

Legal Analysis of Human Rights Protection within Smart City Policy Implementation in Indonesia

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Article Info	ABSTRACT
Article history: Received Oct, 2025 Revised Oct, 2025 Accepted Oct, 2025 Keywords: Digital Governance; Human Rights; Legal Protection; Normative Legal Analysis; Smart City	The implementation of smart city policies in Indonesia represents a major step toward integrating digital technologies into urban governance to improve public services, environmental sustainability, and citizen engagement. However, the rapid adoption of digital systems also raises concerns regarding the protection of human rights—particularly privacy, data security, freedom of expression, and non-discrimination. This study employs a normative legal analysis to examine Indonesia’s legal framework for safeguarding human rights within smart city policy implementation. Using primary and secondary legal materials, including the 1945 Constitution, Law No. 39 of 1999 on Human Rights, the Electronic Information and Transactions (ITE) Law, and the Personal Data Protection Law (Law No. 27 of 2022), the research evaluates their coherence and adequacy in regulating digital governance. The findings reveal that while Indonesia has established a fundamental legal basis for human rights protection, gaps persist in enforcement, institutional coordination, and public awareness. Smart city initiatives often prioritize technological efficiency over human rights safeguards, resulting in privacy violations, digital inequality, and limited accountability. The study concludes that integrating a human rights-based approach (HRBA)—focusing on participation, accountability, non-discrimination, and transparency—is essential for ensuring that smart city development aligns with constitutional and international human rights standards. <i>This is an open access article under the CC BY-SA license.</i>



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1. INTRODUCTION The emergence of smart city initiatives in Indonesia represents a transformative phase in urban development, characterized by the integration of digital technologies into public administration, infrastructure management, and citizen	engagement. The concept of a “smart city” broadly encompasses the application of information and communication technology (ICT) to improve the quality, efficiency, and sustainability of urban services, while fostering greater connectivity between the government and the people. Cities such as
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Jakarta, Bandung, Surabaya, and Makassar have been at the forefront of implementing smart city programs, reflecting Indonesia's national agenda to promote digital transformation under the "100 Smart Cities Movement" initiated by the Ministry of Communication and Information Technology (Kementerian Kominfo). The implementation of these initiatives marks a significant shift in how cities are managed, with ICT serving as the backbone for governance innovation, citizen participation, and data-driven decision-making. In Bandung, for instance, digital technologies have significantly improved public service delivery by enhancing efficiency, transparency, and citizen engagement; however, challenges such as limited interoperability and regulatory gaps persist, necessitating institutional readiness and cross-sector collaboration for successful implementation [1]. Moreover, the involvement of citizens is crucial for the success of smart city initiatives, where engagement is often facilitated through online social networks—though an incentive system remains essential to encourage active participation in addressing urban issues [2]. The development of smart cities also relies heavily on ICT in public services, demanding effective communication and collaboration among stakeholders as well as large-scale campaigns to familiarize communities with digital processes [3]. Despite these advancements, Indonesia faces challenges in maintaining its competitive pace with other ASEAN countries in global smart city rankings, emphasizing the need to address risks, enhance institutional capacity, and optimize implementation strategies [4].

However, the increasing reliance on digital systems in urban governance also introduces new legal and ethical challenges, particularly in relation to human rights protection. The extensive use of surveillance technologies, data collection systems, and artificial intelligence in public service delivery has the potential to infringe upon citizens' rights to privacy, data protection, freedom of expression, and non-discrimination. Inadequate regulation, lack of transparency, and limited public participation in

polymaking further exacerbate these risks, making the intersection between technological innovation and human rights in smart city governance a vital area of legal inquiry. The integration of IoT and AI technologies in urban governance presents complex legal and ethical dilemmas, primarily concerning privacy, data protection, and non-discrimination, as well as the necessity for transparency and accountability in their deployment. Current legal frameworks are often insufficient to handle the intricacies of data collection and surveillance, highlighting the urgency of new regulations that prioritize citizens' privacy rights [5], [6]. Transparency in data usage and algorithmic processes is equally critical to prevent violations and ensure accountability in decision-making [6]. Furthermore, AI systems can inadvertently perpetuate discrimination through algorithmic bias, resulting in unequal treatment of specific groups; hence, fairness and equity must be upheld to protect human rights within smart city governance [5], [6]. To address these risks, robust legal and ethical frameworks must be established to eliminate biases and promote equitable access to public services [5]. Existing regulations remain inadequate amid rapid technological advancements, thereby necessitating comprehensive laws that integrate human rights principles and technology ethics to guide responsible AI and IoT governance [6], [7]. Collaboration among international, regional, and national stakeholders is also essential to develop coherent policies that safeguard human rights in the evolving landscape of digital urban governance [8].

From a legal perspective, Indonesia has established several frameworks aimed at protecting human rights within digital and urban governance. The 1945 Constitution of the Republic of Indonesia guarantees fundamental rights such as equality before the law, freedom of communication, and protection of personal dignity, further reinforced by Law No. 39 of 1999 on Human Rights. In the digital context, the Electronic Information and Transactions (ITE) Law and the Personal Data Protection Law (Law No. 27

of 2022) provide the legal foundation for regulating digital interactions and ensuring responsible data management [9]. Despite this robust legal basis, the implementation of these frameworks in smart city operations remains fragmented and inconsistent. The ITE and Personal Data Protection Laws face persistent challenges, including low public awareness, weak enforcement, and insufficient institutional capacity [10], [11]. Smart city initiatives are often executed without a unified regulatory framework, resulting in inconsistent urban planning and potential violations of citizens' rights, particularly in the use of surveillance technologies that lack comprehensive data protection and public consent mechanisms [12]. Furthermore, Indonesia's legal system continues to struggle with validating digital evidence and safeguarding privacy, underscoring the need for comprehensive legal reform and greater institutional readiness to manage digital governance effectively [9].

To strengthen the alignment between technological innovation and human rights protection, several measures are necessary. Strengthening regulations and enhancing law enforcement capacity are essential to ensure that technology use reflects justice and accountability principles [9]. Developing a national legal framework specifically designed for smart city governance can promote regulatory coherence and create a stable environment for inclusive urban development [12]. In addition, increasing public digital literacy and establishing independent oversight bodies would enhance the enforcement of data protection and privacy rights [10]. Ultimately, the notion of a smart city must be understood not merely as a technological construct but also as a social and legal paradigm that upholds human-centered development values. The integration of smart technologies into governance should prioritize public interest, transparency, and human dignity. Therefore, legal scholars and policymakers must critically assess how Indonesia's legal system can ensure that technological innovation remains consistent with the principles of justice, accountability, and the protection of human rights.

This study adopts a normative legal analysis to examine the adequacy and effectiveness of Indonesia's legal framework in protecting human rights within the implementation of smart city policies. It aims to identify the legal principles governing human rights in digital governance, analyze the extent to which current smart city policies align with those principles, and provide recommendations for strengthening legal and institutional mechanisms to ensure that smart city development upholds human rights values. The significance of this research lies in its effort to bridge the gap between technology policy and legal protection, emphasizing that as Indonesia advances its digital transformation agenda, safeguarding fundamental rights is crucial for achieving sustainable, inclusive, and democratic urban governance. The findings are expected to contribute to legal reform and policy development by promoting a human rights-based approach in the implementation of smart cities throughout Indonesia.

2. LITERATURE REVIEW

2.1 *Concept of Smart City*

The concept of smart cities in Indonesia, as exemplified by initiatives like Jakarta Smart City, Bandung Smart City, and Surabaya Smart City, aims to integrate ICT into urban management to enhance efficiency, sustainability, and citizen participation. These initiatives are part of a broader movement to modernize governance through digitalization, utilizing technologies such as big data analytics and IoT to optimize public services [13]–[15]. Smart cities in Indonesia leverage ICT to improve urban management and service delivery, including the application of big data and IoT to enhance infrastructure and public sector efficiency [14]. Moreover, effective smart city implementation emphasizes citizen participation through e-democracy and e-participation platforms, enabling citizens to engage in decision-making processes [14], [15]. Nonetheless, despite technological progress, challenges such as limited interoperability, the

digital divide, and regulatory gaps continue to hinder the optimal realization of smart city goals, underscoring the importance of institutional readiness and cross-sector collaboration [1]. The success of these initiatives also depends heavily on the development of social and human capital, requiring efforts to empower citizens to meaningfully engage with and benefit from smart city programs [13].

2.2 *Human Rights in the Digital Age*

The protection of human rights in the digital age is a critical issue as technological advancements increasingly challenge traditional legal frameworks. In Indonesia, the 1945 Constitution and the Personal Data Protection Law aim to safeguard rights such as privacy and freedom of expression, aligning with global standards like the GDPR. However, implementation often prioritizes efficiency over individual rights, resulting in privacy violations and data misuse. The accessibility of personal information in the digital era heightens the risk of privacy breaches, demanding effective legal mechanisms to balance progress with human rights protection [16]. Although Indonesia's Personal Data Protection Law represents significant progress, challenges in enforcement and supervision persist, and the complexity of models like the GDPR poses difficulties for smaller entities [17]. Furthermore, the tension between cybersecurity and freedom of information underscores the need for clear regulations and public awareness to protect privacy without restricting access to information [18]. On a global level, international cooperation is essential to harmonize data protection policies, incorporating ethical principles such as fairness and transparency [17]. Ultimately, while the right to privacy remains a fundamental human right, data-intensive technologies pose serious risks, making strong safeguards vital to uphold human dignity and autonomy in the digital era [19].

2.3 *Legal Framework for Smart City Implementation in Indonesia*

The implementation of smart cities in Indonesia is governed by several laws and regulations, yet none provide a comprehensive legal definition or framework specifically addressing the ethical and human rights dimensions of smart city operations. The existing legal landscape, including laws on regional government, electronic transactions, and personal data protection, presents a fragmented and incoherent approach to regulating smart city initiatives. Law No. 23 of 2014 and the ITE Law establish a foundation for the use of technology in public services but lack provisions explicitly tailored to smart city contexts [20], [21]. Similarly, Government Regulation No. 71 of 2019 and Law No. 27 of 2022 address data governance and personal data protection but fail to encompass the broader ethical implications of digital surveillance, data ownership, and citizens' rights within smart city ecosystems [12], [20]. This regulatory gap leads to inconsistencies in urban planning, governance, and evaluation, resulting in fragmented implementation and limited accountability across regions [12]. Persistent challenges such as the digital divide, limited interoperability, and inadequate oversight further impede the success of smart city projects [1]. Therefore, there is an urgent need for a unified national legal framework that explicitly integrates ethical and human rights considerations into smart city governance, providing stability, coherence, and clear direction for both policymakers and citizens [12], [20].

2.4 *Smart Governance and Human Rights Challenges*

Smart governance in smart cities seeks to enhance participatory, transparent, and accountable decision-making through digital platforms, yet the integration of technologies such as IoT and AI introduces complex legal and ethical challenges related to privacy, accountability, and justice. IoT applications in smart cities pose

significant risks to data privacy and fairness, requiring compliance with regulations and equitable access to mitigate algorithmic bias and uphold ethical responsibility [5]. The rise of algorithmic governance also raises concerns about transparency and spatial justice, as automated systems may unintentionally perpetuate discrimination or exclude marginalized groups, emphasizing the need for critical examination of the governance models they represent [22]. While AI integration improves efficiency, it simultaneously challenges privacy, fairness, and public trust; therefore, the adoption of federated learning, differential privacy, and explainable AI becomes vital to ensure transparency and accountability in decision-making [23]. Building public trust further demands participatory AI councils, transparent data-sharing policies, and inclusive citizen engagement frameworks to align technological progress with ethical safeguards [23]. Moreover, digital platforms enhance inclusivity and efficiency in governance, yet issues of data privacy, ethics, and digital accessibility must be addressed to create sustainable, citizen-centered smart cities [24]. Ultimately, a human rights-based governance approach is essential to ensure that digital transformation promotes equality, freedom, and dignity while preventing state overreach and rights violations.

3. RESEARCH METHODS

This study employs a normative legal research approach, focusing on the analysis of legal norms, principles, doctrines, and regulations related to human rights protection in the implementation of smart city policies in Indonesia. Normative legal research views law as a set of norms that guide human behavior and evaluates how these norms align with constitutional and human rights principles (Soekanto, 1986). This approach emphasizes doctrinal and conceptual analysis to examine how existing laws and regulations address human rights issues in digital

governance, allowing a comprehensive understanding of the legal framework without requiring empirical data. The research is descriptive-analytical in nature, aiming to describe and critically assess the consistency, adequacy, and effectiveness of Indonesia's legal system in protecting human rights within smart city governance while identifying legal gaps, overlaps, and contradictions.

The study relies on three categories of legal materials. Primary legal materials include the 1945 Constitution (particularly Articles 28F, 28G, and 28I), Law No. 39 of 1999 on Human Rights, the Electronic Information and Transactions Law (Law No. 11 of 2008 as amended by Law No. 19 of 2016), Government Regulation No. 71 of 2019 on Electronic System and Transaction Operation, the Personal Data Protection Law (Law No. 27 of 2022), Law No. 23 of 2014 on Regional Government, and relevant ministerial regulations issued by the Ministry of Communication and Information Technology (Kominfo). Secondary legal materials consist of books, journal articles, academic papers on smart cities and digital governance, official government reports such as the "Gerakan 100 Smart City" program, expert commentaries in constitutional, administrative, and technology law, as well as international instruments like the UDHR (1948) and ICCPR. Tertiary legal materials include legal dictionaries, encyclopedias, reports from international organizations such as the UN, UNDP, and OECD, and online databases or government portals that provide supporting information on digital transformation and human rights.

Given the normative nature of the study, documentary research served as the primary method of data collection, involving a systematic review of legislation, academic literature, and policy documents. Data were obtained from official sources such as Kominfo and Bappenas, academic databases like Google Scholar, JSTOR, and HeinOnline, and digital university libraries. The process involved identifying relevant legal instruments, classifying materials by hierarchy and relevance, compiling and organizing data systematically, and verifying

accuracy through cross-referencing. Data were analyzed using qualitative normative analysis consisting of three main stages: (1) interpretation—using legal hermeneutics to interpret human rights and digital governance provisions systematically, grammatically, and teleologically; (2) comparison—examining Indonesia’s legal frameworks against international best practices such as the EU’s GDPR and global smart city governance models; and (3) evaluation—assessing whether Indonesia’s current legal instruments sufficiently protect human rights in smart city implementation and identifying areas for necessary reform.

4. RESULTS AND DISCUSSION

4.1 *Overview of Smart City Policy Implementation in Indonesia*

The Indonesian government has actively advanced smart city development since launching the Gerakan 100 Smart City (100 Smart Cities Movement) in 2017, a collaborative initiative by the Ministry of Communication and Information Technology (Kominfo), the Ministry of Home Affairs, and the Ministry of Public Works and Housing. This movement aims to integrate digital technology into governance, urban planning, and public service delivery. Major cities such as Jakarta, Bandung, Surabaya, and Makassar have pioneered various digital innovations, including e-governance platforms, integrated data systems, traffic management applications, and citizen reporting tools. Bandung City, for instance, has made notable progress through e-governance initiatives that enhance transparency and service efficiency [1]. The application of technologies like AI, IoT, and Big Data Analytics in smart governance has enabled real-time decision-making and optimized resource allocation, strengthening citizen participation and engagement [25]. However, the implementation of smart cities still faces several obstacles, including limited interoperability, a persistent digital

divide, and regulatory inconsistencies that hinder their full potential [1]. In addition, technological infrastructure gaps, barriers to system integration, and human resource limitations pose significant challenges to sustaining economic growth and improving social welfare [26], [27].

To address these issues, collaboration among government, industry, and society is essential for creating more sustainable and inclusive smart city ecosystems [26]. Strengthening national digital infrastructure—such as the Palapa Ring—plays a pivotal role in promoting equitable internet access and digital inclusion across Indonesia [27]. Nonetheless, while these initiatives enhance efficiency and sustainability, they also raise pressing legal and ethical concerns. The integration of surveillance systems, artificial intelligence, and big data analytics into public administration often proceeds without sufficient human rights safeguards or standardized data governance frameworks. Consequently, the absence of clear regulations on data collection, use, and protection exposes citizens to risks such as privacy violations, data misuse, and discrimination. Addressing these gaps through a human rights-based approach to digital governance is therefore critical to ensuring that Indonesia’s smart city transformation remains both technologically advanced and socially just.

4.2 *Legal Framework for Human Rights Protection in Smart City Implementation*

Indonesia has enacted several laws and regulations related to human rights and digital governance; however, their integration into smart city policies remains fragmented and inconsistent. The 1945 Constitution provides a strong normative foundation by guaranteeing rights such as privacy (Article 28G), freedom of communication and access to information (Article 28F), and protection from discrimination (Article 28I), but weak enforcement and limited judicial

mechanisms undermine these principles in practice [28]. Law No. 39 of 1999 on Human Rights reinforces constitutional protections and aligns national standards with global conventions like the UDHR and ICCPR, yet lacks provisions specific to digital governance. Meanwhile, the ITE Law and its 2016 amendment regulate electronic systems but are criticized for vague articles that risk criminalizing online expression rather than safeguarding digital rights [29]. Similarly, Government Regulation No. 71 of 2019 outlines data protection obligations but suffers from uneven enforcement due to varying local capacities, while the Personal Data Protection (PDP) Law of 2022—though aligned with the GDPR—faces implementation challenges stemming from overlapping jurisdictions, institutional gaps, and low public awareness [30].

In the context of smart city implementation, Indonesia's fragmented legal landscape contributes to inconsistent urban governance and complicates project evaluation [12]. The lack of a unified regulatory framework and standard operating procedures has hindered coherence across local initiatives and weakened accountability mechanisms. To strengthen human rights protection within digital governance, several measures are necessary: establishing a centralized data protection authority, improving inter-institutional coordination, and enhancing oversight mechanisms [31]. Furthermore, increasing public awareness and engagement is vital for promoting digital literacy and ensuring that privacy and data protection principles are effectively upheld in practice [30]. A cohesive and human rights-oriented legal framework is therefore essential to ensure that Indonesia's smart city development remains both technologically progressive and socially just.

4.3 Human Rights Issues in Smart City Policy Implementation

a. Right to Privacy and Data Protection

Smart city projects often involve extensive data collection through CCTV cameras, IoT devices, and citizen apps. For example, the Jakarta Smart City platform collects real-time data from surveillance systems, transportation networks, and social media. While these technologies improve service efficiency, they also risk violating the right to privacy when data collection occurs without explicit consent or transparent purposes.

According to human rights law, privacy is a core aspect of personal dignity. However, the current regulatory environment in Indonesia provides limited control for individuals over how their data is used. Many local governments lack clear data retention policies and data-sharing agreements with third parties. This raises the risk of data misuse for commercial or political purposes, potentially infringing upon Articles 28G (1) and 28F of the Constitution.

b. Freedom of Expression and Information Access

Digital governance platforms under smart city programs are intended to facilitate citizen participation. However, the misuse of certain provisions in the ITE Law has sometimes restricted online expression. Citizens may hesitate to provide feedback or criticism on smart city platforms for fear of legal repercussions. This condition contradicts the essence of smart governance, which should encourage open dialogue and accountability.

c. Digital Inequality and Non-Discrimination

Another key human rights challenge is digital inequality. Smart city systems often rely on internet access, smartphones, and digital literacy. In many regions, particularly rural and low-income areas, these resources remain limited. Consequently, citizens who lack access to technology are excluded from the benefits of digital public services, violating the principle of equality before the law as stated in Article 28D (1) of the Constitution.

d. Accountability and Transparency

Transparency is a fundamental element of both good governance and human rights protection. Yet, many smart city programs operate without transparent mechanisms for data management, procurement, or technology partnerships. Public oversight mechanisms, such as human rights impact assessments or open data audits, are rarely implemented. The absence of transparency not only erodes public trust but also undermines accountability for potential rights violations.

4.4 Evaluation of Legal and Institutional Gaps

A critical finding of this study is the fragmentation of legal and institutional frameworks. The regulation of human rights in smart city implementation is dispersed across multiple laws with overlapping jurisdictions among ministries and local governments. For instance, Kominfo regulates digital infrastructure, while the Ministry of Home Affairs supervises local governance, and the Ministry of Law and Human Rights oversees human rights protection. The lack of coordination

results in inconsistent enforcement and policy duplication.

Institutionally, there is no dedicated oversight body to monitor human rights compliance in smart city projects. While the National Commission on Human Rights (Komnas HAM) has a mandate to address human rights violations, its involvement in digital governance remains limited. Similarly, data protection authorities under the PDP Law are still in the process of being established. This institutional gap weakens accountability and leaves citizens with limited remedies in cases of rights violations.

4.5 Comparative Perspective

International experiences offer valuable insights for Indonesia in strengthening its legal framework for smart city governance. The European Union's General Data Protection Regulation (GDPR) mandates strict data protection principles, requiring explicit consent and imposing penalties for data misuse, while emphasizing citizen-centric data management and transparency [32], [33]. South Korea's Seoul Smart City model promotes "citizen data sovereignty," ensuring individuals retain ownership and control over their personal information, which fosters greater trust and participation in digital governance [34]. Similarly, Singapore's Smart Nation Initiative integrates innovation with robust legal safeguards for privacy and cybersecurity, demonstrating how technological advancement can coexist with strong data governance [33]. These models collectively highlight the importance of establishing independent data protection authorities, embedding human rights-based design principles, and maintaining open public dialogue to ensure that smart city initiatives are inclusive, transparent, and ethically grounded.

For Indonesia, these global experiences underscore both challenges and opportunities. The country's fragmented legal landscape continues to

hinder coherent policy implementation and consistent urban governance, making it difficult to ensure accountability and data protection in smart city projects. Establishing a unified regulatory framework is therefore essential to harmonize digital governance standards and enhance institutional coordination [12]. By adopting best practices from the EU, South Korea, and Singapore, Indonesia can develop a balanced legal approach that protects privacy, promotes public participation, and supports innovation. This alignment between legal safeguards and technological development will enable Indonesia to build smart cities that are not only digitally advanced but also socially inclusive and rights-oriented.

4.6 Discussion

The analysis shows that Indonesia's smart city policies must shift from a technology-driven approach to a human rights-based governance model that prioritizes citizens' dignity, equality, and participation as core values. This transformation requires several strategic measures, including the integration of Human Rights Impact Assessments (HRIAs) in every smart city project to ensure potential rights implications are evaluated before implementation [35], [36]. and the establishment of a National Digital Rights Oversight Body to monitor data protection, digital ethics, and compliance with human rights standards [35], [37] Revising the ITE Law to remove restrictive provisions on freedom of expression and to strengthen citizens' legal protection against online rights violations is also essential [37], [38]. Additionally, capacity building for local governments and smart city operators is necessary to improve understanding of human rights obligations within digital governance frameworks [36].

Moreover, promoting public participation and transparency through open data policies and participatory platforms is crucial to empowering citizens in monitoring and evaluating

smart city initiatives [37] Encouraging active civic engagement helps foster collaboration and trust between citizens and the government, creating a more inclusive and accountable urban environment. By embedding these principles, Indonesia can ensure that technological innovation serves public welfare and development while safeguarding justice, equality, and human dignity—transforming smart cities into truly citizen-centered ecosystems that balance innovation with ethical and legal responsibility.

5. CONCLUSION

The legal analysis of human rights protection within the implementation of smart city policies in Indonesia reveals that technological progress, while essential for modernization, must not come at the expense of fundamental freedoms and human dignity. Indonesia's current legal framework—anchored in the 1945 Constitution, Law No. 39 of 1999 on Human Rights, ITE Law, and Personal Data Protection Law—provides a normative foundation for upholding digital rights. However, the fragmented nature of regulations, weak institutional enforcement, and inadequate integration of human rights principles in smart city programs indicate the need for significant legal and policy reform. First, there is an urgent necessity to institutionalize human rights impact assessments (HRIAs) for all smart city projects, ensuring that potential rights violations are identified and mitigated before implementation. Second, the government must strengthen coordination among relevant ministries and establish a national digital rights oversight body to monitor compliance and enforce accountability in data management and technology use. Third, legal instruments such as the ITE Law require revision to prevent misuse and to guarantee citizens' freedom of expression and privacy in digital spaces.

Moreover, local governments must be equipped with sufficient legal and technical capacities to implement data protection and citizen participation mechanisms.

Transparency, public consent, and inclusivity must be embedded in every stage of smart city development to ensure equitable access and prevent discrimination.

Ultimately, Indonesia's smart city vision should not be limited to digital efficiency but should embody a human-

centered and rights-oriented governance model. Integrating human rights into the design, execution, and evaluation of smart city policies will foster trust, inclusivity, and sustainability—ensuring that technological innovation genuinely serves justice, equality, and the well-being of all citizens.

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