

## Smart Cities: Balancing Technological Innovation with Human-Centred Urban Design

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The complex relationship between smart city technologies and humanistic urban development represents one of the most significant challenges facing contemporary urban practise. The smart cities presentation revealed a landscape of both promising opportunities and concerning pitfalls as cities increasingly integrate digital technologies into their infrastructure and services. What emerged most clearly through our discussions was that smart cities are fundamentally about choices – not just technological choices, but value choices that determine who benefits, who controls, and who potentially loses in these new urban configurations. This reflection explores the broader context of smart cities development before focusing specifically on the critical tension between technological capability and human needs, and examining our potential role as policy and urban design students in ensuring technology enhances rather than diminishes urban life.

### The Smart City Landscape: Definitions, Evolution and Case Studies

Smart cities represent urban areas that utilize Information and Communication Technology (ICT), the Internet of Things (IoT), and data collection to enhance operational efficiency, information exchange, citizen welfare, and promote sustainability.<sup>1</sup> While technological enhancement of cities isn't entirely new – Los Angeles implemented an urban data project as early as 1974 – the contemporary smart city movement gained significant momentum in the mid-2000s when major technology companies began focusing on creating information systems to improve city operations.<sup>2</sup>

The intention was to highlight several prominent smart city initiatives that illustrate both the ambitions and limitations of this approach. Masdar City in Abu Dhabi, launched in 2006 as a pioneering sustainable urban development, promised carbon emission reductions, waste minimization, and high quality of life through technological integration.<sup>3</sup> However, it has faced significant challenges, including construction delays, funding issues, and questions about its fundamental premise – as one participant noted

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<sup>1</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>2</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>3</sup> (Doshi & Dyanavitha, Class Presentation)

during our discussion, "wouldn't it be greener to just fix the cities that we already have?"<sup>4</sup>

Similarly, the Quayside project in Toronto, spearheaded by Sidewalk Labs (a Google sister company), attempted to create a data-driven "neighbourhood of the future" built "from the Internet up".<sup>5</sup> The project promised affordable housing, sustainability innovations, and economic development, but ultimately collapsed amid concerns about privacy, corporate control, and a lack of meaningful public consultation.<sup>6</sup> As the reading pointedly stated, "Sidewalk Labs went from being a so-called partner with Waterfront Toronto to being the lead developer",<sup>7</sup> illustrating how corporate interests can quickly overtake public priorities.

Perhaps most ambitious is Saudi Arabia's NEOM, which promises to create a futuristic 170-kilometer linear city powered entirely by renewable energy. While NEOM's visions are breathtaking, the costs have ballooned from an initial \$500 billion to potentially \$8.8 trillion, and the project has faced significant scaling back.<sup>8</sup> These case studies reveal a common pattern: grand technological visions often struggle when confronted with real-world economic, social, and political constraints.

### **Smart City Stakeholders: Competing Interests and Power Dynamics**

A crucial aspect of the presentation was its examination of stakeholder dynamics in smart city initiatives. Three primary stakeholder groups were identified: private companies (technology providers, consultants, financiers), public authorities (enablers, regulators, funders), and citizens (contributors, consumers).<sup>9</sup> Each group brings different motivations and priorities to smart city development.

Private stakeholders are typically driven by economic and commercial profitability, market share expansion, and business growth opportunities. Public stakeholders aim to promote citizen welfare, enhance governance efficiency, and

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<sup>4</sup> (Doshi & Parimi, Class Discussion)

<sup>5</sup> (Gruber)

<sup>6</sup> (Robertson, n.d.)

<sup>7</sup> (Robertson, n.d.)

<sup>8</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>9</sup> (Doshi & Dyanavitha, Class Presentation)

improve service delivery. Citizens seek an improved quality of life, better services, and meaningful participation in their community's development.<sup>10</sup>

The presentation highlighted how these interests often come into tension, with corporate priorities frequently dominating despite rhetoric about public benefit. This was evident in the Sidewalk Labs case, where the company expanded its initial 12-acre proposal to encompass 190 acres, sought discounted land prices, and attempted to establish governance structures that would give it significant control.<sup>11</sup> As our discussion revealed, smart cities risk becoming modern versions of company towns, where corporate interests supersede democratic governance and public priorities.

### **Technology vs. Humanity: The Core Tension in Smart City Development**

The first aspect I want to explore more deeply is the fundamental tension between technological capability and human needs in smart city development. As the presentation emphasized, quoting architect Cedric Price, "Technology is the answer, but what was the question?"<sup>12</sup> This gets to the heart of smart city debates – are we implementing technology to address genuine human needs, or are we deploying technology simply because we can?

The presentation revealed competing approaches to this question. On one hand, technology-first approaches prioritize efficiency, optimization, and data collection, often viewing citizens primarily as data points rather than complex beings with diverse needs and experiences.<sup>13</sup> As one participant noted during our discussion, "the people who were going to be affected, who wanted to be living there weren't consulted"<sup>14</sup> in the Sidewalk Labs case, illustrating how technical considerations can overshadow human ones.

On the other hand, human-centred approaches begin by understanding citizen needs and community contexts, then thoughtfully applying technology as a tool to address specific challenges. Barcelona was mentioned as a city that has more

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<sup>10</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>11</sup> (Robertson, n.d.)

<sup>12</sup> (Gruber)

<sup>13</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>14</sup> (Doshi & Parimi, Class Discussion)

successfully balanced technological innovation with citizen engagement, creating digital platforms designed with extensive community input.<sup>15</sup>

This tension manifests across multiple dimensions of smart city development. In transportation, technology-first approaches might prioritize autonomous vehicles and sensor-laden streets to optimize traffic flow, while human-centred approaches might focus more on creating accessible, equitable mobility options that serve diverse needs. In governance, technology-first models might emphasize efficiency through algorithmic decision-making, while human-centred approaches would prioritize democratic participation and transparent processes.

The presentation highlighted how smart city technologies create both advantages and disadvantages. Potential benefits include operational efficiency, improved sustainability through resource optimization, enhanced safety through monitoring systems, and potentially greater access to services.<sup>16</sup> However, significant concerns exist around privacy and security, social equity, governance and control, technological risks and dependence, and broader ethical considerations.<sup>17</sup>

One particularly concerning aspect is the potential for technological dependence, where cities become vulnerable to technical failures, corporate decisions, or geopolitical conflicts that might disrupt critical systems. As mentioned in our discussion, when cities become dependent on proprietary technologies, they risk losing control over essential infrastructure and services, similar to how farmers have become dependent on manufacturers for repairing modern tractors.<sup>18</sup>

The presentation suggested that successful smart city development requires putting "people before gadgets" – recognizing that technology should serve human needs rather than the reverse. This means understanding cities as complex social ecosystems rather than mere technical problems to be solved, and prioritizing inclusive, equitable processes over flashy technological showcases.

## **Data Governance: The Critical Question**

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<sup>15</sup> (Doshi & Parimi, Class Discussion)

<sup>16</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>17</sup> (Doshi & Dyanavitha, Class Presentation)

<sup>18</sup> (Doshi & Parimi, Class Discussion)

A particularly contentious aspect of the human-technology tension is data governance. Smart cities generate enormous amounts of data about citizens, infrastructure, and services, raising crucial questions about who controls, accesses, and benefits from this data.

In the Sidewalk Labs case, data governance was at the heart of public concerns. The company proposed collecting what it termed "urban data" – essentially any data collected in public and some private spaces – and managing it through a data trust that would have been heavily influenced by Sidewalk Labs itself.<sup>19</sup> Citizens and privacy advocates questioned whether this approach adequately protected individual rights and public interests.

The presentation emphasized that building "public tech, not corporate control"<sup>20</sup> is essential for ethical smart city development. This means ensuring that data collection serves genuine public purposes, that citizens have meaningful control over their personal information, and that public authorities maintain oversight of data governance structures. Without such safeguards, smart cities risk becoming surveillance systems that prioritize corporate interests over citizen rights.

### **The Role of Policy and Urban Design Students in Shaping Humanistic Smart Cities**

The second aspect I want to explore more deeply is our potential role as policy and urban design students in ensuring smart cities enhance rather than diminish human experience. The presentation highlighted<sup>21</sup> that we occupy a unique position at the intersection of technical understanding and human-centred design thinking, enabling us to bridge the gap between technological possibilities and genuine urban needs.

One key role we can play is serving as hybrid thinkers – professionals who understand both technological systems and human experiences, and who can translate between technical experts, policymakers, and communities. As the presentation noted, this requires developing what might be called a "new civics for the smart city age" – new frameworks for understanding and governing the relationship between technology and urban life.

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<sup>19</sup> (Robertson, n.d.)

<sup>20</sup> (Doshi & Parimi, Class Discussion)

<sup>21</sup> (Doshi & Parimi, Class Discussion)

First, we need to plan for failure gracefully – recognizing that technologies will inevitably face challenges and designing systems with resilience and adaptability in mind. This means avoiding technological lock-in, ensuring interoperability, and maintaining alternative systems where appropriate.

Second, we should think long-term in real-time – balancing immediate technological possibilities with consideration for long-term impacts and sustainability. This might mean rejecting flashy but impractical solutions in favour of more modest innovations that can be maintained and expanded over time.

Third, we must facilitate meaningful public participation in technological decisions, ensuring that smart city initiatives reflect genuine community priorities rather than corporate or political agendas. This requires new methods for engaging diverse stakeholders in complex technical discussions and creating governance frameworks that maintain democratic control over urban technologies.

The presentation emphasized that effective smart city development requires collaboration across disciplines. As policy and urban design students, we have a responsibility to work with technologists, community organizations, and public officials to create integrated approaches that balance innovation with equity, efficiency with democracy, and technological capability with human values.

### **Conclusion: Towards More Humanistic Smart Cities**

The smart cities presentation offered a nuanced perspective on both the potential and pitfalls of technologically enhanced urban development. What resonated most strongly was the need to maintain a critical, questioning stance toward technological solutions while still embracing thoughtful innovation that serves genuine human needs.

The case studies we examined – from Masdar to Quayside to NEOM – reveal both the ambitious visions and practical challenges of smart city development. They demonstrate that technological capability alone is insufficient; successful urban innovation requires careful attention to governance structures, funding mechanisms, maintenance requirements, and most importantly, citizen needs and priorities.

As policy and urban design students, we have both an opportunity and responsibility to shape more humanistic approaches to smart city development. By combining technical literacy with strong design thinking and policy analysis, we can help ensure that technology serves as an enabling tool rather than a determining force in urban development. This means advocating for inclusive planning processes, transparent data governance, interoperable systems, and design approaches that prioritize human experience over technological spectacle.

Ultimately, the smartest cities may not be those with the most sensors or the most advanced algorithms, but those that most effectively enhance human capabilities, strengthen communities, and create more sustainable and equitable urban environments. By maintaining this human-centred perspective, we can help ensure that smart cities truly serve the needs of all citizens rather than just corporate or political interests.

### **References:**

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