



# SmartCitiesWorld Trend Report 2022

## *Governance and Citizen Engagement*

- *Citizen safety and security*
- *Building equitable cities*
- *Bridging the digital divide for citizens*
- *Engaging on climate, sustainability and environment*



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**PAVEGEN**

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*SmartCitiesWorld Trend Reports are a series of annual reports that are designed to highlight best practice from city leaders and administrations and showcase innovative technologies from across the five key verticals that make up our coverage of the sector. With the publication of these reports over time, we will be able to track the progress that cities are making and how their priorities change. In the first of 2022's reports, we explore how leaders and practitioners are working to create fairer, more equitable cities.*

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### **Introduction**

When there are so many anxiety-inducing challenges affecting citizens globally, it can be hard to see the glimmers of light, the positive progress being made towards creating a fairer society in a growing number of cities around the world. Through smart application of technology, underpinned by innovative policies and partnerships, as well as internal change, city leaders and planners are gradually succeeding in their attempts to improve the quality of life, and access to services and opportunities, for all residents, visitors and employees. Some of these transformations have been well documented; others are lower under the radar.

Often it has been disrupted access to physical services which has spurred progress with digital service transformation, particularly during the pandemic. Other drivers on an international scale include renewed commitments to curbing the impact of climate change, to eliminating discrimination and improving social mobility, and to redressing the balance of focus between mental and physical wellbeing for citizens and employees – by helping everyone to thrive and feel safe, in so far as city leaders can influence those parameters.

This report pays tribute to those cities making positive and tangible progress, exploring what strategies have been the key to their successes. It also assesses the work left to be done – where many cities may still be falling short in their vision, or in their delivery of change – and what needs to happen to turn that situation around.

Interestingly, the cities that make the headlines for their smart infrastructure and advanced connected-city ambitions aren't always those prioritising citizen inclusion, equity and diversity. The emerging best practices are a good source of inspiration for all, however. If every city prioritised the same things, reference points for next projects would be limited.

### Digital inclusion and equity

As long as everyone has access to it, technology can be a great leveller. During the pandemic, the ability to access services and complete tasks remotely over the internet proved a lifeline for people of all ages and situations. From children who could no longer access the classroom to vulnerable people who didn't dare leave their homes, digital services allowed many people to keep learning, working, shopping, accessing health and social services, playing and engaging with loved ones – at least to some degree.

But the last two or more years have also shone a light on gaps in such services, triggering an acceleration in digital transformation projects to improve digital inclusion and equity across communities. Much of this activity needed to happen anyway; the Covid-19 pandemic just pushed plans higher up the agenda.

In Philadelphia in the US, which has a highly diverse population, the city has worked hard to understand and map the gaps in digital services via its Connecting Philadelphia Household Internet Assessment Survey, using the findings to target improved digital service access for its citizens.

Innovative digital equity projects across the city include PHLConnectED, geared to ensuring that all households in need, with infants or school-age children, have free internet access. To date the scheme – a collaboration spanning philanthropic donation, government, internet

service providers (ISPs), and local education agencies (LEAs) – has provided 21,000 internet connections.

A lot of thought has gone into the initiative too. To further reduce barriers, applicants don't have to prove their eligibility – whose scope also includes English language learners and those who receive special education services.

Having access to infrastructure is just a first step, however. It's what happens over the top of it – and how accessible/user-friendly this is – that will determine what citizens get out of it. So Philadelphia has spearheaded some interesting projects here too, around improving local digital literacy.

To date the city's Digital Literacy Alliance (DLA) – a grant-making and advisory body – has distributed over \$1M in funds to local community-based organisations to support innovative digital literacy projects. A current round is designed to support Philadelphia's immigrant and Limited English Proficiency communities, to address creative and innovative ideas for connecting digital literacy and equity with the relevant programmatic needs of their populations.

A pilot wireless mesh network in North Philadelphia, meanwhile, is addressing access in an area of the city with a particularly high need among its large Latino/a/x population. Also the result of a DLA pilot, Philadelphia has put



in place "Digital Navigators" to help residents access City services and forms. The helplines, via three community-based organisations, provide digital case management services to help connect residents to internet access, devices and training.

Philadelphia is also proactively putting technology into the hands of all citizens, via PHLDonateTech, a collaboration between the city's Digital Equity and SmartCityPHL teams, working with local recyclers and refurbishers. The scheme encourages residents and businesses to donate, recycle and provide computers to families and people in need across Philadelphia.

Tying all of these activities together is the city's Executive Order and five-year Digital Equity Plan, which has set itself the goal of elevating digital equity issues, dedicating city staff to these issues, and take things on from a systems level to address historical inequity in access to internet, devices, and skills.

In addressing its own digital divide, Barcelona – one of Juniper Research's top five smart cities for 2022 and host of the annual Smart City Expo World Congress – has

emphasised policy and governance to link digital access to human rights – and to ensure that benefits are delivered efficiently and in a coordinated way. (The harmonised approach can be traced back to 2016, when – at Mobile World Congress – the Government of Catalonia and the non-profit association City Protocol Society announced collaborative research towards the standardisation of Catalan town and cities to help accelerate their respective smart transformations.)

Barcelona and the Catalonia region have made a point of proactively supporting related innovation – today the smart city sector makes up at least 3 per cent of Catalonia's GDP. The region also actively courts foreign investment and promotes the region as an ideal testbed for the latest smart-city technologies. The Government of Catalonia runs a SmartCAT Challenge initiative, for instance – part of the Smart City Hack international project which invites entrepreneurs from around the world to develop solutions for their cities by means of open innovation initiatives.

Like Philadelphia, Barcelona actively seeks citizen feedback to provide digitally-enabled innovation and city service access in

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targeted ways. Latest pilot projects geared to reducing isolation (a scenario magnified by the pandemic) include the use of connected AI-assisted social/service robots in homes of the elderly. The aim is to help vulnerable citizens continue living in their homes for as long as they can, with customised, connected support. The so-called ARI robots, from PAL Robotics, which track movement among other parameters, can quickly identify emergencies such as falls and household accidents. They can also help to control medication and remind citizens about medical visits.

In Hackney, London in the UK, AI is enabling earlier intervention to prevent social problems from escalating, through consolidated data monitoring and analytics. The council's Early Help Predictive System analyses publicly-available data on levels of debt, unemployment, housing inequality, school attendance and reports on anti-social behaviour and domestic violence to build a 'need' profile for families in the area, automatically alerting relevant teams if a certain threshold is approached.

Back in the US, the City of Arlington in Texas is using smart technology to connect more citizens to convenient and affordable transport, for example if being discharged from hospital.

"For years, the City of Arlington was known as one of the largest cities in America without mass transportation. Today, that is no longer the case," says Dr Ann Foss, principal planner with the City's Office of Strategic Initiatives.

To ensure that no citizen is left behind, the city formed a 31-member Transportation Advisory Committee – comprising 31 local residents and stakeholders to address Arlington's current, near-term and future transportation needs. Among the Committee's recommendations was the adoption of a demand-response rideshare scheme as an efficient and cost-effective public transport option.

It's now five years since Arlington forged a partnership with Via Transportation, becoming one of the first cities in the US to provide on-demand rideshare as a public transportation solution. Dr Foss recommends the partnership approach for getting this innovative and cost-effective solution off the ground.

"The innovative public-partnership with Via Transportation has proven a more affordable, flexible way for the City to provide service to its residents and visitors without the staggering infrastructure costs or operating expenses required by traditional public transportation, such as light rail or buses," Dr Foss explains.

An important side benefit is the data being collected as citizens book services, which allows the city to keep honing its service.

"This real-time demand data helped drive the gradual expansion of the service area in the early years of the pilot programme and continues to be valuable today," Dr Foss notes. "We're able to track point-to-point pick-ups and drop-offs, fare revenue and how many rides are shared. All of this data allows us to refine our service almost on a daily basis as we learn how our service is being consumed by the public."

The partnership approach has also enabled the city to scale the service up or down based on data about ridership demands, which saved the city roughly \$1m in expected costs in 2020 as the service was scaled back in line with reduced demand during the pandemic.

Now available right across the city (which covers almost 100 square miles), the Via Rideshare service helps thousands of people each week easily get to school, work, medical appointments, shops, restaurants or other daily activities – without the need for bus stops, train tracks, fixed routes or pre-determined travel times. To date, more than one million rides have been booked via the platform, which routes passengers in real-time to convenient pick-up and drop-off locations, enabling multiple citizens travelling in the same direction to share a single vehicle, Dr Foss notes. So the service is environmentally-friendly too.

Additional spin-off collaborations have resulted in promo codes for free rides, so that currently 18 different non-profits in the community can help their low-income clients with activities such as job searches, finding an apartment, getting to medical or dental appointments or other daily activities, Dr Foss says. Partnerships with The University of Texas at Arlington, Tarrant County College and Arlington Independent School District, meanwhile, are helping students get to and from class at no cost.

One of the newest partnerships with a local hospital means that patients who lack transportation can get a ride home at no charge. Arlington is also working to forge new partnerships with some of the major employers to create rideshare plans for employees getting to and from work.

### Actionable insights

There are a number of ways cities can look to close the digital divide throughout their communities and ensure that select citizens and communities aren't disproportionately affected by digitally-driven change, or left behind in the wake of broader digital innovation.

- Working collaboratively with dedicated local industry agencies and bodies, such as Philadelphia's Digital Literacy Alliance, can promote more widespread digital connectivity to areas and communities most in need of it.
- Digitally-enabled services must keep in reserve an analogue component to enable citizens that aren't digitally literate to make use of them. The cost of such services must also scale to ensure that services remain accessible from a financial perspective as well as digitally.
- At a city level, technology won't always provide a direct solution at street level for citizens, but can provide valuable insights in new tests and pilots to enable cities to take action and invest in the right services in the right areas.

## Citizen safety and security

In a world where it's all too easy for citizens to feel unsafe, city leaders are looking at innovative new ways to deploy innovative technologies, and creative policies and partnerships, to increase people's sense of security.

The UN-Habitat's Safer Cities programme notes that local authorities have a key role to play in addressing the issues of safety – in partnership with other organisations – and provides support with this at <https://unhabitat.org/programme/safer-cities>.

One way of increasing citizens' sense of safety and associated wellbeing is to make it easier and more reliable to access emergency services.

Hexagon, which specialises in digital reality solutions, combining sensor, software and autonomous technologies, is working with cities to improve the resilience and sustainability of critical services and infrastructure, through smarter service coordination.

"A major global trend we are seeing is a rise in calls coming into command-and-control centres," explains Nick Chorley, director EMEA Public Safety & Security at the company. "To alleviate pressure on resources, many centres are developing new programmes – often called nurse navigator programmes or 'speak and treat' – to route medical calls to nurses who can tend to patients over the phone rather than sending EMS resources that are better suited for emergency situations."

Such programmes are often aligned with triage systems, to filter out appropriate calls, for instance. Another example is the growing trend in mental health dispatch programmes. Instead of automatically dispatching a police officer for a mental health emergency, command-and-control centres are dispatching behavioural health professionals, he says. Washington, DC, in the US is one city using Hexagon's technology for this use case.

"The goal of these alternative dispatching programmes is to provide the right care and services to citizens at the right time, promoting greater wellbeing for the entire population. Equally, it is essential that specialist and expensive resources are kept available for critical situations."

Other ways of making citizens feel safer and more secure is through transparent remote monitoring (for example, CCTV), and a means of easy communication (as used to discreetly report concerns on public transport, for instance).

In the north of England, Sunderland City Council has called out improved citizen safety and security as part of a major next-generation digital infrastructure roll-out, in partnership with BAI Communications. As well as providing a platform for business growth and innovation, supporting the UK Government's Levelling Up agenda, new high-speed 5G coverage will underpin improvements to public safety and security through easier deployment of new CCTV technology and a new wifi messaging platform that can relay public information messages via an enhanced public wifi service.

In Singapore and beyond, ST Engineering is deploying all kinds of smart infrastructure solutions, which combine multiple benefits such as safer streets yet lower energy use via smart lighting which harness smart sensors, IoT connectivity, data analytics and cloud computing. The company also provides advanced intrusion and crowd detection systems which use smart sensors and AI analytics.

In the context of technology-enabled surveillance, the challenge is to implement any new measures without conscious or unconscious discrimination. One of the concerns about reliance on AI algorithms for facial recognition is the scope for potential bias. As technology companies and users look to keep pace with the ethical and responsible



use considerations of AI applications, advisory companies such as PwC are developing frameworks and toolkits to minimise any risks, including any scope for unconsciously built-in bias.

Accountability and transparency around data use are similarly important to secure public trust in advanced technology use. In the US, this is something the City of Philadelphia has taken great pains to get right.

Under its SmartCityPHL roadmap, the city recently launched SmartBlockPHL—a pilot programme that uses 14 smart streetlights to collect information about pedestrian traffic, street activity, and the environment in its Midtown Village, to help hone service delivery and efficiency while enhancing public safety.

To mitigate any downside or risk of this technology use, the SmartCityPHL team deliberately appointed a non-partisan taskforce, explains Philadelphia's former Smart Cities Director Emily Yates. "These key partners will help develop data management policies. We recognise there might be risks from the use of new technologies that we are unaware of, but this group of subject matter experts is on hand to advise and help the City think more broadly about the implications."

A webpage for SmartBlockPHL, meanwhile, includes an FAQ for anyone with concerns. It provides more information about the project and clarifies what data will be collected and how it will be used, Yates notes. "Data for this pilot will only be collected for object and people

counting, bicyclists and vehicles monitoring, crowd detection, and environmental shifts, including temperature, relative humidity, air quality. No personally identifiable information will be collected or stored."

## Actionable insights

Citizen safety and security will always sit firmly atop the agenda for city administrations, whether that is physical safety in global 'road to zero' strategies, digital security and privacy for those using digitally-enabled municipal services, health risks as a result of the climate crisis, or otherwise. As such, best practice can be witnessed across the smart city ecosystem on how to make safety and security gains for cities.

- Transparency and openness in monitoring should be ensured as far as possible to help to build trust between citizens, governments and service providers. Technology is indiscriminate in this way and cities must ensure that their use of it does not contribute to any conscious or unconscious bias.
- New technology adoption should be integrated with existing infrastructure, such as streetlights and poles, to bring benefits for cities as well as citizens, enabling a more data-driven and holistic view of city operations, as well as keeping citizens safe through monitoring.



### Equity, inclusion and diversity

Being fair to and inclusive of all citizens should be a central facet of any smart cities strategy in 2022. As well as fostering greater access for all, this means considering the impact of modern solutions on all demographics. If implementing advanced technologies is likely to have a negative impact on certain jobs, or local businesses, those risks need to be mitigated as part of any evolving plans. Related to this, city leaders also need to assume at least some responsibility for equity, inclusion and diversity in the workplaces in their community, ensuring that there is fair access to employment for all.

Key to ensuring all of this is ensuring that city administrations and individual service teams reflect the communities they serve and represent, which hasn't always been the case up to now.

In Philadelphia today, 66 per cent of residents identify as a Black, Latino/a/x, Asian or 'other', and its Office of Diversity, Equity and Inclusion (DEI) has developed a comprehensive strategy to advance equity and diversity, both internally within its own administration and externally in the community.

Under the City's workforce equity strategy, all City departments are creating annual plans to achieve greater representation of – and participation by – employees of colour and

other historically marginalised and under-represented groups in the City's workforce, according to Nefertiri Sickout, the city's chief diversity, equity and inclusion officer. All of this is being driven from the top, by the city mayor's directive for a more racially equitable Philadelphia (Mayor Kenney created the City's first Office of Diversity and Inclusion in 2016).

By the end of 2023, every City department will have completed a racial equity assessment and action plan, setting out more intentional efforts to produce greater racially equitable impact related to each department's budget, core services or programmes, procurement and community engagement.

To help align the city's budget decisions with the administration's vision to build a city where everyone can thrive, the DEI and Budget Offices have embedded a racial equity process in individual departments' budget proposals. This involves a set of racial equity questions and a budget equity committee tasked with elevating strategies explicitly designed to improve racial equity.

As an extension of this work, the city will take what it has learnt and roll this out into community initiatives in due course. As Sickout explains, "We are now carrying forward the hard work of actualising our commitment to equity

and creating tangible strategies for improving the lives of all Philadelphia residents." Externally, projects like the Digital Literacy programme are working towards these kinds of goals, by levelling up access to local opportunities.

Continuing to seek feedback from right across communities is another vital strand to making sure everyone's needs are catered for. In Barcelona, Spain, crowdsourcing of great ideas has provided a powerful means of matching the latest innovation to local needs.

A recent round of funding worth over €600,000 has been allocated across 11 new projects geared to ensuring "a fair and inclusive digital transition", and to improving urban sustainability – to the benefit of all citizens. One of the qualifying projects is WikiHousing Barcelona, which has proposed DIY/co-building of affordable and sustainable housing by and for young people. Three years ago we reported on Barcelona and New York's joint affordable housing challenge, part of a wider suite of initiatives from the cities to try to improve housing affordability. Barcelona is aiming to double the number of public housing units before the end of this decade. This latest initiative, and others like it, will be important contributors to a fair and affordable urban life for all.

Whatever the progress to date, there is always more work that cities can do to even up citizens' experiences across diverse communities.

A report produced by UK social change charity The Good Things Foundation and Liverpool University in 2020 found that levels of digital

exclusion are worse than previously thought, while the Office of National Statistics ONS data shows that as many as 1.2 million residents in the Greater Manchester area may still be unable to fully access the benefits offered by digital services. To address this as a matter of urgency, especially in the light of the pandemic and its impact on isolated individuals and families, Mayor Andy Burnham announced ambitions for Greater Manchester to become one of the first city-regions in the world to equip all under-25s, over-75s and disabled people with the skills, connectivity and technology to get online.

As part of Burnham's reinforced commitment to get residents online following his re-election last year, Greater Manchester Combined Authority (GMCA) has established a Digital Inclusion Action Network. This will lead targeted action to combat digital exclusion with a specific focus on supporting under-25s, over-75s and disabled people in Greater Manchester.

Strategic collaboration and applying modelling techniques and other best practice from neighbouring districts has been key to accelerating the roll-out of new initiatives, so investment can be targeted where it's needed most and improvements can be felt sooner rather than later. Highlights of what's to come, in partnership with organisations such as Virgin Media O2 Business, include internet and equipment supply to those most in need, video sessions with at-risk children, and a digital inclusion scheme for care leavers, which as well as providing vital digital skills will link them to online resources that help them find work, maintain good health and manage their money.

“As many as 1.2 million residents in the Greater Manchester area may still be unable to fully access the benefits offered by digital services.”

A Greater Manchester Social Housing Pilot, meanwhile, has matched five social housing providers with internet providers to explore the potential to co-design a sustainable funding model with the market to provide 5,000 social housing residents (target audiences including over 75s and disabled residents) with connectivity and digital skills support – with a view to wider roll-out 250,000 people in social housing across the council region. Currently the ISPs involved are developing their offers for the tenants, in line with their social value commitments, and are scoping the connectivity requirements to bring their services to the tenants' properties.

Underpinning all of these plans is a commitment to roll out 2,700km of new fibre optic broadband infrastructure across the Manchester city region: a £23.8m Local Full Fibre Networks Programme will connect more than 1,500 public sites across the city region, with additional local authority investments.

Getting the right people involved is almost always a critical success factor in overcoming exclusion and promoting a fairer experience for all. London-HQ'd proptech developer Planet specialises in large-scale, affordable, residential projects in countries like India and Brazil.

A key part of its innovative approach is through its investments into R&D. It has two dedicated R&D centres – called Competence Centres – house more than 200-plus multidisciplinary professionals including sociologists, psychologists and architects. Together, the team has created a bank of smart solutions which are applied to each project dependent on the specific wants and needs of each local community to aid community cohesion and inclusion.

One easy way they do this is via the Planet App. This acts like a dashboard for all residents and effectively allows all to see what is going on in their local community and ensure everyone is engaged. Referencing a smart city project it has established in Ceará, Brazil, Graziella Roccella, Planet Smart City's chief research officer, says, "Our main driver for launching Smart City Laguna was to create an affordable smart community that genuinely provided a more inclusive and empowering place for residents in Ceará.

"Across Brazil there is a significant lack of affordable housing, and a shortage of viable solutions that can solve the problem. Currently, residents in affordable communities have to live in houses that are poorly designed and built, and often in less desirable areas with reduced access to services, transport and jobs."

To help solve this problem, Planet designed a new community with high-quality affordable homes, retail units for 25,000 people, and more than 200 integrated smart solutions – from smart street lighting to mobile-accessible services. "Our role doesn't end there, though," Roccella notes. "The residents buying into our developments are not only purchasing their dream home – the home to raise their family or kick start the next stage of their life – they are drawn to the promise of inclusion, opportunity, and a higher standard of living. Unlike other property developers, we hired a community manager to immediately involve the residents in the ongoing development of their community, strengthening social inclusion and ensuring the project evolves with their needs."

Technology is an important driver of social inclusion at Smart City Laguna, but context and purpose are even more critical. The Planet App



is a mobile application that acts as the residents' control panel within each community. It is both a digital services management tool for homes and a community engagement platform – facilitating conversations and collaboration between residents. A Know Your Neighbours feature enables matching of residents based on their skills and areas of knowledge. This has helped peer-to-peer learning schemes to emerge, covering everything from digital literacy to English. The app also helps Planet better understand the changing wants and needs of residents so it can keep adapting Smart City Laguna to ensure it remains an inclusive and engaging place to live.

Over the last six months, Planet has seen a quarter of Smart City Laguna's current population publish requests and offers for support from their neighbours – from babysitting to borrowing a simple day-to-day tool such as a screwdriver, Roccella says. "A similar percentage of residents are also autonomously using many of the local services on offer – all available to book through the Planet App – including shared kitchens, football pitches and the library. As a community builder, encouraging people to use the solutions and services available to them in their neighbourhoods rather than the next major city is vital for improving quality of life."

### Actionable insights

Equity, inclusion and diversity have leapt high on the city agenda in the last five years, as the Covid-19 pandemic and Black Lives Matter and #MeToo movements have demonstrated the inequity in our societies. At city level, it's easy to see how priorities have shifted as more mayors establish equity, inclusion and diversity offices to build these elements into new citywide strategies across all departments.

- As is the case in Philadelphia, direction and engagement on equity, inclusivity and diversity must filter from the top down and filter through all teams, departments and agencies responsible for serving citizens and delivering municipal services.

- Cities should look to complete racial equity assessments across all departments and teams as part of their efforts to more deliberately encourage equitable use of city budgets and investment.

- Cities should also look to adopt technologies that can be rolled out into communities to improve citizen engagement and relations, getting them closer to the issues that matter to citizens and enabling them to act more efficiently and effectively on them.

“ Getting the right people involved is almost always a critical success factor in overcoming exclusion and promoting a fairer experience for all. ”

## Pushing equity forward isn't an agenda – it's the future of cities

By Mike Lake, founder and CEO; Joaquín Rodríguez, community engagement director, Leading Cities

Regardless of the challenges that cities around the world are facing, inclusivity and equity should be at the heart of planning and strategising to solve them. Whether it's climate change, the transition to cleaner energy and utilities, or more efficient and affordable transportation, the work that city leaders and authorities do to combat these issues must take into account the need for equitable transitions across the board.

As part of this, city administrations must take extreme care in the way they develop policies, launch projects and initiatives, and roll out new technology to ensure that their approach is inclusive and equitable. Building citizen inclusivity into planning rather than building from it as a foundation can see projects quickly come undone, requiring revisions that will cost time and money – as well as potentially damaging a city's reputation among certain communities.

The first thing to take into account is the way that technology is being implemented. Technology adoption must always solve a problem rather than cause one – its use should be purposeful and meaningful, and encourage or enable direct interaction with citizens. It



shouldn't be something that cities put in place to lead a race to innovate without forethought about its impact on communities.

Urban technology rollouts should amplify human will and citizen needs. In this way, it can be used to tackle some of the biggest challenges we're facing as a species, but also brings with it potential risks. Technology can deliver incredible benefits to society and city leaders, improving access to critical public services for those that most urgently require them, but under human control, it could also replicate our prejudice and discrimination if used in the wrong way.

“ Urban technology rollouts should amplify human will and citizen needs. ”

Technology alone won't solve the problems that we have created in our society. Privilege – based on status, income, skin colour and any number of other metrics – exists; acknowledging it is the first step to creating a fairer society, and only then can digitally-enabled tools contribute to the solutions.

Equity in cities must run to a variety of levels to ensure progress is being made. Hiring decisions in citywide agencies and departments must adhere to equity, diversity and inclusivity best practice to ensure city-level decision making puts equity front and centre, which then informs how citizens from all backgrounds and walks of life are affected by decision making, and how they can engage and interact with city governments on those decisions.

Equity must be built both into crucial decision making and into how citizens are able to interact with local government and impact its decisions; a single parent working two jobs to feed their children and pay their rent is unlikely to be able to participate in in-person community meetings, while a retiree is more likely to be able to do so. By the same token, engagement methods mustn't be exclusionary based on access to technology or digital connectivity – cities must also ensure an analogue component to citizen outreach exists to be sure that they're being as inclusive as possible in gathering evidence ahead of making decisions.



Education and raising awareness is also a critical element to address on the road to more equitable and inclusive cities. Without extensive community outreach strategies as part of the solution to their most significant challenges, cities may struggle to deliver results. Such outreach can empower communities to take their own action, improve engagement and participation, push for better engagement techniques and methods from local government, and inspire social mobility.

Without a deliberate effort and conscientious push from city and local authorities to improve equity between communities, they will struggle to solve their most pressing issues and risk repeating the mistakes of the past, which have led to the opportunities that now exist to take much required and long-overdue action.



## Engaging on sustainability and environment

Cities on every continent and in every nation are faced with the reality that climate change has the potential to alter the way they operate permanently. As a result, they are now racing to take action to build resilience against the climate crisis and put in place climate action plans that seek to adapt to the crisis and mitigate its impacts.

Action is not incumbent on cities alone, however, as they seek to empower citizens to make a difference in how they contribute to a sustainable, green urban future. The ways that cities engage with citizens on these issues will determine how successful those efforts will be, with education on these key issues the critical factor in deciding the degree to which citizens will engage with them and be willing to take action.

As this report highlights elsewhere, driving towards an equitable future for cities is a top priority for many local governments today, and sustainability and climate issues are an important part of that. Information is a key ingredient in raising awareness of these issues and educating the public on how they're being impacted, even if on the face of the issue there doesn't appear to be a problem. For example, if a low-income or minority neighbourhood is made aware that the quality its drinking water is lower than in other parts of the city, that information can embolden citizens to take action and seek change.

The community approach is one that is already being taken in cities across the world to ensure that their transition to a more sustainable future is also equitable and inclusive. Looking back to Philadelphia, the city launched its first Environmental Justice Advisory Commission (EJAC) in February 2022, alongside a new inter-agency working group on environmental justice and a community resilience and environmental justice grant fund. The city's mayor, Jim Kenney, described these as "concrete steps towards addressing

the injustices of the past and creating a more resilient future."

Christine Knapp, the city's chief sustainability officer, told SmartCitiesWorld that the commission is "a body not just for the Office of Sustainability to engage with, but for other departments to access for feedback on policy setting as well." The launch of the commission followed Philadelphia's first community-led plan to address climate impact – the Beat the Heat Hunting Park Community Heat Relief Plan.

"We hear a lot about co-creation with community and this was one of our first major attempts at it. It's less policy-oriented and more programmatic; for instance, we're implementing green stormwater infrastructure and supporting tree planting and looking at setting up community resiliency hubs, too," said Knapp in an interview with SmartCitiesWorld in 2021.

"We've been able to replicate that in other areas of work, too, such as energy burden. Philadelphia has one of the highest energy burdens in the country, due in part to how old our city is. We actually stopped working on a policy that we were pursuing to address energy burden to speak to people in high-energy burden communities first."

This thinking is being replicated at varying scale in cities of all sizes, as evidenced by the city of Portland, Maine's efforts to keep society at the heart of sustainability efforts. Portland approaches sustainability using the "three-legged stool" model, encompassing environmental, economic and social sustainability. Troy Moon, the city's sustainability coordinator, says that the social aspect is the most important aspect for the way it impacts the other two.

"In the context of climate change, it's important that we highlight the situation to the community and make sure that we're



not leaving people behind," he says. "From a wellbeing perspective, we want to make sure that everybody in the community is benefiting from electrification and has access to cool spaces, whether that's through heat pumps in homes and offices or otherwise. We have been explicit in our climate action plan that we want everyone in our community to participate in civic life, regardless of race, ability, gender, identity, education, place of birth or income."

Elsewhere in the United States, the city of Boston's diversity team is keen to ensure that communities are engaged and can participate in environmental change, and seeks to use that to drive forward better decision making at city level. Environmental sustainability here goes beyond climate change, too; it must consider noise pollution, light pollution and how decisions on new projects and infrastructure changes might impact the urban landscape – especially for those in lower income and minority neighbourhoods.

Speaking at the end of 2021, the city's former diversity programmes and outreach director Winston Pierre (now employed by the Commonwealth of Massachusetts), told SmartCitiesWorld how engagement on these matters is a key part of upholding democracy in our cities: "It comes down to decision-making – who approved this, and how involved was

the community in the decision? In answering those questions, we move from talking about inclusion and diversity to people's participation in democracy. How do we give these people influence and put them closer to the heart of where these decisions are being made?"

### Actionable insights

Engagement on environment, sustainability and climate is now a crucial part of cities' outreach strategies – without it, we give rise to further discriminatory decision making of the sort that the other sections of this report seek to help minimise. Cities should:

- Look to build sustainability engagement and outreach into all new strategies to ensure that all environmental aspects are considered when rolling out new initiatives
- Ensure that departmental and financial resources are adequately allocated to deliver environmental equity
- Make the public aware of social initiatives that can improve liveability metrics related to sustainability, such as cooling centres or air conditioning funds

## Smarter engagement tools for smart, sustainable cities

By Laurence Kemball-Cook,  
founder and CEO, Pavegen

Emerging from the Covid-19 pandemic, it is easy to see how the make-up of our cities has changed. As cities continue to bounce back, the traditional hustle and bustle we associate with our urban centres is quieter than it was with a rebalancing of the population having taken place over the last couple of years as more people are working from home.

Cities need to pull people back into them – they need to be fun and engaging places that respond to the needs of their citizens. Aspects to city life like sustainability and environmentally-friendly transport are increasingly on the minds of citizens today. As a result, it's never been more important to engage citizens with the ESG agenda. Part of solving that puzzle now sits with city governments and municipalities as they rethink the role they must play in supporting the environment to attract people back. Our cities must work to redevelop their status as places of culture, intrigue and curiosity – places where people want to be.

The focus for cities must be on the future and delivering what future generations need and expect. One of the most important elements of that is sustainability; cities have to show that they're resilient, that they can become greener, and that they can be places

that actively encourage interactivity between leaders and communities.

It is critical for cities to allow the public to join them in their missions to shift to more sustainable operating models. Besides local elections and referendums, where people often feel little in common with the candidates, it can be difficult for communities to feel close to the most important issues facing their cities. Allowing people to be part of the solution is critical in having engaged, happy communities that share in cities' goals and objectives. Consider sustainability and climate change; the public could replace lighting in their homes with greener lightbulbs, but at a city level it is near impossible for them to participate in change using conventional technology.

### Stepping into change

Encouraging citizens to be part of the change they want to see is one of the most challenging aspects of the sustainability agenda for city leaders. Simplifying the way in which the public engage with these issues is critical, but so too is making engagement and education more interactive and less formal. Pavegen's technology begins to enable these changes with as little as a single footstep.

“Cities need to pull people back into them – they need to be fun and engaging places that respond to the needs of their citizens.”

The technology utilises smart flooring that generates kinetic energy to power installations which can be used to educate and engage the public. Using kinetic energy in installations supports sustainability agendas, while the installations themselves can be used to promote sustainability narratives – for example, featuring interactive multimedia and gamification.

Regardless of the use case, two things always remain constant with Pavegen's installations: they are bespoke, and participation begins with just a footstep. These are critical elements in delivering authentic and, above all, tangible awareness and engagement campaigns for both public and private sector organisations.

It's more important than ever to put climate, environment and sustainability issues front and centre – particularly for young people, whose futures rely on making the right decisions to tackle those issues today. Through Pavegen installations, organisations can boost awareness of their ESG agendas and campaigns and have people of all ages engage with them, providing a quantifiable connection to the challenge and presenting a solution.

### The sustainable, everyday

A good example of how to engage the public with sustainability messaging presented itself in Pavegen's work with IKEA. As one of the world's largest furniture manufacturers, the company allows its customers to recycle old IKEA furniture with them rather than sending it to landfill. The recycling scheme represents a huge commitment to sustainability from IKEA but represented a challenge when it came to educating the public on those efforts and engaging them with the project.

IKEA wanted to raise the profile of the investment they'd made in more sustainable operations and infrastructure and a Pavegen installation gave them the opportunity to do so in a way that would engage customers



with their story in a fun and interactive way. Pavegen created a dancefloor, set up at a store in Glasgow during 2021's COP26 summit, which when used generated energy to power and control a light display. The installation used gamification elements to challenge people to see how many lightbulbs they could power through their movement, and charging the bulbs in this way naturally contributed to IKEA's sustainability narrative.

The installation functioned as an education platform, too. As part of the game to power lightbulbs, people could see how much energy it would take to light an LED bulb as opposed to a traditional incandescent bulb, demonstrating how much more energy efficient the former is, and acting as a tool to show the difference that people can make by altering their behaviour – or, in this case, their purchasing decisions.

When we consider how to engage the public on important issues like sustainability, and how we encourage mindset change as a next step, simple examples like these will be key in demonstrating how much difference we can all make on an individual basis. A physical experience like this also helps to



create a memory that is far more prominent in somebody's mind than a form of screen-to-screen communication, which has been an important part of city engagement strategy in the last two years, and can help to start people on a path to sustainability in a different way.

### Shifting behaviours

Awareness is only half the battle, as evidenced by the IKEA work; the route to a greener and more sustainable world must also be paved with action and urgency. Changing public behaviour is a significant challenge – we are creatures of habit, after all – but one route toward transforming mindsets is via incentivisation.

In California, that's what BNP Paribas-owned Bank of the West has been doing in order to drive public sustainability interests forward. For example, if somebody wants a loan to buy a new car, the bank will offer them better interest rates to buy an electric car rather than one that runs on petrol or diesel. On a number of issues, the public will invariably vote with their pockets and sustainability is no exception, so providing financial value as well as ESG benefits will be a significant selling point for people.

Despite their work to put sustainability top of the agenda, Bank of the West had struggled to raise awareness of it with the wider public. Working with the bank, Pavegen wanted to put sustainability front and centre of the bank's communications with not just clients and potential clients, but also its employees.

This project saw us install our smart flooring at a number of sites like Bank of the West's retail stores and its HQ – even outside the Dolby Theatre on Hollywood Boulevard, which is perhaps one of the most-walked stretches of street in the world. At the point at which the users of the installations at each site had accumulated 100,000 steps, it would trigger a donation to local renewable energy projects to aid communities in need.

Outside the bank's HQ, the installation helped to trigger conversations about sustainability and climate among employees and brought a community of people together in a way that the bank would otherwise struggle to achieve.

For the general public, who perhaps didn't know about Bank of the West and its sustainability initiatives, the installation helped to raise awareness and gave them a sense of participation in the bank's mission to contribute to the sustainability agenda. Not only that, the installations across the west coast helped the bank to reconnect with customers and citizens, giving them the opportunity to engage and participate in something that brought them closer to the issues, as well as contribute positively to causes in their own communities.

### Capitalising on citizen engagement

Smart cities are only made smart by the people that live, work and play in them; engagement is the key to unlocking how those people participate in their communities. It's never been more imperative that cities make their citizens feel like they are part of change – not as though change is happening to them.

As cities have recognised the need for broader engagement with citizens and communities, Pavegen has been assessing how to achieve long-term engagement and behaviour change. Incentivisation is a crucial tool for cities and brands in this challenge and can lead to potentially permanent behavioural shifts – that's what led us to build Pavegen GO ENGAGE.

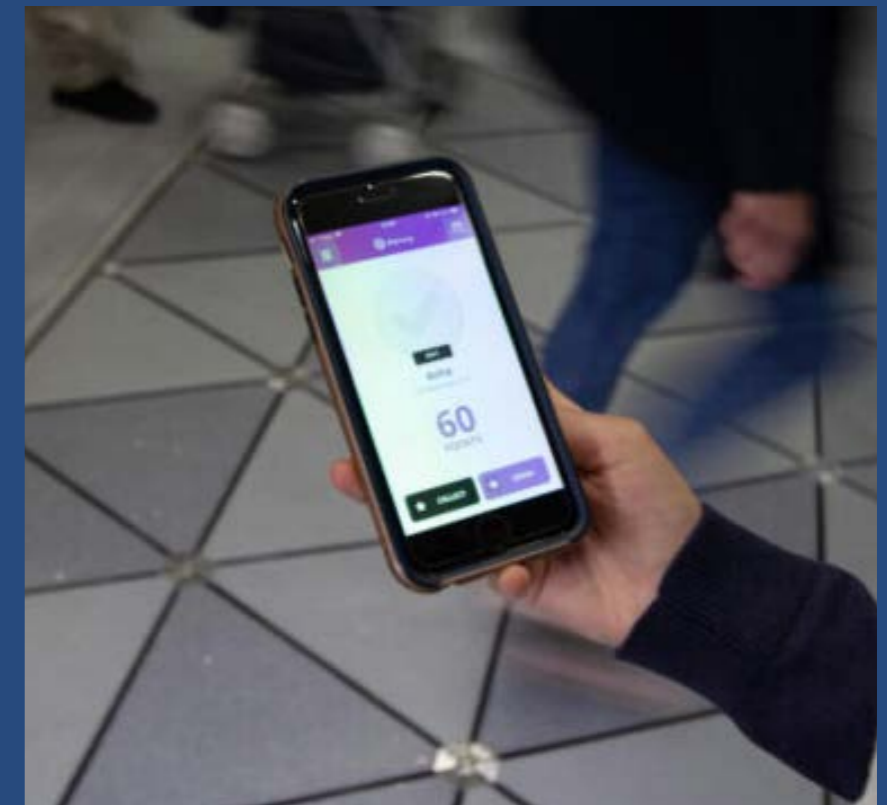
Pavegen GO ENGAGE is a social engagement tool to help inspire, educate and inform stakeholders around ESG and sustainability initiatives. The app-based platform rewards people for their positive community-based actions and provides experiential learning around key topics, enabling cities and brands to measure the impact of initiatives.

For example, if someone takes 10 steps at a Pavegen installation, what would happen if they were given the option to exchange those steps for a charitable donation, or a discount on their next cup of coffee? By building a fair exchange of value into positive action, we can improve dwell time and change the way that people behave and act in the built environment.

For cities and brands, the platform is going to enable them to learn more about their citizens and customers – for example, what attracts them, what keeps them engaged and what their habits are. Pavegen GO ENGAGE is designed to provide an authentic behaviour-altering experience for the public, and improve insights into what communities want for organisations across the city ecosystem.

### Find out more

Further information and reading on Pavegen's work with [IKEA](#) and [Bank of the West](#) is available online, along with several other case studies.



## Summary

### Further reading and resources

[Smart Cities: Key Technologies, Environmental Impact & Market Forecasts 2022-2026 – Juniper Research](#)

[Responsible AI Toolkit – PwC](#)

[Eleven projects to ensure a fair and inclusive digital transition and improve urban sustainability – City of Barcelona](#)

[Smart cities get their houses in order – SmartCitiesWorld](#)

[Digital exclusion and health inequalities – Good Things Foundation](#)

Creating greater inclusion and a fuller and safer experience for all citizens can seem a tall order for city leaders and administrators, when there are so many facets to consider, so many competing targets, when there is so much need, and when budgets and resources are finite. Yet the opportunities to share ideas and best practice have never been greater, and often the best guides to priorities are citizens themselves who are generally falling over themselves to give feedback and articulate their needs.

For elected officials, departmental heads, change managers and those specifically tasked with improving inclusion, an important starting point is the willingness to listen, network and borrow best practice. On top of this, there should be an openness to partner widely with charities and foundations, technology suppliers, other public sector services and more, with a view to creating agile, creative ecosystems in which each player can focus on what they do best – and apply what they've seen work well elsewhere. Time- and resource-wise, this is the most efficient way to drive pace and progress.

Any strong and effective plan has to be based on a solid understanding of the current status and the most pressing issues, which will dictate the roadmap and focus for planned change. Ensuring that local demographics are reflected appropriately within the city administration will help both by showing that those tasked with leading change mean business, and by minimising the risk of missing something critical. But there's no substitute for open dialogue with local communities, which begins with ensuring that the channels made available for those exchanges are open to, accessible for – and known about – by everyone.

Another important takeaway from the city initiatives discussed in this report is that citizens thrive and feel more 'seen' and included when they are connected with each other. So platforms and solutions that help people find each other, or which match needs and solutions, are a powerful way to enhance a sense of belonging, fulfilment and value.

Whatever the events of the last two years have done to disrupt and restrict people's lives, they have also spurred a new sense of urgency to deliver the digital transformation of service delivery. The challenge now is to translate this into benefits for everyone.

