services with new digital technologies to deliver consistent and joined-up customer experiences that often transcend any single service provider's remit. This requires mayoral leadership now to seed a new approach to designing and delivering inclusive and positively joined-up services.

If you do not focus attention now on 'inclusivity' at all stages of your strategy and implementation processes, then you will fail in your drive to create a Smart City.

About Guide Dogs: Guide Dogs is the UK's leading sight loss charity specialising in mobility, particularly in relation to the built environment, technology and smart cities. We believe that everyone, regardless of their ability should be able to get out and about safely and confidently to study, to work, to shop, to play, to maintain their health and fitness and so on. In short, we feel that no one should be left out of life.

Innovate UK

We recently asked citizens around the country what they wanted from their cities of the future – not only what the individual systems (like energy, transport, water, waste, health, and food) should look like, but also what the integration of those systems should be to deliver the products, services and quality of life that people wanted to see.

Smart solutions underpinned a lot of the system integration, but people were clear that whilst cities should be tech-enabled, they should not be tech-centred. What this means in practice is firstly that smart cities need to focus on real citizen needs, which then dictate the tech solutions, rather than the other way around. People were also clear that they wanted smart solutions which increased, rather than decreased, community interaction and offline social cohesion. And lastly, they were looking for smart cities to provide them with the digital tools for information simplification and collaboration that would help them collectively optimise their cities for themselves.

About Innovate UK: Innovate UK is the UK's innovation agency. We work with people, companies and partner organisations to find and drive the science and technology innovations that will grow the UK economy. Through our Infrastructure Systems programme, we stimulate new solutions to the challenges faced by cities, and help bring greater integration and intelligence to city systems.



Mobility is the lifeblood of every city. Moving people and freight has become the main challenge facing city mayors who must tackle both pollution and congestion while enabling all citizens, regardless of income, to move as freely as possible.

1. **Mayors must proactively promote efficient and integrated mass transit systems, combined with ambitious policies for clean vehicle areas.** They need to support the uptake of low emission vehicles using clean and renewable fuels, such as those highlighted in the LowCVP's 'Good Practice Guide' to effective local measures. We must build connected transport systems, embracing 'mobility as a service' using clean and low carbon vehicles.
2. With the range of technologies now emerging across every aspect of transport and mobility services, there has never been a greater opportunity to challenge the all-too-normal experience of gridlocked city streets and polluted air. But **effective policies are needed to deliver the potential afforded by clean, efficient technologies**; unchecked they could deliver undesired outcomes. Working in partnership with the wide range of stakeholders to deliver effective policies, the cities of today can become the thriving communities of the future we all want.

About the Low Carbon Vehicle Partnership: The LowCVP was established in 2003 as a not-for-profit public-private partnership to accelerate a sustainable shift to lower carbon vehicles and fuels and create opportunities for UK business. The LowCVP is also working to join-up the air quality and climate agendas, helping to ensure that policy prescriptions serve both objectives. Around 200 organisations are engaged from diverse backgrounds including automotive and fuel supply chains, vehicle users, academics, environment groups and others.



As a city leader you have the opportunity to guide your city on the enlightened path to becoming a smart city. By creating an over-arching strategy that identifies the key problems smart lighting can solve, you can be clear in your objectives from the get-go.

1. **Form a sustainable business case.** With budgets a key barrier for smart city development, it is important you decide benefits that could be a return on investment and consider collaborative partners to help deliver. Street lighting infrastructure already exists; lampposts are ubiquitous throughout cities and offer the perfect platform for smart enhancements, enhancements, without the initial structural outlay.
2. **Move away from Silo thinking.** A smart city requires collaboration from all levels. Ensuring your Council are all on the same journey, with one shared goal, will build cross-departmental support and encourage senior buy-in.
3. **Keep citizens at the heart.** Smart street lighting initiatives should hold citizens at their core. Engage with citizens in plans for your design and architecture. This will ensure the services you provide meet their needs.

About Lucy Zodion: Lucy Zodion is a leader in the design and manufacture of streetlighting equipment in the UK. Its product range spans the on-street installation of lighting, from electrical distribution to control. Lucy Zodion's leading position has been reached through constant innovation in both our products and service. With over 50 years' experience Lucy Zodion continues to develop products that help to optimise street lighting and power distribution from the ground up.



The race to become a smart city is on. Cities across the world are recognising that they must harness technology to create an environment which is a lively, safe and convenient place to live and work. Better use of technology will help deliver efficient transport networks, clean open spaces and low energy housing. In today's competitive world innovation will decide which city wins and which will be left behind.

1. **Central to this ambition will be mobile connectivity.** Mobile infrastructure provides the platform that makes progress possible and underpins all the applications and data insights that will determine which cities come out on top: real-time traffic management, pollution management and smart metering to name a few examples. Cities must act now and use all their levers of power to enable mobile infrastructure that is fit for the future.
2. **Mobile infrastructure must be integrated into strategic thinking.** It must be central to a city's growth strategy and not simply an afterthought that requires expensive retrofitting. The new City Mayor must look to build an effective cooperative relationship between the mobile operators, local authorities and local enterprise partnerships to make it as easy as possible to deploy mobile infrastructure where it is needed.

About Mobile UK: Mobile UK is the trade association for the UK's Mobile Network Operators (MNO) - EE, Telefonica UK (O2), Three and Vodafone. Its goal is to realise the power of mobile to improve the lives of our customers and the prosperity of the UK as a whole. Mobile UK's role is to identify the barriers to progress, and work with all relevant parties to bring about change, be they Government, regulators, industry, consumers or citizens.



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1. **True smart cities can only be created through cross-sector collaborations between (local and national) government, academia and business**, that seek to develop innovative approaches rooted in the interests and priorities of cities and their citizens. Whilst we all know that smart city solutions will ultimately be central to addressing many urbanisation challenges, most of the potential applications are not yet commercially proven.
 2. **Mayors should recognise the need to share the development risk of new solutions with commercial and other partners** and allow your teams the time and space to engage with communities and service providers to create solutions that will work in your context.

About Milton Keynes Council: Milton Keynes, a city of 270,000 people, sits at the centre of the Cambridge to Oxford innovation corridor. It is the fastest growing UK city economy and is known worldwide as a model of planned new city development. The MK Future City Programme is a globally prominent project that engages government, academia and business to test and implement smart city solutions at scale.



Investments in smart city technologies are increasing exponentially. As the world becomes increasingly interconnected, for these investments to realise their full potential one complex and over-arching challenge needs to be overcome: **interoperability**.

City operations have become specialised and fragmented. Functions, services, and domains are managed within individual procurements, and this creates significant challenges when introducing anything new. While cities may conventionally implement one technology at a time, a smart city can aspire to a connected ecosystem of different technologies and data sources that collectively improve the city's efficiency, security, sustainability and lives of its citizens.

Today, individual systems — smart lighting, road sensors, smart meters, — are each deployed to fulfil a particular objective, but we suggest that the goal should be their integration. **Without interoperable components and common standards, a smart city cannot achieve its true potential.**

High-quality interoperable data that will drive good policies and decisions can underpin a city that works for everyone. It enables all smart technologies to plug into one another and a city to work with its surrounding area and partners elsewhere.

About Ordnance Survey: Ordnance Survey provides the location referencing framework upon which Britain relies. It underpins a huge range of activities, planning, asset management, routing and risk analysis. Government uses its data to improve community services – to fix a street light, to collect rubbish and improve transport networks.



Opportunity Peterborough

The world of 'Smart Cities' is complex, with cities jostling to be 'a' or 'the' Smart City. Chasing the badge, however, can be misleading.

1. **Rather than starting with pre-conceptions of 'a' smart city, solutions must be relevant to that city** in output and scale: buying solutions 'off the shelf' can be a false economy.
2. **To ensure solutions are relevant, the city needs to understand its challenges:** identifying and refining these requires openness and honesty in its leadership.
3. **Collaborative leadership**, will ensure that city silos are broken and the effects of 'smart solutions' are maximised.
4. **Digital technology should not be an end goal in itself;** but solutions may be more effective if they are digitally empowered, and informed by intelligence. Technology is only as good as the people that use it, so behaviour change, inspired by city leadership, is essential.
5. **Ultimately, the 'smarter city' generates outcomes for its citizens and businesses:** creating a better city for its people to live and work in, and for its businesses to flourish.

About Opportunity Peterborough: Opportunity Peterborough is the economic development company for Peterborough. It attracts inward investment, support the organisations already here to grow and develop, lead on the city's skills agenda and deliver a range of projects to boost the local economy. Opportunity Peterborough also deliver Peterborough's Smart City work jointly with Peterborough City Council through the Future Peterborough programme.

“Smart cities, big data and open data provide bold and exciting opportunities for cities and for built environment professionals. Recent research by the University of Reading for RICS Research Trust has shown, however, that UK cities and the built environment sector (or specialists in land, buildings, construction, property and architecture and their clients, as well as planners) are not seizing the opportunities that exist. Potentially rich sources of data on a city’s built assets and their resource use are being overlooked because the business case is not always apparent.

Cities need to develop clear smart city and data strategies to provide greater certainty to stakeholders, and help improve incentives for companies to share their data. This also means professional bodies need to act more decisively, by championing change and promoting the uptake of data and smart city skills within the built environment sector. Built environment professionals need to better understand the potential impacts of big and open data upon professional advice in their sector. City mayors therefore need to work hard to promote increased collaboration between these actors and technology companies to harness the power of built environment data, and help deliver an improved service for citizens”.

About the School of the Built Environment, University of Reading: The School of the Built Environment at the University of Reading, brings together the long-established Department of Construction Management and Engineering with a new Department of Architecture. The School of the Built Environment is an interdisciplinary centre of excellence in research and education with a strong orientation towards societal aspirations for a more sustainable urban infrastructure. Its work on smart cities extends from innovation diffusion to the implications of emerging digital technologies for evolving patterns of sustainable living.

Space Syntax

Cities are ultimately about people – their health, wealth and happiness. A Smart City is driven and developed by the people that live, work and play in it; the social and economic transactions that underpin prosperity are enabled through effective transport systems and high quality networks of streets and public spaces. Space Syntax's top tip for Mayors is to **mobilise smart city technology and drive innovation in city planning through five SMART steps:**

1. Sensing data on the social, economic and environmental performance of the city.
2. Mapping the data spatially to make it visually clearer.
3. Analysing patterns in the data to understand cause and effect.
4. Reacting to the analysis with data-driven policies and planning proposals.
5. Testing future policies and planning options using "predictive analytic" models.

These SMART steps connect people, skills and data - creating a platform for decision making. Through access to deeper insights into how cities function, multidisciplinary expertise and models to interrogate the resilience of urban plans, Mayors can deliver smart, flexible future city environments - which can be modified, without the need to rework the vision.

About Space Syntax: Space Syntax provides an evidence-based, human-focused approach to urban planning, transport and building design. It uses advanced 'spatial analytics' to show how the layout of space has a fundamental influence on the way people move and interact with each other, in buildings and cities. Well-designed layouts facilitate interactions between people, which is how social and economic transactions can occur, thereby driving the performance of places.



Leading smart cities around the world are now recognising that the **greatest long term value can be achieved by embracing an “open ecosystem” approach to smart city enablement. Instead of expecting one vendor to provide a complete smart city solution, they choose solutions which are designed to integrate and collaborate with others.**

This strategy has been proven effective in other markets like mobile, where the dominant providers of the past who relied on in house development (e.g. Nokia and Blackberry) could not match the pace of innovation achieved by providers who encouraged and enabled 3rd parties to improve their solution (eg Android and Apple).

For smart cities this means that the systems which control city street lighting, or manage parking will feed data into wider systems, like citizen open data platforms, security and operation centres or healthcare platforms.

This approach is challenging for some traditional providers who want to ‘own’ the customer relationship. Silver Spring Networks however believe Open Ecosystems will be the winning model as they give the city maximum flexibility in the face of changing requirements and priorities, and also enable local start-ups, who are often best placed to deliver major innovation.

About Silver Spring Networks: Silver Spring Networks is the leading global provider of standards based communication and data platforms for cities and utilities. Silver Springs Networks partners with leading cities to help plan, deliver and support smart city initiatives which tackle diverse challenges including energy reduction, improved transport, enhanced security and resilience, or tackling underlying health issues. In total it connects over 25 million IoT devices in over 500 cities including Copenhagen, Bristol, San Francisco, New York, Chicago and Singapore.

About the APPG on Smart Cities

The All-Party Parliamentary Group (APPG) on Smart Cities was established in 2014 and aims to inform Parliamentarians about how the digital revolution can benefit our cities and identify ways that the UK could take the lead and seize a substantial share of the international “smart cities” market. To do this we provide a platform for Parliamentarians, business, academia, think tanks, trade bodies, NGOs and local government to debate, collaborate and share best practice.

Contact Us

If you would like to suggest topics for discussions or sponsor future events please get in touch with Newington, the Secretariat, using the details below.

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