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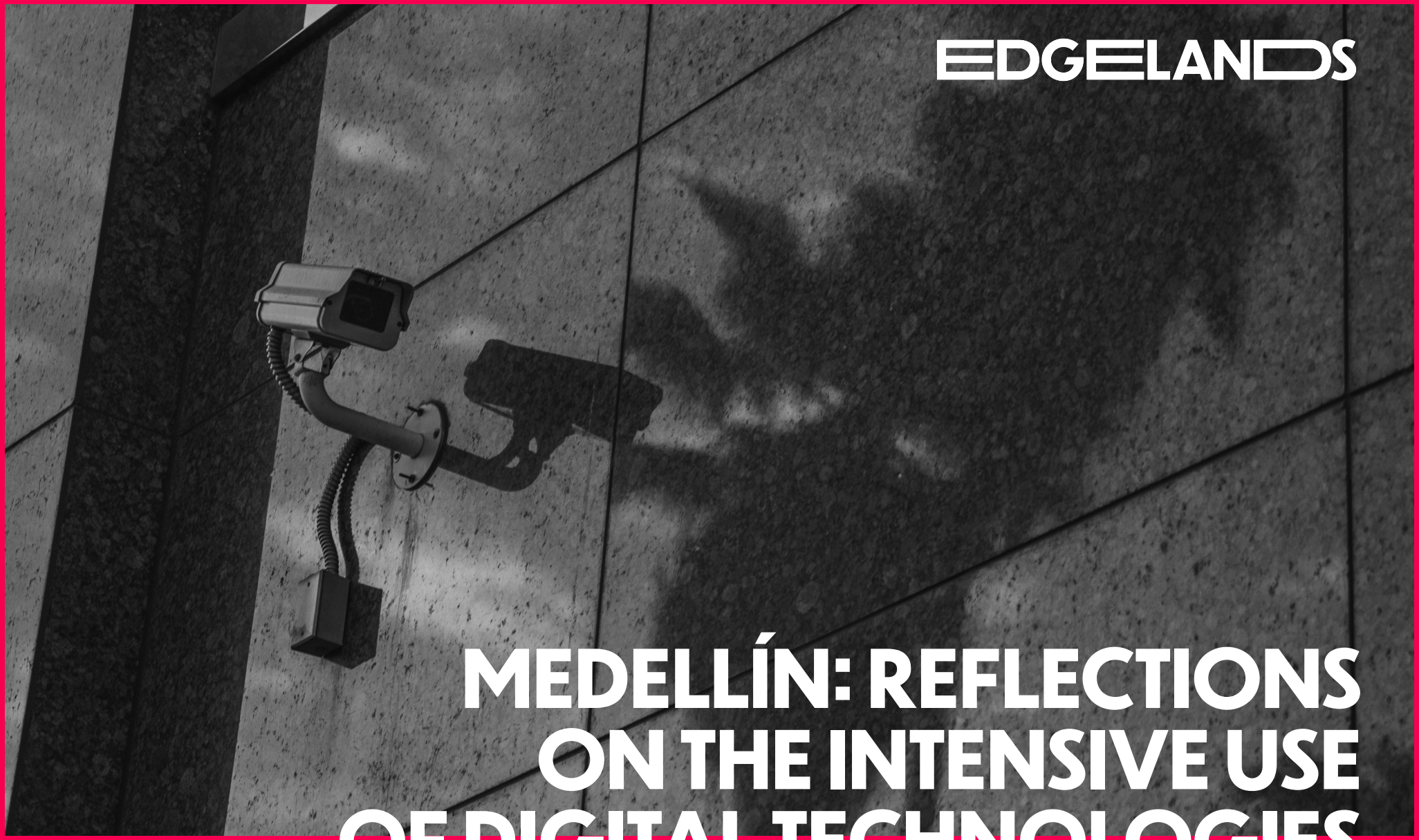


MEDELLÍN: REFLECTIONS ON THE INTENSIVE USE OF DIGITAL TECHNOLOGIES FOR URBAN SECURITY

SUMMARY

INTRODUCTION

Medellín is a worldwide reference in the use of surveillance technologies. Its narrative is one of overcoming adversity in terms of security and of being an example in urban regeneration processes, and there is a clear intention to position the city as a success story in public management and the use of digital technologies.

Nevertheless, the city must evaluate its processes in light of the current needs of its inhabitants and review which of the policies in recent years have really impacted their living conditions. In particular, **Medellín has become a hub for security technologies (surveillance cameras, license plate recognition, drones, helicopters, among others), which not only entails intensive economic investments, but also the development of mechanisms for information collection and use, with little space for discussion, transparency and little (or no) explicit regulation in this regard.**

In this same logic, the city has emerged as a marketplace for vendors offering such technologies, operating under the assumption that their deployment in Medellín guarantees a halo of legitimacy in their validity and replicability in the global south (under the slogan, "If it works in Medellín, it works in [any city] in Latin America/Africa/Asia"). The overarching discourse on the role of technology in Medellín has solidified to the extent that in 2021 the city became Colombia's first Science, Technology and Innovation District[1].

This scenario has been a point of interest for the Edgelands Institute, so almost three years after the first Diagnostic Report we developed a new report where compile a series of **reflections and conclusions[2] on security, surveillance and technology for the city in the coming years.** In view of the new District Administration that began in 2024, we hope they will provide an opportunity to bring to the public conversation the importance of reflecting on the impact of the massive deployment of digital and surveillance technologies in the urban social contract. We also developed new questions that arose and that we consider fundamental to deepen this discussion. Enabling this debate in Medellín can have an impact on reflections around the digitization of security and surveillance in the country, and generate a precedent in this regard in Latin America and the global south.

[1] *See below: Implications of the Transition to a Special District of Science, Technology and Innovation for the Digitalization of Security in Medellín.*

[2] *See below: Recommendations on security, surveillance and technology for the current government of the special science, technology and innovation district of Medellín 2024-2027.*

The information consolidated in this document brings together findings and reflections from the research processes and dialogues conducted by Edgelands with allies and citizens since the beginning of our residency as a pop-up institute in Medellín in 2021[3]. We approach this discussion from the recognition that the social contract in the city seems to be consolidated in such a way that the legitimacy of the state varies geographically and according to the different layers of society, and that informality is sometimes the norm: there is a formal state and an informal state. This reality is juxtaposed with Medellín's position as a regional leader in security and surveillance technologies and innovation.

What does this mean for the city and its social contract in the future?

This document includes a reflection on **security and coexistence** as we observe these elements in Medellín's social contract; an i**nventory of surveillance technologies** that exist or are in the process of being designed or implemented by the city's local administration —this compendium does not exist in any other public source to the extent of our knowledge; it also incorporates a summary of the **planning and governance ecosystem** that surround the surveillance technologies used by the local administration and police in Medellín[4], and at the end of each section we list questions, conclusions and recommendations for the city. We end this report with a list of the projects that the Institute has carried out in the city since 2021.

Some questions will remain open: this is a document for citizens and the government that we hope will help create new conversations.

[3]See below: Edgelands Medellín Final Activity Report

[4]Gathering learnings from our research on local ordinances for surveillance technologies from the AI Localism approach.

SHARED GOVERNANCE AS A SOCIAL CONTRACT

IF THE SOCIAL CONTRACT IN MEDELLÍN IS FRAGMENTED AND RELIES ON TWO STATES, HOW DOES IT CHANGE WITH THE DIGITIZATION OF SECURITY?

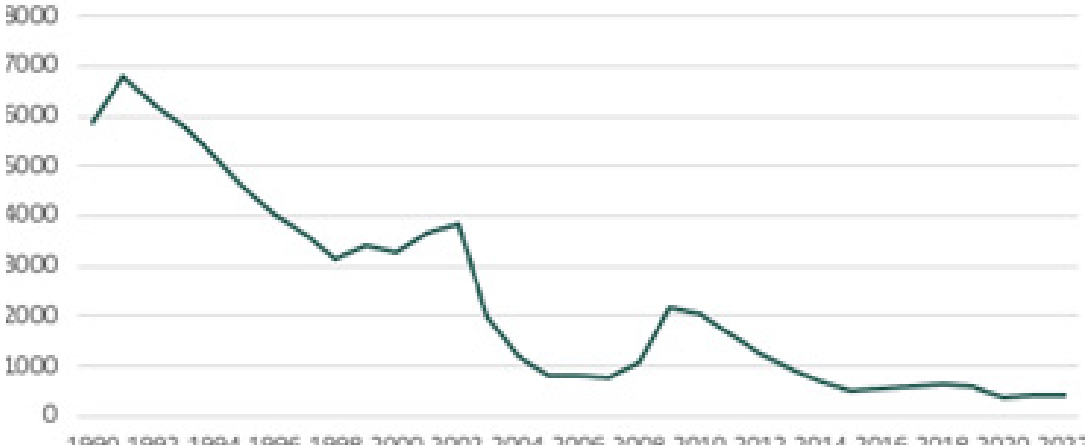
Medellín went from being known as the most insecure city in Latin America, to being perceived and recognised as innovative for its social and cultural policies; more recently, it was named the first District of Science, Technology and Innovation in Colombia. However, criminal structures continue to operate beyond the criminal aspect, especially in low and lower-middle income territories, which has forced the local government to understand, adapt and plan according to the logic under which these structures operate. Studies such as the one conducted by Blattman, Duncan, Lessing, Tobón, & Messa (2020) report a citizen perception of complementarity between the State and criminal governments, where the lack of efficiency and the absence of the State play as an advantage for the actions of these groups. To some extent, this is reflected in **a social contract that has been configured as a shared government as institutionalized in the collective imagination.**

Citizen acceptance of a shared government should at least be a reason for State actors to continue reflecting on public policy approaches to security and coexistence, as well as the implemented mechanisms, and especially their effectiveness in the particular context through the application of impact evaluations and rigorous monitoring of what has been executed. On the other hand, authorities and stakeholders should not forget strategies such as improving public spaces, coordinating institutional response and strengthening the bonds of trust between authorities and community members in order to formulate a good security policy. To quote expert Andres Preciado, *"Technology is the tool but not the strategy."*

Changes in criminal patterns = change of approach in security policies?

In recent years the types of criminal actions with the highest incidence have changed, with a significant increase in theft and extortion[5] and a reduction in homicide, as shown in the following graph. Have security policies adapted to these changes? Has it been proven that surveillance technologies have a positive and significant impact on the appropriate measures of citizen security?

GRAPH 1. Number of homicides registered per year in Medellín 1990-2022.



Source: Information System for Security and Coexistence, Medellín District Mayor's Office.

At the Edgelands Institute we advocate for a broader, more humane approach to security. Beyond the absence of crime and the abundance of positive measures, we consider human security paramount, encompassing economic, social, environmental, health, and food-related factors, among others.

Security should thus not only be related to control, surveillance or crime; it is important to make efforts to improve coexistence, civil freedoms and fundamental rights. One of the lessons we learned in Medellín is to consider coexistence as an expanded form of security, perhaps even a proxy for it.

[5]Robberies and especially extorsion present significantly higher under-reporting than homicides.

According to citizen conversations facilitated by the Institute, the citizens of Medellín associate the concept of security with that of coexistence. Although this integral conception of security is also part of the institutional narrative since the city has a Secretariat of Security and Coexistence, it is worth emphasizing its necessity and relevance for the development of public policies for security.

We understand that security challenges fundamentally stem from issues of coexistence, reflecting the complexities of inhabiting and sharing common spaces. This insight is reinforced through spaces promoted by Edgelands, where various stakeholders explicitly link practices affecting coexistence —such as neighborhood conflicts, misuse of public spaces, environmental neglect (e.g., noise pollution, inadequate waste management), and deterioration of communal areas—with their perceptions of insecurity. Persistent conflicts and difficulties in reaching resolutions sometimes escalate into larger-scale issues, further impacting citizens' sense of safety. Moreover, these behaviors shed light on the way citizens interact, and they are likely translated into traditional security metrics like disorderly behaviors and different types of violence.

We believe that the challenges of coexistence, for example the ways in which citizens fail to share physical space and care for other citizens (for example by not complying with traffic rules, or by imposing noise on others in homes, cars or motorcycles), speak more generally of the cultural ethos of the people of Medellín, from which it is not surprising that other more violent forms emerge, when lack of mutual care leads to more extreme situations such as homicides, sexual violence, extortion and violence due to intolerance.

This understanding has brought us closer to the concept of the urban social contract, which Edgelands understands as "an analytical lens that allows us to map and understand the explicit and implicit agreements and power arrangements in cities between relevant social groups and authorities, or those who hold formal and informal power". We see a clear link between the social contract and coexistence through the origin of disputes, agreed solutions, and mediators — whether formal or informal— who facilitate known agreements among citizens. This leads us to ask: who mediates the conflicts, what are their methods, and what is the public perception of such actors?

Illegal groups have influenced the resolution of neighborhood conflicts, particularly concerning territorial disputes.

Nonetheless, community organizations have played a significant role in solidifying the urban social contract: they have actively pursued the creation of scenarios to foster citizen coexistence through social, cultural and/or educational projects. These initiatives aim to improve the living conditions of populations at risk of marginalization and foster their capacity development.

Although extensive research has examined criminal governance in the city and the policies that have positioned Medellín as a model for innovation and social transformation, the present discussion is centered around the digitalization of security.

The social contract in Medellín could be characterized by a stark contrast between an innovative city, at the forefront of technology by the standards of other developing cities, and an unequal city where the legitimacy of the state varies and informality is sometimes the norm. As the Edgelands Institute aims to spark conversations about the ways in which surveillance and other digital technologies are changing the social contract in cities around the world, we ask the following questions:

- How will the digitization of security and all social interactions affect this social contract?
- How will the dynamics of informality and the parallel state adapt to the digitization of security and society?
- How can security be ensured for community organizations, given their importance in the urban social contract? What occurs when these organizations critique or differ from the local government? Will there be increased or decreased information monopolization? How likely is it that surveillance technologies will be used for political persecution, and what regulations are necessary to prevent this?
- What is the actual impact of technologies when criminals continuously devise new methods to evade them?
- Regarding the possible use of technologies to address coexistence issues like traffic, how can they be relevant in a society with limited regard for norms and varying levels of trust in the State? How might Medellín's increasingly digitized society promote norm adherence?
- How can technology help mediate or avoid conflicts in public space and thus improve coexistence? What can be the role of technology in addressing coexistence issues such as noise, air pollution and problematic uses of public space?

- How can the integration of security digitalization and smart city technologies enhance the connection between urban design and security? In an era dominated by such technologies, how can urban design serve as a means to enhance coexistence and security? Additionally, how might these technologies aid in minimizing the externalities of diverse economic activities in mixed-use areas, fostering improved coexistence and facilitating greater energy efficiency and economic dynamism?
- A particularity of Medellín and its social contract is a fear of reprisal deterring people from reporting crimes to the police. How can technology incentivize increased and improved reporting?
- How can the digitization of services, considering the heterogeneity of digital literacy in the city, promote equitable improvement in security and citizen coexistence?

image: acimedellin.org

CUTTING-EDGE, FRAGMENTED, AND EFFECTIVE?

USES AND LIMITATIONS OF SURVEILLANCE TECHNOLOGIES IN MEDELLÍN

The context of the impact of the digitization of security in the urban social contract of Medellín is very broad, extending beyond the scope of proposals by local governments and technological solutions alone. However, in our experience as a pop-up in the city, and through conversations with various stakeholders, we found that while people generally favor the use of technologies for security, there's limited awareness of the specific technologies being used, their purposes and nuances[6].

Medellín is recognized as an innovative city; some examples of such innovation are initiatives like Ruta N[7], Social Urbanism[8] and its advanced security technology system. Technological tools for citizen protection have been one of the most popular strategies of recent administrations and for this reason Medellín is promoted as a regional and global leader in security technologies (read: Medellín Safe Thanks to Artificial Intelligence). A significant focus of the 2019-2022 administration was the implementation of Safe Zones, targeting high-crime areas with surveillance cameras, community alarms and panic buttons, as well as the provision of training to business owners.

Due to investments in security technologies by the local administration and to the establishment of institutions like the Urban Security Company (ESU), which is tasked with the acquisition of such tools, Medellín now boasts a diverse array of technologies, largely managed and coordinated within the Integrated Emergency and Security System of Medellín (SIES-M[9]).

Below we list and describe those devices or methods that are used for the operationalization of security services in Medellín and that were mentioned and explained to us by experts interviewed over the last 3 years. We exclude some that are not within the jurisdiction of the city and that are for the exclusive use of institutions outside the scope of the local government, such as the Army, *Migración Colombia* and the Attorney General's Office[10], in addition to intelligence work.

[6] See below: https://es.edgelands.institute/cities/Medellín

[7] Ruta N is a non-profit organization and an innovation district focused on driving economic and social development through the promotion of technology, entrepreneurship and innovation.

[8] A set of public policies at the beginning of the 21st century in Medellín that consisted in the implementation of "Integral Urban Projects in the poorest and most violent areas, where architecture and urban planning works go hand in hand with deep social and cultural changes in the communities" https://arqa.com/arquitectura/urbanismo/la-transformacion-de-Medellín-urbanismo-social-2004-2007-2.html

[9] In the Governance section we delve into the role of SIES-M in the city's governmental ecosystem.

[10] The Attorney General's Office uses IBM's Watson system, which is known for its AI applications.

TECNOLOGÍA	DESCRIPCIÓN
123 Emergency System	The 123 line is the unified emergency call line in Medellín. According to official sources, the Icad Intergraph Computer-Aided Dispatch (I/CAD) system efficiently receives and manages alerts from all channels within SIES-M, including those received via 123, aiming to minimize response times. It accurately identifies the citizen's location and related cases to prevent duplicate incidents, while also ensuring user data and privacy protection by restricting information access to other agencies.
Community alarms and panic buttons	Community alarms were first deployed in Medellín in 2006, with 604 devices installed by 2023. These alarms were distributed to security fronts comprising community action board members, municipal councilors, or citizen security associations. Initially connected via copper telephone lines to the SIES-M, the migration to IP technology by the telecommunications company Tigo-UNE in 2023 disrupted their connection to security agencies, rendering them only capable of sounding a high-volume siren upon activation without alerting the SIES-M. This information has not been socialized with the communities where the alarms were deployed, even though the devices were not retrieved upon the connection disruption. Panic buttons utilizing IoT technology were introduced to enhance alert transmission to the SIES-M. 212 panic buttons were installed during the 2016-2019 administration, and an additional 220 implemented during the 2020-2023 administration, totaling 432 by the time of this publication. These buttons allow immediate police response upon activation, aiding in crime prevention by enabling citizens to trigger emergency protocols. The Secretariat of Security directly provides these sensors to merchants, fostering community involvement in ensuring public safety.
Carbyne Universe	Technology utilized by the 123 Emergency Attention Center within SIES-M allowing callers to share various data such as video, location, altitude, and speed with responders, enabling more efficient resource management and emergency response. This service doesn't require callers to install an application; instead, the center sends an SMS to the caller's cell phone to share case information. This technology is developed by the software company Carbyne.

AVL (Automatic Vehicle Location)	AVL is an automatic vehicle tracking system that facilitates real-time vehicle location and is widely used in passenger and cargo transportation management. The Colombian National Police uses it in patrol vehicles for quadrant surveillance, dispatch assistance and resource routing. AVL includes alerts for events like speeding, departures from an assigned jurisdiction, stopped vehicles, and unauthorized movement. In Medellín, SIES-M monitors 1621 AVL-equipped vehicles, 1400 of which are operated by the police, with the remainder used by organizations such as INPEC, firefighters, health entities, ambulances, and the 123 social line.
Body cameras (popularly known as bodycams)	Bodycams are cameras that record video and audio and are carried by police officers in their uniforms during their operations and patrol duties. They seek to increase police transparency by allowing interactions with citizens to be recorded to ensure adherence and improve resource management. One of the people interviewed for our research stated that these devices have been effective in meeting these purposes. These cameras record from beginning to end of the patrol shift or specific operation. They can connect to the SIES-M and transmit real-time video, audio and location, which can allow reinforcements to be sent to the scene if necessary. They can live-broadcast for up to 20 minutes; this transmission can be activated from the dispatch center, through the action of the police officer in the territory, or automatically with the activation of the taser or firearm. The bodycams used by the National Police do not store information; For this reason, at the end of each shift, the agents download the videos to computers (docking stations) where the information is archived for later consultation, which means that, in theory, such cameras allow both real-time monitoring and historical data review. The bodycams and docking stations were purchased by the Ministry of Security and donated to the Police, the body that is responsible for establishing the management protocols for the cameras and the information they produce. In theory, all police officers on duty must use bodycams, but this is not the case and it is not something in which the Security Secretariat can intervene, since it is in the jurisdiction of the Police. In 2023, Karisma foundation questioned a resolution of the Bogotá[11] District Mayor's Office according to which, in practice, citizens do not have real access to bodycam data. At the time of publishing this research, we are unaware of the information management protocols applied in Medellín, but we know that the Police receive many requests from individuals seeking access to such information, which are typically denied due to lack of legal basis. The local government has no influence in the management of this information. According to our knowledge, as of 2023, 1,644 bodycams were operating in Medellín, many of which are becoming damaged, and in practice fewer units end up being used in daily operations.

[11]There was a scandal in Bogotá involving procurement for a bodycams contract.

	These devices have a lifespan of 3-5 years, which will be reached in the years 2022-2023. One of the people interviewed for this investigation told us that the Police in Medellín is aiming for officers to have bodycams both in their uniforms and in patrol cars.
PDA (Personal Digital Assistant)	PDA devices, used by the Police throughout the country, are pocket-sized mobile devices that allow queries for judicial pending cases by comparing the *cédula de ciudadanía*[12] of a person detained at a police checkpoint with the Dijin[13] database of people with pending judicial cases. They also allow the consultation of the background of people and vehicles. As of 2021, Medellín had a total of 1,249 PDAs. It is not clear how many of them work or what the equipment distribution protocol is.
CCTV (Closed Circuit Television Cameras)	Video surveillance cameras that are consolidated via Closed Circuit Television (CCTV) and monitored by retired police officers in the SIES-M. The system deployment began in 2001, with major expansions in 2014 and 2015. By October 2023, there were approximately 2,919 cameras in the city, according to information from SISC. At the transition between the 2020-2023 and 2024-2027 administrations, 3,212 installed devices were reported. According to a person interviewed by Edgelands in 2023, "There are more and more cameras, expanded coverage, increased resolution and wider angles of focus." For example, those known as PTZ have the ability to pan, tilt, and zoom. In our activities in Medellín, community organizations and citizens expressed recurring concerns about the operational status of surveillance cameras[14]. An expert interviewed for this research stated that typically 5% to 7% of the devices are offline on a daily basis, and explained to us that it is impossible for any such system to have all cameras online at all times. The Secretaría de Seguridad has grouped failure causes into 12 categories, including connection failures, software failures, insects, problems with line of sight, power outages, among others. System maintenance involves daily and strenuous efforts. At the transition between the 2020-2023 and 2024-2027 administrations, 171 cameras were reported as out of operation. As part of the Edgelands fellowship program, the SISC's work revealed that camera installations adhere to various criteria set by the Administrative Department of Planning of Medellín and other agencies, and that due to the extensive existing coverage installing new devices is increasingly complex. A key outcome of this project is a prioritization model for camera installations that includes protocol reviews with the agencies involved.

[12] *Closed Circuit Television*

[13] *Directorate of Criminal Investigation and Interpol.*

[14] *See: Security Perception and Public Video Surveillance Cameras: the Cases of the Villanueva and El Poblado Neighborhoods of Medellín.*

LPR (Plate Reader)	Type of video surveillance cameras that use character recognition to read license plates of automobiles and motorcycles. From the control center at SIES-M, partial or complete license plate number searches are conducted. The software then provides vehicle trajectories and timestamps corresponding to any vehicles with the queried characteristics. LPR aids police and prosecutorial investigations. In Medellín, as of this report's publication date, there are 549 operational LPRs, meaning that roughly 17% of the total of approximately 3,000 CCTV cameras in the city have the capacity to recognize license plates. The specialists consulted emphasize LPR technology as the most effective, dubbing it the 'true jewel in the crown'. It is apparently the only technology of whose effectiveness the authorities are sure. According to a publication from the Medellín Security Secretariat, in one week of 2024, LPR facilitated 37 arrests, recovery of 27 motorcycles and 5 cars, and seizure of 60 knives, one firearm and two traumatic weapons. Experts interviewed for this investigation confirm that these numbers are representative of those consistently achieved each week with this technology.
Facial recognition	Facial recognition involves software and computer systems that map, analyze and verify a person's identity based on their face in images or video. It comprises three stages: detection, analysis and recognition. Detection locates faces in images, often indicated by boxes drawn around them. Analysis measures facial features and converts them into numerical data (faceprint) for unique identification. Recognition aims to confirm identity by matching faceprints with biometric databases. Many detection and recognition methods use Artificial Intelligence algorithms. Multiple cameras in Medellín's CCTV network, along with technologies like Robocop and possibly the Halcón helicopter, at least in theory possess facial recognition capabilities. **An implementation of facial recognition in Medellín would enable the identification of individuals with active warrants** using the warrants database from the Dijin[15] and a biometrics database from the National Registry. The legal basis for this would be that in this process not all people who appear in video recordings are identified, but only those with warrants. This would be a selective identification, analogous to the Police PDA (described in this same table). In our research on local ordinances for the governance of Artificial Intelligence in security technologies in Medellín, we found that widespread implementation of this development has not taken place in the city. The database that would enable person identification is the Automatic Biometric Identification System for facial, palm and fingerprint recognition, ABIS, of the police[16]. The only exception in the public sphere is that since 2015 the Atanasio Girardot stadium has had 166 cameras capable of detecting previously flagged as problematic or potentially problematic.

[15]Directorate of Criminal Investigation and Interpol.

[16]More about ABIS: https://digitalid.karisma.org.co/2021/07/01/ABIS-reconocimiento-facial/.

	Despite new contracts and the technological inventory transition that the city seems to be in, it is unclear if Medellín is currently moving forward with widespread facial recognition implementation, or if it even has the necessary legal and operational resources to do so. This seems to be a matter concerning the Police and will likely be resolved at the national level.
Object recognition	Detecting objects or people with specific characteristics from CCTV camera images (e.g., people wearing certain colored shirts crossing defined areas) has been possible for years, but it demands significant processing power. Considering the trade-offs, it was discontinued. With current software, some real-time alerts could be programmed. Real-time weapon detection would require purchasing software, and this apparently is not very justified since currently about 5 or 6 traumatic weapons are seized per week and 1 firearm per month. According to one expert interviewed, assaults involving traumatic weapons are decreasing in frequency. Gunshot detection has been tested and this technology could also be added to the existing system, although technical details would need to be resolved to do so.
Intelligent Mobile Comprehensive Monitoring System (Known as "Robocop")	Each robocop is a solar-powered mobile artifact connected to a cellular network and integrated into the video surveillance system. These devices, acquired in 2021 by the Medellín mayor's office through the Company for Urban Security (ESU), feature audio components for sound emission, 360-degree vision, PTZ, the potential to use facial recognition and license plate detection (LPR), as well as the ability to identify color, make and model of cars. They have a direct connection to the 123 emergency line. The district mayor of Medellín in its 2020-2023 administration argued that the benefits of robocops, of which there are 10 so far, lie in their mobility, allowing them to provide support at disaster sites, emergencies or mass events, as well as their ability to operate daily in significant (though not necessarily fixed) areas of the city. In addition to their potential mobility, **the strategic advantages of robocops compared to existing surveillance cameras in Medellín are unclear.** Many CCTV cameras already have capabilities such as facial recognition, PTZ and LPR. The extent to which these devices end up being mobile in practice is also unclear. Furthermore, their large and visible nature raises questions about the trade-off between their dynamism and their high visibility in deterring crime. While the mayor's office sometimes refers to these tools as automated, it appears that they are operated by humans.

Drones	Drones "are remotely controlled unmanned aerial vehicles. They often come equipped with cameras and could be enabled with facial recognition technology, speakers, surveillance equipment, radars and communications interception tools, such as IMSI catchers."[17] In Medellín, there are reportedly 3 drones purchased by the Police, but their integration into the system and specific uses remain unclear. One of our sources said that 5 drones were first acquired for the city, but the current quantity and status of the potential missing drones are uncertain. Drones appear to be a questionable strategy due to their high cost relative to their capabilities, and the fact that police are untrained to operate them. While governments or security agencies may justify their purchase based on features like storage capacity, zoom capabilities, night mode, heat detection, and autonomy exceeding 30 minutes, drones are notably noisy and therefore not commonly used for intelligence purposes.
Helicopter	Since 2017, Medellín has had the Bell 407 helicopter, known as "el halcón" (the hawk), equipped with cameras with a maximum range of 2 kilometers, optical zoom, and day and night sensors. It has a flight autonomy of 3 to 4 hours, communication with ground units, is connected to a police command, and has the capability to transmit live to the SIES-M. Donated by the National Police, it underwent technological upgrades costing 6 billion pesos. The helicopter is equipped with a Trakkabeam 800 searchlight for long-distance object or person tracking, and a high-definition vision system with monitors for pilots and operators. It features three cameras including a thermal camera, as well as license plate and person detection capabilities. Although the helicopter has been used to solve crimes of various kinds and, at least in theory, in the fight against organized crime and drug trafficking, the question that remains to be answered is whether the investment in the technology and its operationalization corresponds to concrete crime reduction metrics. One of the experts interviewed suggests that this tool is merely a deterrent, although not enough to justify its cost, since each hour of helicopter flight can be worth more than 10 million pesos. **Ownership and operation of El Halcón may improve safety perception indicators, but it does not actually change safety.** The combination between drones and helicopters can be effective for large operations in alliance with other technologies, but these operations, according to our sources, are not carried out in Medellín on a day-to-day basis for citizen security operations.

[17] *Guide to protect yourself digitally during a protest. From this Dejusticia report we point out the following statement: "In Colombia the police acquired drones in 2019, but we are not certain of their technical characteristics or their uses in the context of the protest."*

When researching the technologies used in Medellín, we were left with many concerns and reflections: controversies about the contracting of technologies that reveal the need for greater transparency and regulation in their acquisition; the question of cybersecurity and the integrity of personal information and whether this is sacrificed for the sake of public safety; a dramatic contrast between the excessive self-promotion of Medellín as a pioneer in the use of technologies for security and a palpable lack of cost-benefit analysis and impact assessments; and concerns about the role of such technologies in mediating the urban social contract in a city like Medellín.

In January 2023, a controversy arose over the non-competitive contracting of facial recognition software valued at around US$840,000. The government of Medellín justified this action by stating that only one company in the market offered software integration and compatibility with the facial recognition system. While no conclusions have been drawn regarding this case, it underscores the importance of government guidance and regulation in procurement and transparency protocols.

In February 2023, a cyber-attack targeted the information system of the 123 Emergency System of the SIES-M, which hosts sensitive data from the entity's alert service. With a rise in attacks against government-hosted data, it's crucial to prioritize safeguarding citizen information entrusted to the State. This underscores the need for transparency in security technology procurement protocols and assurance regarding the treatment of citizen data. In the Edgelands activities in Medellín[18], a reflection emerged on the costs to citizens' rights, such as privacy, resulting from crime reduction efforts. Strategies that limit such rights should align proportionally with the pursued objectives.

Cases like the cyber-attack on SIES-M are deeply concerning as they represent a breach of the social contract where citizens entrust their personal information to the State in exchange for protection, yet the data is not adequately safeguarded. Conversations during our residency in Medellín and the Hablemos Medellín survey confirmed that **citizens value the integrity of their personal data and are concerned about the risk of cyber-attacks.** For the survey participants, the perceived risk of being a victim of cyber-attacks is comparable to that of being mugged in public space and higher than the risk of being murdered or sexually abused in the same space. Governments and security agencies should prioritize improving prevention and timely response to digital security and cybersecurity incidents.

[18] *See below: Edgelands Medellín Final Report, 2022.*

Notably, the National Police has only 5 trained individuals nationwide to address these challenges, all stationed in Bogotá.

It is pertinent to question Medellín's self-promoted narrative as a city at the forefront of using technologies for security, including AI[19], and whether its claimed success in improving crime indicators is grounded in reality. In addition to the aforementioned challenges indicating areas for attention, **there may be a potential contrast and dissonance between the levels of deployment and investment in security technologies and their effectiveness, which remains largely unknown to the public.** To date, Tobón et al.'s (2020) research is among the few to measure the impact of security technologies in Medellín, specifically surveillance cameras, indicating a modest impact on crime reduction, no impact on deterrence, and suggesting that strategies like hotspot policing[20] may yield similar results at relatively lower costs compared to installing and operating security cameras.

We believe that before further enhancing the city's integrated security technology system, **rigorous impact evaluations of current technologies are necessary.** These evaluations can help identify whether investments have effectively addressed Medellín's security challenges and inform evidence-based decisions in the future.

One recurring concern among interviewees and participants at Edgelands Institute events in Medellín is the fear that investments in technologies are being made primarily for public and media demonstration rather than for genuinely improving residents' lives. **We wonder if more visible policies are prioritized over effective ones to enhance the favorability of those in power.** This raises concerns, particularly if certain technological tools offer short-term solutions, potentially diverting attention from the importance of thoughtful, long-term, evidence-based policies.

We believe that strategies like Safe Zones, which initially promised extensive deployment of technologies, allocate significant resources but lack rigorous evaluation and clear impact measures. For these reasons, they should be reassessed in the future. We advocate for less flashy but more long-term strategies that offer greater potential for evaluation, cost-benefit analysis, scaling, among other factors.

In addition to considering the direct impacts of security technologies, it is crucial to reflect on their broader implications and their ability to fulfill promises of improving crime indicators.

[19]We call on the government and citizens to be precise about the terms under which these discussions are conducted. It is clear that Medellín sells itself as a city at the forefront of Artificial Intelligence for security technologies. Artificial Intelligence is a term that has existed for decades and has also been implemented for many years; we call on the government and citizens not to be dazzled by this shiny object, much less distract us from the real debates by making use of the black box nature of the term, such as its methods.

[20]Hotspot policing, or hotspot policing, refers to a policing strategy that focuses on allocating resources and attention specifically in geographic areas identified as critical due to high rates of criminal activity.

We suspect that many of these tools have not been fully integrated into a comprehensive prevention strategy and fail to address the root causes of criminal behavior, and that they often narrow the discussion on security to easily observable crimes, overlooking structural issues such as extortion that directly impact citizens.

Examples of technologies seemingly implemented more for public spectacle than tangible impacts include robocops and drones. They appear to lack cost-efficiency and may have been primarily intended to generate media attention. Despite their initial strategic intent in crime reduction, robocops have been relegated to monitoring improper waste management[21].

One case that prompted us to question the effectiveness of the technologies in use occurred during riots at the stadium on April 16, 2023. **Despite being the only location in the city theoretically equipped with facial recognition for almost a decade, security measures for suspected vandals couldn't be obtained due to lack of evidence.** This was partly because 17 cameras were destroyed, and apparently only 30 cameras (those at the entrance) among 166 had facial recognition on the day of the riots. While this may be attributed to the transition of facial recognition software and databases in the city[22], the destruction of several cameras raises questions about the reality of surveillance technologies in the context of the social contract in Medellín, a city where evading rules tends to be part of the idiosyncrasy.

Thus, as we have indicated in other sections of this report, in Medellín, it is ingrained in the social contract to attempt to circumvent norms, including technologies designed to enforce compliance. Consider traffic cameras and corruption related to noise or air pollution measurements, among other examples.

[21] *See below: https://www.elcolombiano.com/antioquia/robocop-paisa-sin-resultados-y-compran-otros-10-GD20458529*

[22] *See: https://www.elcolombiano.com/deportes/futbol/camaras-del-estadio-no-sirvieron-para-detectar-a-los-vandalos-del-domingo-KK21185861.*

image: acimedellin.org

We question the role of technologies in a city where the social contract has been fragmented by institutional dynamics but also by social dynamics such as a lack of respect for norms and authority, as well as the "culture of the advantageous,"[23] which involves challenging the established order not always for legitimate or legal purposes, but merely to defy it or for personal gain.

When considering the various layers of the social contract in Medellín, questions arise about the technologies utilized by other actors who shape the social contract, particularly in the informal sector. For instance, it's known that in the municipality of Bello, gangs controlling the territory employ a system of surveillance cameras. We suspect that, similar to governmental technologies, there may be counter-technologies emerging from the informal and parallel state.

From the above, it can be inferred that in Medellín, where two parallel states exist with varying degrees of informality penetration —i.e. informality levels are not homogeneous across the territory— security technologies may not be uniformly accessible throughout the city and their impacts may differ depending on the governance level of the state in each area. This is particularly significant when technology investments fail to deliver tangible results, often only influencing the perception of security. Thus, even the perception of security may not be uniform across all residents, highlighting the need for a conversation about equity.

This prompts us to question the relevance of significant investments in surveillance technologies and whether they are tailored to the context and operational needs. In other words, we ponder about adaptability. It's evident that not all globally trending technologies can be seamlessly adapted in the city due to geographical, technological, cultural, and compatibility limitations.

We believe that security technologies are important, but they should be regarded as tools rather than strategies in themselves. They not only require financial resources but also demand human capital and the development of operational strategies that are realistic and aligned with the capabilities of security agencies.

- Is there any assessment conducted by the District of Medellín to measure the results or impact of its investment and utilization of security surveillance technologies? The **necessity for evaluatio**n is intrinsic to all public policies, but it's particularly imperative for security technologies in Medellín due to the city's leadership status. Given the potential for these technologies to introduce bias, alter social dynamics, and affect individuals' right to privacy, thorough evaluation is essential.

[23] In Spanish, cultura del vivo, culture of the 'alive' for its meaning in informal language. Vivos are people who take advantage given the opportunity no matter how ethical their choice is.

- The city invests significantly in technology, but it remains unclear whether these investments lead to improvements in security indicators. We presume they influence the perception of security to some extent, as governments persist in making these investments, possibly to bolster their popularity. However, our survey and fieldwork suggest that citizens are generally unaware of the existing technologies in Medellín. Consequently, uncertainty prevails, **emphasizing the necessity for cost-benefit analysis of these technologies. Additionally, it's pertinent to address the question: do investments in security and surveillance technologies indeed affect citizens' perception of security?**
- What factors inform technology purchasing decisions?
- How can we reconcile the deployment of extensive security technologies in a city known for its defiance of norms? What is the interaction between these two contrasting realities?
- How to ensure comprehensive policies around security technologies that involve guarantees for the treatment of personal data, effectiveness and coherence with existing policies and with the context, and that are applicable and scalable in terms of operability? How to ensure that all sectors of society sit down to discuss the importance of regulating such technologies without waiting for future problems to arise?
- How can we guarantee comprehensive security technology policies that ensure data privacy, effectiveness, coherence with existing policies and context, and operational scalability? How do we ensure inclusive discussions across all sectors of society regarding the regulation of these technologies, without waiting for future issues to emerge?
- Can we ascertain the inventory of technologies utilized by informal actors in the city?
- Given the advance of AI systems and the use of technologies for surveillance in the city, which organizations are leading in the city and in the country the development of regulations or clear protocols on this matter that indicate contracting processes, implementation and what type of technologies are or are not allowed to avoid infringements to the rights and freedoms of citizens?
- What efforts are being made to face the challenge of cybersecurity? How to ensure that the guard is not lowered on this front, and that the authorities' responses to such challenges respond to transparent regulations and protocols?

PLANS, INSTITUTIONS AND AGENCIES: A DEVELOPING ECOSYSTEM

GOVERNANCE OF SURVEILLANCE TECHNOLOGIES

The governance of security and coexistence in the **Special District of Science, Technology, and Innovation of Medellín** involves decision-making at various levels, including regional institutions (such as the Metropolitan Area of the Aburrá Valley and neighboring municipalities' mayors) and national institutions (like Ministries and security agencies). Instead of providing an exhaustive list of agencies and processes related to surveillance technologies and security digitalization, this section aims to prompt reflections for the future governance of security and coexistence. Consolidating the use of surveillance technologies and digitalizing security necessitates addressing fundamental challenges and fostering coordination among stakeholders and processes.

The District Mayor, as established by the Constitution, serves as the primary police authority in the city. However, he does not have command authority over the National Police or other security and justice agencies, as they fall under the jurisdiction of the National Government. To implement public policy proposals, the District utilizes two key instruments: **the District Development Plan (PDD) and the Integral Security and Coexistence Plan (PISC)**, both formulated and executed over the course of its four-year mandate. The Secretariat of Security and Coexistence is responsible for implementing the security and coexistence aspects outlined in the PDD, specifically in formulating, executing, and monitoring the PISC.

The Secretariat of Security and Coexistence is tasked with various functions, including executing actions for preventing and reducing insecurity and supporting technological innovation within the community (Alcaldía de Medellín, n.d.). **Within this Secretariat operates the Security and Coexistence System (SISC)**, which furnishes information crucial for strategically managing security and coexistence. It prioritizes city interventions in a planned manner, transcending

immediate circumstances and ensuring cooperation and coordination among security and justice agencies, the Municipal Administration, academia, and civil society to generate knowledge (Mayor's Office of Medellín, n.d.).

Another significant unit within the Secretariat of Security and Coexistence concerning technology is the Integrated **System of Emergencies and Security Medellín (SIES-M)**. This system operates in coordination with the National Police, responsible for surveillance camera operation and related police operations, as well as other District secretariats handling risk and disaster response, and assistance to vulnerable populations, among others. SIES-M serves as a central emergency and security management hub, where various agencies conduct video surveillance and coordinate operational activities (Alcaldía De Medellín, n.d.).

The Company for Security and Urban Solutions (ESU[24]), functioning as a social and commercial entity of the State within the public conglomerate of the District of Medellín, specializes in "offering comprehensive security solutions, technology, network and telecommunications services, as well as urban and risk management to both national and international entities through the marketing and provision of goods and services" (Empresa para la Seguridad y Soluciones Urbanas, n.d.). Acting as a commercial ally, ESU provides security technology services to the District of Medellín and other municipalities. Specifically, for the District of Medellín, ESU is responsible for developing and acquiring new technologies to support strategies outlined by the Secretariat of Security and Coexistence that require a technological component.

The **National Police** is a centralized institution that adheres to national hierarchical command structures, which gives rise to coordination challenges with local institutions. While historically, this relationship has been relatively smooth in Medellín, in terms of urban security digitization, this separation in command lines poses practical implementation and structural challenges in conceiving surveillance and its boundaries (with implications for the urban social contract). This institution plays a crucial role in utilizing technologies for surveillance and security digitization, as it is responsible for overseeing public space surveillance and operational processes in the analog realm.

Furthermore, this configuration of the police has certain implications for the city in recent times. Primarily, it's associated with a trend among administrations to appoint retired high-ranking police officers (typically colonels and generals) as

[24] *Empresa para la Seguridad y Soluciones Urbanas.*

secretaries and undersecretaries in the Security and Coexistence Secretariats. While this fosters a strong relationship and coordination between the District and the Police, it could potentially limit other processes linked to transparency, as well as comprehensive views of security and coexistence, which encompass aspects beyond physical security.

Secondly, it impacts the type of acquisitions and innovations needed by the city in terms of security and surveillance. While the National Police conducts operational activities based on the use of surveillance technology tools provided by the Secretariat of Security and Coexistence, the majority of these new initiatives must be approved by the Police institution. In other words, the Police wield significant influence over the acquisition process and protocols for the use of these technologies (which are restricted). Technological innovations and regulations for their implementation are largely mediated by the technical capacity and policy influence of the National Police.

Although the District of Medellín has a robust institutional framework in comparative terms, the processes of governance of security and coexistence are linked to scenarios of articulation of various levels of public policy (national, regional and local) and coordination of various agencies. In the process of research and work in Medellín developed by the Edgelands Institute since 2021, it is evident the need to raise the conversation on technologies and surveillance used in the city from the perspective of the citizen. The city requires greater openness in the public conversation about the impacts of the implementation of these technologies and the responsibility of the institutions in charge. Some of the questions to rethink the urban social contract in Medellín that Edgelands poses to the city are the following:

While the District of Medellín boasts a relatively robust institutional framework, the governance processes concerning security and coexistence are intricately tied to the coordination of various agencies and the articulation of public policies at national, regional, and local levels. Through research and projects conducted by the Edgelands Institute in Medellín since 2021 it has become apparent that there's a pressing need to shift the conversation on technologies and surveillance used in the city towards a citizen-centered perspective. There is a call for greater transparency and openness in discussing the impacts of implementing these technologies and the accountability of the responsible institutions.

Edgelands poses several questions to prompt a reevaluation of the urban social contract in Medellín, including the following:

- What institution oversees the management of technological surveillance information in Medellín and with what criteria?
- What criteria (technology plan) does the Secretariat of Security and Coexistence use to prioritize investments in technology?
- What role does the ESU play in the acquisition and implementation processes of surveillance technologies in the city?
- Are there any protocols or regulations within the District for the integration of AI into surveillance processes?
- Is there oversight by the City Council and the general public regarding the utilization of surveillance technologies for addressing public safety?
- How can transparency be ensured in the dissemination of information and protocols concerning the use of surveillance technologies, especially in cases where the police hold decision-making power and authority over safeguarding the information?

AFTERWORD

After 3 years of research, dialogue, and arts from the Edgelands Institute, we bid farewell to the first city of our pop-up. In this document we summarize the conclusions of our work, which we hope will serve to rethink the security, surveillance, and social contract of the city, and the role that digital technologies play in them. We believe that such learnings can be valuable for other cities in the region and the global south.

Below is an inventory of our projects in the city and some of their associated initiatives:

SUMMARY OF EDGELANDS ACTIVITIES IN MEDELLÍN:

- May - August del 2021 Diagnostic report
- October - November 2021 Research Sprint: We Are Recording You
- November 2021 Conversation with el Derecho a No Obedecer
- February - March 2022 Matza - Edgelands
- April 2022 Magnum - Edgelands
- March - April 2022 Edgelands maps with Casa Morada
- March - April 2022 Social Lab: We are Recording You with Fundación Mi Sangre

- April - May 2022 Data analysis sprint: We're Recording You
- June 2022 Round table
- July 2022 Are all activities monitored in Medellín?
- September 2022 Lessons and questions from our work in Medellín
- June - July 2023 Partnership with Hablemos Medellín
- August - September Curso de datos
- September 2023 Reporte de la Encuesta
- November 2023 Implications of the Transition of Medellín to a Special District of Science, Technology and Innovation for the digitalization of security in the city
- November 2023 Towards a New Prioritization Model for the Location of Video Surveillance Cameras in Medellín
- November 2023 Perception of security and public video surveillance cameras: The cases of the Villanueva and El Poblado neighborhoods of Medellín
- November 2023 Analysis of the technological component in the planning instruments for security and coexistence in Medellín (2016-2022)
- December 2023 Recommendations for the new government of Medellín

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