

SMART CITY MIAMI

MAGAZINE



Biotech Impact Generated	
CO2 Absorption	188kg/year
Energy Generation	61Wh/day
Heat Reduction	-3.02 C
Water Saved	15.1L/year



SPECIAL EDITION

FUTURE-READY COMMUNITIES

INNOVATION & CHANGE

SUSTAINABLE GROWTH





RESILIENT INFRASTRUCTURE

CLIMATE ACTION

**BUILDING THE SMART CITY
ECOSYSTEM IN SOUTH FLORIDA**

We work with local, national and international actors offering a wide scope of news, research and events production to ensure sustainable solutions to the complex urban environmental issues that major cities are facing worldwide.

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Welcome,

I am delighted to share this special edition of *Smart City Miami Magazine*, brought to you by Smart Cities Americas LLC.

The theme of Smart City Expo Miami 2024 was “FUTURE-READY COMMUNITIES,” inspiring the launch of this exclusive issue. The event, now in its fifth year, garnered a global audience.

Attendees at the expo witnessed cutting-edge innovation firsthand. Sessions on Sustainable Growth, Climate Action, Resilient Infrastructure, and Quality of Life provided valuable insights on sustainable urban living.

Renowned experts in various fields delivered enlightening presentations, sharing concrete cases that deepened our understanding of city infrastructure and highlighted actions necessary to enhance citizens’ quality of life.

A year of collaboration with these experts in selecting topics, structuring content, and organizing presentations fostered a sense of camaraderie, forming a community dedicated to advancing city development and quality living standards.

The event featured a diverse lineup of award-winning and globally recognized speakers, leading authorities in urbanism and technology, underscoring the significance of Urban Planning, Climate Action, and Green Economy.

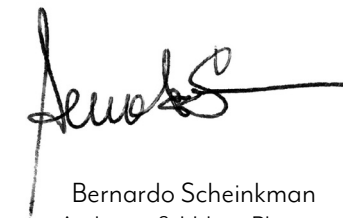
The outcome was the establishment of the leading sustainable community event in the United States, showcasing the collective efforts toward sustainable city development.

The immersive experience, impactful discussions, and networking opportunities empowered participants with practical and optimistic strategies for promoting climate action.

Representatives from cities, countries, technical bodies, NGOs, corporations, startups, and entrepreneurs joined together, fostering a collaborative environment.

Gratitude is extended to the speakers, participants, and supporting organizations for their contributions.

Special recognition is due to the Smart Cities Americas team for their professionalism and dedication, instrumental in the event’s success and the publication of this magazine.



Bernardo Scheinkman
Architect & Urban Planner
Founder & CEO, Smart Cities Americas LLC
Founder, CEO & Curator, Smart City Expo Miami

Bernardo Scheinkman
Founder & CEO, Smart Cities Americas
Miami, Florida

Architect and urbanist Bernardo Scheinkman is building South Florida’s smart city ecosystem and leading it through Smart Cities Americas, the platform for smart cities intelligence, trade shows, and conferences. He interacts with local, national, and international stakeholders to offer a wide range of news, research, and events through his organization that promote sustainable solutions for complex urban environments.

SMART CITY MIAMI

MAGAZINE

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SmartCityMiami.com

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SMART CITY EXPO MIAMI ADVISORY BOARD

The Smart City Expo Miami Advisory Board held its annual in-person meeting during the fifth edition of the event, held September 23-25, 2024 in Downtown Miami. The meeting highlighted the importance of curating themes for the expo, which provide attendees with a learning experience.

The event established itself as the leader in the U.S. in the theme of sustainable cities. This was made possible by the support of all award-winning speakers who presented the state of the art in their presentations.

The committee also selected six leading innovators who have made significant contributions to advancing sustainability at the community level for the expo's "Who's Who In Sustainability Award." They also discussed the strategy for putting together the upcoming sixth edition, including its theme, speaker selection, marketing work, and venue.



Smart City Expo Miami Ambassador
Dr. Gabriela Gerón Piñón, Founder, Connecting Iberoamérica

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SMART CITIES AMERICAS BUILDING SOUTH FLORIDA'S SMART CITY ECOSYSTEM

Smart Cities Americas is attracting leading smart cities companies to Miami that will generate \$40 billion revenue for South Florida businesses, while creating more than 20,000 new jobs in our region.

Smart Cities Americas is building South Florida's smart city ecosystem. Led by architect and urbanist Bernardo Scheinkman, it is the leading platform for smart cities intelligence, trade shows, and conferences. The organization interacts with local, national, and international stakeholders to offer a wide range of news, research, and events that promote sustainable solutions for complex urban environments.

According to Scheinkman, "A city is smart if its citizens are smart." Technology might immediately come to mind when people think of smart cities. However, technology is just a tool that enables modern urban areas. Smart Cities Americas believes in focusing on what citizens want and need from their government, and using new technologies to make the government work for them.

It is clear that businesses stand to gain from the smart city revolution. Global market research consulting firm Frost & Sullivan expects the market value of smart city opportunities to surpass \$2.4 trillion

by 2025. Technology spending comprises approximately 15% (\$327 billion) of this overall valuation. The remaining 85% is distributed across activities, including education, smart infrastructure, smart health care, smart energy, smart transportation, and smart building.

Smart Cities Americas is fostering a community around urban innovation. The organization unites smart cities stakeholders under one roof, from architects and urban planners to business leaders and cutting-edge technologists.

Miami continues to be validated as a top destination for developing new ideas and catalyzing innovation. Leading startups and venture capital firms are increasingly growing roots in the Magic City. Miami is home to innovative, environmentally conscious companies working in sectors as diverse as mobility, marine tech, and built infrastructure.

Equally, local government officials are tackling climate change head on. The City of Miami has committed to reach net zero carbon emissions by 2050, having set out an action plan for building a green

economy. Miami-Dade County even has the world's first Chief Heat Officer. And with its ongoing Sea Level Rise Strategy, Miami-Dade County is identifying and developing financially feasible mitigation and adaptation strategies to prepare for sea level rise and coastal storms.

Smart Cities Americas' flagship event is Smart City Expo Miami, which brings together some of the world's leading urban innovators under one roof. The 2022 brought award-winning and globally recognized experts to raise awareness on the importance of urban planning, climate action, and green economy.

Simultaneously, Smart Cities Americas is developing Miami's smart cities ecosystem through a handful of other initiatives. Its forthcoming news channel, **SmartCityMiami.com**, will highlight trends related to urban innovation and citizens' engagement in the process of building sustainable and resilient urban environments. Its streaming hub, CitiesHub.tv, will provide video content about the

Smart City Expo Miami and related media. Its Hack-a-Town program and CIURBE-Urban Innovation Lab will enable civic-minded technologists to maximize their impact.

With these and more initiatives already underway, Smart Cities Americas is attracting leading smart cities companies to Miami that will generate \$40 billion revenue for South Florida businesses while creating more than 20,000 new jobs in our region. And the best is yet to come.

Discover more about Smart Cities Americas' quest to put Miami on the map for smart city innovation by visiting **SmartCitiesAmericas.com**.

"A CITY IS SMART
IF ITS CITIZENS
ARE SMART."

— **BERNARDO SCHEINKMAN,**
FOUNDER & CEO,
SMART CITIES AMERICAS

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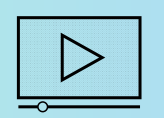
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Engage and Empower
Citizens, Communities & Cities



SMART CITY EXPO MIAMI

FUTURE-READY COMMUNITIES

September 23-25, 2024

Shaping the Future: The fifth edition of Smart City Expo Miami unites visionaries and innovators around future-ready communities

Smart City Expo Miami – Future-Ready Communities, held September 23-25, 2024, was a vibrant showcase of innovation and collaboration bringing together thought leaders, startups, government officials, and urban planners from around the world.

The event's theme, **Future-Ready Communities**, served as a springboard for discussions on how cities can evolve to meet the growing challenges of sustainability, equity, and rapid urbanization in the 21st century.

Over the last five years, Smart City Expo Miami has successfully brought together

the best minds in urbanism and technology with decision-makers—all in a single room and through a single platform.

Attendees were treated to a diverse range of presentations, panels, and networking opportunities that centered on the human element of smart city planning, emphasizing health, well-being, and the environment. From AI-powered urban solutions to new ideas on creating carbon-positive cities, the second day of the expo was an inspiring reminder of the possibilities that lie ahead when technology and people come together.

The cities experiences presented by


our speakers can be found in articles published in this edition of *Smart City Miami Magazine*, presenting city experiences covering, among others, the following topics: The Evolving Definition of Smart Cities, People-Centered Innovation, Designing for Human Resilience, Inclusion and Equity in Smart City Planning, A Key Focus on Sustainability and Resilience, Resilience and Climate Action, and AI and the Evolution of Urban Spaces.


In this fifth edition, Smart City Expo Miami stands out as the U.S.'s most cutting-edge global network for sustainable communities.

“THE IDEA BEHIND THESE TALKS IS THAT WE WANT OUR EXPO TO BE MORE THAN A MEET-AND-GREET BETWEEN COMPANIES, EXPERTS, AND PUBLIC SERVANTS IN THE SMART CITY SECTOR. WE WANT OUR AUDIENCE TO BE INSPIRED AND LEAVE WITH ACTIONABLE INSIGHTS.”


— **BERNARDO SCHEINKMAN, FOUNDER & CEO, SMART CITIES AMERICAS**


THE POWER OF SMART CITY EXPO MIAMI


 Award-winning and globally recognized experts.

 The best thinkers in urbanism and technology.


 Stimulate public and private partnerships in infrastructure.


 Encourage the use of circular economy.

 Promote educational activities.

 Engage with local communities in powerful ways.

 The place to connect the whole smart city ecosystem.

 Position Miami as a launchpad for innovation.

 Raise awareness on the importance of urban planning, climate action, and green economy.



INSIGHTS STAGE



SUSTAINABLE AWARD



MASTERCLASS



STARTUPS PLAYGROUND



ART GALLERY + MUSIC



NETWORK



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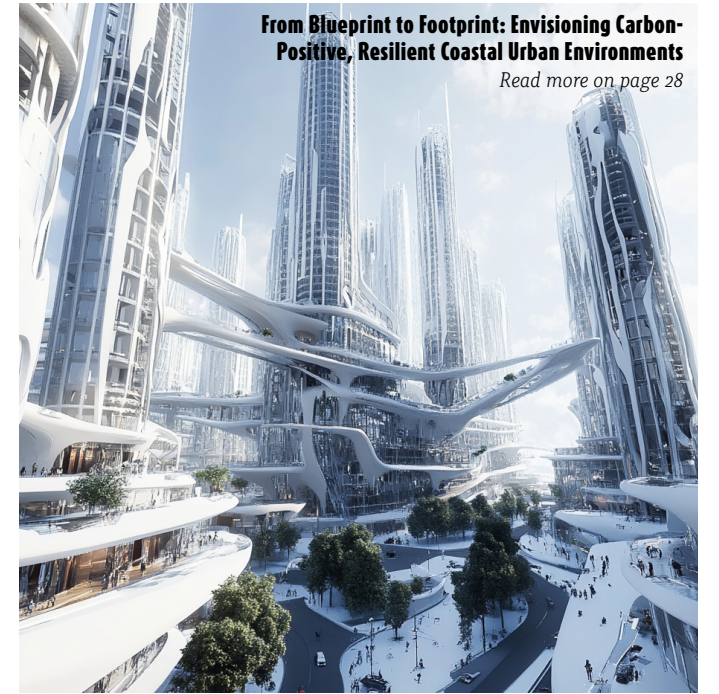
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Hello,

I am thrilled to welcome you to the fifth edition of *Smart City Miami Magazine*! This year, we embrace the theme of “Future-Ready Communities,” inspired by the vibrant presentations, discussions, and innovative ideas shared during Smart City Expo Miami, which took place in Downtown Miami September 23-25, 2024. This annual gathering brought together experts and visionaries from around the world to explore critical topics such as Innovation & Change, Climate Action, Sustainable Growth, Resilient Infrastructure, Quality of Life, and Inclusive & Sharing Cities.

The topics covered in this edition highlight the fact that building future-ready communities goes beyond implementing the latest technologies. While

innovation is critical, the true challenge lies in how we use these advancements to address real-world issues and enrich the lives of citizens. The articles also underscore the idea that preserving our cities (and the planet as a whole) is not simply the responsibility of elected leaders. Everyone—large corporations, small business owners, educators, architects, urban planners, community advocates, and everyday citizens like myself—plays a vital role. We all have the power to contribute to the future of our communities.

I hope this magazine inspires you to view your city—and cities around the globe—through a new lens and encourages you to take action to ensure it remains vibrant and livable for generations to come!

Sherri Balefsky Hanson

Sherri Balefsky Hanson
Editor & Creative Director
Smart City Miami Magazine

Visit SmartCityMiami.com for the latest updates, news, trends, and more regarding urban innovation and community engagement in building sustainable, resilient cities around the world.

WE NEED TO REDEFINE SMART CITIES

PRESENTATION BY PROF. DR. BRUNO LANVIN AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

As smart cities prepare to face new challenges and seize new opportunities, it is high time to prevent further backlash and offer a positive definition of smart cities.

For over two decades, smart cities have been instrumental in deploying real solutions to real problems. Energy consumption per inhabitant has decreased, traffic is better managed, and waste is disposed of in more efficient and eco-friendly ways while mobilities have been radically transformed. Over the last few years, however, some degree of backlash could be felt among urban leaders, urban planners, and, more importantly, citizens. In his 2019 book, *The Smart Enough City*, Ben Green warned, “Technology should be put in its place.” Since then, Google’s Sidewalk Labs’ high-tech project in Toronto has been replaced by the city’s own human-centric project, Quayside, after fears were expressed about the multiplication of sensors and video surveillance cameras. Similar debates arose during the Paris Olympics in 2024.

As smart cities prepare to face new challenges and seize new opportunities (both exemplified by AI, for instance), it is high time to prevent further backlash and offer a positive definition of smart cities.

Defining the Smart City of the Future (POSITIVE)

People-centric: The first impetus for designing smart cities was provided in the 1990s. At the time, a number of high-technology companies (including IBM) pushed the idea of “smart everything” (from grids to corporate organizations). Three decades later, the examples of the most successful smart cities around the world show that citizens expect more than sleek technological applications and devices. They expect real solutions to real problems. In the longer run, successful smart cities

will be those that show how technology can help solve human problems, not just problems created by other technologies.

Open (Attractive): Too often, smart cities have been considered as “closed environments” for which self-sufficiency could be a viable goal. Even in recent efforts to create smart cities ex nihilo (for example, in deserts or under-urbanized areas), this principle has been put forward. Here again, evidence shows that the most successful cities in history have been hubs for trade, investment, and culture. Smart cities will be no exception. To thrive, they need to attract investments, talents, tourists, and new ideas about what the future should be. They should be places where “engineered serendipity” can take place on a daily basis.

Sustainable: Climate change mitigation is a priority for mankind. In the next 25 years, 3 billion people (mostly from emerging economies) will be living in cities. If those cities are not smart enough, this trend will diminish our collective ability to make this planet more livable and restore the appropriate balance between growth and sustainability. However, addressing sustainability only from an environmental point of view will not help; smart cities

have a unique role to play in showing how technology, innovation, and human-centricity can generate economic, social, political, and environmental sustainability.

Inclusive: Cities have traditionally been the places where cultures, ideas, and techniques converge and combine. Globalization has contributed to reduced distances among people, nations, and cities. In that process, traditional values of tolerance and support for minorities have been challenged. Smart cities have the power (and the duty) to rejuvenate our collective ability to fully integrate minorities and other less-protected groups. Imaginative and effective policies around diversity, gender balance, and making cities more friendly to the disabled and elderly remain needed in many cities around the world. Smart cities can show the way.

Tech-Savvy: Being human-centric does not mean being technophobic. Clearly, smart cities are the ideal testbeds for some of the most advanced technological innovations the world can offer. They can also be the ideal places to provide the necessary “reality check” that their wide social adoption will require. Here again, starting from the concerns and expectations of citizens will be the healthy way

“SUCCESSFUL SMART CITIES WILL BE THOSE THAT SHOW HOW TECHNOLOGY CAN HELP SOLVE HUMAN PROBLEMS, NOT JUST PROBLEMS CREATED BY OTHER TECHNOLOGIES.”



to prevent the blossoming of the thousand flowers of “solutions in search of a problem.” Current debates on video surveillance, for example, or on the governance of AI, are perfect examples of spaces where the voice of smart cities needs to be heard.

Innovative: There are many ways to be smart. But being smart is always being innovative, in one way or another. Smart cities can spearhead new ways of thinking, designing, and governing communities. This means that they need to consider that innovation is not just technological innovation; being socially, politically, and organizationally innovative will allow smart cities to “act out of the box” and offer new models for the future. Successful smart cities will also often be innovation hubs (clusters), and developing their own innovation districts will be a factor of success.

Versatile: One-dimensional smart

cities are bound to fail. Examples abound in history of cities that went brutally from prosperity to ruin because they specialized in one specific product or production factor (coal, steel, automobiles). In a world characterized by increased unpredictability, smart cities will need to develop their ability to adapt rapidly to future challenges and be agile enough to seize new opportunities when they arise. Growing, attracting, and retaining the right talents will be a vital asset in this regard. As online collaboration increases the ability of workers to contribute anywhere from anywhere, cities that are livable, safe, and fertile in terms of networking and career opportunities will be ahead of the competition.

Excellent (Brand): Last but not least, smart cities will be competing globally with each other. As investments, talents, and technologies continue to flow rapidly from

one location to another, excellence will guide arbitrations between one smart city rather than another. Offering unique combinations of advantages will need to be accompanied by strong and imaginative branding strategies. Globally competitive smart cities will be the ones that can gain instant name recognition and acquire an aura of “the place to be” or “the place to operate from.” Hosting major universities, research hubs, or global organizations will be part of this effort, as will be the hosting of world-resounding events in sports, culture, or entertainment.

Articulating a strategy that includes and combines all of these eight elements will constitute a healthy basis for tomorrow’s smart cities. It may also be the best safeguard we can build against another wave of smart city backlash and generate a positive state of mind inside and around smart cities in all parts of the world.



Prof. Dr. Bruno Lanvin
President, Smart City Observatory
Lausanne, Switzerland

Bruno Lanvin is the president of IMD’s Smart City Observatory and a Distinguished Fellow at INSEAD. He is the co-founder and co-author of four of the most widely used global indices on technology (Network Readiness Index), innovation (Global Innovation Index), talent (Global Talent Competitiveness Index), and Smart Cities (Smart City Index). He is also the author of the Future Readiness Economic Index Report (FREI). He is co-founder and advisor of Portulans Institute, a think tank based in Washington, D.C. He is the founder and president of DL Partners, a Geneva-based consultancy, and of Descartes Institute, a think tank also based in Geneva.

SHAPING FUTURE COMMUNITIES WITH AI

WRITTEN BY EDITORIAL STAFF | PRESENTATION BY PROF. DR. JONATHAN REICHENTAL AT SMART CITY EXPO MIAMI

As AI technology rapidly advances, it's reshaping how cities operate and adapt. From enhancing citizen engagement to tackling complex urban challenges, AI is driving transformative changes across industries and public services. By proactively preparing for these shifts, cities can leverage AI's potential to create more efficient, sustainable, and responsive communities.

Al is evolving at an incredible pace, so it's essential to frequently update our understanding of its impact, particularly on cities and communities. AI has already been a part of our daily lives for years, from using credit cards to email, but the rise of generative AI in October 2022 brought a new level of awareness. Whether you're a city planner, an architect, a doctor, or a pilot, AI is affecting your work and will increasingly do so in the years ahead.

We're in a period of great change, comparable to the industrial revolutions of the past. The Fourth Industrial Revolution is marked by digital transformation, with AI playing a critical role. The more prepared cities are for these changes, the better they will adapt and thrive.

AI in Cities

Currently, about 50% of U.S. organizations are using generative AI in some capacity, up from just single digits a year or two ago. By 2025, it's expected that nearly every organization will be involved with AI. While some businesses may not be officially incorporating AI yet, over 75% of employees are bringing AI tools into their workflow (BYOAI). These numbers will rise as AI becomes a crucial part of how we work.

AI is augmenting our abilities, which is why many prefer the term "augmented intelligence" over "artificial intelligence." People use it to create content, design graphics, make presentations, and analyze data. AI adds a layer of capability previously unavailable, improving efficiency

across industries.

Cities, as central hubs of economic activity, are also adopting AI at an increasing rate. Currently, 72% of cities are testing or implementing generative AI, and by next year, this number will be 100%. Today, cities primarily use AI for data analysis, citizen assistance, and content creation.

The most common use of AI in cities is for customer service, particularly chatbots. These tools are becoming more useful, and soon, the difference between speaking to a chatbot and a person will be indistinguishable. Companies like Citibot.io are leading the charge in creating effective AI-driven tools for municipal governments.

Despite concerns about AI generating

false results, known as "hallucinations," platforms like Citibot reduce the chances by focusing on local content. AI solutions such as Legislate are streamlining administrative tasks by drafting legislation and proclamations, helping city officials work faster and more efficiently.

The Atlas of Urban AI tracks over 220 AI implementations across various sectors. One of the primary goals of cities is to use AI to enhance community engagement and make policymaking more responsive and efficient.

Future Opportunities and Challenges

Creative tasks, like writing first drafts and generating artwork, are prime areas for AI



Prof. Dr. Jonathan Reichental at Smart City Expo Miami 2024



Prof. Dr. Jonathan Reichental
CEO, Human Future
San Francisco, California

Jonathan Reichental is a multiple award-winning technology and business leader whose career has spanned both the private and public sectors. He's been a Senior Software Engineering Manager, a Director of Technology Innovation, and served as Chief Information Officer for O'Reilly Media and the City of Palo Alto. Reichental is currently the founder of advisory, investment, and education firm Human Future and also creates online education for LinkedIn Learning. He has written five books on the future of cities: *Smart Cities for Dummies*, *Data Governance for Dummies*, *Exploring Smart Cities Activity Book for Kids*, *Exploring Cities Bedtime Rhymes*, and *Cryptocurrency QuickStart Guide*.

augmentation. However, AI is not yet ready for social or physical tasks, though this will likely change by 2025 with advancements in robotics. AI-powered robots will assist in homes, factories, and cities, integrating AI into physical labor.

One of the top priorities for cities is transportation. Self-driving vehicles, powered by AI, will radically transform urban mobility. In places like San Francisco, autonomous cars are already a reality with services like Waymo, and this technology will soon spread to other cities.

AI also holds promise for addressing environmental and climate challenges. AI solutions are being used to monitor urban environments, enforce traffic laws, and improve public safety, as seen with Hayden.ai's implementation of sensors on public vehicles in New York City.

In the future, human driving may be

outlawed due to the dangers it poses compared to AI-driven vehicles, which are much safer and more efficient. As self-driving cars become widespread, cities will be designed differently, with AI shaping urban infrastructure and transit systems.

Preparing for AI Adoption

Cities and organizations need to prepare for the AI revolution by training employees. Many workers lack the necessary skills to leverage AI effectively, so training is essential. Leadership plays a crucial role in guiding AI adoption, and a lack of awareness at the leadership level can be a significant barrier to progress.

Policies must also evolve to govern AI usage, particularly concerning issues like public records and AI-generated "hallucinations." Experimentation with AI tools is necessary, but public sector

risk-aversion often hinders innovation. City managers need to create safe spaces for experimentation to encourage AI-driven improvements.

Once the groundwork is laid, cities must move forward with AI deployment. The challenges faced by cities—transportation, environmental sustainability, and public safety—are immense, and AI offers the best tools to address them.

Conclusion

The impact of AI on our communities will be profound, and we are only scratching the surface of what's possible. While some may worry that AI is being overhyped, the reality is that its transformative potential is likely underestimated. For cities to thrive in the future, they must embrace AI, prepare for its challenges, and integrate it into every aspect of urban life.

UNLOCKING THE METAVERSE: SINGULARITY AND THE FUTURE OF URBAN ENVIRONMENTS

PRESENTATION BY PAUL DOHERTY AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

Smart cities, digital twins, and the metaverse are redefining our relationship with the built environment and urban spaces, enhancing sustainability, connectivity, and human experiences while addressing the complex needs of modern communities.

I began my journey of curiosity studying architecture and became a New York-licensed architect in 1994. What always fascinated me was how many of us focus on one building when that project has such ramifications for neighboring buildings, traffic, people in the neighborhood, and the city as a whole. I never went through formal urban planning education, but I learned it by being immersed in urban projects throughout my career. Street smarts and enough formal architecture training provided me with the tools to continue my journey.

While in architecture school, I was given the opportunity to enter a work/study program. I chose to work with IBM, which at the time was the largest information technology company in the world. I designed and fabricated booths for trade shows like Comdex and PC Expo. To properly design and showcase IBM technologies, I was partnered with the world's best system engineers and computer engineers. I became an expert in AS400, RS600, PS2 Desktop Computers, Token Ring Networks, and OS2 Operating Systems, all IBM products. I also had to learn IBM's partner companies' hardware and software to show how they were used in a showroom/showcase environment. These partners included startup companies like Microsoft, Adobe, Lotus, Citrix, Norton, Intuit, and McAfee. With this experience, I was always intrigued by why buildings could not be like computers. IBM was a leader in that industry because it knew how to fit together other equipment manufacturers' (OEM) products into a singular unit called. I know it's more complicated than that, but to me, IBM put

together other people's work and productized it—not too far from an analogy of a building. An architect designs “the product”; the general contractor delivers the product (in this case, a building).

So, I have asked myself for decades, why can't a building be a computer?

Embedding the OEM components and properly placing them into a building provides the foundation of a fourth utility of a building. Electrical, plumbing, and mechanical are the three primary utilities of today's buildings. Can information communication technology (ICT) be the fourth utility where every building becomes a new form of computer?

I am seeing this vision become a reality with the work my company is performing today. Our work involves designing and delivering manufactured buildings that bring the reality of the building as a computer to life. Moving from just one building to a cluster of buildings as computers, we are at the threshold of connecting these smart buildings to each other as a community that works as an internet of buildings. Efficiencies with safety, security, water, and entertainment are just being discovered in real-world metrics.

Our existence as a species depends on four fundamentals: clean air, clean water, safe food, and shelter. The nobility of providing shelter for the human race drives the passion behind smart cities and, in turn, healthy urban environments for humanity to survive and thrive. With this foundation, the Qingdao International Virtual Reality Industrial Park (VRIP) in Qingdao, China, is an amazing example of challenging the

definitions of time and space while inspiring our existence through the use of a metaverse, sometimes described as a digital twin. Using my 1996 book *Cyberplaces: An Internet Guide for Architects, Engineers and Contractors* as a foundation, the VRIP metaverse is being created to assist in the following: increase accuracy and confidence in design and construction documentation; increase trust and authenticity in the digital data meant for facility management and operations of buildings and infrastructure; provide a construct of a bidirectional communication and relationship between the physical world and its digital equivalent; and deliver new and ever-evolving environments for experiences for people who live, work, play, and learn in the VRIP.

The VRIP uses a heterarchy as its basis of design. A heterarchy is a system of systems that identifies each system as a horizontal layer that is connected by a vertical ontology. This ontology for the VRIP is our metaverse, our digital twin. All VRIP capital assets have information technology as a fourth utility. This allows all buildings and infrastructure to have archived and live data run through its structures. When linked together, these assets create the internet of buildings that operates in a mixed reality environment. This blurs the lines between the physical and digital worlds. This inspired collision creates the opportunity for a safer, more secure, and healthier urban environment. To provide a higher value for VRIP's physical and digital assets, all digital assets will be on the blockchain. Most of these digital assets will be secured through a fungible token (FT) that will tie intrinsically

to the physical asset's value, providing a shareholder-style relationship between the physical asset, the digital asset, and the shareholder. Securitizing digital real estate through the connection to physical real estate provides a whole new era of time, space, and existence never available before now.

Upon delivery, the Qingdao VRIP will have three main roles: virtual, augmented, and extended reality (VR/AR/XR) research and development (including an incubator for startup companies); a VR/AR/XR theme park (education through entertainment); and a gateway for foreign VR/AR/XR hardware, software, and content companies to locate their regional headquarters to Qingdao, creating a strong global community of innovation and an example to inspire the human condition.

The introduction of new technologies into the built environment and its professions are fraught with the challenges of hype, limited adoption, and, in some cases, indifference. In some cases, there is a trend that new technologies are showing signs of adoption but need guidance, education, and sound strategies in order to become valuable to the built environment industries and professions. A first step in the education and communication process is to define the numerous elements that are affecting our built environment. The following definitions are a snapshot from this moment, a foundation to build upon, and are meant to be revisited and challenged as we learn, fail, succeed, and adapt to our ever-changing world of the intersection of the physical and digital worlds.

Metaverse

William Gibson's quasi-prophetic vision of cyberspace as a “consensual hallucination” manifests itself in the emerging definition of the metaverse. Our company describes metaverse as an analogy to outer space. There is no “there” there. It is a digital immersive environment that has the



Paul Doherty at Smart City Expo Miami 2024

equivalent of galaxies, solar systems, and planets (virtual worlds) that provide a sense of place. The term “metaverse” originated in the 1992 science fiction novel *Snow Crash* as a portmanteau of “meta” and “universe.” Metaverse development is often linked to advancing VR technology due to the increasing demands for immersion. Recent interest in metaverse development is influenced by Web3, a concept for a decentralized iteration of the internet. Information privacy, user addiction, and safety are concerns within the metaverse, stemming from challenges in the social media and video game industries.

At its core, the metaverse is a spatial computing platform providing digital experiences as an alternative or replica of the real world. It integrates aspects like economy, property ownership, and social interactions, supported by blockchain. The metaverse enables real-time interactions across distances. A vast ecosystem of online applications is emerging to build these interactions.

The road ahead for smart cities is limitless, but I hope the term “smart cities” evolves

into simply “cities.” These high-performing urban environments must inspire, delight, and respond to human aspirations while avoiding restrictive technologies that could enable surveillance or suppression.

The promise of smart cities lies in improving human life, not creating dystopian futures. These cities must balance aspirations with practical realities. Designing for the human condition—accepting emotions, biases, and diversity—requires careful consideration. I've learned that utopia doesn't exist, but we can design healthier, livable, and sustainable cities.

Delivering smart cities is a challenge requiring solutions for emerging problems. For instance, do we need street curbs in the age of autonomous vehicles? Or street grids? Who manages dynamic EV charging infrastructure embedded in roads?

The concept of smart cities is emerging, and conversations like this are vital to refining it. I'm humbled to help plan, design, and deliver these projects, and I invite others to join in shaping our shared future. Humanity's fate depends on our collective response to these challenges.



Paul Doherty
CEO, The Digit Group
Singapore

Paul Doherty is a globally renowned and award-winning architect who is one of the world's most sought-after thought leaders, strategists, and integrators of process, technology, and business. As seen in *The Wall Street Journal*, Bloomberg TV, acknowledged by CNBC as one of “America's Business Titans,” and reported by *Forbes* as “Changing the World,” Doherty is a Senior Fellow of the Design Futures Council and a Fellow of the International Facility Management Association (IFMA). Doherty's current work is as Chairman of TDG Global Ventures, a Smart City real estate development company that provides impact investment, design-build and innovative technology solutions around the world.

AI AS CITIES TIME MANAGER

PRESENTATION BY PROF. DR. JOSÉ A. ONDIVIELA AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

The complex interplay between time and urban life reveals how our perceptions and experiences shape city dynamics. The transformative potential of artificial intelligence plays a crucial role in optimizing urban efficiency and enhancing citizen engagement in modern cities.

The city is a complex and dynamic setting, where multiple social, cultural, economic, and political dimensions intersect. One of these dimensions is temporal, which refers to the way in which individuals and groups perceive, experience, and organize time in an urban space. Urban temporality is not something fixed or homogeneous; it varies according to the contexts, practices, and representations of social actors. Thus, the city can be seen as a set of diverse times, sometimes complementary and sometimes contradictory, which shape the experience and identity of its inhabitants.

Ancient Greeks used three different concepts of time: Chronos, Kairos, and Aion.

Chronos is the time as an arrow, as we understand it, in an unstoppable flow forward (Future) to show in front of us (Present) to go onward and become knowledgeable (Past). Kairos is the moment, the experience, the sensation. Our modern life frequently tries to create this kind of time as a feeling, a well-being emotion enjoying the situation. Aion shows in everything we do through a cycle (history repeats, day/night, circadian cycles or customs, traditions).

City and time play/dance together in an endless motion. Each one tries to control/set the scene, with time forcing the movement and city creating timeless places and building history to remember, to build city identity, making time pass slower, with a relativistic effect. Time materializes on cities as history. History is cosmopolitan (Kant). As everything human is not alien to cities (Terence), all social (human) activities happen in cities, with cities using that to slow down time, with an Aion effect, as history builds and destroys cities in a dynamic eternal effect.

Cities show a new space-time equation. Distance in cities is no longer measured

in km/miles but in time—time that must be reduced, as we increase the speed and acceleration on everything we do in cities (with the help of technology). This has a twofold effect: A faster city means time slows down, then we have a decreased perception of time. Time is mainly an experience of our consciousness. And a second effect: Technology helps cities improve the efficiency and speed of urban mobility, and that means that the size of our metropolitan area expands (not the one in the maps or in the physical boundaries, but the human, the psychological association to a metropolitan area). Then, the city expands as time shortens. In other words, less time to get there means a larger expanded metro area.

If we consider it a perception of our consciousness, time flows at different speeds in different cities. In a test, walking the same one mile at the same speed in Venice, Italy, or on Fifth Avenue in New York City created very different perceptions: one, slow motion, beauty; another, stress, but creativeness and competitiveness stimulation.

Time should be considered another human right—the right to spend eight hours resting, eight working, and eight on what you like (not wasted on traffic to go from A to B or on other waiting queues). Time is a main component of our integral health, and time has obviously an economic impact. So, most city services (and mainly based on AI) are trying to save us time, from core technology (speed of processing, AI to reduce time to find information or to reach an answer, time to compute/process data, assistants, co-pilots, time in communications, latency) to any specific service (procurement and administrative services, water services, energy services, traffic and urban mobility, national defense, public safety and cybersecurity, emergency services (responsive time for health, natural disasters, or human crime) to predict, simulate, and anticipate the future (main human desire).

And the technology? Digital twins. With an AI-based digital twin, we can predict the future (utilize digital twin technology to forecast future events), simulate scenarios (create virtual models to test different



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scenarios), and anticipate outcomes (analyze data to foresee potential outcomes).

A city council's digital transformation plan can take advantage of the latest technologies (especially artificial intelligence) to develop a more inclusive, efficient, sustainable, innovative, and attractive city for talent and investment.

So, AI has become the time manager in our cities' digital transformation plans at the four main pillars: civil servants, citizens, the physical city, and the social city.

- **Civil Servants:** Boosting efficiency in administrative management (with new collaboration tools and internal assistants) becomes more creative and less communicative; more new documents and fewer emails received/sent; less time completing a task, finding information, and understanding documents; hybrid working model.
- **Citizens:** Enjoy their own time. Improving communication and electronic service to citizens (single platform of services and applications, chatbot virtual assistants, improved call centers, better personalized services, etc.).
- **City Things (Physical):** Prediction. Simulation. Managing the urban physical environment (generating an accurate

inventory that serves as a basis for the construction of digital twins to optimize operations and decision-making); digital twin to run simulations and virtually test alternatives to any physical problem (traffic, energy, water, pollution, safety, urban planning, tourism); complex AI algorithms to manage the complexities of traffic and mobility.

- **Social Digital Twin:** Understand/react to human behavior/needs. Better understanding of our citizens' social and human environment (detecting needs by neighborhood and situations of vulnerability). Create monitoring systems based on IoT combined with neural networks generated patrons of behavior to analyze activities, movements, or alerts, monitoring people at home with respect and no intrusion.

In addition, the use of advanced models based on metaverse technologies to optimize interaction with citizens represents a line of exploration and incorporation of new technologies as they become consolidated.

So, AI is our main ally to save time in our daily interactions with the city, our movements, and our digital life (transactions, data usage, conversations) and our main tool to try predicting the future and prepare for it.



**Prof. Dr. José A. Ondiviela at
 Smart City Expo Miami 2024**

“THE CITY CAN BE SEEN AS A SET OF DIVERSE TIMES, SOMETIMES COMPLEMENTARY AND SOMETIMES CONTRADICTORY, WHICH SHAPE THE EXPERIENCE AND IDENTITY OF ITS INHABITANTS.”

A DATA-DRIVEN FUTURE FOR CITY PROSPERITY

PRESENTATION BY DR. PATRICIA MCCARNEY AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

By implementing the ISO 37120 Series, the World Council on City Data (WCCD) enables cities to benchmark performance, attract investment, and make data-driven improvements across services, quality of life, smart technology, and ESG standards.

While working in Washington at the World Bank, Dr. Patricia McCarney noticed a critical issue: Although cities have collected significant amounts of data and measured many of the same indicators, the definitions, methodologies, and boundaries of cities used to measure the data varied greatly across cities in any one country and across the globe.

Without standardized data to make clear comparisons, cities struggled to identify best practices, measure progress, and make improvements in critical areas like emergency response, infrastructure, and public services.

To address this issue, Dr. McCarney set out to build standardized data for cities. She and her team, working with cities worldwide, developed indicators on city services and quality of life, with standardized definitions and measures, and according to the administrative boundaries of the city for which the mayor and city council are responsible.

The Creation of ISO 37120

In 2012, Dr. McCarney and her team presented over 100 key performance indicators (KPIs) to ISO. However, the concept was initially met with hesitation. Up to that point, ISO had never considered working with standardized city data for cities.

However, two months later, Dr. McCarney received a call from ISO about her idea to measure and standardize data for cities around the world. “Would you like to come back and discuss this idea?

Japan and France are interested,” the ISO representative said.

And so, Dr. McCarney worked with the ISO community to establish a technical committee at ISO and a special Working Group on city indicators, which she still convenes today. As of 2014, the first-ever ISO Standard on city data was published by ISO in Geneva, *ISO 37120 – Sustainable Cities and Communities – Indicators for City Services and Quality of Life*.

On the same day, Dr. McCarney founded the WCCD in Toronto to help cities implement the standard. She and her team established a certification and audit protocol and third-party verification process, helping cities understand how to fine-tune the data they were already measuring to meet the standard’s definitions and methodologies.

The WCCD quickly gained momentum, with ISO 37120’s rollout beginning with major cities like Dubai, Toronto, Shanghai, London, Boston, and Los Angeles. This initial cohort of 20 “Foundation Cities” inspired other cities to join the WCCD network, and the rest is history. Today, the WCCD, with over 100 cities across 40 countries, is making globally comparable city data accessible to city leaders and stakeholders.

Following the success of ISO 37120, the WCCD team has expanded the ISO 37120 Series to include two additional standards.

The first of these is *ISO 37122 – Indicators for Smart Cities*. Cities can use ISO 37122 indicators to measure the effectiveness of their smart technologies (think: energy consumption and traffic management) and

work toward smarter, more sustainable urban living.

The second is *ISO 37123 – Indicators for Resilient Cities*. Developed in collaboration with the United Nations Disaster Risk Reduction Agency (UNDRR)—the UN body in Geneva responsible for resilience—this standard can be used to assess risk and track data on emergency response, infrastructure resilience, and disaster recovery. Aligned with the Sendai Framework, ISO 37123 enables cities to plan for and mitigate the impacts of floods, fires, and other extreme weather events.

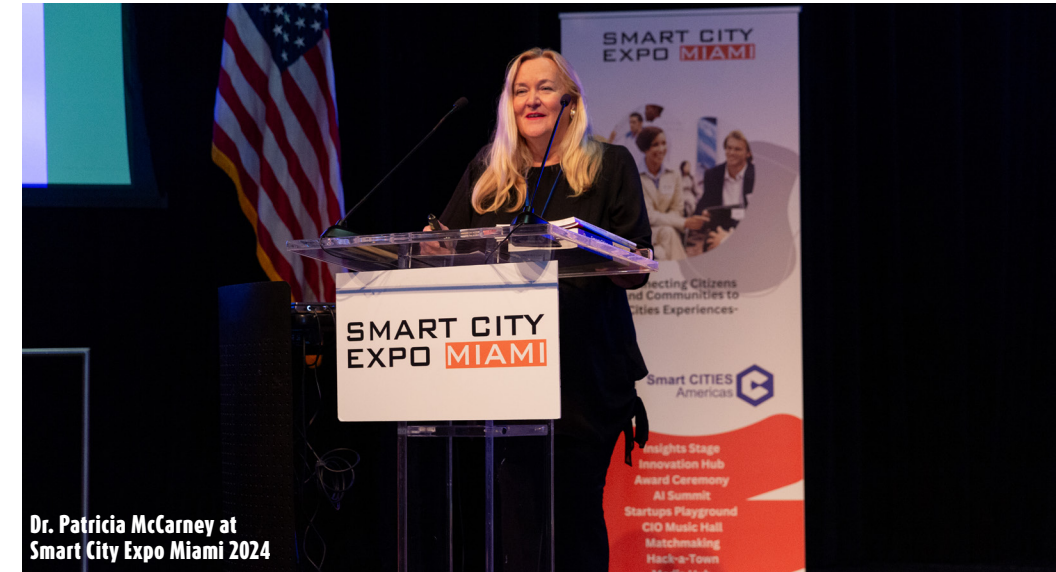
These three international standards are now globally referred to as the ISO 37120 Series.

How Have Cities Been Using the ISO 37120 Series?

Cities in the WCCD network have been using ISO 37120 Series-verified data for economic development—specifically, to attract investment to cities and build more prosperous futures.

This approach has yielded tangible outcomes. In one instance, Dr. McCarney used comparative data to show a mayor his city’s ranking in health care infrastructure. After realizing that his city ranked near the bottom on the number of hospital beds per 100,000 people, considering his similar-sized peer cities, the mayor went to senior levels of government to leverage funds for a new hospital, which successfully opened during the COVID crisis.

The WCCD has also established a visualization portal where cities can track their data trends over time and benchmark



Dr. Patricia McCarney at Smart City Expo Miami 2024

against other cities globally. This resource can help cities with strategic planning initiatives, such as “how to make our city greener” or “how to make our city safer.” The WCCD also has tracking tools to help cities implant data into their strategic planning goals and achievements.

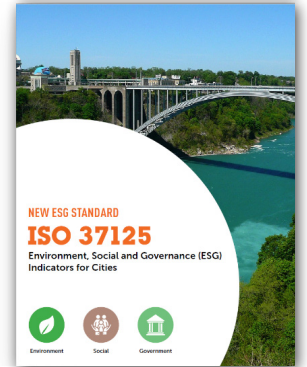
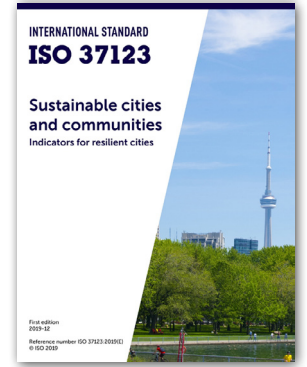
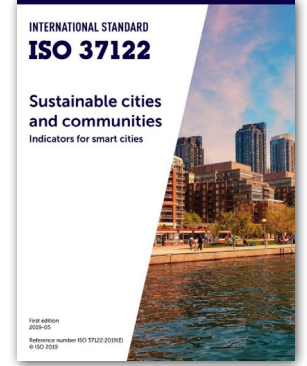
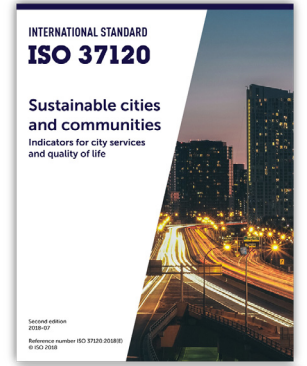
At the end of the certification process, once the team has supported cities from start to finish on the data certification process, the WCCD provides cities with what they call a “Data-Driven Insights” report, a comprehensive comparative analysis mapped to the UN Sustainable Development Goals (SDGs). Cities can group comparisons by peer cities, enabling leaders to assess and communicate their progress, including improvements made over the course of their strategic goals. These insights empower city leaders with actionable data to guide policy and enhance public services.

A New Standard: ISO 37125 – Sustainable Cities and Communities

Besides expanding the WCCD network, Dr. McCarney has also established a new company, Standardized Urban Metrics (SUM), to launch a new international standard, another global

first, to build data on Environmental, Social, and Governance (ESG). The publication of the standard was announced on November 1, 2024, at the Toronto City Hall Council Chambers. This was the Global Launch Event to announce *ISO 37125 – Environmental, Social and Governance (ESG) Data for Cities* and the inaugural global cohort of the World Premiere Cities and Regions, the first adopters of the standard. Once again, and with the support of the Standards Council of Canada, SUM has developed a detailed certification protocol to ensure data is of the highest caliber, third-party verified, and trusted. It is now certifying cities across the globe, fortifying their ESG data.

A global first, ISO 37125 fills the critical gap in the ESG global ecosystem: trusted, third-party verified, and globally standardized data. By adopting ISO 37125, cities and regions can measure and track progress across key ESG dimensions. They can also use ISO 37125-verified data to develop a robust data-informed Annual ESG Profile Report, which can attract investment by showcasing their strong commitment to the key ESG principles of environmental sustainability, social inclusion, and responsible governance.



Dr. Patricia McCarney
President & CEO, World Council on City Data
Toronto, Canada

Patricia McCarney is the President and CEO of the World Council on City Data (WCCD) and Director of Standardized Urban Metrics (SUM). She is a professor of political science at the University of Toronto, where she also served as Associate Vice President for International Research and Development. She received her Ph.D. from MIT in international development and city planning and worked as a professional staff member in several international agencies, including the World Bank and UN-Habitat. She is currently the core partner to the UN program, Making Cities Resilient – a Strategy and Vision for 2030 (MCR 2030) and serves on the Mayor of Toronto’s Economic Advisory Committee.

DESIGNING FOR HUMAN RESILIENCE

PRESENTATION BY ANGELA MAZZI AND MEGAN MAZZOCCO AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

We often think about resilience through a lens of environment and property loss prevention. However, the resilience of the human is equally important. How can we maintain our health and well-being? Here are some best practices.

Resilience is about the ability to recover from a stressor, whether it comes from the environment or socioeconomic conditions. That recovery is impeded when those conditions, known as the exposome, are toxic or adverse. At the core, our mind, body, and spirit perceive this as threatening and, therefore, unsafe. In fact, the physiological response to feeling unsafe occurs before we are even consciously aware of a situation. Let's take a look at what makes up the exposome.

Stimuli in the physical environment are perceived and received via the five senses. Incoming data is filtered by a brain function known as the salience network. This is why we are only consciously aware of a very small fraction of what our senses perceive; however, our well-being and sense of safety are being impacted. While undetected by conscious perception, 80% of the information the nervous system receives comes from the physical body, so if something is off physically, like your shoes are too tight—or, in the case of a city, too loud, too smelly, too bright, too hot—it activates a vigilance response, and the brain starts scanning for what is making the body's nervous system uncomfortable. Think about how the following environmental conditions (most of which we pay little or no attention) are impacting you:

- Climate expectations
- Light pollution
- Noise pollution
- Air pollution
- Smell and productivity

The other half of the exposome is comprised of socioeconomic factors. Our social resilience can provide us with the resources to cope with many hardships. Socioeconomic factors that can create adverse health are:

- Level of social connection and safety (physical and psychological)
- Access to healthy food
- Stable, quality housing
- Education level and skills
- Mobility

What are some urban interventions that can positively impact the exposome? (Figure 1)

Several case studies illustrate how the most impactful urban interventions for mental health and social resilience that also serve a multigenerational population are green spaces. For example, urban gardens in Chicago replace food deserts, link

nutrition to overall health, provide a lean, sustainable food source, increase property values, and improve food literacy.

Sustainably managed gardens in Paris create readily available, beautiful public spaces for multigenerational gathering while also filtering water and air.

And, finally, micro-forests being planted in Japan and across Europe mitigate the heat island effect, provide a noise-mitigating sanctuary, and encourage biodiversity in dense urban hubs.

What Role Can You Play?

As designers, policymakers, researchers, and students, we have the ability to impact our cities and address negative aspects of the exposome. First, we can be advocates within the projects we work on. We can ask thought-provoking questions that help frame a situation in a different way or unlock possibilities that can make including



Angela Mazzi and Megan Mazzocco at Smart City Expo Miami 2024

well-being affordable. We can challenge the standard ways of doing things and make sure that the project process includes time for learning about community well-being and environmental conditions. We can take responsibility as citizens to raise awareness about these issues. Educating people brings awareness, and that awareness leads to a demand to do better. Engage in your local government or via nonprofits to share your expertise. We can emerge as a voice within our industry through speaking, publishing, and getting involved in professional organizations. When we collaborate together, our voices are more powerful, our ideas are stronger, and those we serve receive consistent information.

“AS DESIGNERS, POLICYMAKERS, RESEARCHERS, AND STUDENTS, WE HAVE THE ABILITY TO IMPACT OUR CITIES AND ADDRESS NEGATIVE ASPECTS OF THE EXPOSOME.”



Community Garden in Paris

MULTISENSORY DESIGN FRAMEWORK



Figure 1



Angela Mazzi
Principal, GBBN Architects
Cincinnati, Ohio

Angela Mazzi, FAIA, FACHA, EDAC, is an architect and firm partner at GBBN Architects known for her research and designs that promote well-being. She is a fellow and past president of the American College of Healthcare Architects, a fellow of the American Institute of Architects, and 2023 president of its Cincinnati Component. Her work earned her the HCD10 Top Architect Award in 2022. She is the founder of Architecting, a community consisting of a podcast, online learning, and weekly Clubhouse room “Architects as Healers: Buildings as Medicine.”



Megan Mazzocco
CEO, Wellbeing X Design
Chicago, Illinois

Megan Mazzocco is an architecture and design journalist fascinated by the power of the built environment as a conduit to positive health outcomes. She began teaching in a corporate setting in 2018, and when she observed her positive impact, she started yogaXdesign to guide architects and designers to a path of ease through yoga. Her CEU, “A+D Toolkit for Daily Creative Renewal,” teaches micro-practices to help design professionals sustain creativity-on-demand.

SMART CITIES MATURITY STANDARDS

PRESENTATION BY ALICE MCLAUGHLIN AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

In a world of rapid urbanization, smart cities are transforming into hubs of innovation and sustainability, with data as their driving force. SyncData.ai is dedicated to this journey, providing AI-powered tools to secure and integrate data to create cities that are safe, efficient, and responsive to citizens' needs.

In a world of rapidly growing urban populations, smart cities are emerging as essential hubs of innovation, sustainability, and security. Central to this transformation is the role of data: how we capture it, interpret it, and use it to create cities that are efficient, safe, and responsive to human needs. At SyncData.ai, we believe in accelerating this journey toward smarter cities by providing the tools necessary to integrate and safeguard the vast streams of data that modern cities generate. Through AI-powered insights and resilient data frameworks, we aim to support the growth of cities where connectivity enhances urban living, driven by secure, optimized data that serves the public.

The Role of the International Telecommunications Union (ITU) in Smart Cities

The International Telecommunications Union (ITU) has taken a pivotal role in defining the structure and standards for smart cities. By creating a unified framework, the ITU aims to ensure that cities around the globe can achieve smart city status efficiently and inclusively. ITU standards address connectivity, data security, and sustainability in urban development, making these guidelines essential in realizing a smarter global future. The framework emphasizes cross-border cooperation, cybersecurity, and the optimization of telecommunications systems.

At SyncData.ai, we see the ITU's role as a critical support in helping cities manage the potential risks that come with extensive connectivity. From regulatory guidelines to

smart city governance, the ITU's policies align closely with our belief in resilient, scalable solutions for cities of all sizes.

Data-Driven Smart Cities: Turning Potential into Action

Data lies at the heart of any smart city, and it's here that SyncData.ai shines. We are working to support data integration that allows cities to function more seamlessly. Data-driven insights can, for example, help to manage traffic flows, reduce pollution, and even anticipate public health needs. Our approach focuses on using AI to filter through massive datasets in real time, extracting actionable insights that can optimize municipal resources and improve quality of life.

Think of data as the heartbeat of a city—pulsing information on transportation, utilities, infrastructure, and safety systems. Our mission at SyncData.ai is to make this data accessible and usable, empowering cities to make informed decisions that align with the ITU's global smart city standards. This allows local governments to be proactive rather than reactive, strengthening urban infrastructure and enhancing resilience against unforeseen challenges.

Case Study: Ecuador's 250 Municipalities Transforming with SyncData.ai

A recent collaboration with Ecuador demonstrates SyncData.ai's ability to help cities advance using data-driven solutions. Ecuador has over 250 municipalities, each with unique urban planning and infrastructure challenges. With SyncData.ai's technology, these municipalities can improve

essential services like waste management, public transportation, and public health monitoring by making their city systems smarter and more connected.

SyncData.ai has helped Ecuadorian cities leverage vast datasets to make real-time decisions that reduce waste, optimize energy use, and address environmental concerns. This case exemplifies the effectiveness of our approach: Through real-time monitoring and data-driven insights, municipalities in Ecuador are equipped to manage resources better, improve urban safety, and reduce environmental impact—all aligned with ITU standards. This partnership has empowered local governments to modernize without compromising sustainability, ensuring that Ecuador's cities can thrive now and in the future.

Data Security: The Foundation of Trust in Smart Cities

As cities become smarter, they also become more vulnerable to cyber threats. Without a strong foundation of security, the promise of smart cities cannot be fully realized. SyncData.ai is committed to safeguarding data in line with ITU recommendations on cybersecurity, providing a robust infrastructure to protect sensitive urban data. We apply cutting-edge encryption, secure data access, and continuous monitoring to ensure that the data flows in and out of city systems remain secure.

By focusing on cybersecurity, SyncData.ai supports urban centers in building and maintaining public trust. Citizens deserve to

Alice McLaughlin at Smart City Expo Miami 2024



“THE RISE OF SMART CITIES IS NOT JUST ABOUT BETTER TECHNOLOGY; IT'S ABOUT CREATING URBAN ENVIRONMENTS THAT PRIORITIZE THE WELL-BEING OF THEIR RESIDENTS.”



Alice McLaughlin
CEO, SyncData.ai
Fort Lauderdale, Florida

know that their information is handled with care and that their safety is prioritized. As more cities adopt IoT devices, automated services, and digital infrastructure, maintaining this trust will be essential to the long-term success of the smart city movement.

Sustainability and Smart Resource Management

A major focus of the ITU's smart city framework is sustainability. Smart cities are only as effective as their ability to manage resources efficiently. SyncData.ai offers solutions that can help reduce environmental impact and support cities' sustainability goals. By collecting and analyzing data on energy consumption, waste management, and water usage, we enable cities to become more environmentally conscious while reducing costs.

For example, by using data to monitor and control energy consumption in real time, cities can reduce waste and optimize energy use, resulting in lower costs and a reduced carbon

footprint. Our solutions enable cities to manage resources with the precision needed to support a sustainable urban environment.

The Future of Smart Cities with SyncData.ai

Our goal at SyncData.ai is to propel cities into a future where technology and data work harmoniously to improve urban living. Partnering with the ITU's established standards, we are excited to drive innovations that make cities smarter, safer, and more sustainable. Through our AI-driven, data-first approach, we are committed to supporting urban resilience and delivering practical solutions for complex urban challenges.

The rise of smart cities is not just about better technology; it's about creating urban environments that prioritize the well-being of their residents. At SyncData.ai, we are more than a technology provider—we are a partner in the evolution of cities. The future of urban living is smart, and with the right tools, we can turn that vision into reality.

Alice McLaughlin, CEO of SyncData.ai, is a serial entrepreneur and technologist dedicated to innovating traditional industries through best practices technology. She is committed to democratizing and making compliance affordable for small and mid-sized businesses across the globe through business continuity and disaster recovery planning. A recognized social media influencer and digital marketing strategist, she excels in fostering strong professional relationships and driving collaboration across diverse teams, developing innovative products and ideas and leading them to multimillion-dollar sales. She has also achieved success as a national brand manager, an international art collector, a television journalist, a video program producer, and a Hispanic cable media entrepreneur.

FROM BLUEPRINT TO FOOTPRINT: ENVISIONING CARBON-POSITIVE, RESILIENT COASTAL URBAN ENVIRONMENTS

PRESENTATION BY PROF. DR. THOMAS SPIEGELHALTER AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

Cities consume around 75% of the world’s energy and contribute significantly to greenhouse gas emissions, pivotal in exacerbating and mitigating climate change challenges. This article delves into a transformative vision for reimagining urban building and infrastructural landscapes, particularly in coastal regions vulnerable to climate change, sea level rise, and extreme weather events.

As of 2024, approximately 54% of the world’s population lived in cities, and by 2050, this number is expected to reach 6.7 billion, or 68% of the global population. While cities are vital hubs for social-cultural and economic activity and innovation, they also place immense pressure on resource demands and infrastructure. The growing urban population necessitates rethinking how resilient cities and infrastructures are designed, built, and maintained to ensure they are carbon-neutral and carbon-positive—meaning they contribute more to the environment than they consume.

The carbon-positive design tools, methodology, and workflows involve creating structures, landscapes, and urban ecosystems that actively remove carbon from the atmosphere, generate renewable energy, and incorporate nature-based solutions. This is critical for cities, particularly coastal ones, as they are increasingly at risk from climate change, including rising sea levels and extreme weather events. Resilient urban design must integrate environmental, cultural, and socioeconomic strategies to ensure smart cities thrive while reducing their ecological footprint.

AI Data-Driven Hybridization for Smart City Planning

My awarded research and presentation outlined the ongoing AI data-driven hybridization of scientific knowledge and global design/build/post-occupancy evaluation (POE) research practices, which I have been actively involved in since 1986.

This hybrid approach bridges traditional architectural and engineering tools, methods, and workflows with technologies like AI-driven generative Building Information Modeling (BIM), parametric design tools, 3D printing, and other design-to-production protocols.

This shift toward an AI data-informed and performance-oriented design approach transforms smart cities’ planning and construction. AI-driven tools enable complex iterations for real-time performance and life-cycle analysis and optimization of urban infrastructures and buildings to ensure maximum efficiency and adaptability. We can create more resilient environments by incorporating bio-inspired design—understanding bionic properties, patterns, and systems found in nature—into urban development.

The projects showcased in my lecture span Europe, Africa, Asia, and the Americas, reflecting a global perspective on resilient master planning and infrastructure development. Whether designing carbon-neutral bridges or planning industrial infrastructures, the goal remains the same: to create resilient, adaptable environments that can withstand the challenges posed by climate change (Figure 1).

One such project is the ongoing Grande Calusa Off-the-Grid Resilient Mixed-Use Complex on a 22.5-acre Fort Myers, Florida, site. It is elevated 15 feet above mean sea level and protects against hurricane-induced storm surges. This development will integrate WELL-certified,

carbon-positive design, and renewable energy systems to address the pressing issues of sea level rise and storm surges. AI data-driven BIM tools, digital fabrication, and optimization frameworks allow for real-time adjustments based on environmental data, ensuring the design remains responsive to changing conditions.

Another ongoing project in Duisburg, Germany, involves a biology-inspired smart park and a lightweight 3D-printed steel bridge for brownfield redevelopment. This project draws inspiration from natural growth ecosystems, incorporating green-blue infrastructure and circular urban metabolism principles to reconnect cities through post-industrial, redeveloped, publicly accessible new park systems in the Ruhr Valley (Figure 2).

Biologically Inspired Network Design and Digital Twin Scenarios

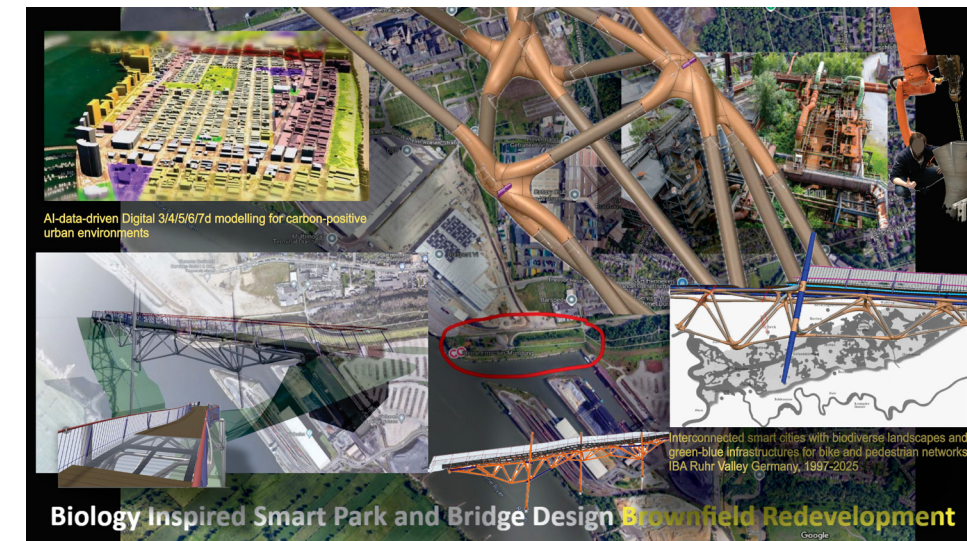
One key concept is biologically inspired network design, using ecosystems to inform city planning. In one experiment, we modeled transportation networks with the slime mold *Physarum polycephalum*, which

“THE URGENCY OF A CARBON-POSITIVE, RESILIENT SMART CITY CANNOT BE OVERSTATED.”

Figure 1



Figure 2



formed efficient routes between key nodes, often improving upon existing infrastructure.

We also developed digital twins—virtual city models simulating environmental conditions like storm surge, wind flow, and temperature. For Miami Beach and South Miami, a cloud-based digital twin and generative design framework helped us design resilient infrastructure adapting to climate change impacts from 2018-2100. This aligns with carbon-neutrality goals and international standards like ISO 37120, ISO 14001, and ISO 50001, as well as the UN Sustainable Development Goals.

Another important topic is shifting from a linear urban metabolism to a circular model, focusing on resource efficiency, recycling, and renewable energy. The 15-minute city concept exemplifies this, ensuring essential services are within a

short walking or biking distance, reducing emissions and promoting sustainability.

Research Collaboration and Global Partnerships

None of this work is possible without global research collaboration. One of my FIU research collaborations sponsored by US NSF, EU Belmont, and Horizon 2020 spanned continents, involving partnerships with universities, governments, and private sector stakeholders in the U.S., the U.K., the Netherlands, Poland, and Taiwan. One of the most rewarding aspects of this effort has been the opportunity to mentor over 190 students through the FIU CRUNCH Design Scenario Studio from Fall 2018 to 2025, fostering the next generation of architects, engineers, and urban planners. The contributions have been published in five volumes by FrancoAngeli, Italy, and



Prof. Dr. Thomas Spiegelhalter
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Thomas Spiegelhalter, Ph.D., is a German-U.S. architect, engineer, and urban planner with over 35 years of experience. He has led numerous solar, carbon-neutral, zero-fossil-energy, and passive architecture projects across Europe, the Americas, Asia, and Africa. As a professor at FIU, his research focuses on AI-driven, bio-inspired design workflows for carbon-positive buildings and urban planning. Spiegelhalter has taught at several universities around the world, including the Global Visiting Professor at Keio University in Tokyo from May 2023 to May 2024

Taylor & Francis Routledge, USA.

Conclusion: A Call to Action

The urgency of a carbon-positive, resilient smart city cannot be overstated. As cities continue to grow, the challenges we face will only intensify, and so will the opportunities for innovation. We can transform our urban environments into resilient, thriving ecosystems through AI-driven design, bio-inspired solutions, and a focus on sustainability and well-being.

At the core of this transformation is a simple but profound idea: smart cities must give back more than they take. By embracing carbon-positive design, fostering biodiversity, and integrating renewable energy systems, we can ensure that cities meet the needs of today’s population and contribute to a sustainable, equitable, and livable future for generations to come.

ROLE OF DIGITAL TWIN TECHNOLOGIES IN BUILDING FUTURE-READY COMMUNITIES

PRESENTATION BY PROF. DR. INGRID VASILIU-FELTES AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

Digital twins, virtual replicas of physical entities, play a crucial role in building future-ready communities by promoting resilience, efficiency, and sustainability.

Digital twin technologies are rapidly transforming how we envision and build future-ready communities, particularly within the context of smart cities. These virtual models allow city planners, businesses, and governments to simulate, monitor, and optimize infrastructure, resources, and services in real time. As cities face growing challenges—ranging from increased population pressures to sustainability demands—digital twins offer a unique opportunity to create more efficient, resilient, and sustainable urban environments. We aim to explore the global landscape of digital twin technologies, their key use cases in smart cities, the convergence of related technologies, challenges, and future opportunities for innovation and improvement.

The Global Landscape of Digital Twin Technologies

The adoption of digital twin technologies is experiencing significant growth, driven by a variety of factors. First, there has been an increase in digital twin investments across industries, with companies and governments recognizing the potential for optimizing operations and services. Digital twins allow for improved decision-making by creating a virtual replica of physical systems, whether they be infrastructure, utilities, or transportation networks. The integration of real-time data into these digital models helps city planners and engineers make data-driven decisions that enhance efficiency and reduce costs.

Additionally, smart cities have emerged

as a critical area for digital twin deployment. As urban areas continue to grow, managing resources like energy, water, transportation, and waste becomes increasingly complex. Digital twins can model these systems and predict future needs, helping cities to better plan for and manage growth. A significant factor driving this trend is the shift in population demographics, with cities experiencing rapid urbanization, aging populations, and migration. These changes require cities to become more adaptable, and digital twins are central to this transformation.

Digital twins are also playing a vital role in emerging technology megatrends. As technologies like AI, blockchain, and the Internet of Things (IoT) become more prevalent, they are converging with digital twins to create smarter, more connected cities. This convergence allows for a more seamless flow of data between systems, improving operational efficiency and enabling new, innovative solutions for urban challenges.

Key Use Cases for Digital Twins in Smart Cities

The practical applications of digital twins are vast, offering opportunities for enhanced urban planning, resource management, and service delivery. Urban planning and development is one of the most promising areas, where digital twins can model the impact of new buildings, roadways, or green spaces on the existing infrastructure. This helps city planners to make informed decisions about land use and development.

In transportation and mobility, digital twins can simulate traffic flow, optimize public transportation systems, and improve the deployment of autonomous vehicles. Real-time data from traffic sensors, vehicles, and public transit systems can be fed into digital twins to ensure efficient and safe transportation networks.

Energy management is another key use case. Digital twins can model energy consumption patterns and simulate various scenarios to optimize energy distribution, contributing to the development of smart grids. Similarly, utilities and water management can benefit from digital twins by improving resource allocation, detecting leaks, and predicting system failures before they occur.

Digital twins are also revolutionizing buildings and infrastructure management by providing insights into maintenance needs and lifecycle costs. Public infrastructure like bridges, roads, and utilities can be monitored continuously, ensuring better upkeep and reducing downtime.

Other areas where digital twins are having an impact include public safety and security, where cities can simulate emergency scenarios to improve response times; environmental monitoring, which allows for real-time tracking of pollution levels and climate-related risks; and waste management, where collection routes can be optimized to reduce costs and environmental impact.

In addition to these, digital twins are being used in telecommunications, healthcare, and education. For example, in



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healthcare, digital twins can model patient data and optimize healthcare delivery in smart cities. In education, digital twins can help manage school facilities and enhance the learning environment by simulating different teaching methods or classroom configurations.

Technology Convergence in Digital Twin Deployments

The power of digital twins is amplified by their convergence with other cutting-edge technologies. AI enhances digital twins through predictive analytics, allowing cities to anticipate and respond to infrastructure and service needs more effectively. Multi-cloud computing enables the storage and processing of vast amounts of data across multiple cloud environments, ensuring the scalability and flexibility needed for smart city applications.

Zero-trust cybersecurity is critical in protecting the sensitive data managed by digital twins, ensuring secure access and preventing unauthorized breaches. Federated learning allows digital twins to leverage distributed AI models while maintaining data privacy, which is especially important for sensitive systems like healthcare or security.

Other technologies like blockchain, IoT, 5G networks, and edge computing further enhance the capabilities of digital twins by enabling real-time data collection, secure data exchange, and low-latency communication. These technologies work in tandem to create a comprehensive, connected infrastructure that supports smart city operations.

Challenges in Digital Twin Deployments

Despite the immense potential of digital twins, several challenges must be addressed to ensure their successful deployment. One significant issue is digital identity management, as ensuring secure and verifiable identities within digital twin ecosystems is critical. Similarly, data privacy concerns arise due to the vast amounts of sensitive data being collected and analyzed by digital twins.

Cybersecurity is another challenge, as digital twins are vulnerable to hacking or data breaches, which could compromise critical city systems. Additionally, the development and deployment of digital twins require a skilled workforce, and addressing workforce readiness is essential.

There are also legal and regulatory hurdles to navigate, particularly around data ownership, security standards, and liability in the event of system failures. Interoperability and standards must also be established to ensure that different digital twin platforms can work together seamlessly.

Finally, the cost of developing, deploying, and maintaining digital twins can be prohibitively high for some cities, especially those with limited resources.

Future Opportunities

Despite these challenges, digital twins present a wealth of opportunities for the future. Smart city orchestration using digital twins offers the potential to optimize urban environments holistically, from transportation and energy to healthcare and education. As digital twins align with



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global sustainability goals like the UN 2030 and 2050 Agendas, they can play a pivotal role in creating greener, more efficient cities.

Emerging technologies such as 6G networks, human-computer interfaces, and quantum computing are expected to further enhance the capabilities of digital twins. These advancements will allow for even more sophisticated real-time data processing, enabling cities to become more adaptive and responsive to the needs of their residents.

Conclusion

Digital twin technologies offer immense potential for transforming cities into smarter, more sustainable, and more efficient urban environments. By integrating with emerging technologies and addressing key challenges, digital twins can help cities optimize resources, improve quality of life, and meet the demands of future populations. As cities continue to grow and evolve, digital twins will be instrumental in ensuring that urban environments are equipped to handle the challenges of tomorrow.

LESS IS MORE: THAILAND'S CITIZEN-CENTRIC APPROACH TO SMART, LIVABLE CITIES

PRESENTATION BY DR. NON ARKARAPRASERTKUL AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

In an era of rapid urbanization, Thailand is redefining the concept of smart cities by prioritizing practical, citizen-driven solutions over flashy technology. This approach, exemplified by Nakhon Si Thammarat, emphasizes collaboration, data-driven strategies, and community engagement to tackle local challenges effectively and sustainably.

What if, in an era of rapid urbanization, smart cities focused less on flashy technology and more on meaningful, practical solutions? That's exactly the path Thailand has taken—emphasizing simplicity, data-driven strategies, and direct citizen engagement to address real problems with scalable solutions tailored to each city's unique needs. And that's not all. By prioritizing people over expensive infrastructure, our “less is more” approach ensures that every initiative not only solves local challenges but also enhances quality of life in a sustainable, lasting way.

Nakhon Si Thammarat: A Case Study in Citizen-Centric Innovation

A standout example of Thailand's citizen-centric approach is Nakhon Si Thammarat, a culturally rich city that faced chronic challenges, including recurring floods and inadequate public services. Instead of relying on top-down solutions or large infrastructure projects, the city embraced a collaborative, digital-first strategy that empowered its residents to take part in problem-solving.

The city launched the @NakhonCity citizen-reporting app through a widely used messaging platform, empowering residents to report issues such as flooding, clogged drains, and other municipal concerns. This initiative began with a listening process, where the city engaged with citizens to understand their needs, co-designed and co-created the app with them, and

tested and refined it based on continuous feedback. The result is a dynamic platform that not only provides city authorities with real-time information but also fosters ongoing civic engagement. As of Sept. 23, 2024—one day before this presentation at Smart City Expo Miami—the platform has resolved 33,732 issues, with 80,052 residents (over 80% of the city's population) subscribed and actively participating in making their city more livable.

The impact is evident not just in numbers but also in the speed of service delivery. The city's average operation time across all municipal services is now under 42.34 hours—10 times faster compared to before the app was used—ensuring timely responses to urgent issues.

Here's a breakdown of key service times:

- **Flooding Response:** 17 hours, 11 minutes, 22 seconds
- **Animal Controls:** 36 hours, 9 minutes, 31 seconds
- **Garbage Collection:** 23 hours, 20 minutes, 41 seconds
- **Sidewalk Repairs:** 52 hours, 30 minutes, 33 seconds
- **Sewer Drain Maintenance:** 106 hours, 4 minutes, 52 seconds

These results highlight how a simple, citizen-driven approach can outperform traditional solutions by improving efficiency and engaging the community.

Empowering Local Governments to Lead

At the Digital Economy Promotion Agency (DEPA), Thailand's hub for smart city

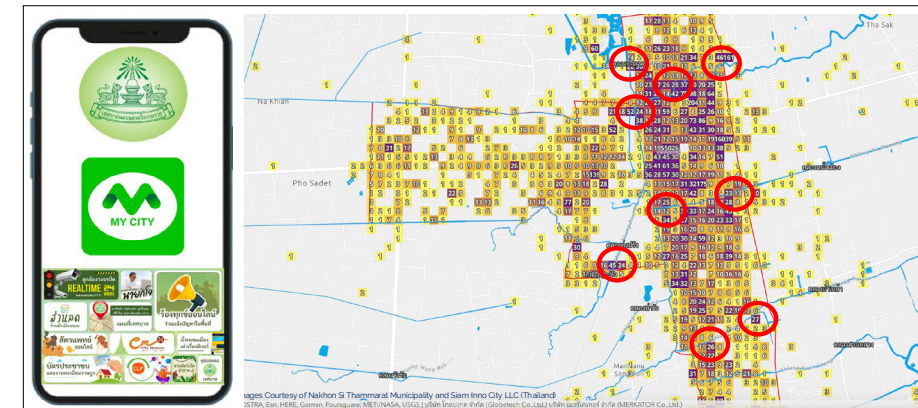
promotion, we understand that the most effective solutions come from those closest to the challenges. That's why we avoid acting like “well-intentioned parents” imposing top-down directives on how cities should develop. Instead, we empower local governments to take ownership of their smart city initiatives, fostering collaboration with residents and stakeholders to create solutions tailored to each community's specific needs.

For example, Nakhon Si Thammarat has harnessed its cultural heritage to enhance livability in a post-flood recovery environment, while high-growth zones like the Eastern Economic Corridor (EEC) benefit from municipality-led initiatives aligned with multiple government-mandated incentives. This approach ensures that each city defines its own vision for the future, grounded in its unique context and strengths.

Once these local visions are in place, DEPA steps in to refine proposals and align them with national priorities. The National Steering Committee on Smart City Promotion and Development, consisting of representatives from key ministries and agencies, evaluates these proposals to unlock the necessary incentives, making projects financially viable and ensuring smooth execution.

Data-Driven Solutions that Deliver Results

The success of Nakhon Si Thammarat also demonstrates the importance of data-driven decision-making. Real-time data empowers



@NakhonCity App

The citizen-centric app was co-designed with the citizens of Nakhon Si Thammarat to address challenges related to issue reporting, paper-based processes, and fragmented analog data. The app enables the city to crowdsourcing verified reports from residents, using metadata to plot issues on a digital map. This visualization allows city staff to quickly identify problem locations and resolve them efficiently. By generating a heatmap of reported issues, the city can easily identify critical locations and strategically allocate its limited resources to address potential flooding risks effectively.

cities to allocate resources effectively, ensuring that services respond to residents' needs swiftly. For instance, flooding reports through the app allow the city to address drainage blockages proactively, reducing incidents and minimizing damage.

From my own experience, I have seen firsthand how relying on outdated assumptions can lead to inefficiencies. The success shown in this case study underlines the importance of real-time insights in guiding decisions, ensuring resources are deployed where they are needed most. Data doesn't just enhance efficiency—it builds trust and transparency, encouraging citizens to engage more actively in urban development.

Start Small, Scale Up

Our philosophy centers on starting small and scaling up. Instead of launching expensive, large-scale initiatives, we focus on pilot programs to test solutions incrementally. This approach minimizes risks and ensures that only effective solutions are scaled. Nakhon Si Thammarat's success with the

citizen-reporting platform is a clear example: What started as a small initiative has become a key tool for urban management that can be replicated in other cities.

This model aligns with global best practices, such as the “urban lab” concept used in cities like Vienna, where small-scale experiments are tested in real environments before being expanded. In Thailand, over 100 cities have been designated as smart city promotional zones, each following a similar iterative approach. We have also trained more than 1,000 mayors and decision-makers, equipping them with the skills needed to drive innovation. That is not all: Our incubation programs have supported over 200 startups, fostering a vibrant innovation ecosystem that keeps our smart city initiatives dynamic and responsive.

A New Model for Smart Cities

Thailand's experience offers a compelling blueprint for the future of smart cities. Our “less is more” philosophy demonstrates that effective solutions don't need to be

“OUR GOAL IS NOT TO CHASE TRENDS BUT TO CREATE CITIES THAT ARE GENUINELY LIVABLE. IN THE END, A SMART CITY ISN'T ABOUT THE TECHNOLOGY IT SHOWCASES; IT IS ABOUT THE LIVES IT IMPROVES.”

complicated—they need to be tailored, practical, and responsive to the community. The success of Nakhon Si Thammarat proves that collaboration, data-driven insights, and local leadership can deliver results that benefit everyone.

As we continue to refine and expand our model, the global recognition we have received—including the Best Partnership Award at 2023 World Smart City Expo in Korea and the Best Smart City Project Award from 2024 Regional Smart City Expo World Congress in China—serves as both validation and inspiration. Our goal is not to chase trends but to create cities that are genuinely livable. In the end, a smart city isn't about the technology it showcases; it is about the lives it improves. With citizens at the center, practical solutions leading the way, and partnerships driving sustainability, Thailand is building cities that thrive. Less truly is more when every solution is intentional, collaborative, and aligned with the needs of the people.



Dr. Non Arkaraprasertkul
Senior Expert, Smart City Thailand Office
Bangkok, Thailand

Non Arkaraprasertkul is a Senior Expert in Smart City Promotion at Thailand's Digital Economy Promotion Agency (DEPA). With over 20 years of experience in urban innovation, he has led more than 120 smart city projects across 77 provinces, focusing on citizen-centric solutions that are practical, scalable, and sustainable. He has trained over 1,000 government officials and supported more than 200 startups, building an ecosystem of innovation across Thailand. His work emphasizes collaboration, data-driven decision-making, and community engagement, earning him international recognition, including leadership and innovation awards at global smart city forums.

CLIMATE-SMART AGRICULTURE

PANEL AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES FEATURING DR. AMIR KHODDAMZADEH (MODERATOR), DR. MARUTHI SRIDHAR BALAJI BHASKAR, DR. ABDERRACHID HAMRANI, AND LUIS CENDAN

Smart City Miami Expo brought together a panel of experts from Florida International University to discuss cutting-edge strategies for integrating sustainability into agriculture and the pressing impacts of climate change, particularly in South Florida. The panel highlighted the challenges and opportunities that climate-smart agricultural practices offer to farmers and researchers alike.

Dr. Amir Khoddamzadeh, Associate Professor of Horticulture/Co-Director of the Global Sustainable Tourism-GST Program at FIU, opened the panel by providing an overview of the Climate Smart Agriculture (CSA) initiative, emphasizing its “triple-win” approach that seeks to balance three crucial objectives: enhancing agricultural productivity, building resilience to climate change, and reducing greenhouse gas emissions. His presentation offered a critical perspective on the current state of agriculture in South Florida, where rising temperatures, saltwater intrusion from sea level rise, and increased frequency of storm surges are threatening the viability of local farms. He pointed out that climate-smart agriculture is not just about adjusting to these changes but proactively working toward solutions that will secure food systems for future generations. His lab’s focus on conservation and sustainable horticulture is a prime example of science-driven solutions being applied to real-world problems, combining academic research with practical outcomes.

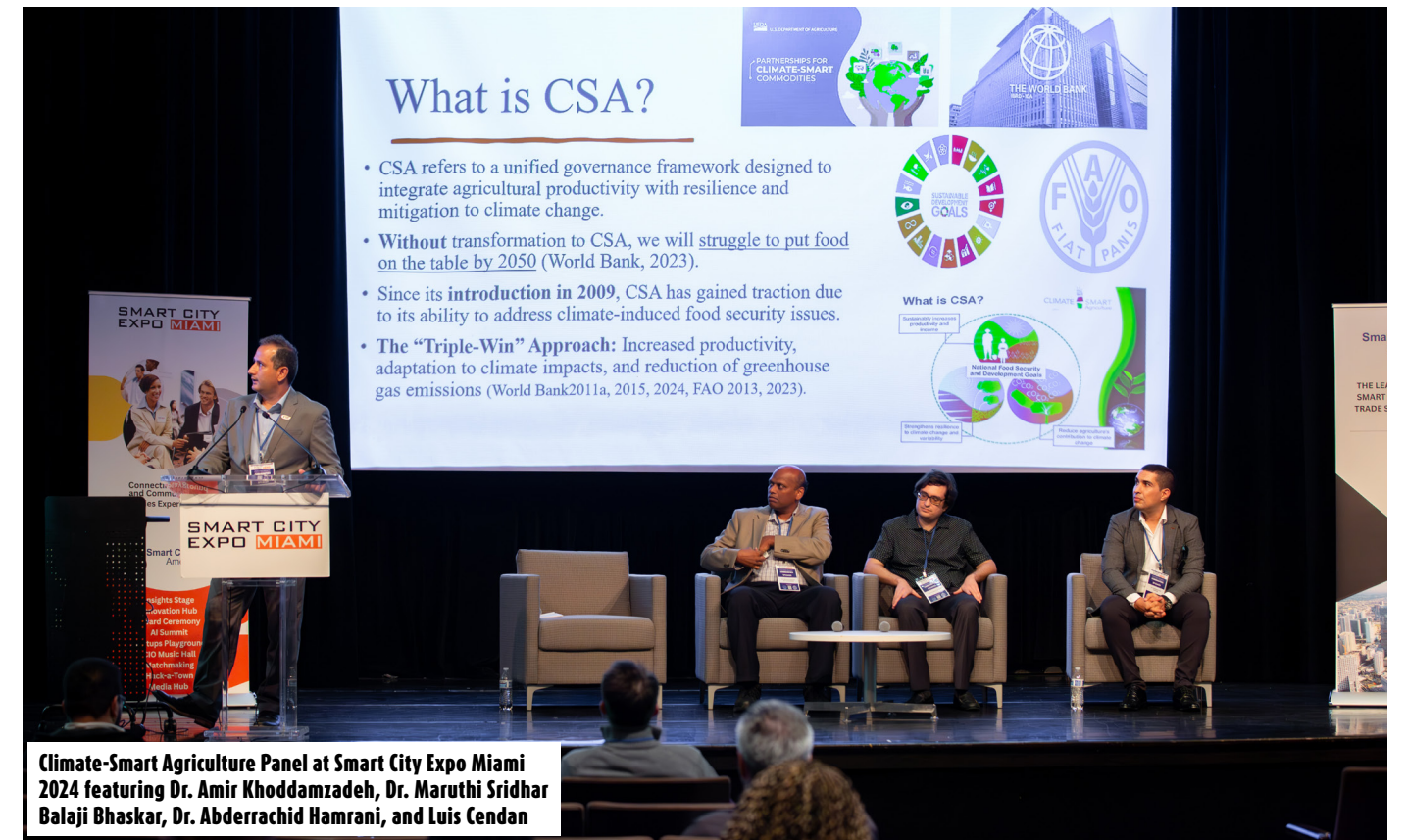
Next, Dr. Maruthi Sridhar Balaji Bhaskar, Associate Professor of Agricultural and Environmental Remote Sensing/Graduate Program Director at FIU, took the stage to delve into his research on the application of remote sensing and GIS (Geographic Information Systems) technologies in sustainable agricultural management. Dr. Bhaskar, a key figure in precision agriculture

research, has been developing tools that allow for a more detailed understanding of soil health, plant productivity, and the effects of both biotic (living organisms) and abiotic (non-living environmental factors) stressors on agricultural systems. His presentation demonstrated how remote sensing technology could be used to monitor soil quality over large areas, providing farmers with the data they need to make informed decisions about resource allocation. One example from his research involved the use of biosolids to improve soil fertility, a technique that not only boosts crop yields but also recycles organic

waste, contributing to circular agricultural economies. Dr. Bhaskar also highlighted the importance of GIS mapping in tracking changes in land use, water availability, and environmental stressors in real time. He illustrated how integrating this data into farming practices could lead to more precise resource management, reducing the need for excessive fertilizers and pesticides while promoting healthier ecosystems. His research aligns with the CSA goals of mitigating environmental impact while maintaining productivity. The panel’s next speaker, Luis Cendan,



Dr. Maruthi Sridhar Balaji Bhaskar, Dr. Amir Khoddamzadeh, and Dr. Abderrachid Hamrani at Smart City Expo Miami 2024



Climate-Smart Agriculture Panel at Smart City Expo Miami 2024 featuring Dr. Amir Khoddamzadeh, Dr. Maruthi Sridhar Balaji Bhaskar, Dr. Abderrachid Hamrani, and Luis Cendan

a Ph.D. student at FIU, presented his ongoing work in the field of precision agriculture, with a focus on urban farming systems. Cendan’s research explores the application of non-destructive optical sensor technologies to monitor plant health and soil nutrient levels. These sensors allow farmers to track the physiological status of plants in real time without harming them, enabling more accurate and timely interventions in the growing process. This technology is especially beneficial in urban agriculture, where space and resources are often limited. Cendan pointed out that urban farms can serve as models of sustainability by efficiently using resources and minimizing environmental footprints, especially in densely populated areas.

One of the standout aspects of Cendan’s presentation was the demonstration of how optical sensors can optimize fertilization practices. These sensors measure chlorophyll levels in plants, which correlate with nitrogen levels—a key indicator of soil fertility. By using real-time data to adjust fertilization rates, farmers can avoid over-fertilization, which not only saves money but also reduces the risk of nitrogen runoff into waterways, a major contributor to environmental degradation.

Dr. Abderrachid Hamrani, Assistant Professor of AI and Machine Learning at FIU, rounded out the panel with his presentation on the role of artificial intelligence (AI) in transforming urban agriculture. Dr. Hamrani, a forward-thinking researcher, focused on how AI can be used to enhance resource efficiency and increase climate resilience in agriculture. He emphasized that as urbanization continues to expand, it is crucial to integrate AI technologies into urban farming systems to ensure sustainable food production. His research delves into how AI can be used to analyze complex data sets, automate irrigation systems, and predict crop performance under varying environmental conditions.

Dr. Hamrani highlighted the potential of AI to support smart cities by integrating agricultural practices into urban infrastructure. This could revolutionize the way we approach food security, especially in regions like South Florida, where urban sprawl is increasingly encroaching on farmland. By employing AI-powered systems, urban farms could operate autonomously, adjusting water and nutrient delivery based on real-time data from sensors, thereby reducing waste and

enhancing productivity. Throughout the panel, the discussions made it clear that Climate Smart Agriculture is not just a buzzword but a necessary shift in how we approach farming in the face of climate change. The panelists collectively underscored the importance of integrating new technologies—whether it be remote sensing, GIS, optical sensors, or AI—into agricultural practices to meet the challenges posed by a rapidly changing environment. These technologies offer not only solutions for improving productivity but also pathways for reducing environmental impacts, promoting sustainability, and enhancing resilience against climate-related risks. Dr. Khoddamzadeh summed up the panel by emphasizing the importance of interdisciplinary collaboration in advancing CSA initiatives. He noted that FIU’s efforts in sustainability are critical to developing real-world solutions that will benefit both local and global communities. His lab’s work, along with the contributions from Dr. Bhaskar, Mr. Cendan, and Dr. Hamrani, exemplifies how academic research can directly impact agricultural practices and sustainability initiatives.

A VISION FOR A COOLER, SUSTAINABLE FUTURE

PRESENTATION BY TIM SPERRY AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

With innovations like CaptureCrete and CoolCrete, Carbon Limit is leading the charge in climate solutions, embedding carbon capture into construction materials to reduce emissions and urban heat. Partnering with other climate tech pioneers, Carbon Limit envisions a resilient, sustainable future for cities worldwide.

As climate-related events intensify—from record-breaking heat waves to catastrophic storms—climate tech companies are stepping up to provide solutions. Carbon Limit is one of these trailblazers, striving to create a world where buildings and infrastructure contribute to climate solutions rather than detracting from them. We are committed to developing sustainable technologies that capture and store carbon, reduce urban heat, and improve energy efficiency in buildings, with the goal of lowering CO2 emissions and mitigating global warming.

The Urgency of Climate Action

CO2 emissions drive global warming, impacting weather patterns and everyday life. Urban areas, in particular, are vulnerable to extreme heat due to the urban heat island (UHI) effect, where buildings and roads absorb heat, raising temperatures.

At Carbon Limit, we know that addressing climate change requires reducing emissions and adapting to the effects of extreme weather. We work alongside other pioneering companies in direct air capture (DAC), ocean carbon capture, and renewable energy. Climeworks, for instance, leads in DAC by extracting CO2 directly from the air, while Ocean Visions explores ocean-based sequestration methods. Our shared goal is a healthier, more resilient environment for future generations.

Embedding Carbon Capture in Everyday Materials

Carbon Limit focuses on embedding carbon capture into everyday materials to address emissions at their source. Our CaptureCrete technology, a breakthrough in the concrete industry, blends natural pozzolans with a metal oxide catalyst to capture CO2 as it hardens. CaptureCrete can replace up to 30% of cement in concrete, absorbing CO2 from the atmosphere while enhancing the material's strength and durability.

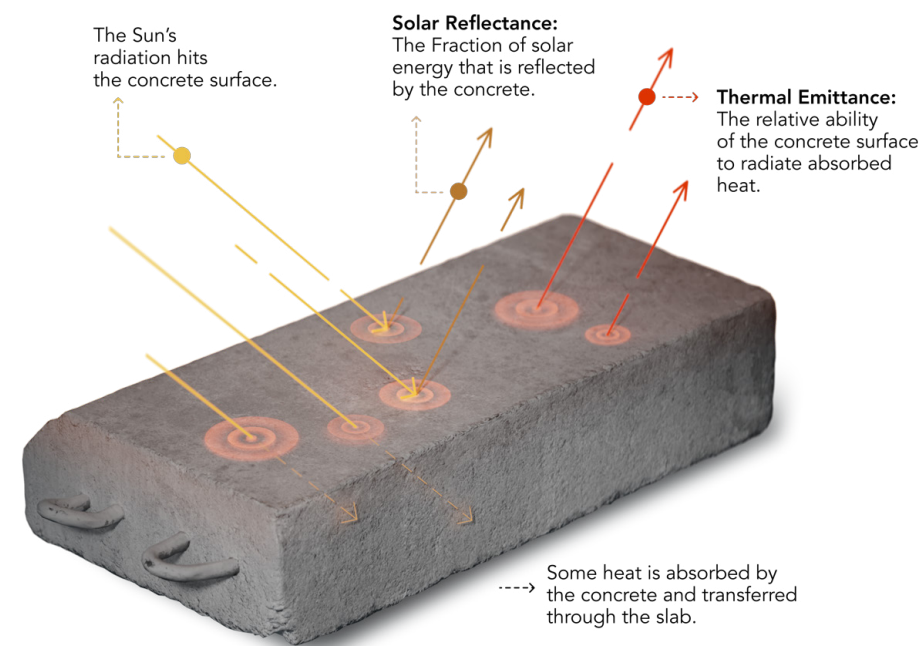
Our CoolCrete technology addresses both carbon reduction and heat mitigation by using materials that reflect solar energy,

contributing to a cooler urban environment. CoolCrete reduces the UHI effect and lowers energy needs for cooling, helping residents save on electricity costs.

Working with Industry Innovators

Carbon Limit is part of a growing coalition focused on sustainable innovation. CarbonCure, for example, injects CO2 into concrete during production, permanently locking it away. Heirloom and Running Tide are exploring novel carbon capture techniques through mineralization and ocean-based solutions. Together, we are developing a suite of technologies that address different parts of the carbon cycle.

CoolCrete: How It Works



In the renewable energy sector, companies like Tesla and NextEra Energy lead in clean energy storage and distribution, making solar and wind power more accessible. SolarEdge and Enphase Energy enable households to generate and store clean energy, helping reduce reliance on fossil fuels.

Adapting to a Changing Environment

While carbon reduction is critical, adaptation to current climate effects is equally necessary. Our cooling technologies at Carbon Limit, for example, help communities withstand high temperatures, reducing health risks and energy demands. Green roofs, urban gardens, and tree-planting initiatives offer additional cooling benefits, while organizations like Sidewalk Labs work on sustainable urban planning.

Adaptation also means creating resilient systems that can handle climate challenges, from extreme heat to increased storm

intensity. By addressing both reduction and adaptation, we help communities become better prepared for climate-related impacts.

Moving Toward Widespread Adoption

The time for adopting these technologies is now. Increased awareness of climate science, bolstered by the internet, social media, and climate advocates, has significantly reduced misinformation. As a result, sustainable practices are being adopted at a faster rate than ever. Governments and businesses are supporting these efforts through incentives for green buildings, renewable energy grants, and policies favoring sustainable development. With collective action from climate tech companies, policymakers, and consumers, we can create an environment that supports a healthy life for everyone.

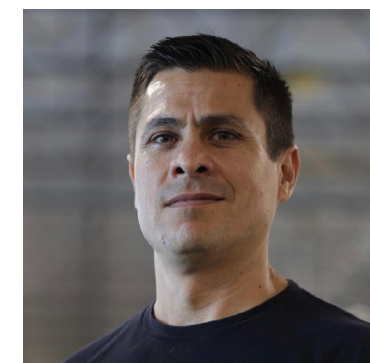
A Vision for the Future

Carbon Limit envisions a future where every building and street contributes positively

“WE’RE CONFIDENT THAT SUSTAINABLE, CARBON-CAPTURING TECHNOLOGIES WILL BECOME A STANDARD PART OF LIFE, CREATING A WORLD WHERE THE BUILT ENVIRONMENT ACTIVELY CONTRIBUTES TO A SUSTAINABLE FUTURE.”

to the environment. With CaptureCrete, CoolCrete, and other sustainable technologies, we aim to provide solutions that are both effective and accessible. But the fight against climate change requires a united front. We’re one part of a larger movement, working alongside companies like Climeworks and CarbonCure to redefine the built environment.

At Carbon Limit, we believe everyone deserves to live in an environment that promotes health and well-being. As more organizations and individuals join this movement, we’re confident that sustainable, carbon-capturing technologies will become a standard part of life, creating a world where the built environment actively contributes to a sustainable future. The need to adopt these solutions has never been greater. With the shared vision of organizations worldwide, we are shaping a healthier, more sustainable future for generations to come.



Tim Sperry
 Founder & CEO, Carbon Limit
 Boca Raton, Florida

Tim Sperry is the founder and CEO of Carbon Limit, where he has spearheaded the development of pioneering negative emission and carbon capture technologies. He is a dedicated inventor and entrepreneur who led his company to create the world's first patented CO2-capturing concrete, CaptureCrete, which has revolutionized sustainable infrastructure. Tim is renowned for his ability to cultivate innovative teams and build businesses that have a substantial positive impact on the planet. His unwavering commitment to environmental innovation has not only inspired industry peers but also earned Carbon Limit the prestigious title of GreenBiz's Climate Tech Company of the Year at VERGE23 in 2023.

DECARBONIZING CITIES THROUGH THERMAL ENERGY NETWORKS: A PATH FORWARD

PRESENTATION BY GIANLUCA GALLETTO AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

As cities confront the challenge of reducing carbon emissions, innovative solutions like Thermal Energy Networks (TENs) are emerging as key strategies for decarbonizing urban environments.

As cities face the urgent challenge of reducing carbon emissions, sustainable urban planning and energy efficiency have never been more critical. Thermal Energy Networks (TENs), also called Heat Networks, are revolutionizing how we approach urban heating and cooling and how scalable solutions can be leveraged to achieve broader decarbonization goals.

NYC Leading the Charge with the Climate Mobilization Act

NYC has emerged as a leader in urban decarbonization through its groundbreaking Climate Mobilization Act of 2019. With its Local Law 97, the act aims to reduce greenhouse gas emissions by 80% by 2050, targeting one of the biggest offenders: buildings. It imposes strict emissions limits on a sliding scale over time on buildings over 25,000 square feet, encouraging property owners to implement energy-efficient technologies and renewable energy sources if they want to avoid hefty fines. This legislation underscores the city's aggressive approach toward carbon neutrality and serves as a model for urban areas globally.

The decarbonization of buildings, which account for nearly 70% of the city's emissions, is no small feat. However, with the implementation of TENs and other innovative technologies, New York is setting a precedent that can inspire other global cities.

Thermal Energy Networks: A Revolutionary Approach

At the core of my presentation was the introduction of TENs, an advanced system

that can capture and redistribute heat across buildings and districts for space heating, hot water, and cooling. By utilizing waste heat from sources like sewage, data centers, or subsurface water, TENs enable cities to reduce reliance on fossil fuels, significantly lowering their carbon footprint.

These networks have already been adopted in various European cities, such as Copenhagen and Stockholm, where district-wide heating systems powered by waste heat are providing residents with sustainable, cost-effective heating solutions. Copenhagen now boasts over 8,000 miles of district heat networks, a system that began during the oil crisis of the 1970s when Denmark and Sweden pioneered their sustainable energy approaches. Today, 94% of Copenhagen's district heating comes from waste heat, cutting household heating bills by nearly \$1,700 annually.

For New York City, where dense urban environments and high energy demands create significant challenges, TENs offer a practical and scalable solution. By connecting multiple buildings to shared networks, these systems create economies of scale that reduce overall energy costs while slashing emissions.

Equity Considerations in Decarbonization

Decarbonizing cities, however, is not just about reducing emissions; it's about addressing inequality. The impacts of climate change disproportionately affect low-income and marginalized communities. In New York City, neighborhoods with the highest social vulnerability—those with lower incomes, aging populations, and higher

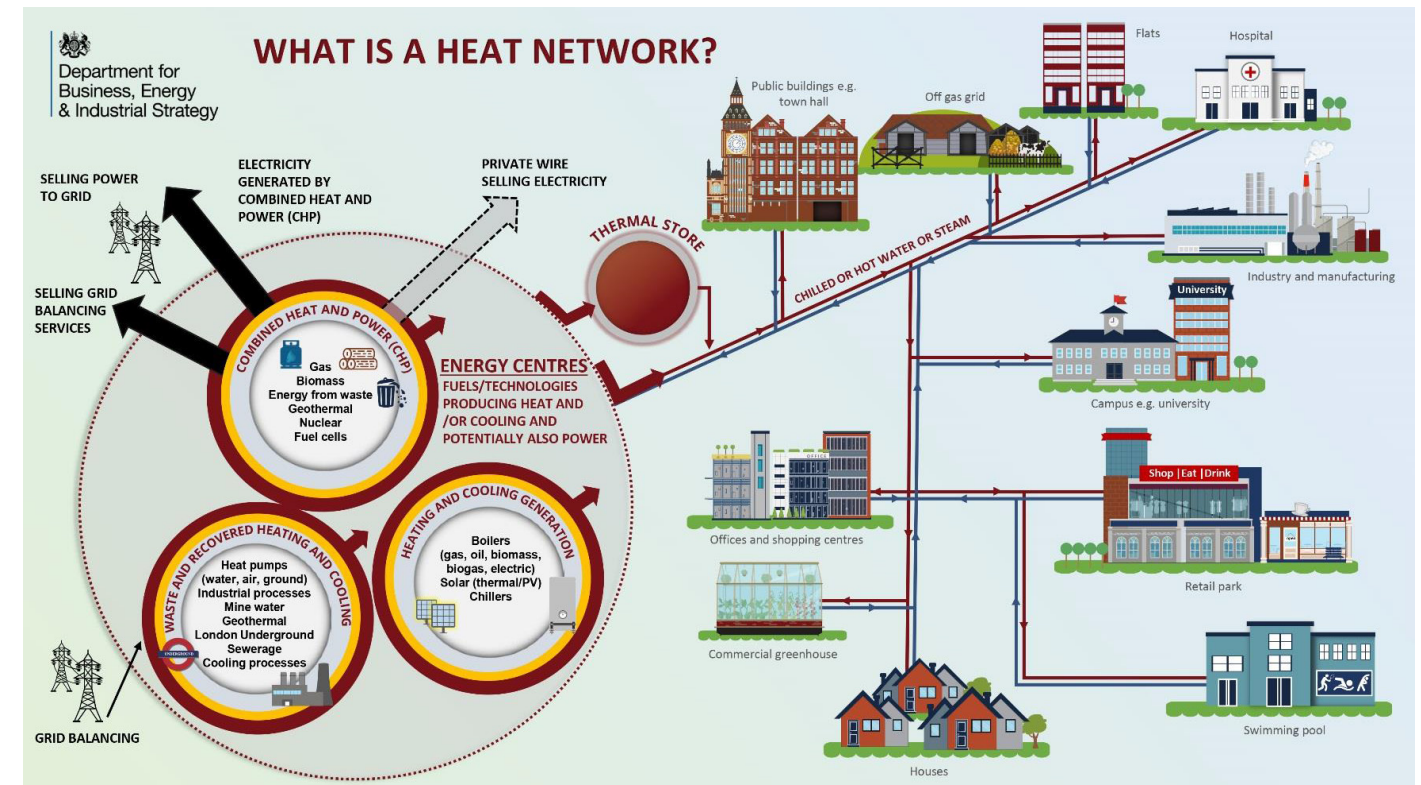
proportions of Black and Latinx residents—are often the most affected by extreme heat and energy poverty. For instance, neighborhoods with less green space and more industrial activity can experience temperatures 5-20 degrees Fahrenheit higher than affluent areas, exacerbating the urban heat island effect.

To address these inequities, New York's decarbonization efforts must prioritize the needs of vulnerable communities. TENs can play a significant role in this effort by providing affordable and sustainable heating and cooling solutions to underserved neighborhoods. As demonstrated by Vienna's district heating system, which utilizes waste heat from wastewater to provide heat to over 120,000 households, equitable energy distribution is possible and essential for a just transition.

Ensuring that New York's decarbonization initiatives incorporate environmental justice principles is crucial. By involving communities in the planning process and focusing on equitable access to clean energy, the city can lead by example, demonstrating that climate action and social justice go hand in hand.

Global Inspiration and Best Practices

NEW YORK'S approach is not happening in isolation. My presentation drew heavily from international examples, particularly from Europe, where countries like Sweden, Austria, and Denmark have made significant strides in deploying TENs at scale. For example, in Austria, solar thermal heating combined with TENs provides efficient heating to large urban districts, while Sweden sources 60% of its national heat from similar networks.



The Bunhill project in London, which uses waste heat from the city's subway system to heat nearby buildings, serves as another forward-thinking model. Such innovations not only reduce emissions but also offer economically viable solutions by repurposing energy that would otherwise go to waste.

Challenges and Opportunities Ahead

While the potential of TENs is clear, several challenges remain. Resistance to change, especially in densely built cities like NYC, can slow the adoption of new technologies. Public awareness campaigns and incentives for property owners will be critical in overcoming these hurdles. Additionally, capacity-building efforts must prioritize collaboration between government entities, private sector innovators, and local communities to ensure these systems are effectively implemented.

Yet, the benefits far outweigh the obstacles. With strong policy support, the scaling of TENs across New York and

other cities can drive major reductions in greenhouse gas emissions, making significant progress toward achieving carbon neutrality.

The Future of Decarbonized Cities

The path to a decarbonized urban future is paved with innovative solutions like TENs. As cities grapple with the dual challenges of climate change and rapid urbanization, embracing scalable, cost-effective, and resource-efficient technologies is the key to success. By learning from global leaders and adapting these solutions to fit local needs, New York City is not only positioning itself as a model for sustainability but also inspiring other cities to follow suit.

The work being done in New York, supported by the Climate Mobilization Act, provides a roadmap for how urban areas can decarbonize at scale. With continued collaboration, investment, and innovation, we can create cities that are not only energy efficient but also resilient, sustainable, and ready to face the future.



Gianluca Galletto
 Founder & President,
 DG Advisors
 New York, New York

Gianluca Galletto is an economist, entrepreneur, a former advisor to New York City's mayor on innovation and foreign direct investments (FDI). With over 30 years of experience in both public and private sectors, he leads DG Advisors, supporting governments and businesses on global PPPs for smart and sustainable cities, innovation ecosystems, and international business development. He is also the founder of Sity, a nonprofit for innovation, and author of *Viva New York*, which provides practical lessons for cities and countries on building innovation ecosystems.

“WITH THE IMPLEMENTATION OF TENS AND OTHER INNOVATIVE TECHNOLOGIES, NEW YORK IS SETTING A PRECEDENT THAT CAN INSPIRE OTHER GLOBAL CITIES.”

TWO SIDES OF ONE COIN: INTEGRATING CLIMATE ADAPTATION WITH MITIGATION FOR RESILIENT COMMUNITIES

PRESENTATION BY ALAN SCOTT AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

The frequency and severity of natural hazards are increasing, threatening the health and well-being of people, the value of properties, and the economic viability of communities. A thoughtful and comprehensive assessment of climate and natural hazard risks and vulnerabilities is required to guide effective public and private investments in resilience to protect homeowners, businesses, and communities from devastating losses when, not if, hazard events strike.

The world is getting hotter and drier and, at times, wetter and windier. We are experiencing an increasing frequency and severity of hazard events due to climate change. We must redouble efforts to reduce greenhouse gas (GHG) emissions to limit the future impacts of climate change and simultaneously implement climate adaptations to protect public health and life safety and to prevent property damage and economic disruption from major hazard events. According to the National Oceanographic and Atmospheric Administration (NOAA), the U.S. set a record for natural hazard events in 2023, with 25 separate events with losses of \$1 billion or more, breaking the previous record of 22 set in 2020 and far exceeding annual averages from previous decades. As of the beginning of September 2024, NOAA tallied 20 such major disasters, with two unprecedented hurricanes and several large wildfires since. Sadly, another record-setting year of disasters seems likely, underscoring the need for increased sustainability and greater resilience, two sides of one coin.

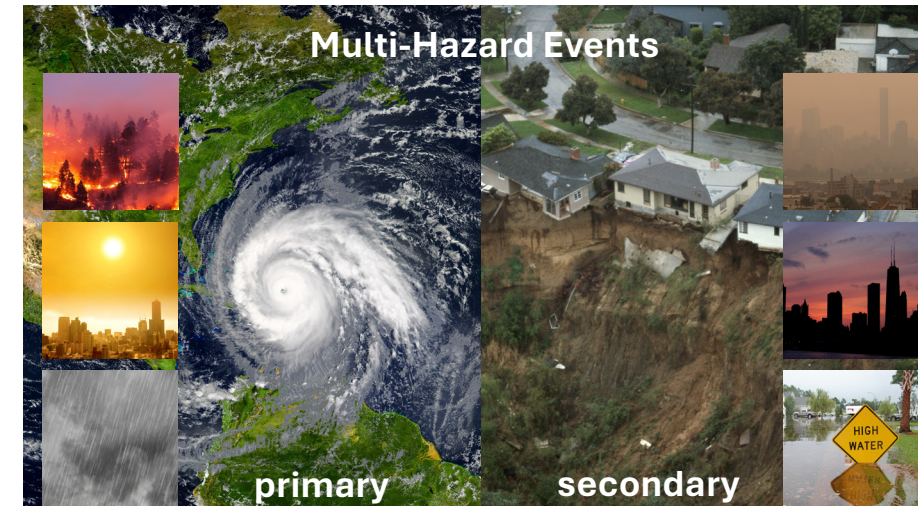
Unfortunately, we are not very good at acknowledging and acting on these increasing hazards to reduce risks. Part of this comes from the language we use to describe hazards like storms and floods. When these are described with 100-, 500-, or 1,000-year event recurrence periods, it implies frequency when it actually refers to probability. A

100-year event does not mean it happens approximately once every 100 years, but rather that it has a 1% annual exceedance probability. While 1% may seem insignificant, that means there is a 10% probability of such a hazard event during a 10-year commercial real estate hold period, or a 26% chance during the course of a 30-year home mortgage. Additionally, these recurrence periods are derived from historical data and don't reflect the increasing probability due to climate change, which is certainly higher.

Even when we do recognize hazard risks, a common shortcoming in risk assessments is to look at each hazard individually. It is not uncommon to experience multi-hazard events, with secondary hazards cascading from the primary hazard or compounding

its impacts. For example, a wildfire directly threatens structures in its vicinity, but it also causes hazardous air quality hundreds of miles away. Likewise, an extreme heat event can lead to power outages due to a spike in electricity demand for air-conditioning, thus creating deadly indoor conditions in buildings dependent on that air-conditioning.

These direct and indirect climate change impacts are creating risks for commercial real estate investors, building owners, and even lenders, with increasing insurance costs and potentially significant capital costs for damage repair, extended business disruption, or complete loss of property value after hazard events. With insurance companies pulling back and investors seeking information on climate-related



financial risks, new regulations are beginning to require disclosures.

In the regulatory world, the two-sided coin is known as double materiality, addressing both transitional risks (sustainability) and physical risks (resilience). Transitional risks arise from the impacts that a company has on Mother Nature and the legal and regulatory mechanisms pushing impact reductions like carbon pricing, building performance standards, and climate litigation. Physical risks come from the impacts that Mother Nature is having, or will have, on a company in the form of current natural hazards (hurricanes, floods, etc.) and future climate hazards (sea level rise, extreme heat, etc.).

The European Union and other countries around the world are beginning to require companies to disclose these risks to investors, usually focused on GHG emissions and climate-related financial risks. The U.S. Securities and Exchange Commission (SEC) and the State of California will both be requiring similar disclosures in the near future.

Companies subject to these disclosure regulations will need to conduct resilience assessments of their assets. ASTM is poised to release its new Standard Guide for Property Resilience Assessment (PRA). The PRA guide was developed as a companion to existing standards for property condition assessments and environmental site assessments to support real estate transaction due diligence, but it also provides a standardized three-stage process for resilience assessment in support of physical risk disclosures. The PRA process starts with a hazard screening to identify which current natural hazards and future climate-related hazards pose the greatest threat to a subject property or asset. In many cases, current and

future physical risks due to natural hazards and climate change are very localized, so risks are best assessed at the asset level. A minor difference in topography or location could significantly change the potential impacts from flooding, storm surge, sea level rise, wildfires, or other hazards.

Once primary hazards are identified, the second PRA stage assesses the vulnerability of the subject property. Vulnerability is a factor of exposure, sensitivity, and adaptive capacity. These are influenced by the position, size, and configuration of the asset and the equipment and infrastructure that serve it, as well as the uses of the facility and the type of occupants it supports (e.g., young children, able-bodied adults, elderly residents).

Based on the hazards and vulnerabilities revealed, the third PRA stage is focused on the identification of feasible capital improvements and operational changes to mitigate risks. Building professionals can identify practical measures like flood barriers, wind-resilient roofing, impact-resistant glass, wildfire smoke mitigation, and backup energy generation and storage and integrate these with a capital improvement plan. For new construction and major renovation projects, the PRA can inform design and engineering standards to create a resilient building from the start. In some cases, the implementation of risk mitigation measures could also be used to negotiate more favorable insurance rates or could be a selling point to attract buyers or renters. In other cases, resilience measures, like on-site energy generation and storage to provide for continuity of operations or thermal enclosure improvements to increase extreme heat resilience, will also reduce utility costs and cut GHG emissions, providing sustainability benefits.

“ANOTHER RECORD-SETTING YEAR OF DISASTERS SEEMS LIKELY, UNDERSCORING THE NEED FOR INCREASED SUSTAINABILITY AND GREATER RESILIENCE, TWO SIDES OF ONE COIN.”

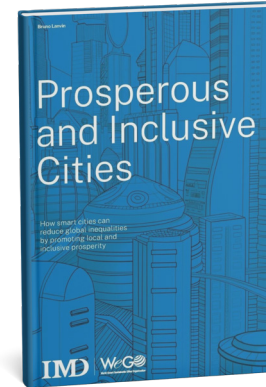
While we still have time to avert the worst impacts of climate change, it is already our reality, and businesses and governments alike must simultaneously address both mitigation of climate impacts through GHG emission reduction and adaptation to current and future climate-related hazards through asset-level resilience investments. Assessing and addressing climate-related financial risks is becoming a legal requirement for many companies and an expectation of investors, insurance companies, and regulators.



Alan Scott
Director of Sustainability,
Intertek
Portland, Oregon

Alan Scott, FAIA, LEED Fellow, LEED AP BD+C, O+M, WELL AP, CEM, is an architect and consultant with over 36 years of experience in sustainable, resilient building design. He is Director of Sustainability with Intertek Building Science Solutions, serves as Vice-Chair of the LEED Resilience Working Group and volunteers with the AIA Resilience and Adaptation Advisory Group.

SMART CITIES 2.0: SHIFTING GEARS OR CHANGING MODELS?



*THIS ARTICLE IS BASED ON THE INTRODUCTORY CHAPTER OF PROF. DR. BRUNO LANVIN'S LATEST BOOK, *PROSPEROUS AND INCLUSIVE CITIES*, AVAILABLE ON AMAZON, BARNES & NOBLE, AND OTHER MAJOR BOOKSELLERS

By focusing on inclusion, smart cities can open new ways to address persistent global inequalities.

Whether they apply to countries or cities, most competitiveness strategies have traditionally been articulated around the clever use of local-specific endowments (e.g., geography, natural resources) to generate absolute or comparative advantages. Typically, prosperous nations (or cities) were those that could build and protect such advantages as long as possible through the development of trade connections and by becoming magnets for investments and talents. In such a model, innovation is playing a critical role by allowing nations (and cities) to complement their initial endowments by creating or adopting novel ways of producing and exchanging goods and services.

In that model, each wave of innovation, similar to the discovery of a new valuable natural resource, has the power to initiate a new cycle of prosperity. Nothing guarantees, however, that innovations (or natural resources discoveries) will always happen in the same places. Nations and cities hence face prosperity cycles, which are subject to uncertainties regarding their length and intensity.

History tells us that nations and cities emerge, lead, and fade. Some of the reasons for their decline are difficult to identify and measure. To describe them, economists often use the phrase “negative externalities” to indicate that their effects have often been neglected in the initial models. In the case of prosperity cycles, such externalities include, for example:

- A lack of long-term vision (e.g., on

- environmental sustainability)
- A lack of diversity/openness (e.g., in talent and governance)
- A lack of inclusion (e.g., growing inequalities)

This model (prosperity cycles model) can be considered as the dominant one at this point in time. It is represented in Figure 1 below.

To prevent such cycles, it is important to turn negative externalities into positive inputs to the model. To do this, all key components of the previous model (prosperity cycles) must be revisited. The basic idea behind this approach is that neither competitiveness nor attractiveness are ends in themselves. They need to be attached to a specific purpose and impact. Those could include, for example, the quality of life and well-being of citizens. They could also allow the specification of attraction policies for investment and

talent, for example, by giving preference to activities that address longer-term issues such as decarbonation, for example. From that perspective, it becomes possible to turn negative externalities into positive ones, for example, by encouraging and supporting:

- Long-term visions (e.g., on environmental sustainability)
- Diversity and openness (e.g., in immigration policies and trade relations)
- Inclusion (e.g., by actively fighting inequalities)

The resulting positive externalities generate at least three kinds of effects that increase the sustainability of the model by (1), exerting a constant positive loop vis-à-vis competitiveness, attractiveness, quality of life, and citizens' satisfaction; (2), stimulating innovation in areas where its impact is expected to be most significant in

Figure 1

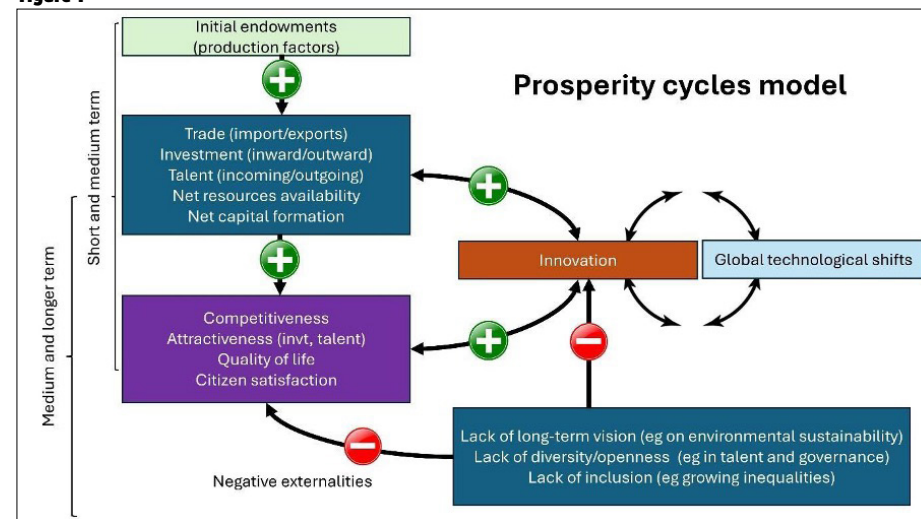
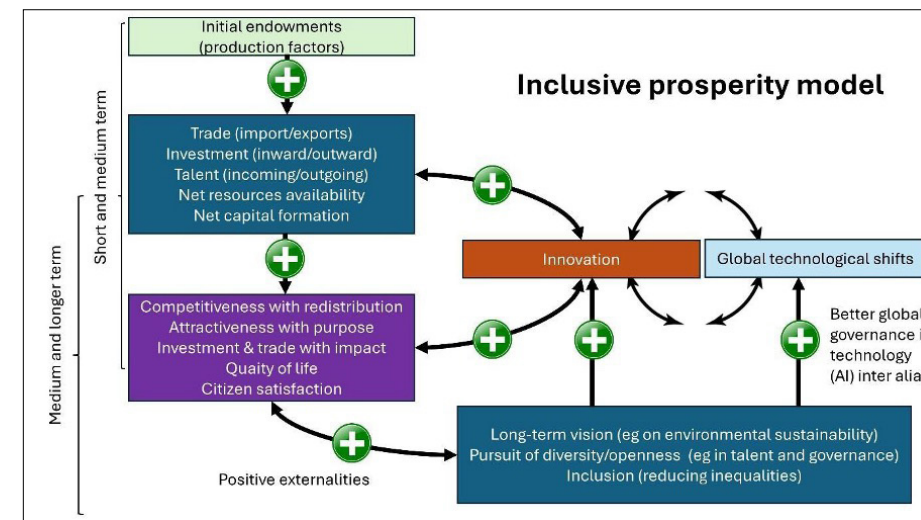


Figure 2



the longer term; and (3), adding a “purpose and regulation” dimension to what is likely to become a major issue in the years to come—i.e., that of global technological governance (e.g., in AI).

This “inclusive prosperity model” is summarized in Figure 2 above.

Making It Work: The Importance of Metrics and International Cooperation

As underlined earlier, when dealing with “prosperity cycles” and “inclusive prosperity” models, inclusive prosperity is a multidimensional concept concerned with various aspects of quality of life, including economic inclusion (e.g., access to employment) and social/spatial inclusion (e.g., tolerance of minorities). An assessment model must have a good definition of these dimensions and a clear conceptualization of their inter-relations. Qualitative information about the trade-offs and synergies that exist between

pro-inclusiveness and growth-friendly policies can complement the quantitative analysis to make better decisions.

In any advanced society, human basic needs such as safety, sanitation, and medical care should be widely available.

What will make a society more inclusive is the wide access to education and jobs, independently of initial socioeconomic status, and having equal social acceptance in society regardless of gender, race, or other personal characteristics.

All of these aspects need to be part of the benchmarking tools that smart cities need and deserve. Recent progress in that area needs support and acceleration.

As persistent inequalities are becoming one of the top concerns in the global economy, the practical initiatives developed in smart cities around the world should be considered as a toolbox to further innovate at the local level to help solve a global issue.



Prof. Dr. Bruno Lanvin
President, Smart City Observatory
Lausanne, Switzerland

Bruno Lanvin is the President of IMD's Smart City Observatory and a Distinguished Fellow at INSEAD. He is the co-founder and co-author of four of the most widely used global indices on technology (Network Readiness Index), innovation (Global Innovation Index), talent (Global Talent Competitiveness Index), and Smart Cities (Smart City Index). He is also the author of the Future Readiness Economic Index Report (FREI). He is co-founder and advisor of Portulans Institute, a think tank based in Washington, D.C. He is the founder and president of DL Partners, a Geneva-based consultancy, and of Descartes Institute, a think tank also based in Geneva.



“AS PERSISTENT INEQUALITIES ARE BECOMING ONE OF THE TOP CONCERNS IN THE GLOBAL ECONOMY, THE PRACTICAL INITIATIVES DEVELOPED IN SMART CITIES AROUND THE WORLD SHOULD BE CONSIDERED AS A TOOLBOX TO FURTHER INNOVATE AT THE LOCAL LEVEL TO HELP SOLVE A GLOBAL ISSUE.”

BETTER STREETS FOR THE NEW ERA

PRESENTATION BY VICTOR DOVER AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

There is a dramatic evolution underway in street design, as we rethink our public spaces for a time of rapid change and “15-minute cities.”

We have heard it for so long that it takes a minute to realize the “let’s get traffic moving” mantra came originally from skillful propagandists. But the widely held belief that “wider, faster roads are better roads” turns out to be false.

Worse, the free-flowing condition motorists crave isn’t even achievable, due to induced demand and the space we take up in individual cars. So, trying to widen our way out of traffic congestion was an exercise in futility, and any extra asphalt in the off-peak times is just a clear invitation to more speeding and more mayhem.

The pursuit of more driving has divided cities, decimated neighborhoods, emptied the public treasury, and created an unprecedented public safety crisis. We must

be numb: 44,000 people are dying each year in the American streets. How did we get here?

GM’s “Futurama” exhibits during the 1939 World’s Fair showed an America in which a new, four-wheeled lifestyle would emerge. The underlying assumption was that everyone would and should drive alone for every trip, for everything, every time, and city planning, transportation engineering, and infrastructure funding were all immediately retooled around that assumption. It was all implemented on a continent-wide basis without a field test.

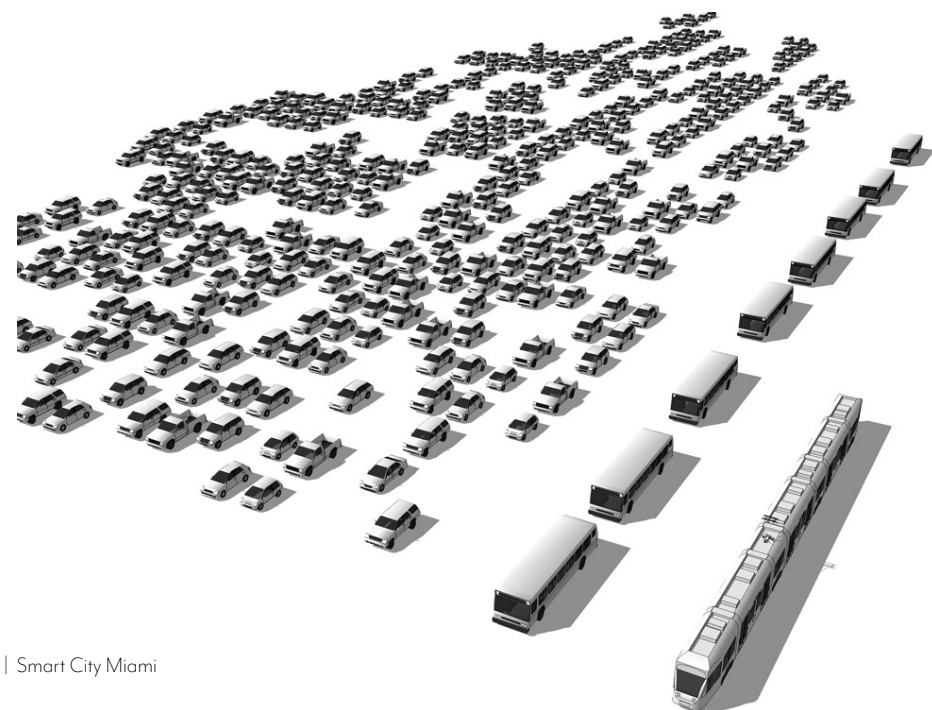
The question for many years was this: How do we solve the plight of the individual motorist, who has chosen to drive long distances alone, and speed them up—no matter what the costs?

That was the wrong question. Here are some better questions: How do we attract a

larger percentage of people to choose short trips, walking trips, biking trips, and transit trips, each year? How do we grow our cities without choking on car traffic? How do we restore the confidence that growth and change can make things better rather than worse?

Cities, David Engwicht has pointed out, were invented to minimize the need for transportation, not to maximize it. Cities were invented to shorten the distances between us, by making most of our social and commercial interactions close at hand, by design.

First, remember that our built environment is the product of regulation (for good or ill) and design (good or bad). We get the human habitat that reflects the intent of our rulebooks and design habits. So, we can grow our way out of our problems, but the key is design. And the most important feature in our designed environment is the street.



“GIVE YOURSELF THE GREEN LIGHT... DEMAND MORE HIGHWAYS AND MORE PARKING SPACE. DON’T HONK YOUR HORN. RAISE YOUR VOICE. IT’S YOUR COUNTRY.”

— From *Give Yourself the Green Light*
Jam Handy Productions for General Motors, 1955



Street Design Matters

Street design has always been a hallmark of advanced civilizations. When communications and transportation were virtually synonyms, the streets were designed not just to transport us and our goods and services but to literally send messages to one another. We also arrange the physical features in the street scene—the architecture, the landscape architecture, the signs—to send messages about what is important to us as a society.

In our advanced civilization, we should be making streets that are places where people want to be. There are five simple features that such streets always need: They need to be shaped, comfortable, connected, safe, and memorable.

Electrification, autonomous animation, car-sharing apps, and more gadgets will be great, but they will not save us from the fundamental problems: Cars take too much space—whether we are driving them or parking them—and we drive too much. That is why street design in modern America is the one thing we can least afford to get wrong (being stupid instead of smart cities), and it is the one thing most often gotten wrong.

So, what if we shifted our emphasis in street design from maximizing flow to maximizing safety, livability, and walkability?

We could have a world where driving long distances, when one needs to, is accommodated, but all the other kinds of trips, including short trips, walking trips, biking trips, and transit trips, are also welcomed.

We’ll get improved public health, and we’ll get higher property values and higher returns on investment, the key ingredients in making both local government and private real estate

work. We’ll get better quality of life and save lives. We’ll return our towns and cities into places for the exchange of ideas instead of just places to honk and park and road rage. That’s efficiency of a better kind.

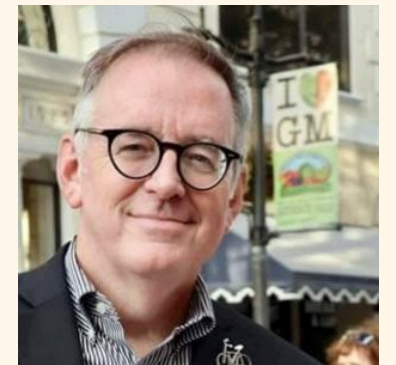
We don’t need to invent magical technological gadgets to achieve this. We already know how to do it; we have the power of precedent. Humans have thousands of years of combined experience with making streets. Streets are sometimes said to be the most lasting of human institutions, slowest to change, so many of the results of thousands of years of experimentation and refinement are still with us.

We can quickly and easily build the best streets imaginable—if we give ourselves permission to enlarge the menu of street types in our manuals and apply the design lessons of the best streets, new and old.

Instead of just arterials, collectors, and local streets, our engineers and neighborhood planners could be empowered with a fuller menu. Instead of just wide major streets that are bad places and regular minor streets that are bad human habitats, we could have wide streets that are still great places, where we need them, and lots of other kinds of streets, customized for a whole range of contexts.

In *Street Design: The Secret to Great Cities and Towns*, we catalog 10 Essential Street Types and illustrate 28 of the many variations on them. People tell us about going into their meeting with the mayor or the public works director, sliding the book across the table, pointing to one of the pictures and asking, “Why can’t we have a street like that, in our town?”

Why not?



Victor Dover
Dover, Kohl & Partners
Town Planning
Coral Gables, Florida

Victor Dover is a founding principal at Dover Kohl & Partners Town Planning, where he focuses on the creation and restoration of real neighborhoods as the basis for sound communities. Dover lectures around the world on the topics of livable communities and sustainable development and is the co-author of *Street Design: The Secret to Great Cities & Towns*, a leading textbook on the subject. Dover and his partner, Joseph Kohl, have both been awarded the John Nolen Medal for Contributions to Urbanism and were named the 2024 recipients of the Seaside Prize. Dover is a former Board chair of the Congress for the New Urbanism (CNU) and the Founding Chair of the CNU Florida Chapter.

LEVERAGING AI AND MACHINE LEARNING TO IMPROVE MUNICIPAL SERVICES AND QUALITY OF LIFE

PRESENTATION BY RAIMUNDO RODULFO AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

The City of Coral Gables is leveraging AI and machine learning to drive innovation in urban analytics, automation, and citizen services, setting new standards for smart city innovation while boosting operational effectiveness and quality of life for its residents.

The City of Coral Gables leverages artificial intelligence (AI) and machine learning (ML) technologies to boost enterprise automation, urban analytics, and business intelligence (BI) capabilities that add value and efficiencies citywide. These AI-powered capabilities help our city analyze millions of data points in real time to derive actionable insight for stakeholders, decision-makers and incident responders on areas critical to quality of life, such as public safety, traffic management, environmental sustainability, citizen engagement, cybersecurity, and city operations, among others. AI also enables workflow automation and higher efficiencies on city enterprise systems and processes, helps us engage with citizens and improve customer service 24/7 on city portals and apps, and facilitates the implementation of complex traffic management systems.

AI and ML are by no means new concepts. Applied AI and heuristic models have existed in many fields and verticals over decades and have been a subject of discussion, study, and research for many years—and before that, a frequent topic in the scientific imagination of visionaries like Arthur C. Clarke, Carl Sagan, and Isaac Asimov, and the field’s pioneers like Ada Lovelace. In the 21st century, AI and automation became one of the center pillars of the Fourth Industrial Revolution, intertwined with other STEM fields, trends and innovations in data science, robotics, cyber-physical systems (CPS) and the Internet of Things (IoT), digital transformation, quantum computing, and other areas. Most recently, the exponential adoption and much-hyped omnipresence of AI

and ML in the enterprise, the consumer market, and society have been fueled by advances and new capabilities in cloud and high-performance computing (HPC), consumer and industrial electronics, the semiconductor and nanotechnology industry, generative AI (GenAI) and large language models (LLM), software engineering and open-source platforms, developer communities, and other trends and innovations.

The modern smart city technology infrastructure that builds capacity and advanced capabilities for quality of life in key areas like public safety, mobility, government services, health care, digital inclusion, and education fosters hyperconnectivity (broadband infrastructure), high visibility (intelligent connected infrastructure and cyber-physical/IoT sensing networks with edge analytics), and hyper-automation (AI and ML-powered predictive data analytics, correlation and trend detection, computer vision, automated workflows, and digital efficiencies). It would be extremely difficult to analyze millions of data points in real time and historically from thousands of connected sensors, smart devices, and moving objects/entities in our city without the use of AI and ML hyper-automation capabilities, to make sense of big data, and produce timely, actionable information and insight for first responders, emergency managers, employees, decision-makers, planners, researchers, students, residents, businesses, visitors, and other key stakeholders.

Some of the AI and ML use cases that our team in the City of Coral Gables Innovation and Technology (CGIT) department have

worked on over the past 10 years include:

Enterprise Systems, User Applications & Service Delivery: Smart city platforms with actionable AI-powered insights (public hubs, digital twins); customer relationship management (CRM) with AI chatbots and digital assistants (like our homegrown AIDA chatbot), Web3/XR avatars, and digital personas; and robotic process automation (RPA), GenAI use cases, and smart mobile apps.

R&D in Smart City Labs, Incubators & Research Collaborations: Internships and residencies and grant-funded research with universities, industry, and scientific institutions; CGIT research projects and pilot prototypes; and Gables TechTank incubator AI training and upskilling programs.

Cloud and Backend Analytics & Automation: AI/ML models and algorithms;

urban analytics engines and AI-powered data platforms; data correlation, actionable insight, and hyper-automation for traffic, emergency management, and public safety environments; and predictive crime analytics using ML algorithms and traffic studies.

IoT Sensors & Cyber-Physical Systems: AI-powered smart poles and devices, edge analytics, environmental public safety and situational awareness, AI-assisted connected mobility and traffic management systems, and computer vision training models; training AI models to detect, classify, analyze, and count multimodal traffic entities (bicycles, vehicles, pedestrians, curb management, and street parking spots); LiDAR photonics right-of-way (ROW) asset analytics (application of Random Forests ML algorithms programmatically on traffic engineering and point-cloud data of city roads to predict road condition, anomalies, and deterioration); and situational awareness and traffic safety analytics in our community intelligence center (CIC), such as using AI and anonymous morphological analysis to find a missing child in the middle of a crowded event in Coral Gables.

Crowdsourced & Commercial AI-Powered Analytics: Public sentiment, market, behavioral, and traffic data analytics applications; use of commercial GenAI and LLM open platforms and AI-as-a-Service data marketplaces (OpenAI ChatGPT and GPT-4 API, Google Gemini, Microsoft Copilot, Apple Siri, Alexa, Meta AI, Zencity.io, Placer.ai, Spectus.ai, etc.) to boost office and field productivity.

Intelligent Networks: AI-powered fault-tolerance with automated network failovers and advanced cybersecurity systems, threat detection and heuristics.

The Institute of Electrical and Electronics Engineers (IEEE) is holding the International Conference on Machine Learning and Applications (ICMLA) in Coral Gables Dec. 18-20, 2024. The IEEE ICMLA is the leading international forum for the dissemination of original scientific research in ML, with an emphasis on applied AI and ML applications as well as novel algorithms and systems. This conference brings together international researchers and practitioners in Coral Gables to present their latest achievements and innovations in the area of ML. Our city’s innovations are also represented at the conference, with a presentation by PNNL of the AutonomIA research project in Coral Gables. The

AutonomIA research team is presenting an original paper titled “Deep Multi-Agent Reinforcement Learning for Real-World Signalized Traffic Corridor Control,” which explains the signalized traffic control deep learning (DL) approach and adaptive signal phase timing coordination in a multi-intersection corridor setting.

In conclusion, the above use cases respond to a need for automation and intelligence capabilities to (1), analyze millions of data points in real time to derive actionable insight for city stakeholders and decision-makers and incident responders; (2), hyper-automation capabilities and advanced urban analytics for intelligent connected infrastructure (ICI) and CPS in city districts; (3), workflow automation and higher efficiencies on city enterprise systems and processes; (4), low-friction citizen engagement and improved/accessible customer service 24/7 on city portals; (5) AI-powered efficiencies to improve key performance indicators (KPI) in public safety, emergency response, mobility/transportation, environmental sustainability, smart policing, and cybersecurity; and (6), RPA/ERP efficiencies and enhanced UX with AI chatbots on city websites, smart city platforms, CRM portals, mobile apps, and other channels.

The positive impacts and benefits derived from the use of AI and ML in our city include (1), a significant reduction in crime and traffic incidents from AI-powered hyper-automation; (2), improved UX; (3), cost savings and operational efficiencies; (4), automated tools, predictive analytics, and actionable insight for researchers, marketing and city analysts, businesses, planners, public safety officials, first responders, traffic engineers, city officials, and all members of the smart city ecosystem.

In our collaboration and discussions with experts from industry, government, and academia, and with organizations like the NIST Global Communities Technology Challenge think tank, the Government AI Coalition, Singularity University, the Miami-Dade College AI Center, the University of Miami Institute of Data Science and Computing, and other organizations, our team has strengthened our core principles and policies for a responsible adoption of AI for civic good. It started with adopting standards and best practices (like the NIST AI Risk Management Framework and Cybersecurity Framework), policies (like the GovAI Core Policy Templates), controls (like annual audits and advanced threat detection



Raimundo Rodulfo
Director of Innovation and Technology / CIO, City of Coral Gables
Coral Gables, Florida

Raimundo Rodulfo, PE., MSEM, PMP, started his career in the early '90s as an electrical engineer in the telecommunications industry. He joined the City of Coral Gables in 2004 and currently serves as Director of Innovation & Technology and Chief Innovation Officer. He leads strategic planning, oversight, and management of citywide IT operations, infrastructure, and smart city initiatives. Under his leadership, the city has received numerous awards, including IEEE Smart Cities Jury Award in 2022, first place in the U.S. Open Cities Index in 2019 and 2020, and Smart 50 Award in Urban Infrastructure in 2020 and 2023.

and DL-powered cybersecurity systems), and other frameworks that inform and guide our ethical, secure, responsible, and productive use of these technologies. Our practices have also evolved by fostering dialogue and research on these rapidly evolving fields to embrace a balanced approach that includes technological innovation alongside public trust and ethical governance.

From chatbots to smart city portals and ICI, AI plays an important role in our ability to leverage innovation and technology to continuously improve quality of life and municipal services for our community while bringing new challenges and opportunities for governance and responsible use. You can learn more about our smart city and digital transformation initiatives, AI use cases, and Industry 4.0 technology infrastructure in the Coral Gables Smart City Digital Library at coralgables.com/itdocs.



THE TRANSFORMATIVE POWER OF NEUROARCHITECTURE

PRESENTATION BY YOHANY ALBORNOZ AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

Neuroarchitecture is a discipline that sits at the intersection of architecture and neuroscience, exploring how spaces can profoundly influence human behavior, emotions, and cognitive processes. By decoding human needs and behaviors, we can create spaces that not only accommodate but also enhance our capacity for happiness, productivity, and creativity.

From a young age, I've been a fascinated observer of how people's moods and behaviors change in different spaces. I used to play in a symphony orchestra and had the opportunity to perform in many stages, concert halls, and rehearsal rooms, and I became curious of how each environment affected not just the sound but the way we, as musicians, felt and performed. At first, I thought it was all due to acoustics, but I always had this idea that something more was going on. I was moved by the dream to become an architect to elicit the soul of musicians and as many people as possible.

This has led me through a fascinating journey. I have learned about architecture, technology, innovation, materials, and construction systems but also about many intangible and, sometimes, invisible concepts that are as important, like understanding our mind, our evolutionary history, our neurophysiological responses, and our cognitive bias, among many other concepts. In exploring these ideas, I've come to see architecture as a key to enhancing the human experience.

In today's smart city era, technology, data, and innovation are rapidly reshaping how we design environments. But amid these advances, it's essential not to lose sight of a crucial factor: the human mind. Neuroarchitecture is an emerging field that bridges architecture, neuroscience, and psychology. It conducts scientific research with the objective to understand the intangible interaction we have with space so we can apply it to design projects with the

objective of promoting well-being, positively influencing our behavior, and, at its core, showing us how we can design for the mind.

Understanding Human Needs in Spaces

Humans are not passive observers of the environment. Our brains are wired to continuously process and interpret the spaces we inhabit—often without us even being aware of it. This constant, unconscious scanning affects everything from our stress levels to our ability to focus. Therefore, it's vital to design environments that meet both our biological and psychological needs.

Our body processes information through multiple receptors. Our senses are argued to be from at least nine to possibly 33, and our brains rapidly interpret this sensory input to make automatic responses.

One aspect that particularly interests

me is how these responses are tied to the meaning we assign to an experience. This meaning is influenced by factors at three levels: biological (shared across humanity), cultural (shaped by societal backgrounds), and personal (formed by individual experiences and expectations). This is why even though we share commonalities, we don't all perceive things in the same way.

That's why it's essential for designers, urban planners, and policymakers to understand users. By doing so, they can create spaces that support growth, foster opportunities, or, at the very least, avoid being a source of stress.

Through my work and studies, I've found that the brain's role in decision-making is a critical component of how we experience space. In designing smart cities or even individual workplaces, it's

“WHEN WE DESIGN WITH THE HUMAN MIND IN MIND, WE TAP INTO THE POWER OF MEANING. WHEN WE DESIGN FOR MEANING, WE CAN FOSTER A SENSE OF BELONGING, WHICH IS DEEPLY CONNECTED TO WELL-BEING AND STRESS REDUCTION.”



essential to consider how the design of space interacts with our cognitive processes. This understanding leads to environments that not only look appealing but also promote a sense of belonging, engagement, and well-being.

Applying These Concepts into Practice

As mentioned earlier, neuroarchitecture is still in its early stages, and we don't yet have a standardized manual to follow. However, we rely on primary and secondary research, original studies, and experiments, as well as systematic reviews and meta-analyses to begin understanding how certain concepts and insights can be applied in different contexts.

However, across what I have read, I have identified three insights that can help our brain save energy, avoid a sense of threat or danger, and have pleasure, which are all essential from an evolutionary standpoint.

The first one is balance. It's important to carefully manage the stimuli within an environment and create a balanced multisensory experience. For example, incorporating nature into built environments is essential for well-being, but overexposing us to it can feel overwhelming or threatening. Similarly, even though there is research showing we prefer curved shapes, it doesn't mean everything in a space should be curved—it's all about finding balance and should apply to all forms of stimuli.

The second one is legibility. This refers to designing spaces in a way that allows users to understand and navigate them easily. When we can form a mental map of a space, we quickly assess it as safe, reducing cognitive load. Clutter, for instance, forces the brain to work harder to process information,

which can lead to stress. This is why a well-organized space promotes a sense of calm, a principle that applies across different scales, from rooms to entire urban layouts.

Finally, we come to pleasure and how beauty, often seen as subjective, can be a powerful tool to enhance well-being. Recent research in neuroaesthetics, the study of how the brain responds to beauty, reveals that much of what we find beautiful is linked to patterns we see in nature. By integrating this understanding into design, we can create environments that are both functional and emotionally enriching.

Designing for Future Cities

When we design with the human mind in mind, we tap into the power of meaning. When we design for meaning, we can foster a sense of belonging, which is deeply connected to well-being and stress reduction.

This approach can significantly impact various industries, including workplaces, retail, hospitality, health care, and educational environments. From a sustainability perspective, it also fosters a stronger connection to the built environment—when people feel a sense of belonging, they are more likely to care for and preserve those spaces.

By focusing on how our brains and bodies interact with the built environment, neuroarchitecture can help us design spaces that are more intuitive, meaningful, and, ultimately, more human. In the rapidly evolving landscape of smart cities, this approach can create environments where both technology and human well-being thrive, making our urban spaces not just smart but truly intelligent.



Yohany Albornoz
Creative Director, The Marketer Architect
Miami, Florida

Yohany Albornoz is a Venezuelan architect specialized in the intersection of neuroscience and architecture. As an independent researcher, she contributes as a consultant at the University of Texas Rio Grande Valley under the Alzheimer's Disease Resource Center for Minority Aging Research, Neurosciences, and Human Genetics, led by Dr. Gladys Maestre. Alongside her research, she is a guest teacher in neuroarchitecture courses and is a co-founder of Discover Neuroarchitecture, Human Sensory Studio & Consulting; co-founder of Building Art X, Consulting Services for Public Art Projects; and co-founder of The Marketer Architect Agency, dedicated to commercial interior design.



USING ADAPTIVE POSITIVE DEVIANCE TO INTEGRATE AI IN EDUCATION

PRESENTATION BY DR. EDNA PASHER & ADI SARANGA AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

Does integrating artificial intelligence into learning processes create significant changes? The Adaptive Positive Deviance approach provides a powerful tool for improving the learning experience, making education more personalized, creative, and inspiring.

In today's rapidly advancing technological landscape, education is one of the sectors most impacted by new developments. The Israel Smart Cities Institute (ISCI) initiated a unique and in-depth project examining the impact of artificial intelligence (AI) on learning processes using the model of Adaptive Positive Deviance (APD), an innovation management tool that focuses on identifying individuals and institutions that excel in using AI to enhance education and using their successes as models for broader implementation in the education system.

The Methodology of Adaptive Positive Deviance in Education

Adaptive Positive Deviance is a management approach that identifies "positive deviants"—those who succeed where others fail—and analyzes their behaviors to derive insights for wider application. In the context of AI in education, this project focused on teachers, students, and institutions that have successfully utilized technology to improve learning experiences and educational outcomes.

The project was structured as an action research study, carefully selecting case studies, conducting interviews with key players in education and technology, and analyzing the positive deviations to develop recommendations for broader implementation.

The Impact of AI on Education

The study examined how AI tools, such

as ChatGPT, affect students' learning processes and emotions. One of the central findings was that the use of AI significantly enhances positive emotions such as curiosity, enthusiasm, and motivation among students. Those who used the technology effectively were able to improve their understanding of the material, develop creative thinking, and achieve better learning outcomes.

Key Findings

Throughout the research, several notable discoveries were made, emphasizing the value of AI in learning processes:

- **Enhancing Positive Emotions in Learning:** The APD approach improves learning experiences by boosting positive emotions like curiosity and motivation. This, in turn, leads to greater student engagement in the educational process.
- **Personalized Learning Programs:** AI tools enable the development of personalized learning plans for each student, making the learning process more efficient and targeted. Teachers

who embrace these technologies are able to track student progress more accurately and tailor lessons to individual needs.

- **Improved Learning Outcomes:** AI allows students to receive immediate feedback on their performance, which helps them better understand the material and learn more quickly. This instant feedback also boosts students' confidence and increases their motivation to continue learning and improving.
- **Fostering Creativity in Education:** AI not only improves efficiency but also allows students and teachers to think more creatively. The use of these tools fosters critical thinking and problem-solving skills, enabling students to tackle complex issues with innovative approaches.

The Positive Deviants in the Project

Throughout the project, several key individuals were identified as demonstrating groundbreaking approaches to using AI in education.



These include Ofer Danino, who launched the "Robophysics" initiative that merges science education with AI interfaces, and Ranin Habshi, who applies AI technology for personalized learning and innovative assessment processes.

Insights and Recommendations for Broader Implementation

Based on the findings of the project, several recommendations have been made for broader implementation of Adaptive Positive Deviance in the education system. First, it is crucial to focus on training teachers in the effective use of AI as an educational tool. Second, expanding the use of AI technologies in more educational institutions, especially in underprivileged areas, could help reduce educational disparities.

Additionally, it is important to continue exploring the emotional impacts of AI on students, finding ways to leverage the positive effects of this technology to

enhance students' sense of security and motivation.

Conclusion

Dr. Edna Pasher's project, conducted through the Israel Smart Cities Institute, demonstrates how integrating artificial intelligence into learning processes can create significant changes. The Adaptive Positive Deviance approach provides a powerful tool for improving the learning experience, making education more personalized, creative, and inspiring.

In the future, the education system should adopt the methods and tools that have proven effective through this research and integrate AI as an integral part of the learning process. Implementing these technologies in educational systems within smart cities will promote educational innovation and lead to continuous improvements in learning outcomes and student experiences.



Dr. Edna Pasher
 Founder and Chair,
 Israel Smart Cities Institute
 Tel Aviv, Israel

Edna Pasher is the founder and chair of the Israel Smart Cities Institute, a think tank made up of local and global experts who focus on providing smart solutions to municipalities and startups that make our cities smarter and more sustainable. Pasher earned her Ph.D. at New York University in communication arts and sciences and has served as a faculty member at Adelphi University, the City University of New York, the Hebrew University in Jerusalem, and Tel-Aviv University.



Adi Saranga
 Project Manager,
 Israel Smart Cities Institute
 Tel Aviv, Israel

Adi Saranga is a skilled project manager with a B.A. in psychology from Reichman University. Passionate about community impact, she volunteers with Beit Issie Shapiro, supporting children with disabilities, and coordinates volunteer efforts for Tzemach, guiding educational initiatives in leadership and Zionism for youth.

“THE USE OF AI SIGNIFICANTLY ENHANCES POSITIVE EMOTIONS SUCH AS CURIOSITY, ENTHUSIASM, AND MOTIVATION AMONG STUDENTS.”

“THOSE WHO USED THE TECHNOLOGY EFFECTIVELY WERE ABLE TO IMPROVE THEIR UNDERSTANDING OF THE MATERIAL, DEVELOP CREATIVE THINKING, AND ACHIEVE BETTER LEARNING OUTCOMES.”

SOCIAL VALUE & EQUITY BY DESIGN

PRESENTATION BY DR. SARA CANDIRACCI AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

The built environment plays a pivotal role in driving social progress by shaping the places where people live and interact. By prioritizing social value and equity, cities can improve quality of life, foster community connections, enhance climate resilience, and enable inclusive governance.

The design, construction, and operation of built and natural environment projects, as well as social initiatives and policies, shape the places, neighborhoods, and cities that form the stage of people's everyday lives. As such, the built environment industry is central to driving social change across society.

Despite this, we seldom talk about the social outcomes we want to deliver or enhance through our work. This means we often miss significant opportunities to reap social benefits and redress the inequities between different community groups. Practitioners, authorities, business leaders and investors across the industry increasingly acknowledge the role they have to play in creating more sustainable and inclusive environments. They are starting to take their responsibilities toward the local communities they work in far more seriously. Today, ESG (Environmental, Social, and Governance) considerations are becoming a priority in the industry. Yet, questions around social value and equity have until recently taken a back seat to environmental concerns—which isn't surprising given the climate crisis. The focus has been on reducing the carbon footprint and environmental impact in our cities, but less attention has been placed on understanding and improving the social impact of the built environment industry on individuals and communities.

In light of this, Arup has examined the emergence of social value and equity as a concept that needs to be considered as the essential part of the built environment practice. We recognize that the meaning of social value and equity depends on historical, cultural, and social contexts, and, therefore, there cannot be a one-size-fits-all solution.

The creation of social outcomes must be a dynamic and flexible process that adapts to the unique attributes of every place and community. This is why Arup's approach is expressed as a "Theory of Change," a methodology that can be adapted to different types of projects and contexts.

Putting community needs and wants at its heart, Arup's Social Value and Equity "Theory of Change" starts from the desired outcomes or large-scale aims that we seek to achieve through our work, which contributes to our ultimate aim: to create a better quality of life for people and a more inclusive, equitable, and just environment and society. Working backward, once the outcomes have been agreed, the outputs—or initiatives and interventions—that support the aims are devised.

The project outcomes and outputs must be identified in close collaboration with its end users and the local community affected by our work. Only this will base outputs on their needs and values and within the specific contextual characteristics. The identification and delivery of outputs are supported by a set of inputs—methods and tools—that form the backbone of Arup's practice and services.

We identified six major outcomes that contribute to our ultimate aim: enhancing people's quality of life and creating a more inclusive, equitable, and just environment and society. They can be used as areas of focus when engaging communities, clients, and other key project stakeholders. Engagement around these areas helps to understand local needs and opportunities and to set up priorities.

The outcomes identified by Arup are not definitive: They should be refined and adapted

according to the needs and values of the individuals and communities affected, as well as in accordance with the scope of the project. Additional outcomes may also be identified through the engagement of local communities. Not every project will be able to contribute to all these outcomes and beyond, but we should seek to contribute to as many as materially possible—and ensure we don't have negative impacts on any of them. These outcomes are:

Standard of Living

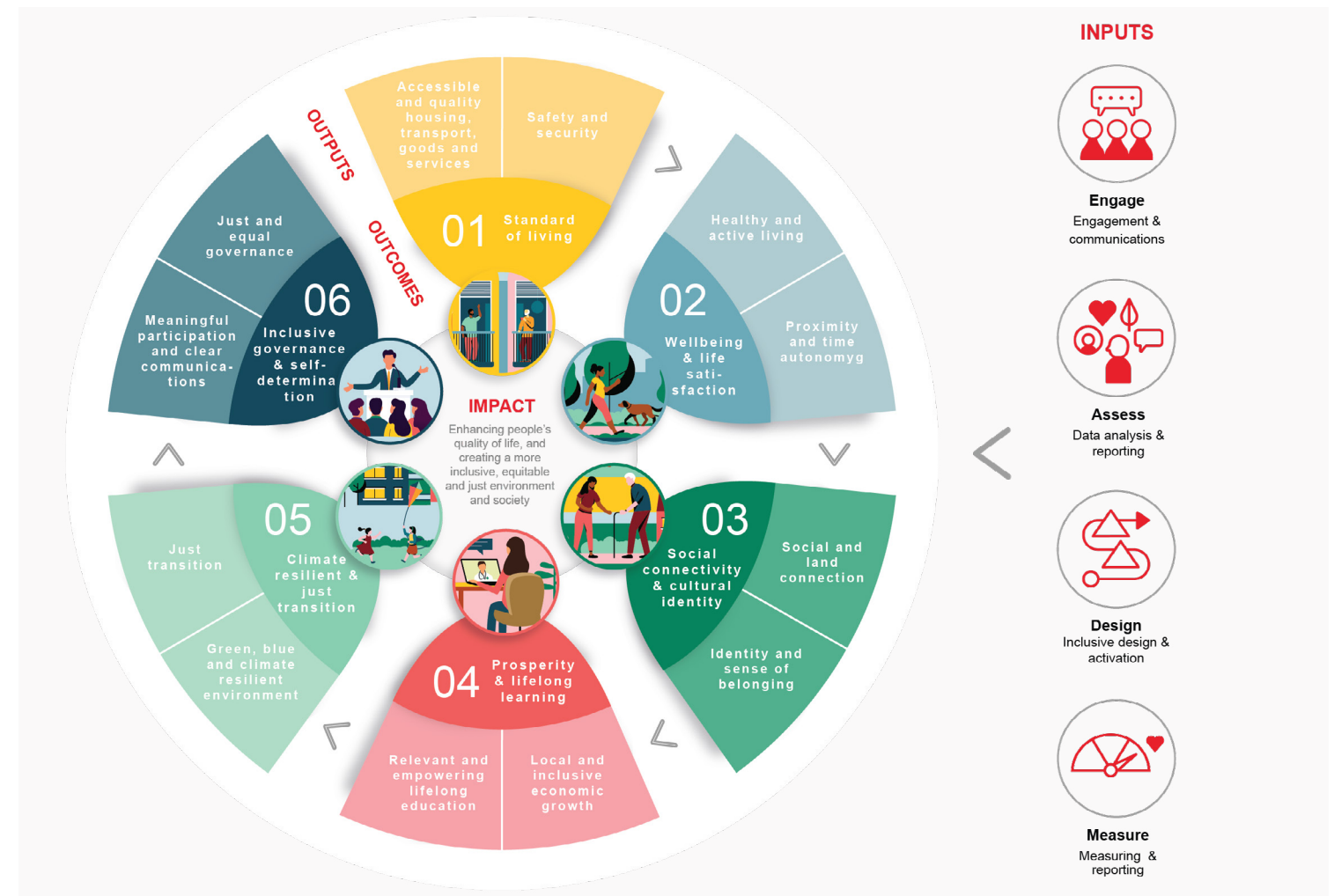
Includes satisfaction of the basic physiological and safety needs and is a foundation for quality of life and for an inclusive, just, and equitable environment and society. Through our work, as we seek to improve the housing, food, energy, sanitation, and drinking water conditions of a target community, we need to ensure that social aspects such as gender equality, safety, justice, and a sense of control are duly considered.

Well-Being & Life Satisfaction

This is ultimately the feeling an individual or a community holds about their state of health, happiness, and life accomplishment, as well as a collective sense of cohesion and stability. Through our work, we need to consider how to improve key socioeconomic, cultural, and physical factors, such as physical and mental health.

Social Connectivity & Cultural Identity

Includes the quality and density of individuals' and communities' support networks, their sense of trust in neighbors and authorities, and their sense of safety, conviviality, and cultural identity. By nature, humans are social creatures, and through our work, we need to enable positive social connections, a sense of belonging, and mutual support.



Prosperity & Lifelong Learning

Includes access to equal job opportunities, as well as to inclusive educational, professional, and personal skills development. Through our work, we need to enhance economic activities that lead to a comfortable life and to enable individuals to expand their knowledge, perspectives, and abilities and empower them to make decisions.

Climate Resilient & Just Transition

This is a requisite for a thriving environment and society. Through our work, we need to ensure that the transition to climate neutrality is delivered in a socially just manner that benefits

all, starting with those most vulnerable. This includes supporting the socioeconomic and green transformation required to address climate change and create social resilience.

Inclusive Governance & Self-Determination

This is the extent to which people feel legally and culturally empowered to participate in civic and political life and decision-making. It includes the degree of support from, and trust in, institutions, as well as freedom from discrimination. The sovereignty of Indigenous people and First Nations is an aspect of this. Through our work, we need to ensure the active participation and self-determination

of local communities—in particular, the most excluded and vulnerable groups—and create better governance overall.

The involvement and engagement of different stakeholder groups (i.e., institutional, technical, private sector, academia) and the community we work in for the duration of a project is key to delivering social value & equity outcomes. They can provide a wealth of information about local conditions and expertise, hence their deep engagement from the early phases of a project and throughout is critical to shaping contextually relevant solutions and ensuring that benefits are achieved in an inclusive way.



Dr. Sara Candiracci
Associate Director, Global Leader for Social Value & Equity, Arup Milan, Italy

Sara Candiracci is an Associate Director in Arup's Cities, Planning, and Design team in Milan and the Global Leader for Social Value and Equity. She also leads Arup's work on gender-responsive urban planning and child-friendly and playful cities. With more than two decades of experience as an urban planner, researcher, and international development expert, she has been at the forefront of designing and leading projects and programs focused on creating more equitable, inclusive, healthy and resilient cities. She also has the ability and passion to use applied research to shape innovative ideas and approaches and transform them into strategies and practices that enable innovation and change.

WHAT IS A SMART, INNOVATIVE, FUTURE-READY CITY?

PRESENTATION BY DR. JANICE PERLMAN AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

Today’s visions for future cities are high-tech enclaves that emphasize aesthetics over resilience. But beneath their glossy promotional materials lies a critical question: Will these designs actually serve the people who live in them or merely create isolated, sterile enclaves? True urban innovation, the kind that fosters resilience and creativity, thrives not on shiny facades but on climate adaptation, community bonds, diversity, and social flexibility.

Let me begin by asking you to close your eyes for a moment and conjure up an image of a future city. What might it look like? Who is living there? How might it function on a day-to-day basis? A few of the many designs that cities have proposed or built include Tianjin’s Eco-City, Dubai’s Floating City, Saudi Arabia’s Linear City, and Telosa’s Private City in Nevada.

Saudi Arabia’s Linear City, NOEM, has been scaled back from a line to a dash—a series of recreational spaces for the ultra-rich. It is the model for Nevada’s Telosa, costing \$400 billion for the first 50,000 people. Its stated mission is “to create a new city in America that sets a global standard for urban living, expands human potential, and becomes a blueprint for future generations.”

These are just a few conceptions for future cities, all of which echo that tagline. Their promotional materials are more enticing than smart or sustainable. It’s hard to imagine a city-loving person willing to live in such isolated sterility. Where will the workers live? What is the economic base? Where will their food and water come from—and their waste be disposed of? How much will they add to global warming as they attempt to cool the buildings?

Urgently, what are the measures to deal with extreme temperatures, sea level rise, or the floods, droughts, hurricanes, and fires we have been experiencing over the last several years? The smart cities are not exempt from the so-called “natural” disasters resulting from manmade climate change.

In fact, research on what makes some

cities more resilient than others found that the best single predictor of speedy recovery time from such disasters as hurricanes and floods is the strength of the civil society. The community bonds that are mobilized to the rescue before any official agencies act make all the difference. Disaster preparedness and recovery capacity is a social and cultural issue as well as an architectural one. It is about creative, resilient people in communities on the ground who know what to do in emergencies.

These change-averse futuristic city designs appear dystopian. Promotional videos show recruited residents talking about diversity, inclusivity, and creativity. Like past Utopian communities, they will fade out if they are not sufficiently flexible to adapt to changing social norms or individual preferences.

Learning from Biosphere 2

Some of you will remember Biosphere 2. It was built in the Arizona desert between 1987 and 1991 as a closed, self-sustaining community useful for designing a space station. It attracted some of the best minds of the time. It was conceived in 1984 when Ed Bass, a businessman and billionaire philanthropist, and John P. Allen, a systems ecologist, began collaborating. They started with \$150 million to last until 1991. This was a real-life test of whether a closed space could support life. Biosphere 2 was planned to house eight people for two years. It failed socially, technically, and ethically.

On the social level, the eight people did not get along. No provision had been made for

dealing with extreme isolation, conflict over scarce resources, and the stress of living in a closed environment. A power struggle over the project’s direction led to the formation of two opposing factions that became hostile toward each other. The syndrome is known as “confined environment pathology.”

On the technical level, not enough oxygen was generated to sustain human life. As was true in the real world outside, the problem was rising carbon dioxide. The drop in oxygen levels led to health issues akin to high altitude sickness, including fatigue and difficulty performing physical tasks.

On the ethical level, we learned that air was secretly being pumped into the space under the cover of night and other interactions with the “outside world” were going on (such as doctor’s consultations). Instead of announcing the problems and trying to improve the model itself, the system failure was covered up.

The Innovative City

Urban innovation arises from density, diversity, and proximity. The more heterogeneous, the better for complex problem-solving. The unexpected encounters that spark insight cannot be planned by algorithms. Innovation is rarely a solo act; it arises from the friction between different types of people sharing the same urban space. It is provoked by conflicting worldviews that call into question our own assumptions. People continue to flock to the world’s big cities where chaos and creativity blossom.

The soaring sculptural shapes



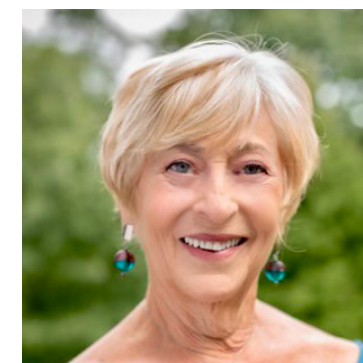
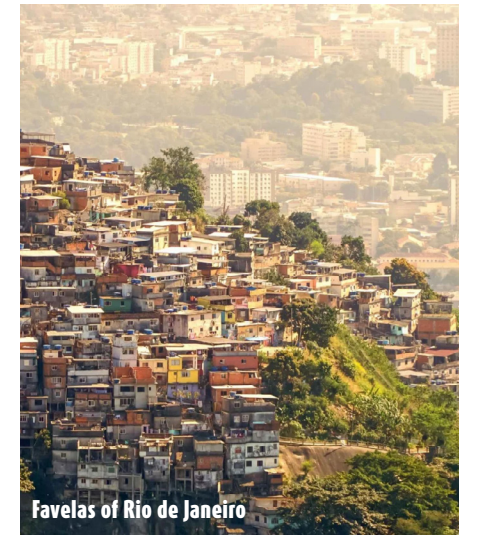
seem to have rubbed out the various neighborhoods, the interstices where deviant ideas can bubble up and be debated or tested. Perhaps to confront the ecological imperatives our planet is facing and the millions of people flocking into the cities, the fastest-growing segment of the world’s population is this newcomer group living in “informal settlements.” The billion people in this sector will double by 2030 and triple by 2050.

In addition to preparing for climate change and sea level rise, this population is what a smart city should be preparing for. Within this population might be the next Albert Einstein or Pablo Picasso. Financing techno-toys in inaccessible locations is taking

gated communities to the ultimate level.

The new urbanism was all about cities that are robust, green, sustainable, high-density, low-cost, near center city, accessible by foot or bike, and composed of close-knit communities with strong ties. How have we moved so quickly to the polar opposite with these designs that barely merit the designation of cities?

I contend that future cities and future-ready cities are going to look a lot more like the favelas (squatter settlement) in Rio de Janeiro than like any of the sleek designs we see. Cities of the future will only be smart, innovative and future-ready only if they go beyond designing snazzy high-tech playgrounds for the elite.



Dr. Janice Perlman
 Founder & President, The Mega-Cities Project
 New York, New York

Janice Perlman’s viewpoint on smart cities is shaped by over 50 years dedicated to bridging the worlds of research and public policy. She has lived in and conducted longitudinal field research in the favelas (informal settlements) of Rio de Janeiro, published two books on the findings, advocated for policy change, and taught at universities around the globe. She is the founder and current president of a global not-for-profit organization, The Mega-Cities Project, starting in 1988. Its mission is “to shorten the lag time between ideas and implementation in urban problem-solving.” It works in the world’s largest cities to identify, share, and jump-start successful innovations addressing the challenges cities face in common.

URBAN INCLUSIVITY IN AFRICA: THE ROLE OF SMART CITY INITIATIVES

PRESENTATION BY JULIET CHINEMELU AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

By leveraging technology, smart city initiatives in Africa can promote urban inclusivity, improve access to essential services, enhance governance, and foster sustainable development, benefiting all urban residents, especially marginalized communities.

Urbanization is rapidly reshaping Africa's landscape. As of 2020, around 600 million Africans live in urban areas, with projections suggesting that by 2050, the continent's urban population will double to reach 1.5 billion. While urbanization presents opportunities for economic growth and development, it also exacerbates existing challenges such as housing shortages, infrastructure deficits, and social inequality.

Urban Slum Prevalence in Africa

The concept of smart cities has emerged as a potential solution to address these challenges and drive urban inclusivity. By harnessing technology, data, and innovative planning, smart city initiatives can bridge the gaps in infrastructure, enhance access to essential services, and foster inclusive growth.

This article explores how smart city initiatives in Africa can address urban challenges and promote inclusivity, with a focus on affordable housing, inclusive urban planning, improved infrastructure, sustainable development, environmental management, governance, citizen participation, economic development, job creation, public safety, and security. It highlights best practices and successful smart city projects across the continent.

Smart Cities: The African Context

Smart cities refer to urban areas that integrate technology and data-driven solutions to optimize resources, improve infrastructure, and enhance the quality of life for residents. Globally, smart city initiatives have taken root in cities like Barcelona, Tokyo, Seoul, New York, Amsterdam, and Singapore, where innovative technologies are used to improve urban services, manage traffic, and implement e-government platforms.

In the African context, however, smart cities take on a more nuanced role. African smart city initiatives are not just about high-tech advancements but about addressing basic urban challenges, creating job opportunities, managing environmental challenges, and ensuring inclusive development for all residents, including marginalized communities. According to UN-Habitat, people-centered smart city development is crucial for Africa since many cities face critical challenges ranging from government financial constraints to digital inequality and poverty.

Urban Inclusivity and Africa Smart Cities Initiatives

Urban inclusivity is key for sustainable urban development in Africa. It ensures that all city residents, regardless of socioeconomic background, gender, or disability status, have equal access to services, opportunities, and participation in governance. Unfortunately, many African cities suffer from persistent inequalities. Informal settlements often lack access to basic services like water, electricity, sanitation, and health care.

Smart city initiatives hold immense potential to address these disparities by providing technology-driven solutions that benefit all urban residents. The role of inclusivity can be divided into four key areas:

1. Affordable Housing and Infrastructure

A challenge for many African cities is providing affordable and adequate housing for their rapidly growing populations. According to the World Bank, over 50% of urban dwellers in sub-Saharan Africa live in informal settlements, where they face overcrowded conditions, poor sanitation, and insecure tenure.

Smart cities offer innovative solutions to address housing issues. For instance, modular

housing, prefabricated construction, and smart building materials have been proposed to reduce construction costs and time while maintaining durability and sustainability. In cities like Kigali, Rwanda, and Lagos, Nigeria, projects aim to provide affordable housing while incorporating smart infrastructure, such as renewable energy grids and eco-friendly materials.

In Cape Town, South Africa, smart water meters have been installed to monitor water usage, prevent leakages, and ensure equitable access to water for residents in informal settlements. Similarly, smart grid technology can expand electricity access to remote areas while promoting sustainable energy consumption.

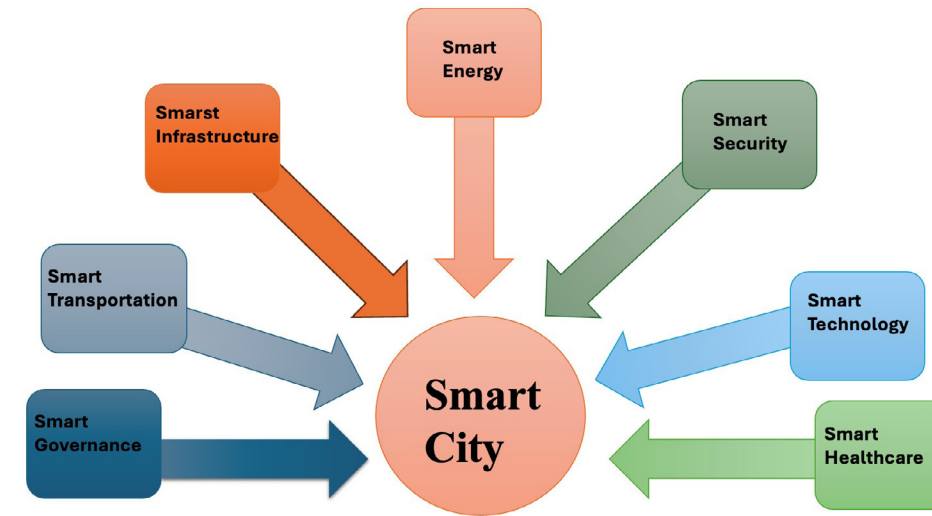
2. Inclusive Transportation Systems

In many African cities, public transport systems are inadequate, unreliable, and often unaffordable for low-income residents. A lack of accessible transportation worsens socioeconomic disparities and limits opportunities for employment, education, and health care.

Smart transportation systems can make mobility more inclusive by offering affordable, efficient, and sustainable transportation options. Intelligent transport systems (ITS) use real-time data to optimize traffic flows, reduce congestion, and improve public transport efficiency. In Lagos, ITS has improved the performance of the city's Bus Rapid Transit (BRT) system.

Ride-sharing platforms like Uber and Bolt are leveraging technology to provide alternative mobility options in African cities. In Kenya, Little Cab offers discounted fares and features that cater to women and the elderly.

Rwanda has become a leader in promoting



electric vehicles as part of its green city initiatives. The Rwanda Green Fund has invested in charging infrastructure and electric motorcycles to reduce carbon emissions and make transportation more sustainable.

3. Digital Infrastructure and Bridging the Digital Divide

Digital connectivity is at the heart of smart cities, enabling the use of data, the Internet of Things (IoT), and e-governance platforms to improve service delivery and urban management. However, Africa faces a significant digital divide, with millions of urban residents lacking access to the internet, smartphones, or digital literacy.

Smart cities must expand digital infrastructure to reach all urban residents, especially those in informal settlements and rural areas. Projects like Konza Technopolis in Kenya and Eko Atlantic in Nigeria are working to provide universal digital access.

Smart city initiatives can also leverage digital technology to improve health care and education access. Telemedicine platforms can enable remote consultations, while e-learning tools can enhance education for children in marginalized communities. In South Africa, the Cape Town Smart City Strategy aims to use data-driven solutions to improve health services and expand digital literacy programs.

E-governance platforms enhance citizen participation in urban planning. In Kigali, e-governance platforms have been instrumental in involving citizens in urban planning processes, ensuring that development reflects community needs.

4. Inclusive Governance and Civic Participation

Smart cities thrive on inclusive and transparent decision-making processes that

involve all stakeholders. In many African cities, governance structures are centralized, with limited avenues for citizen participation.

Smart city initiatives can promote inclusive governance by creating platforms for civic participation. E-governance tools such as mobile apps and websites can facilitate citizen feedback on urban issues, enabling residents to report problems and suggest solutions.

In Ethiopia, the Hawassa Smart City Initiative uses digital platforms to engage communities in city planning. Through a mobile app, residents can report issues, which are then addressed by city administration in real time.

Challenges and Opportunities for Smart Cities in Africa

While the potential of smart cities in Africa is immense, several challenges must be addressed to ensure they promote inclusivity. Funding constraints, infrastructure deficits, and the digital divide remain significant obstacles to implementing smart city solutions. The success of smart cities depends on strong political will, transparent governance, and long-term planning.

There are also opportunities for innovation and collaboration. Partnerships between governments, international organizations, and the private sector can provide the necessary funding, expertise, and technology to implement smart city solutions.

Conclusion: The Future of Inclusive Smart Cities in Africa

Smart city initiatives present a unique opportunity for African cities to address urban challenges and promote inclusivity. By leveraging technology and innovation, smart cities can provide affordable housing, improve transportation, bridge the digital divide, and

“SMART CITY INITIATIVES HOLD IMMENSE POTENTIAL TO ADDRESS AFRICA'S URBAN DISPARITIES BY PROVIDING TECHNOLOGY-DRIVEN SOLUTIONS THAT BENEFIT ALL URBAN RESIDENTS.”

foster inclusive governance. However, smart cities must prioritize the needs of marginalized communities to truly succeed.



Juliet Chinemelu
Lecturer, Akanu Ibiam Federal Polytechnic
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Juliet Chinemelu is a Nigerian, currently a lecturer at the Department of Urban and Regional Planning, Akanu Ibiam Federal Polytechnic, Nigeria. She is a certified urban planner with a TU Delft-IHE master's in transport and road engineering, a master's in geography, and BSc in urban and regional planning. With a wealth of experience in urban development and city planning, she is pivotal in shaping city planning in developing nations, collaborating with donor agencies and governments. Serving as an envoy to the United Nations and African Union ECOSOC, she is dedicated to empowering communities and fostering inclusivity, equity, and sustainable development.

A GLOBAL NETWORK OF MUNICIPAL INNOVATION CENTERS

PRESENTATION BY BATIA MACH SHEPHERD AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES

The Global Network of Municipal Innovation Centers (G-MiC) addresses city challenges by transforming how municipalities innovate and connecting cities with cutting-edge solutions and expertise on a global scale, fostering collaboration and innovative urban development worldwide.

In today's rapidly evolving urban landscape, cities face a multitude of challenges ranging from infrastructure development to sustainability and efficient governance. To address these issues head-on, a visionary initiative, Global Network of Municipal Innovation Centers (G-MiC), has emerged, transforming the way municipalities operate and innovate on a global scale.

The Genesis of MiC and Evolution into G-MiC

The journey of G-MiC began with the establishment of the Municipal Innovation Center (MiC) in Israel, a hub designed to facilitate the seamless connection between local authorities and innovative resources. MiC's mission was to empower municipalities by providing them with access

to cutting-edge solutions, technologies, and expert knowledge from the Israeli ecosystem. The center's holistic approach revolutionized urban management by bridging gaps between decision-makers and the tools they needed to create resilient, smart cities.

MiC's success at the local level led to a global initiative: G-MiC. This means it is now extending its reach beyond local boundaries to create a unified network of innovation centers around the world. By leveraging both physical and digital platforms, G-MiC aims to cultivate a comprehensive global ecosystem that supports smart, sustainable urban development.

The Vision and Mission of G-MiC

At its core, G-MiC's vision is to empower cities with the knowledge, tools, and collaborative

opportunities needed to become smart, sustainable hubs of innovation. The initiative focuses on a holistic and integrative model that addresses various urban challenges, including governance, infrastructure, mobility, energy, health, security, education, and environmental sustainability.

The holistic approach employed by G-MiC ensures that cities are not just implementing isolated technological solutions but are adopting a comprehensive strategy that aligns with their unique socioeconomic and environmental contexts. This methodology enables cities to improve their governance structures, enhance citizen engagement, and make data-driven decisions that lead to a better quality of life for all residents.

Smart Cities: From Technology to Citizen-Centric Solutions

The concept of a smart city has evolved significantly over the years. G-MiC embraces the idea of Smart City 4.0, which focuses on the active engagement of citizens and stakeholders in the development process. Unlike earlier technology-driven models that primarily concentrated on infrastructure and IoT deployments, Smart City 4.0 integrates societal needs with technological advancements to create more inclusive and sustainable urban environments.

The G-MiC Approach: Blending Physical and Digital Platforms

One of the most striking features of G-MiC is its dual-platform approach that combines physical innovation hubs with digital engagement tools. This synergy allows municipalities worldwide to participate in G-MiC's network, regardless of their geographical location.



Municipal Innovation Center (MiC) in Tel Aviv, Israel

- **Physical Innovation Hubs:** These hubs serve as centers for learning, collaboration, and experimentation. They feature state-of-the-art facilities where stakeholders can participate in workshops, lectures, and networking events. The physical space is designed to inspire creativity and foster partnerships between local authorities, technology providers, and community members.
- **Digital Platform:** G-MiC provides a comprehensive website that includes a market analysis platform, webinars, and a database that showcases innovative solutions and case studies from around the world. This platform enables cities to access a wealth of knowledge and connect with global experts to tailor solutions to their specific urban challenges.

The holistic and integrative approach of G-MiC emphasizes that smart city projects should be grounded in a business strategy rather than isolated, siloed efforts. This perspective focuses on leveraging interconnected technologies to enhance urban living comprehensively. For example, smart infrastructure isn't just about sustainable building practices; it's about integrating various technologies, such as sensors, cameras, and data-driven systems, to address critical issues like CO2 reduction, traffic congestion, and public safety. Furthermore, G-MiC promotes the incorporation of citizen-oriented applications into the city's operational systems, creating a unified ecosystem where all elements of urban management work together to improve efficiency, sustainability, and quality of life.

Key Areas of Focus for G-MiC

G-MiC's approach is driven by a focus on multiple interrelated areas of urban development, aiming to deliver a significant and holistic impact on city life.

This integrative focus ensures that G-MiC's initiatives are not just isolated efforts but are strategically aligned to transform cities into cohesive, intelligent environments where all systems work together seamlessly by streamlining leadership and decision-making processes to enable transparent, data-driven, and efficient municipal operations integrating solutions; developing integrated smart transportation systems to promote sustainable mobility; deploying smart sensors and monitoring systems to optimize energy use, promote environmental conservation, and significantly reduce the city's carbon footprint; or utilizing advanced technologies to bolster public safety measures; and much more.

G-MiC's Global Impact and Future Vision

The establishment of G-MiC as a global network signifies a paradigm shift in urban innovation. It moves beyond localized efforts and embraces a collaborative model where cities across the world share knowledge, resources, and solutions. This international network facilitates a continuous exchange of ideas, enabling municipalities to learn from each other's successes and challenges.

As G-MiC continues to grow, it aims to shape the future of urban environments by making cities smarter, more sustainable, and better equipped to handle the complexities of modern urban life. G-MiC encourages all local authorities, counties, and governments to be part of this transformative movement.

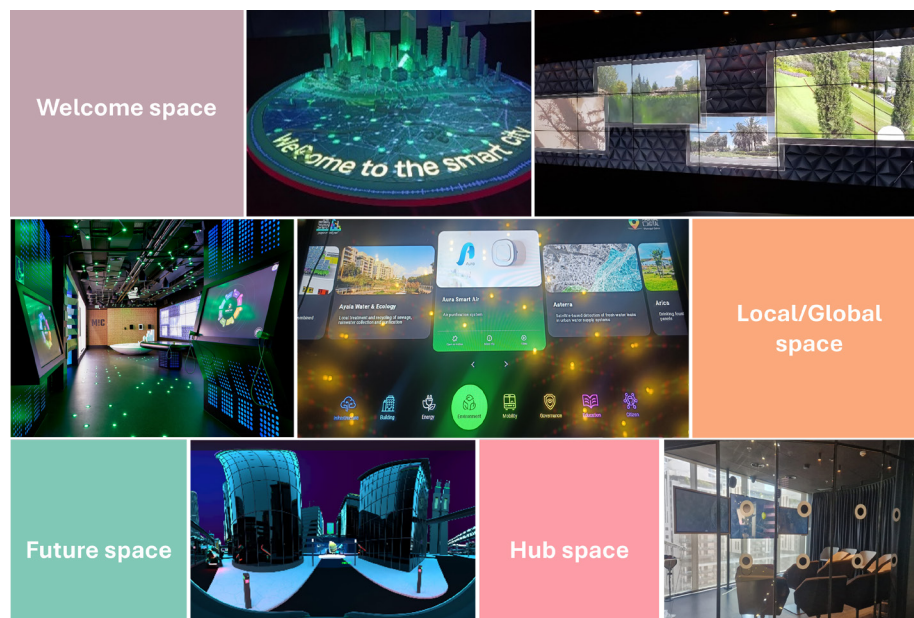
Together, we can shape a world where cities flourish and become attractive to live in, where innovation knows no bounds, and where sustainability is not just a goal but a way of life. The legacy of MiC continues with G-MiC—igniting cities, propelling progress, and building a future where every city is a testament to innovation and sustainability.



Batia Mach Shepherd
Senior Innovation Strategy
Advisor, Mashcal
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Batia Mach Shepherd is a smart city strategy expert who formed the vision and strategy for "MiC - Municipal Innovation Center" in Israel, a unique knowledge center based on academic research with a holistic and integrative approach to smart cities. She is also a lecturer, a keynote speaker, and a mentor and a judge in an international program called AcceliCITY for smart technologies.

A sneak preview of MiC



WHO'S WHO IN SUSTAINABILITY: IN FOCUS AT SMART CITY EXPO MIAMI 2024



In recent years, sustainability has become a pressing concern for citizens and communities worldwide. As people become more aware of environmental and social issues, they are recognizing the importance of incorporating sustainable practices into their own lives and communities. As we build toward a cleaner future, we must adopt renewable energy sources and resource-efficient practices that will help cities on a path toward a more environmentally and socially responsible future.

Smart City Expo Miami's 2024 "Who's Who In Sustainability" highlighted the leading innovators who have made significant contributions to advancing sustainability at the community level. The international group of awardees included Dr. Patricia McCarney, President and CEO of the World Council on City Data, for her work on sustainable smart standards (Toronto); Prof. Dr. Jonathan Reichental, CEO of Human Future, for his outstanding performance in sustainable smart education (Silicon Valley); G-MiC, an organization that provides logistical and project management services to all local authorities in Israel, for its work as a sustainable smart hub (Tel Aviv); Prof. Dr. Bruno Lanvin, President of the Smart City Observatory, for his development of the sustainable Smart City Index (Lausanne, Switzerland); Prof. Dr. Thomas Spiegelhalter, an architect, engineer, urban planner, and Florida International University professor, for his research into sustainable smart environments (Miami/Berlin); and Victor Dover, President of Dover, Kohl & Partners Town Planning, for innovation in sustainable smart urban planning (Coral Gables).

The awards were hosted by Bonnie Schneider, a meteorologist, author, and

special weather correspondent, who was honored with the Sustainable Meteorologist Author Award during the 2023 edition of Smart City Expo Miami.

"It's very exciting to be here to talk about sustainability and all the achievements of our award winners who represent diverse areas like education, urban planning, environmental design, standardization, city evaluation, and innovation hubs," Schneider said. "They have made significant contributions to sustainable urban living, creating valuable tools and insights that benefit cities and the people who live there."

Let's dive in to learn a little more about their outstanding accomplishments.

SUSTAINABLE SMART STANDARDS: DR. PATRICIA MCCARNEY

Dr. Patricia McCarney is the president and CEO of the World Council on City Data and Director of Standardized Urban Metrics. A political science professor at the University of Toronto and MIT graduate, she has played a pivotal role in creating international standards for sustainable cities. Her career spans both academic and professional realms, with a focus on standardizing urban data. McCarney's work with the United Nations Habitat and the World Bank led her to the ISO, where she developed global standards, including ISO 37120. She now co-chairs the ISO committee on ESG, advancing corporate and city data standardization efforts.

SUSTAINABLE SMART EDUCATION: PROF. DR. JONATHAN REICHENTAL

Prof. Dr. Jonathan Reichental is a leader in smart city innovation, sustainability, and digital transformation. As the former CIO for the City of Palo Alto, he launched groundbreaking projects, including a pioneering open data

platform. His work has been recognized globally, including by President Barack Obama for his work in creating a digital city. An educator, Reichental has lectured worldwide on cities and sustainability. As CEO and founder of Human Future, he continues to advise cities and organizations about sustainability and all things related to preparing humans for the future.

SUSTAINABLE SMART HUB: G-MiC

Mashcal, a nonprofit serving all local authorities in Israel, has managed municipal projects for 50 years, generating annual revenues exceeding \$2 billion. Specializing in tenders and project management, it offers customized, high-quality solutions for local governments. Five years ago, Mashcal launched the Municipal Innovation Center (MiC), a unique knowledge hub providing technological and methodical solutions to urban challenges. Recently, Mashcal expanded MiC globally, creating the Global Municipal Innovation Center (G-MiC) that will connect MiCs worldwide, providing a shared digital platform for accessing global best practices, technological solutions, and research. G-MiC fosters collaboration, enhancing global efforts toward smart, sustainable urban development by simplifying access to information and promoting international partnerships.

SUSTAINABLE SMART CITY INDEX: PROF. DR. BRUNO LANVIN

Prof. Dr. Bruno Lanvin is the President of the Smart City Observatory at the International Institute for Management Development in Lausanne, Switzerland, and a distinguished fellow at INSEAD. He is also the founder of the Descartes Institute for the Future and DL Partners consultancy. He co-founded the



Ram Sidis, Thomas Spiegelhalter, Jonathan Reichental, Bernardo Scheinkman, Patricia McCarney, Victor Dover, and Bruno Lanvin at Smart City Expo Miami 2024

Portulans Institute and has created some of the most widely used global indices, including the Smart City Index, the Network Readiness Index, and the Global Innovation Index. Over his 30-year career, Lanvin has held senior leadership roles and advised governments, international organizations, and multinational companies on issues of innovation, urban sustainability, and economic competitiveness. A passionate advocate for future readiness, he emphasizes the need for cities to leverage technology, reduce inequality, and foster inclusion to create smart, sustainable environments. His recent books, *The Future is Young* (2022) and *Prosperous and Inclusive Cities* (2024), reflect his belief that innovation, education, and citizen engagement are key to shaping a better world.

SUSTAINABLE SMART ENVIRONMENT: PROF. DR. THOMAS SPIEGELHALTER

Prof. Dr. Thomas Spiegelhalter, Ph.D., is a distinguished leader in environmental sustainability and urban design based

in Miami, Florida. With over 35 years of experience as a licensed architect, engineer, and urban planner, Spiegelhalter integrates cutting-edge technologies with sustainable practices, advancing the development of environmentally conscious urban spaces. A tenured professor at FIU, he co-directs the Structures and Environmental Technologies Lab and is instrumental in educating the next generation of architects and urban designers on sustainable and resilient city planning. His expertise in AI-driven design, carbon-positive architecture, and bioclimatic engineering has set new standards for greener, more efficient cities. Spiegelhalter's groundbreaking research and projects continue to shape the future of smart, sustainable urban environments, contributing significantly to the field's evolution.

SUSTAINABLE SMART URBAN PLANNING: VICTOR DOVER

Victor Dover, FAICP, is a renowned urban planner, designer, and futurist, co-founder of Dover, Kohl & Partners, in Coral Gables,

Florida, who has dedicated his career to creating livable, walkable, and sustainable communities. Dover is recognized as an authority on neighborhood restoration, street design reform, and sustainable urban development. His firm emphasizes visualizing change to help people make better decisions about their communities. He champions a "green first" approach, designing cities around public spaces and green infrastructure. A key project in Lake Wales, Florida, reconnects the city with its historic green network, emphasizing walkable, tree-lined streets and competitive, attractive main streets.

These innovators are dedicated to sustainability and environmental consciousness, and their work doesn't go unnoticed. They aim to offer innovative solutions and awareness-building initiatives with groundbreaking technologies. Smart City Expo Miami was thrilled to acknowledge them all for their contributions to a greener, more sustainable future.

STARTUPS PLAYGROUND PITCH

The session welcomed four startup companies—three local, one international—that have been working to solve cities’ challenges. The presenters each had five minutes to pitch their company and ideas to a panel of judges, each followed by a five-minute Q&A session.

The program was moderated by Jaap Donath, Ph.D., Assistant Executive Director of Programs at Alan B. Levan | NSU Broward Center of Innovation in Fort Lauderdale, Florida, which is billed as a “one-stop shop” to take startups through the process from idea to execution.

“A lot of us talk about policy projects in different communities, but at some point, somebody needs to come up with a solution, and that’s where startups come in,” Donath said. “South Florida has been designated by the U.S. government as a tech hub, in particular for climate tech. So, how do we make sure that we create an environment where technology startups can thrive to solve climate-related issues, which is a major component of smart cities.”

The presenters were Jazmin Locke-Rodriguez, Ph.D., Founder & CEO of Phytoflora, a company that uses hydroponically grown plants on floating rafts to cleanse waterways; Raquel de Antonio Crespo, Co-Founder of Sargassum Eco Lumber, which is transforming harmful seaweed and recycled plastics into eco-friendly building materials; Joop Veenis Founder of Scool2Walk, an app that helps children walk to school safely in groups; and Joe Baker Co-Founder of Regenerate Waste Management, which uses automation to extract valuable materials from landfills, transforming trash into new products.

The judges were Prof. Dr. Jonathan Reichental, CEO of Human Future; Gianluca Galletto, Founder & President of DG Advisors; and Diana Popic, Founder & CEO of Perla Venture Investments.

After careful consideration, the judges announced Sargassum Eco Lumber as the pitch winner. More information about each startup can be found on the following page.



Startups Playground judges Jonathan Reichental, Diana Popic, and Gianluca Galletto with moderator Jaap Donath



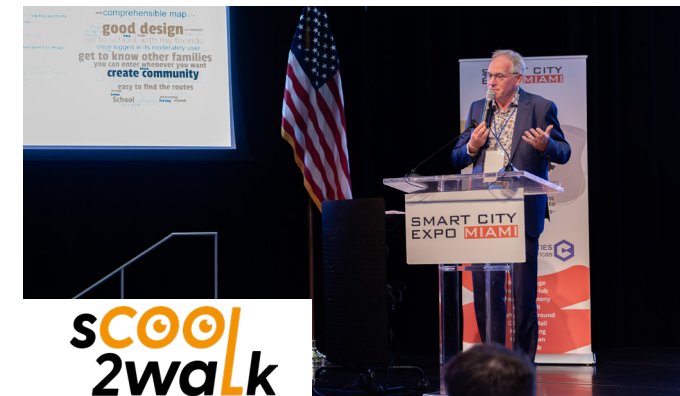
Startups Playground participants, judges, and moderator



PHYTOFLORA

Presented by Jazmin Locke-Rodriguez, Ph.D.

Jazmin Locke-Rodriguez, Ph.D., is a South Florida native environmental scientist focused on nature-based solutions to build soil, water, and ecosystem resilience. Specializing in agriculture, she sees the bioeconomy as a pathway to broader ecological restoration, with productive floating wetlands as a key tool. Her company, Phytoflora, is revolutionizing the fight against water pollution with its pioneering green infrastructure that employs productive floating wetlands that replicate the purifying power of natural wetlands. By integrating age-old Indigenous practices from Latin America, the approach utilizes hydroponically grown plants on floating rafts to cleanse waterways while simultaneously cultivating marketable crops such as cut flowers. This not only addresses nutrient pollution but also creates a sustainable model that supports and scales environmental efforts through the resale of these crops.



SCOOl2WALK

Presented by Joop Veenis

With over a decade of leadership in new mobility, automated transport, and mobility infrastructure, Joop Veenis is a visionary whose expertise spans policy, governance, and the intersection of social, economic, and sustainable technology innovation. As a former Knowledge Manager at the Dutch Ministry of Infrastructure and Public Works and Program Manager for Mobility in several municipalities, Veenis has honed his skills in aligning human factors with cutting-edge solutions for safer, more efficient cities. Joop has spearheaded the development and deployment of Scool2Walk, a “walk sharing” platform and app designed to help children walk to school safely in groups. Successfully implemented across the EU, Scool2Walk has significantly reduced car traffic around schools, promoting healthier lifestyles, lowering emissions, and enhancing safety for young pedestrians.



SARGASSUM ECO LUMBER

Presented by Raquel de Antonio Crespo

Raquel de Antonio Crespo has three decades of experience in marketing and business development, having led brand strategy and campaign initiatives across various industries. As a co-founder of Sargassum Eco Lumber, she applies her marketing knowledge and entrepreneurial experience toward promoting sustainable building materials. Sargassum Eco Lumber is revolutionizing the construction industry with sustainable materials. The solution tackles both land and ocean challenges by transforming harmful seaweed and recycled plastics into eco-friendly building materials, reducing the carbon footprint and environmental damage associated with traditional lumber. This innovation supports the vision of smart cities by addressing pressing global issues like deforestation, waste, and pollution, offering a circular economy solution for the future.



REGENERATE WASTE MANAGEMENT

Presented by Joe Baker

Throughout his career, Joe Baker, co-founder of Regenerate Waste Management and Planet Earth Partners, has led corporate sustainability strategy and ESG reporting for enterprises and startups, raised capital for environmental impact investment funds, and worked in sustainability technology. He is focused on leveraging technology innovation to empower businesses to reduce waste, decarbonize their operations, and amplify their social impact. Leveraging a proprietary automated landfill mining system, Regenerate Waste Management reclaims precious metals and other valuable recyclables from landfills to turn trash into treasure and create a circular supply chain. The company simultaneously creates economic value for shareholders, benefits the surrounding communities, and systematically addresses climate change by redesigning critical infrastructure.



AI AND ETHICS IN SMART CITIES WORKSHOP: A FORUM FOR RESPONSIBLE INNOVATION

The recent workshop at South Florida's cutting-edge AI Center of Miami Dade College brought together local Chief Information Officers (CIOs), policymakers, and urban planners to discuss ethical, governance, and practical applications of AI in smart cities. As a side event of Smart City Expo Miami and hosted by Dr. Michael Mannino, an expert in AI ethics, responsible AI frameworks, and AI governance, the event explored the opportunities and ethical challenges of AI in urban settings.

Setting the Stage: The Urgency of Ethical AI in Smart City Development

The workshop kicked off with an introduction by Dr. Mannino, who emphasized the critical role of ethics and governance in AI applications within smart cities. As smart city projects continue to proliferate worldwide, responsible AI use is essential to ensuring that these systems respect fairness, transparency, accountability, privacy, safety, and human-centric design. Dr. Mannino introduced these key ethical principles and frameworks, reminding attendees that the role of AI is to enhance, not undermine, the quality of urban life. At the beginning of the session, participants were invited to share brief introductions, setting a collaborative tone for the workshop.

Defining AI Ethics and Governance

In the first session, Dr. Mannino led an in-depth presentation on AI ethics and governance, exploring frameworks that can guide cities in deploying AI responsibly. He addressed fundamental ethical concerns like bias, security, and privacy, which are often magnified in urban contexts due to the scale and diversity of data involved. Furthermore, he highlighted the growing demand for accountability from public entities as AI becomes more integrated into daily life. A fascinating discussion of all attendees ensued, and policy considerations emerged as a central theme, with Dr. Mannino underscoring that public policy

can shape how cities govern AI, implement protections, and encourage innovation without compromising ethical standards. This segment set a strong foundation for the interactive portions that followed, grounding participants in the principles that should guide smart city AI initiatives.

Real-World Applications and Challenges: AI Use Cases in Smart Cities

Next, the workshop shifted into a practical exploration of AI applications with an interactive session led by Raimundo Rodulfo, Chief Innovation Officer of the City of Coral Gables. Rodulfo shared successful AI initiatives from Coral Gables, including predictive analytics for city services and real-time data-driven decision-making, which illustrated how AI can solve real urban challenges. Each CIO in attendance then contributed insights from their own cities, creating a dynamic exchange on the opportunities and difficulties they face in adopting AI.

Many participants noted the complexity of navigating advanced technologies like large language models (LLMs) and generative AI, particularly when balancing innovation with ethical considerations. Concerns included the need for scalable solutions that are robust against bias and capable of protecting citizen data. For some cities, intellectual property issues arose as they tried to adapt proprietary technologies to public applications, and others faced policy gaps that limited AI deployment. This

session provided attendees a platform to openly discuss how cities can implement AI responsibly, offering a rare opportunity for peer-to-peer learning.

Navigating Key Challenges: Security, Privacy, and Trust

Dr. Mannino facilitated a discussion on the ethical and security challenges inherent in AI use. Privacy emerged as a focal point, particularly given that urban data often contains sensitive information that, if mishandled, could harm residents' trust. Security issues—ranging from cyber vulnerabilities in AI systems to the ethical considerations of data ownership—were addressed, with participants agreeing that robust public policy is essential for managing these risks. Dr. Mannino steered the conversation toward actionable steps, emphasizing the importance of transparency and collaboration with citizens to foster trust. Intellectual property and the complexities of responsibly adopting AI in public settings were also debated, adding nuance to the ongoing conversation about responsible AI use.

Looking Ahead: Preparing for Future AI in Cities

The group also discussed the future of AI in smart cities. With AI adoption accelerating in public sectors and intersecting with technologies like quantum computing and neural networks, there is immense potential to further optimize urban infrastructure



and services. Dr. Mannino highlighted that rapid AI advancement brings unique challenges—particularly in anticipating and addressing future ethical issues before they arise. Participants discussed how cities can proactively prepare for these developments, considering training and upskilling initiatives for city staff and encouraging cross-sector collaboration to keep pace with AI's evolution.

The conversation also touched on the concept of “adaptive cities,” where AI enables cities to respond in real time to the needs of their residents. This future-forward view of AI aligns with the emphasis on human-centricity: While AI can enhance

urban life, its success depends on aligning with the well-being and safety of citizens.

Concluding with Collaboration and Next Steps

Dr. Mannino wrapped up the session by summarizing key takeaways and outlining next steps. Participants expressed enthusiasm for continued collaboration, suggesting future workshops to expand on specific topics such as privacy frameworks, policy development, and practical deployment strategies for emerging technologies. The workshop concluded with a commitment to sharing best practices and supporting each other

as they navigate the evolving landscape of AI in smart cities. Attendees left with actionable insights on how to manage the ethical, governance, and technical aspects of AI deployment, with a collective vision for cities that prioritize safety, inclusivity, and resilience.

The workshop provided an inspiring example of how South Florida is leading the way in responsible AI practices. It highlights the AI Center's role as a pivotal resource for local leaders committed to creating future-ready, ethically governed communities. With more events like this, Miami's smart city initiatives are well-positioned to serve as a model for cities around the world.

PROXIMITY OF CARE DESIGN GUIDE

PRESENTATION BY DR. SARA CANDIRACCI AT SMART CITY EXPO MIAMI - FUTURE-READY COMMUNITIES



The Proximity of Care Design Guide developed by Arup and the Bernard van Leer Foundation helps urban planners, designers, developers, city leaders, and early childhood development practitioners embed child and family-friendly design principles into their work.

The lives and development of most children are now shaped in cities, but these spaces are not designed with children and their families in mind. Spaces that consider the needs of children, their caregivers, and pregnant women deliver social and environmental benefits for the whole community in which they live, as well as commercial return on investment.

The guide is a practical and free online tool that can be used to assess, design, and build healthy, protective, stimulating, and supportive spaces in a cost-effective way, and to advocate for child and family-friendly urban environments.

A Collaborative Process

More than 1 billion children worldwide are growing up in cities. Although cities are rapidly expanding, they are not being shaped to meet the needs of children, caregivers, and pregnant women. The early years of a child's life are crucial for their physical, socio-emotional, language, and cognitive development. Neuroscience shows that a child's early experiences with family, caregivers, and their environment provide the foundation for lifelong health, learning, behavior, and well-being.

To develop to their full potential, young children require more than the minimum basics of good nutrition and health care, clean air and water, and a safe environment. Children also need plenty of opportunities to explore, play, and experience warm, responsive human interactions. For young children to make the most of their surrounding environment, places and the people in them need to cater to age-relevant developmental needs. This includes enabling

and supporting caregivers to provide healthy and nurturing care.

The guide is designed considering different urban contexts, including informal and refugee settlements, to respond to the needs of three groups of people: children 0-5 years old, their caregivers, and pregnant women living in urban contexts. Although, when the guide is put into practice, the whole community benefits.

A Practical, Inclusive, and Tested Guide

The first version of the *Proximity of Care Guide* was launched in 2021. It was originally created primarily for vulnerable urban contexts such as informal and refugee settlements, home to hundreds of millions of children worldwide. Arup and the Bernard van Leer Foundation partnered with four experienced organizations operating in these vulnerable contexts: Catalytic Action in El Mina, Lebanon; Civic in Azraq, Jordan; Kounkuey Design Initiative (KDI) in Kibera, Kenya; and Violence Prevention through Urban Upgrading (VPUU) in Khoyelitsha, South Africa.

A Technical Review Committee was set up to inform the guide, including experts and decision-makers from city government, humanitarian, and development sectors at the forefront of policy, design, and construction in vulnerable contexts: UNDP, UN-Habitat, UNICEF, International Federation of Red Cross and Red Crescent Societies, International Rescue Committee, Save the Children, ImagiNation Afrika, NACTO, World Health Organization, World Wide Fund for Nature, Norwegian Refugee Council, European Network for Child Friendly Cities, Municipality of Tirana, Ciudad Emergente, Qendra Marrëdhënie (The Relationship Center), and American Red Cross.

After a number of city authorities, private developers, and urban practitioners expressed interest in applying the guide to a range of projects and initiatives, Arup and the Bernard van Leer Foundation decided to further develop the guide to benefit children, caregivers, and pregnant women in any neighborhood or city worldwide for a wider range of users.

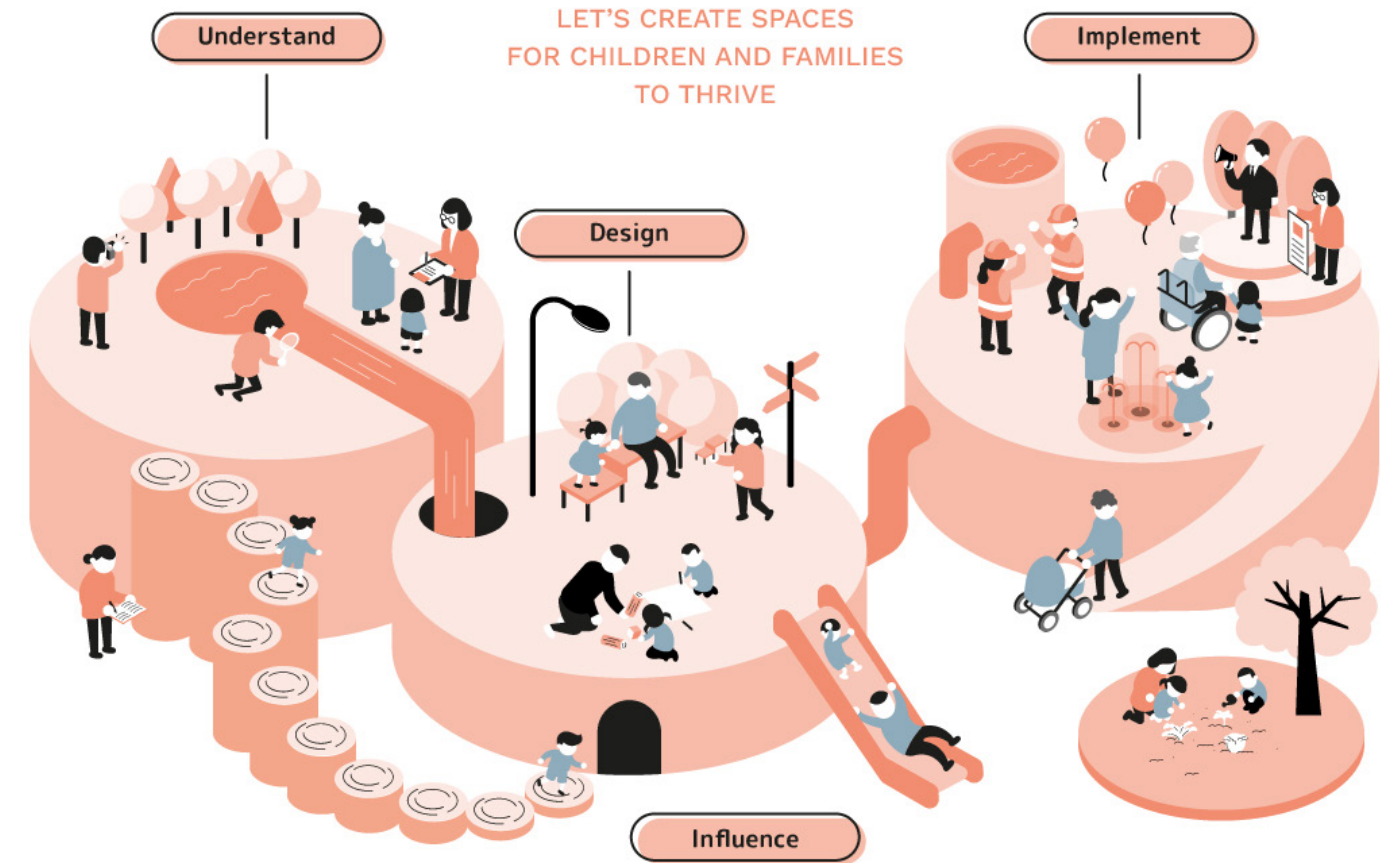
Partners from eight cities worldwide took part in a training program that we developed to apply the Proximity of Care approach to a particular challenge in each city and develop pilot solutions. The experience of using the guide for developing spatial interventions and implementation plans will help to form an expanded new version of the guide. The partners selected are Ciudad Emergente in Chile; Huasipichanga in Ecuador; Cidade Ativa and Estudio +I in Brazil; arki_Lab in Denmark; IPOPOP in collaboration with Pazi!Park in Slovenia; Espacio Ludico in Uruguay; and city authorities in Waltham Forest, London, and Lima, Peru.

The current guide incorporates knowledge, expertise, and practical experiences from the new partners, offering additional content to a broader audience, tools, and case studies to guide and inspire child and family-friendly solutions in cities worldwide.

Structure of the Guide

The guide provides a compendium of guiding principles, working tools, best practice examples, and recommendations, which can be used to assess, design, and build healthy, protective, stimulating, and supportive environments for young children's optimal development.

It is structured around four sections that represent the main stages in the life cycle



of an urban project: Understand, Design, Implement, and Influence.

- **Understand:** Explore the child-friendly approach to the starting steps of a project and how to better understand the constraints and needs of young children, their caregivers, and pregnant women in your targeted area. Discover how the Proximity of Care Framework can support you in exploring the relationship between various urban systems and children's developmental needs. Identify the right way to measure success along your project.
- **Design:** Explore how to bring children's perspectives into different design activities and how to integrate them with caregivers' and other stakeholders' priorities. Identify design choices that will optimize the social, economic, and environmental effectiveness of your projects. See examples from around the globe of projects that demonstrate practical, clear, and creative ways for designing child-centered interventions.
- **Implement:** Explore practical examples and insights to embed child- and family-friendly principles into your delivery process, inform your investments, and

deliver healthy, protective, stimulating, and supportive environments for young children. In this stage, you will find relevant guidance on how to implement a pilot or a public launch or how to think about future maintenance and impact measurement.

- **Influence:** Explore how to influence professionals, decision-makers, community champions, and other stakeholders on the need for, and value

of, child- and family-friendly interventions in urban contexts. This stage is relevant across different steps, advocating for impact across the project life cycle.

Each stage contains clear steps to guide users through the process of adopting a child- and family-friendly approach at every point of a project. Although the four main stages are presented as a linear process, they can be accessed and used in any order. Explore the guide at proximityofcare.com.



BOOKSTORE

The bookstore features books published by our award-winning speakers, raising the importance of urban planning. **Click on the book to purchase it.**

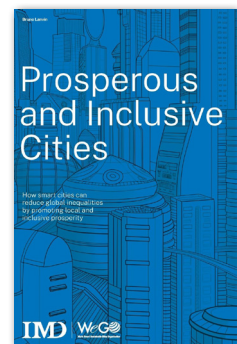
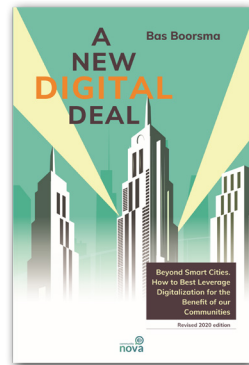


SIXTEEN SHADES OF SMART
How Cities Can Shape Their Own Future
Bruno Lanvin (et al.)

We are living in times when old paradigms are morphing into new ones: economically, socially and geo-strategically. Cities are playing bigger roles in delivering what citizens want. They also compete with each other to attract investment, talent, innovation, and jobs. In this new world, smart cities are ahead of the pack.

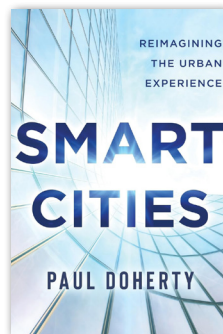
A NEW DIGITAL DEAL
Beyond Smart Cities. How to Best Leverage Digitization for the Benefit of our Communities
Bas Boorsma

A New Digital Deal explores the essence of digitalization, how communities can benefit from the next leap of digital change, and what is needed to orchestrate it across stakeholders, both public and private, targeting economic, societal, and environmental aims, cumulating in a New Deal that is digital in nature.



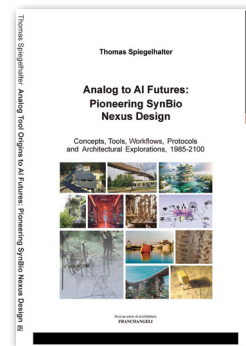
PROSPEROUS & INCLUSIVE CITIES
How Smart Cities Can Reduce Global Inequalities by Promoting Local and Inclusive Prosperity
Bruno Lanvin

“Inclusion without prosperity is just a call to redistribute poverty,” claims Bruno Lanvin at the opening of this provocative comparative analysis of smart cities around the world. The book includes 12 case studies illustrating different approaches to designing, building, and managing smart cities.



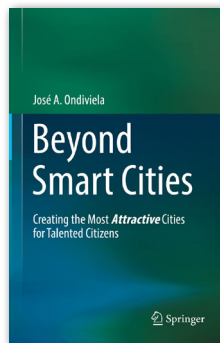
SMART CITIES
Reimagining the Urban Experience
Paul Doherty

The definitive guide on understanding smart cities and how to integrate your value into today’s #1 challenge to the human race: the reimagining of the urban experience. Paul Doherty shares his organization’s “secret sauce” recipe to marry information technology infrastructure—design thinking—with sustainable development goals for building smart cities.



ANALOG TO AI FUTURES
Pioneering SynBio Nexus Design
Thomas Spiegelhalter

From traditional design to cutting-edge, renewable, and carbon-positive urban solutions, this book is a manifesto for resilient, adaptive buildings, infrastructures, and urban design, seamlessly blending nature with bio-inspired structures. It is a transformative documentation with research and awarded design/built case studies.



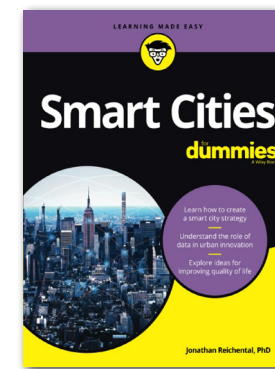
BEYOND SMART CITIES
Creating the Most Attractive Cities for Talented Citizens
José A. Ondiviela

Cities are at the beginning of the Fourth Industrial Revolution, and all of them want to play a relevant role in it. To do this, they must retain and attract the necessary talent. There is a fierce competition where cities transform to become as attractive as possible. But what makes a city attractive to talented citizens?



THE FUTURE IS YOUNG
How Technology, Talent, and Innovation Can Help Us Face the Most Pressing Challenges of Our Time
Bruno Lanvin & Osman Sultan

“The world has talents; it is time to offer them an ambition,” state the authors at the opening of this refreshing book about sustainability and our ability to build a better future for ourselves and our children. The future is young because it belongs to younger generations. But the future is also young because it can be shaped and improved.

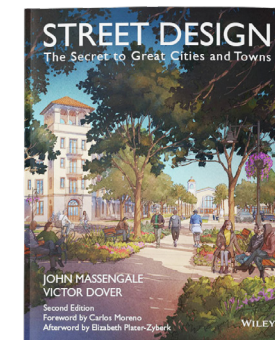
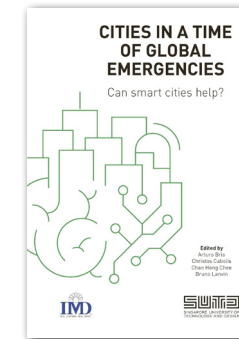


SMART CITIES FOR DUMMIES
Become Empowered to Build and Maintain Smarter Cities
Jonathan Reichental

Ambitious and creative projects in all types of cities around the globe are beginning to make a big difference. New ideas, powered by technology, are positively changing how we move humans and products from one place to another; create and distribute energy; manage waste; combat the climate crisis; build more energy efficient buildings; and improve basic city services through digitalization and the smart use of data.

CITIES IN A TIME OF GLOBAL EMERGENCIES
Can Smart Cities Help?
Bruno Lanvin (et al.)

Ideally, smart cities are the places where people, technology, and innovation converge to shape a common, desirable future. However, the experience of cities in facing the pandemic—and addressing environmental challenges—has been very diverse.

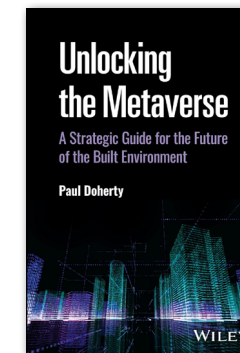
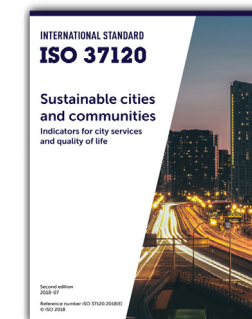


STREET DESIGN
The Secret to Great Cities and Towns
Victor Dover & John Massengale

This book shows examples of over 150 excellent streets and explains why they are successful and how they were designed and created. It also reveals crucial elements that many modern street designs lack and offers step-by-step instruction on how to design new streets and improve existing ones to create more walkable cities and towns.

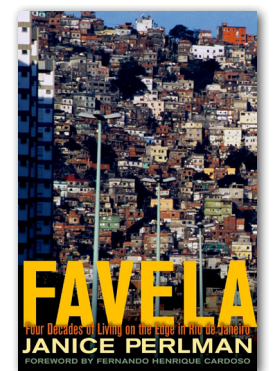
ISO 37120: SUSTAINABLE CITIES AND COMMUNITIES
Indicators for City Services and Quality of Life
Patricia McCarney

This document defines and establishes methodologies for a set of indicators to steer and measure the performance of city services and quality of life. It follows the principles set out in ISO 37101 and can be used in conjunction with ISO 37101 and other strategic frameworks.



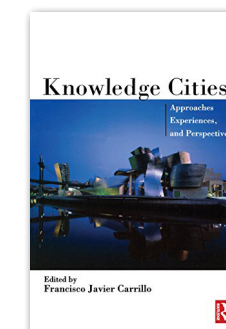
UNLOCKING THE METAVERSE
A Strategic Guide for the Future of the Built Environment
Paul Doherty

This book is considered a milestone moment in providing you with a strategy of working with Web3 technologies like blockchain, AI, digital twins, and the metaverse. It focuses on the strategic implementation of processes and the execution of metaverse strategies, technologies, and innovations and provides readers with real-world tools and strategies to succeed with market demands.



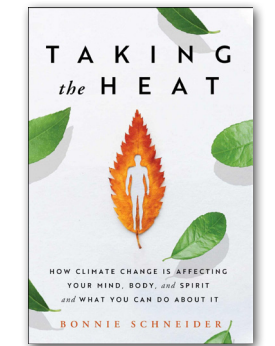
FAVELA
Four Decades of Living on the Edge in Rio De Janeiro
Janice Perlman

Roughly half of all city dwellers in the developing world live in squatter settlements. The most famous are the favelas of Rio, which have existed for more than half a century and continue to outpace the rest of the city in growth. Perlman carries that story forward to the present, re-interviewing many longtime favela residents whom she first met in 1969—as well as their children and grandchildren.



KNOWLEDGE CITIES
Approaches, Experiences, and Perspectives
Edna Pasher

Francisco Javier Carrillo of the Monterrey Institute of Technology (ITESM) brings together a group of distinguished scholars to outline the theory, development, and realities of knowledge cities.



TAKING THE HEAT
How Climate Change Is Affecting Your Mind, Body, and Spirit and What You Can Do About It
Bonnie Schneider

The impacts of climate change have become dire. Rising temperatures, volatile weather, and poor air quality affect our physical and mental health in dangerous new ways.

PARTICIPANT ORGANIZATIONS

Smart City Expo Miami's Production Team thanks the support of the following organizations and companies whose participation contributed to the success of the event.

SMART CITY EXPO MIAMI

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SMART CITY EXPO MIAMI FUTURE-READY COMMUNITIES

September 23-25, 2024

“

Giving the opening keynote in an international meeting is always a challenge: how to provide a global view while generating some degree of empathy that will help you reach out to the brains and hearts of an audience with which you have had no previous interaction?

Smart City Expo Miami was not different from my previous experiences in that role. However, there was a special warmth and a rather unique degree of ‘togetherness’ that made this event very special.

Of course, this is largely due to the personality and experience of the event’s inspirer and leader, Bernardo Scheinkman, but also to the incredibly powerful and talented lineup who showed up for the occasion.

—
PROF. DR. BRUNO LANVIN
PRESIDENT, SMART CITY OBSERVATORY



“

It was a great pleasure to be at Smart City Expo Miami. This is the fifth year that we are participating. Thank you to Bernardo for the opportunity to listen to experts from all over the world in multidisciplinary areas like urban planning, research, social science, technology, and innovation, getting together to share ideas about how to improve the quality of life in our communities.

—
RAIMUNDO RODULFO
DIRECTOR OF INNOVATION AND TECHNOLOGY/CIO, CITY OF CORAL GABLES



“

I love the fact that Smart City Expo Miami brings together so many different points of view and people at all levels, from students to esteemed experts in their field, so that we can learn from one another and continue to innovate around smart cities.

—
ANGELA MAZZI
PRINCIPAL, GBBN ARCHITECTS



“

What I found most interesting about this conference is the diversity—the diversity of subjects in areas and high-caliber experts with profiles of work. It surprised me how multifaceted the solutions can be for a smart city concept. From social science and neurobiology to data-driven engineering, all kinds of subjects were embedded, demonstrated, and discussed. Outstanding!

—
PROF. DR. THOMAS SPIEGELHALTER
PROFESSOR & CO-DIRECTOR OF STRUCTURES AND ENVIRONMENTAL TECHNOLOGIES LAB, FLORIDA INTERNATIONAL UNIVERSITY



“

Smart City Expo Miami was a great opportunity to learn about cutting-edge solutions for urban challenges and to network with like-minded individuals who are passionate about building inclusive, smart, and sustainable communities.

—
JULIET CHINEMELU
LECTURER, AKANU IBIAM
FEDERAL POLYTECHNIC



“

Smart Cities Expo Miami is a fantastic dialogue between experts from academia, municipalities, and the private sector about the real issues of sustainability, resilience, and technology in our cities and how to make our cities more livable, resilient, and better places to live now and in the future.

—
ALAN SCOTT
DIRECTOR OF SUSTAINABILITY,
INTERTEK



SMART CITY EXPO MIAMI FUTURE-READY COMMUNITIES

September 23-25, 2024

“

I was really moved by the presentations—not just the ones on technology but also the ones on human culture and wellness. It’s really interesting. You work in an area of practice that’s your specialty, but all of us are trapped inside those narrow confines of our specialties. An expo like this gives you a chance to hear about people who are coming at the same problems from dramatically different angles and professional specialties, sharing data, examples, and case studies. The case study in good branding is also a case study in good wellness for human beings and transportation efficiency.

—
VICTOR DOVER
PRESIDENT, DOVER, KOHL & PARTNERS TOWN PLANNING



“

I’m very hopeful that this event is helping us break through silos to share the information that’s needed, from the design of the built environment all the way up to the planning and the legislation. This is a multigenerational experience, and only magic can come from the wisdom, learning, and sharing that Smart City Expo Miami has created.

—
MEGAN MAZZOCCO
CEO, WELLBEING X DESIGN



“

This is my fifth year coming to Smart City Expo Miami. What I appreciate about this conference is that we talk about topical things like sustainability, artificial intelligence, resilience, and transportation—things that really matter to people. And we’ve got the right speakers here talking about these topics. We’ve also got lots of students because here we are at Miami-Dade College. So, we want to make sure that students are learning about it and getting excited about the future (and perhaps they’ll even take it into careers).

—
PROF. DR. JONATHAN REICHTAL
CEO, HUMAN FUTURE



“

Smart City Expo Miami has been a very, very good experience. I am fascinated with all the other speakers who have been giving incredible talks. Thank you for the opportunity to share my knowledge about neuroarchitecture.

—
YOHANY ALBORNOZ
CREATIVE DIRECTOR,
THE MARKETER ARCHITECT



“

I’m very happy to be at Smart City Expo Miami. What I enjoy about this event is not only the quality and depth of the presentations but also the way it approaches smart cities from a human-centric approach. So, not only are we looking at technologies (because that is normally the approach) but there is also a lot of thinking about how we can make cities smart for people and how we can involve people in the process of this transformation that is happening in our cities.

—
SARA CANDIRACCI
GLOBAL LEADER FOR SOCIAL VALUE & EQUITY, ARUP





SMART CITY EXPO MIAMI FUTURE-READY COMMUNITIES

September 23-25, 2024



Smart City Expo Miami is a wonderful event. There are plenty of different world professionals thinking about the future of our cities, how our cities are trying to cope with the many challenges they have today, from the environmental point of view to the social point of view, and also trying to create the best conditions for our citizens to thrive.

—
PROF. DR. JOSÉ A. ONDIVIELA
DIRECTOR, HUMAN-CENTERED INTELLIGENT CITIES RESEARCH
INSTITUTE, UNIVERSIDAD FRANCISCO DE VITORIA, SPAIN



Smart City Expo Miami was a vibrant showcase of innovation and global collaboration bringing together leaders, academics, speakers, practitioners, experts, startups, government officials, real estate, urban planners, and social impact leaders who shared community-based innovations across cities around the world and on how cities can evolve to meet the growing challenges of sustainability, equity, and rapid urbanization in the 21st century. This event convened a global community of innovators that locally tackle global challenges, and working together, learning from each other, we advance a better future for all.

—
DR. GABRIELA GERON
FOUNDER, CONNECTING IBEROAMÉRICA



It's such a pleasure to be at Smart City Expo Miami. I've been to the Smart Cities Expo in Barcelona and some of the other very large events around the world, but I find this one particularly valuable. It's very much a thought leadership gathering. It's people thinking through ideas on the cusp of things. And having a smaller audience like this really helps to feel and have feedback and discussion over lunch and coffee. It's just a lovely gathering.

—
DR. PATRICIA MCCARNEY
PRESIDENT & CEO, WORLD COUNCIL ON CITY DATA



I was excited to participate in Smart City Expo Miami, a platform focused on global innovation and collaboration. The event gathered leaders from various fields, including startups, government officials, and urban planners, to discuss solutions for the cities of tomorrow. The discussions centered on how cities can tackle modern challenges like sustainability, equity, and urbanization.

—
SANDRA VALENCIA
SALES VICE PRESIDENT,
SMART NETWORK SOLUTIONS



I really enjoyed this platform, as well as the other speakers, as we're all talking about creating future-ready communities. There's a big intersection between what I spoke about and what the other speakers talked about that is really relevant for today. So, a lot of value out of this conference. I highly recommend you come check it out.

—
TIM SPERRY
FOUNDER & CEO, CARBON LIMIT



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