

**PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ
ESCUELA DE POSGRADO**



"Enhancing Public Safety in Santiago de Surco: A Strategic Approach to Reducing Crime through Body Cameras and Technological Innovation"

TESIS PARA OBTENER EL GRADO ACADEMICO DE MAESTRA EN ADMINISTRACION DE NEGOCIOS OTORGADO POR LA PONTIFICIA UNIVERSIDAD CATOLICA DEL PERÚ

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DEDICATIONS

I dedicate this thesis to my family, whose love and encouragement have been my source of strength. To my friends and mentors, thank you for your support. This work is also dedicated to my team, without whom this project would not have been completed.

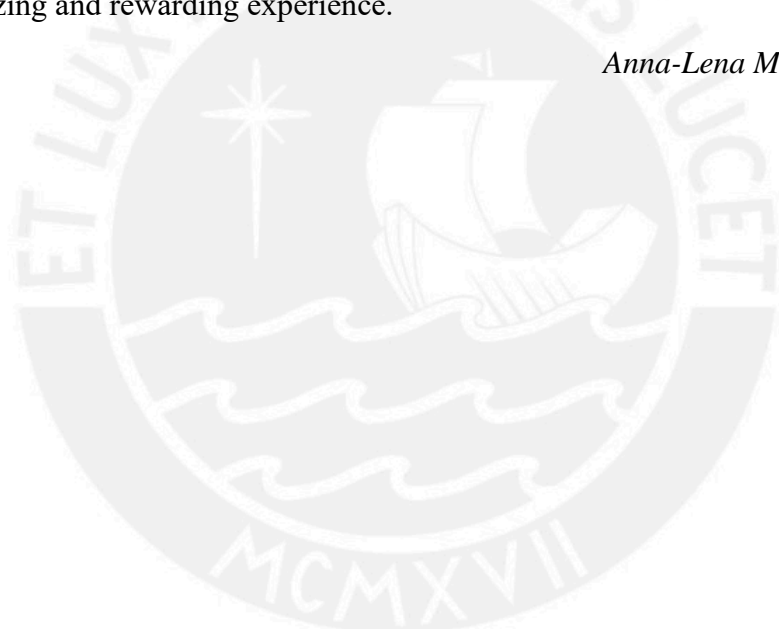
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Executive Summary

Despite its reputation as one of Lima's safest districts, Santiago de Surco is struggling with a growing sense of insecurity among its residents and visitors. High-profile crimes, such as drive-by robberies and assaults, have drastically increased the public anxiety, particularly in areas where resources and infrastructure are lacking. The Serenazgo and police forces, though present, struggle to fully address these issues due to limitations in personnel, technology, and geographic coverage, leaving certain neighbourhoods more vulnerable to criminal activity.

To address these issues, this report proposes implementing body cameras for Serenazgo officers, focusing initially on high-crime areas. This solution would enhance accountability, improve officer transparency, and build public trust. Coupled with advanced surveillance technology and real-time monitoring, the initiative aims to reduce crime rates, increase security, and foster better relationships between law enforcement and the community.

The expected social impact includes improved perceptions of safety, increased trust in authorities, and enhanced law enforcement practices. Financially, the pilot program is cost-effective, scalable, and aligned with the municipality's budget, providing a long-term sustainable solution for Surco. If successful, this initiative can serve as a model for other districts within Lima, fostering broader community trust and security throughout the city.

ABSTRACT

Esta tesis explora la implementación de soluciones tecnológicas para mejorar la seguridad pública y el orden en el distrito de Surco, Lima, Perú. Reconociendo los crecientes desafíos para mantener la seguridad en entornos urbanos, la investigación propone el uso de cámaras corporales para el personal de seguridad local, específicamente el cuerpo de serenazgo municipal. El estudio enfatiza un enfoque centrado en el usuario, con un enfoque en las necesidades y preocupaciones tanto de los oficiales de seguridad como de la comunidad a la que sirven.

A través de métodos de investigación cualitativa y cuantitativa, que incluyen entrevistas y encuestas con actores clave, esta tesis identifica brechas críticas en las estrategias actuales de seguridad pública. Se propone la integración de tecnologías de vigilancia en tiempo real para aumentar la transparencia, la rendición de cuentas y la efectividad en la aplicación de la ley. El sistema de cámaras corporales se analiza en términos de costo-efectividad, preocupaciones sobre la privacidad y su potencial para reducir conflictos y mejorar la confianza comunitaria.

Los hallazgos sugieren que la implementación de cámaras corporales podría mejorar significativamente la eficiencia operativa de los oficiales de seguridad, al mismo tiempo que fomenta relaciones más sólidas con la comunidad. La solución propuesta es escalable y adaptable a otros distritos que enfrentan desafíos similares, lo que la convierte en un modelo viable para la mejora de la seguridad urbana.

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Chapter I: Defining the Problem

The district of Santiago de Surco, located in Lima, Peru, is considered one of the safest districts in the capital. However, despite this reputation, residents and visitors to the district face a constant fear related to public safety. This fear is mainly triggered by incidents of drive-by robbery and assaults perpetrated by criminals on linear motorcycles, especially in areas of greater vulnerability (Instituto Nacional de Estadística e Informática [INEI], 2017). Despite being ranked as one of the safest districts according to reports from the Citizen Security Observatory of Metropolitan Lima (2019), perceptions of insecurity among citizens persist due to recurrent crimes in certain areas.

1.1 Safety in Surco

Surco, like many other expanding districts, faces the difficulty of managing the security of a large and heterogeneous territory. Although it is supported by the Serenazgo and the Peruvian National Police, resource and personnel limitations complicate the task of providing effective security throughout the district, particularly in certain more dangerous areas (Ministerio del Interior [MININTER], 2020). In areas such as Surco Viejo and the peripheries of the district, crime rates are significantly higher compared to more central and better-policed areas (Municipality of Santiago de Surco, 2021). These sectors present conditions that facilitate criminal activity, such as poorly lit streets, easy access for criminals to flee, and less presence of Serenazgo agents due to the wide geographic distribution of surveillance quadrants (Municipalidad Metropolitana de Lima, 2021).

1.2 Security Resources Limitations

One of the problems most reported by residents is theft, in which criminals take advantage of momentary distractions of people to steal belongings such as cell phones, purses, and other valuables (INEI, 2018). Linear motorcycles are also a key factor in this type of crime, as they enable criminals to carry out robberies more swiftly and escape with greater ease. (El Comercio, 2019).

Surco's Serenazgo is divided into 9 quadrants, which implies a great responsibility for a team that often lacks the necessary resources to effectively monitor each area of the district (Municipality of Santiago de Surco, 2021). Added to this is the fact that the Serenazgo, by law, is not authorized to carry weapons, which limits its response capabilities to violent or extreme risk situations (MININTER, 2020). In addition, the lack of advanced technology and adequate tools, such as strategically distributed surveillance cameras or real-time monitoring systems, also affects the ability of the Serenazgo to act quickly and effectively in cases of emergency (Municipalidad Metropolitana de Lima, 2021). The lack of lighting in critical areas and the difficulty to access some areas of the district increase the vulnerability of citizens (INEI, 2018).

1.3 Perceptions and Feelings of Insecurity among Citizens

In Surco, residents and visitors repeatedly mention their desire to live and transit in a safe place, without the constant fear of being a victim of robbery or attack (INEI, 2017). This includes the need to be able to walk quietly through the streets without worrying about the lack of lighting or the presence of criminals on motorcycles (El Comercio, 2019). The need to improve Serenazgo response times and increase police presence in areas with higher crime incidence has also been identified (MININTER, 2020).

1.4 Opportunities for Improvement Through Technology

Addressing these challenges requires a focus on the adoption of advanced technology that allows for better surveillance and control of the most vulnerable areas. The use of security cameras at strategic points in the district and the implementation of an efficient monitoring system for Serenazgo patrols are some of the elements that could make a significant difference in crime prevention and reduction (Municipality of Santiago de Surco, 2021).

1.5 Potential for Scalability

The implementation of technological solutions would not only help improve security in Surco, but also has the potential to be replicated in other districts of Lima with similar problems. At the national level, the expansion of these measures could contribute to improving the perception of security in various urban areas of the country (MININTER, 2020). Furthermore, by addressing this problem with a justice and equality perspective, these initiatives align with Sustainable Development Goals (SDGs) 10 and 16. SDG 10 seeks to reduce inequalities by ensuring that all citizens of Surco have access to the same levels of security, regardless of their location within the district (United Nations [UN], 2021). On the other hand, SDG 16 focuses on promoting just, peaceful and inclusive societies, which can be achieved through the effective use of technology and a more efficient security system (UN, 2021).

Chapter II: User Research

The aim of this chapter is to examine and elaborate on the concerns that residents of the Surco district have regarding public safety. Through the creation of representative user profiles, such as Andrea's case, we seek to identify the challenges faced by residents, visitors, and the Serenazgo, with the objective of better understanding their daily experiences and areas of opportunity to improve security in the district. The research is based on interviews conducted with citizens from various areas of Surco and direct observation of insecurity situations affecting the community. By understanding these concerns and experiences, solutions can be designed that are more specific and appropriate to the real needs of the population (Berg, 2016).

2.1 User Profile

Andrea is an example of an average resident of the Surco district, a 22-year-old who came to Lima from the province two years ago to continue her university studies. She lives alone in an apartment on Primavera Avenue, near a university, which allows her to be close to her academic and work environment. In addition to studying during the week, she works part-time at a local coffee shop, which forces her to move around different areas of the district, both day and night. Despite leading an active and social life, Andrea is constantly worried about her safety. She has experienced thefts in passing around the university and in other areas close to her home, which has generated in her a feeling of unprotection (INEI, 2017).

Andrea represents many young residents of Surco who find themselves in similar situations. Most of these young people have come to Lima from other cities in Peru to study or work, and do not have a close family support system, which makes them feel more

vulnerable to insecurity. Andrea's fear is intensified by the experiences of her friends and colleagues, who have also been victims of robberies or have heard stories of criminal incidents in the district. These young people, like Andrea, adapt their behavior to the district's security conditions, which affects their mobility and daily activities (Observatorio de Seguridad Ciudadana de Lima Metropolitana, 2019).

2.2 User Needs

One of the main needs of Surco residents and Lima residents, as evidenced in Andrea's case, is for greater security in their daily lives. For Andrea, this means being able to walk the streets of her district without the constant concern of being a victim of robbery or assault, especially when she has to walk home alone after work or attend a social gathering. Safety has become a limiting factor for her and many other residents, who modify their daily activities or choose longer and safer routes to avoid exposing themselves to dangerous situations (Motorola Solutions., 2014).

In common with the need to feel safe while traveling through the district, Andrea and other users have expressed a concern that security should not be a constant worry. The idea of being able to use their mobile devices on public roads without fear of being assaulted is a common concern among the residents interviewed. This feeling of always being on alert affects the quality of life of citizens, who avoid answering calls or texts in public and prefer not to walk through certain areas they consider dangerous (National Institute of Justice, 2012).

Users' precautionary behaviour in response to insecurity is evident. Andrea, for instance, avoids walking alone at night on poorly light streets, even if it means having to take longer routes. This behaviour is not unique to Andrea, as many citizens have adopted similar precautions to protect themselves, reflecting the magnitude of the insecurity problem in the

Surco district. Interviews revealed that these avoidance behaviours are a direct response to the perception that authorities are not providing adequate protection (Berg, 2016).

2.3 Barriers and Limitations

Surco residents face some obstacles and limitations related to public safety. First, the scarcity of effective and visible police or Serenazgo presence in certain areas of the district makes many citizens feel unsafe. In areas such as Surco Viejo or the areas near universities, the incidence of drive-by robberies is higher, which has generated a negative perception of the authorities' ability to ensure security. Residents, like Andrea, must plan their daily activities based on the areas of the district they consider safer, which limits their freedom of movement and affects their quality of life (Instituto Nacional de Estadística e Informática [INEI], 2017).

For many users, the fact that they are prevented from walking freely around the district, especially at night, is one of the biggest obstacles they face. Andrea has mentioned that, due to insecurity, she avoids going out after a certain hour, which limits her social and work interactions. In addition, this perception of insecurity generates a constant state of anxiety among citizens, who feel vulnerable to the possibility of being victims of crime (National Institute of justice 2012).

On the other hand, Surco's Serenazgo faces its own limitations in ensuring security in the district. Despite having a presence in several areas, Serenazgo officers are not equipped with advanced defensive tools or lethal weapons, which prevents them from effectively confronting high-risk situations. This limitation has been mentioned in several interviews, where residents expressed frustration with the lack of adequate resources for security forces. In addition, the lack of advanced technology, such as real-time surveillance cameras in all areas of the district or monitoring systems, reduces the capacity of the Serenazgo to respond

quickly to emergencies, which increases the sense of insecurity among citizens throughout the district (MININTER, 2020).

2.4 Perception of Solutions

Surco residents have expressed their support for the implementation of technological solutions to improve security in the district. In interviews, many users mentioned that the use of bodycams for Serenazgo officers would be an effective measure to increase transparency and trust in the security forces. The bodycams would allow monitoring the activities of the agents in real-time and provide evidence in case of criminal incidents, which would contribute to improving the perception of security in the district (Garcia & Panzeri, 2021).

In addition to bodycams, residents suggest the implementation of real-time monitoring systems, which would allow for better coordination between the Serenazgo and the National Police. This technology would not only improve emergency response times but would also help deter crime by making surveillance visible in the most vulnerable areas. Citizens believe that these technological solutions could generate a greater sense of trust in the authorities and reduce the incidence of crime in the district (Motorola Solutions, 2014).

The use of technology also has the potential to improve the relationship between the Serenazgo and citizens. In the interviews, several residents mentioned that, despite the presence of the Serenazgo, they do not always feel safe when they see them patrolling, as they are not familiar with their action protocols and in the interviews with the Serenazgos they reported that they also felt distrust from the citizens. With the use of bodycams and the exposure of success stories, citizens could gain a clearer understanding of the role and efforts of the Serenazgo, which would contribute to strengthening the relationship between residents and security forces (Garcia & Panzeri, 2021).

Chapter III: Product or Service Design – Solution

In order to create a desirable, feasible, and viable solution that is relevant to the social problem of the security in the district of Surco, and potentially scalable across other districts and cities of Peru, several ideation sessions were conducted. The objectives identified for the ideation meetings are the following: “(a) limit the problem and the needs of the user and (b) propose solutions that respond to the central problem/ needs” (Sánchez, 2024c). Based on the objectives the clear goal for the brainstorming session was defined: to reduce insecurity.

The brainstorming process was facilitated by the use of the “6x6 Canvas Tool”. The tool promotes the generation of collaborative solution ideas by addressing a specific challenge and focusing on the needs of the target audience (Sánchez, 2024c). The input for the tool was derived from the user experience map based on the most negative experience. Subsequently, the most pressing needs of the user were added in order to be able to formulate the open questions. Once, formulated, they were placed at the top of the canvas address the most pending concerns such as (a) the lack of utilization of the app “Alerta Surco”, (b) lack of community engagement, (c) trust in Serenazgo officers, (d) presence of officers in high-risk areas of the citizens were placed on the (e) crime prevention and education and (f) space usage for safety (Surco citizen, personal communication, July 25, 2024).

The process has brought forward several potential solutions for the issues identified and consequently one of them had to be selected to move on with the ideation session. During the following meeting, the most promising ideas based on its desirability, feasibility and viability, and overall brings the most value to both the citizens of Surco and additionally the Serenazgo, were selected. Subsequently a “Cost vs. Impact” matrix was created in order to visualize the solutions for prioritization. Through collaborative effort, a solution was selected based upon the feedback received on the canvas and the matrix (Sánchez, 2024c).

The next step was to start with the prototyping in order to identify the most suitable solution. Prototyping is a crucial step in the New Product Development (NPD) phase and experiments with different potential outcomes (BenMahmoud-Jouini & Midler, 2019).

Once the first prototype was defined, several design sprints were conducted in order to identify, if the solution meets the municipality's expectation (Sánchez, 2024d). The gathered feedback from the interview with the municipality and the additional interviews with other citizens were crucial for the development and the finalization of the solution. The last interview was very successful, and the municipality has since then started with the implementation process of our idea (Municipality of Surco, personal communication, August 21, 2024).

3.1 Conception of the Product or Service

The initial conception of the project was aimed to tackle the growing security concerns in the district of Surco by identifying and prioritizing key issues through structured ideation. The design sprints provided a framework for the continuous development of the solution based on real feedback from the users and the stakeholders (municipality and Serenazgo). The initial idea of increasing the numbers of security cameras in the district was adapted further due to the revelation of the vulnerability of Serenazgo officers face in their daily work tasks (Municipality of Surco, personal communication, August 21, 2024).

Based upon the design sprints and the prototyping process, the idea that potentially has the biggest impact on the improvement of the security in Surco is an increase in the quantity of cameras for surveillance. The solution derived from the process has then been adapted further by gathering additional information about its potential. At the beginning the idea was to employ more security cameras within the district, however during the interviews

it became evident that the Serenazgo officers are vulnerable in interactions with the public since they are not allowed by law to carry any kind of weapon (Municipality of Surco, personal communication, August 21, 2024).

Hence, the proposed solution is to improve the security for citizens in the district of Surco and furthermore, the Serenazgo itself, by equipping the officers with body cameras. The use of body cameras goes beyond protecting the officers during their daily work tasks but furthermore, reshapes public interactions with law enforcement (Municipality of Surco, personal communication, August 21, 2024).

The implementation should start with the procurement of the cameras for a few selected officers in high-risk areas of the district. The cameras' software system is going to be integrated with the already existing surveillance systems and potentially requires infrastructure improvements. The new control centre of the Serenazgo in Surco will serve the purpose of managing and supervising the camera footage. In order to familiarize the officers with the equipment and its underlying technologies, specific training will be provided (Municipality of Surco, personal communication, August 13, 2024).

In order to measure the effectiveness of the proposed solution, both quantitative and qualitative measures should be used. First and foremost, the (a) overall crime rates need to be reviewed in the areas where officers equipped with body cameras have been deployed in order to see if there has been an improvement. Other metrics that have been identified to visualize the effectiveness of the body cameras are: (b) number of preventive interventions, (c) public survey on security perception, (d) fear of crime index, (e) trust level in the Serenazgo and (f) behavioural changes in officers (Sander, 2019).

Primary testing of the effectiveness of the new equipment and the financial feasibility will be reviewed by the municipality, before the project can be implemented on a larger scale (Municipality of Surco, personal communication, August 21, 2024).

3.2 Development of the Narratives (Canvases, Narratives, etc.)

In order to develop the final solution, several different tools have been used to facilitate the process. The “Design Thinking Structure” presented in the Research Methodology course has served as a clear guidance throughout the whole development by structuring the following steps: (a) empathize, (b) define, (c) ideation, (d) prototyping and (e) evaluating. The use of the tool “Design Thinking Structure” and the “Meta User Canvas” helped to clarify the needs and pain points of the residents in the district of Surco (Sánchez, 2024a).

In regard to the first and second step, the “Meta User Canvas” was created to emphasize on the experience of the citizens of Surco. The user that has been created as part of the canvas is called “Andrea”. The personification of the meta user has allowed the team to delve deeper in the emotions that the citizens encounter when facing unsafe situations, such as walking home alone late at night. The input for the canvas has been based on multiple interviews that have been conducted in the streets of Surco. The interviews, furthermore, served as a basis for the creation of the “User Experience Map” that allowed for more interpretation and insights into the exposure of unsafe situations of the citizens (Sánchez, 2024b).

The scenario for the experience map is the way home for a regular resident after work and incorporates the positive and negative experiences that the meta user (Andrea) is confronted with (Surco citizen, personal communication, July 25, 2024).

Subsequently, the visualization of the user experience assisted in the process of the multiple brainstorming sessions. As previously mentioned, (a) the “6x6 Canvas Tool”, (b) the “Cost-Impact Matrix” were crucial for the development of the prototypes and design sprints (Sánchez, 2024d).

Furthermore, a visualization of the solution process was created solely for the interview, which profoundly facilitated the explanation of the project. Subsequently, the “Relevance Target Canvas” was created to envision the feedback received from the municipality and the interviewed residents, which played a crucial role in the solution development and ensured the inclusion of multiple perspectives (Sánchez, 2024e). The interviews with both the citizens and the municipality were used to ensure that the final solution is viable (Municipality of Surco, personal communications, August 21, 2024).

3.3 Innovative and Disruptive Nature of the Product

The use of body cameras in the district of Surco represents an innovative leap for the municipality law enforcement officers. Other districts may rely solely on traditional surveillance measures, the introduction of body cameras pushes Surco ahead by implementing modern technology to increase transparency, accountability and safety. The point that sets this project apart is its dual function of protecting the unarmed Serenazgo officers and furthermore, the citizens.

To review and prove the effectiveness of the proposed solution, several case studies from the United States of America have been reviewed. In the studies both state and local law enforcement officers have been equipped with body cameras that are operating in open and direct contact with the public (National Institute of Justice, 2022). The reason for the increased use in body cameras is the assumption that it improves work performance,

accountability and crime prevention (Ariel, 2017). In the case of the Phoenix police department, it demonstrated that the officers who wore body cameras achieved a decrease of the complaints made against them by 23 percent, compared to officers who were not equipped. Furthermore, the paper states that there has been an increase in arrest rates by 17 percent which indicates that the cameras contribute to a more effective arrest process (Katz et. al, 2014).

In the case of the “Las Vegas Metropolitan Police Department” (LVMPD) it became evident that the cameras have a positive impact on de-escalations. Furthermore, the officers that were equipped with cameras conducted more arrests (Ariel, 2017). The findings of these cases demonstrate not only an increase in accountability, but moreover, contribute to a reduction in crime rates and an increase in safety of police-citizens encounters.

By drawing upon the case studies from these two cities in the United States, it became evident that the use of body cameras reduces citizen complaints, improves arrest rates and leads to de-escalation in tense situations (National Institute of Justice, 2022).

The solution is innovative because it is introducing Surco’s municipal security force to body cameras and hence, leverages modern technology to increase safety and transparency. Additionally, the project would disrupt traditional models of security operations by holding both the officers and the public accountable which creates a shift in power dynamics (Municipality of Surco, personal communications, August 21, 2024).

3.4 Value Proposal

The “Value Proposition Canvas” was used as a visualization aid to demonstrate the connection between the solution and the needs of the user (Sánchez, 2024e). The primary job of the Serenazgo is to ensure safety and security in the district of Surco, which correlates to

the citizens' desire of feeling protected and secure. However, through the interviews some concerns and frustrations such as (a) lack of transparency and accountability, (b) slow response time and (c) overall feeling of unsafety on the street, were identified. This dissatisfaction leads to distrust in the security officers and their capabilities. The user wants to achieve a feeling of safety and security in the district which translates to efficiently handling crime and to prevent incidents (Citizen of Surco, personal communication, July 25, 2024).

Furthermore, the citizens seek transparency and accountability from Serenazgo officers, hence the users' gains (or joys) are (a) reduced crime rates in the district, (b) increased trust in security enforcement, and (c) fairer and safer incident resolutions (Citizen of Surco, personal communication, July 25, 2024).

The implementation of body cameras for Serenazgo officers would address the citizens' frustrations, while at the same time meeting the community's needs. By introducing this equipment to the security force, it would on one hand, improve the public's feeling of safety and at the same time increase the level of trust. On the other hand, it would provide more safety to the unarmed officers since body cameras are proven to provide a preventive effect. Additionally, the overall efficiency in crime resolutions can be improved by streamlining the video footage and hence, speeding up response time (Municipality of Surco, personal communication, August 13, 2024).

Overall, the implementation of body cameras is a well-rounded solution to the district's safety and security concerns, improving the situation for all stakeholder ((a) citizens, (b) Serenazgo, and the (c) municipality of Surco). Hence, the "Value Proposition Canvas" made it evident, that the solution closely aligns with the key concerns of the residents of Surco (Municipality of Surco, personal communication, August 13, 2024).

3.5 Minimum Viable Product (MVP)

The MVP for this project is designed to balance costs and effectiveness in order to ensure that the solution could potentially be scaled without a significant financial burden for the municipality of Surco. The MVP for implementing body cameras for Serenazgo officers in Surco, would be to start it with a small pilot program to test the effectiveness of the overall solution. The initial roll out would include the equipment of around 40 officers with a focus on high-risk areas within the district to ensure that the cameras are placed in an environment where they can bring the most value (Municipality of Surco, personal communication, August 21, 2024).

For the MVP, the municipality could consider starting with cheaper cameras and less features which significantly reduces initial investment costs. The camera's software, however, should be compatible with the already existing security systems of the Serenazgo to minimize future expenses of the project. The footage can then be reviewed in the new control centre for incidents (Municipality of Surco, personal communication, August 21, 2024). Necessary features of the body cameras include for instance, (a) high-definition recording, (b) extended battery life, (c) one-touch recording to ensure a facilitated use of the product, and (d) GPS tagging (Municipality of Surco, personal communication, August 21, 2024).

The municipality has stated that it has an approximate budget for around PEN 200,000 (USD 52,865.60) for the pilot project during the first year (Municipality of Surco, personal communication, August 14, 2024). Based on the budgetary constraints and the required features, research on the most common body cameras used in law enforcement was conducted and it has presented that the most suitable camera model is the "Bodycam→ 4 – Police Body Camera" of the company "Pro-Vision" or the "Axon Body 3" of the company "Axon" (with the most basic option plans). For the "Bodycam→ 4", the municipality is able to

obtain a better monthly plan which includes more features than for Axon's product. The Axon body cameras, however, are the most widely used body cameras for law enforcement and security officers in the United Kingdom and they are, furthermore, frequently used in the United States, which underpins the quality it delivers (Axon, 2023). The "Bodycam→ 4" solely enables the municipality to watch the captured video footage after it has been uploaded into the cloud or to the on-premises solution (Pro-Vision, n.d.), hence not in real-time, while the "Axon Body 3" allows livestreaming and real-time analysis of the footage to command centres (Axon, 2023).

The municipality must consult with their Information Technology (IT) department which of the cameras' operating systems is more feasible to integrate with their present security network in order to decrease expenses in the acquisition process (Municipality of Surco, personal communication, August 21, 2024).

Furthermore, the municipality needs to set up clear guidelines for the officers for instance when to activate or deactivate the cameras and how the training is going to be conducted. The coaching should provide the officers with information on how to handle the equipment. The training should give the officers a clear understanding and a structured overview of the guidelines, in order to avoid future compliance issues which often occur with the use of body cameras (Municipality of Surco, personal communication, August 21, 2024). The selection of the officers who are going to be equipped during the pilot phase should be based on following factors: (a) high risk areas, (b) willingness and tech-savviness of the officer and (c) officer experience (National Institute of Justice, 2020).

In addition to the points mentioned above, the municipality needs to define specific metrics to review the effectiveness of the cameras. Some of the metrics that could be used are mentioned in the first section of this chapter. Based on the outcome of the metrics, the

municipality then has the necessary data to decide whether they want to scale up the project within the district or even across other cities (Municipality of Surco, personal communication, August 21, 2024).

In conclusion it can be said that the ideation, prototyping and development process for improving the security in the district of Surco has led to the creation of a solution that is not only innovative but moreover, highly relevant for the needs of the municipality and ultimately its citizens. A clear understanding about the district's most pressing concerns was established by the use of the "6x6 Canvas Tool" and the "Design Thinking Structure". The prototyping and the design sprints facilitated the development of the MVP, equipping the Serenazgo officers with body cameras, further. Based on data from the United States, the effectiveness of the solution was demonstrated. The body cameras ensure the increase of transparency, accountability and security in the district by reducing crime rates and increasing public trust. The process of the MVP ensures the project to be tested on a smaller scale, in case adjustments are necessary. The solution offers a forward-thinking, scalable model for other districts of Lima or even cities of Peru.

Chapter IV: Business Model

The business model for the bodycam initiative in Surco is aimed at addressing critical issues concerning the public safety. By implementing bodycams for Serenazgo officers, the model seeks to enhance accountability, deter misconduct, and ultimately foster a safer community. Built on the principles of transparency and community engagement, the business model ensures that key stakeholders, including local residents and law enforcement, benefit from improved relations and an increased sense of security. This chapter will explore the structure of the initiative's business model, highlighting its key components, financial viability, scalability, and social sustainability.

4.1 Business Model Canvas

The bodycam initiative in Surco is designed to enhance law enforcement accountability and improve public trust. By focusing on transparency and community engagement, the model ensures that the bodycam program not only addresses immediate safety concerns but also provides long-term social value. A detailed depiction of the business model canvas can be found in Appendix K, while this section discusses the different parts of the proposed model.

At its core, the business model addresses a key problem in Surco, which is the diminished public trust in law enforcement and growing concerns about safety. The purpose of the initiative is to rebuild that trust by deploying bodycams for Serenazgo officers, enhancing public safety through transparency and accountability.

The value chain plays a crucial role in delivering this solution, consisting of key partners that contribute directly to the success of the bodycam initiative. These partners include bodycam suppliers, software companies responsible for data management and

analysis, data storage providers ensuring the secure handling of footage, and community organizations that aid in the educational outreach of the program. The value chain ensures that every aspect of the initiative, from procurement to community engagement, is streamlined and effective.

The key activities involved in this business model center around the deployment and operational management of bodycams. This includes not only the physical distribution of bodycams to officers but also ensuring proper data storage solutions, integrating software that analyses bodycam footage for insights, and implementing ongoing training for officers to use the technology effectively. In any business model, key activities are the actions that are essential to delivering the value proposition to customers, and here, these activities ensure transparency and enhanced law enforcement practices.

To support these activities, the model relies on several key resources, which refer to the assets required to make the model work. In this case, the resources include bodycams, software solutions, data storage facilities, and training materials for officers. These resources are vital in ensuring that the bodycam system operates smoothly and that it continues to serve its purpose of improving safety and trust within the community.

The value proposition is the central offering of any business model, representing the unique value the initiative brings to its stakeholders. In the underlying canvas the value proposition is clear: the initiative provides enhanced transparency, accountability, and public trust in law enforcement. By offering real-time evidence of officer interactions, the bodycam system ensures that law enforcement practices are transparent and accountable, reducing the likelihood of misconduct and fostering a safer community.

The customer segments are the groups that benefit directly from the initiative. This bodycam initiative targets several segments, including local residents, businesses, vulnerable populations (such as women, children, and the elderly), tourists, and Serenazgo officers themselves. Each of these groups benefits from improved public safety, greater transparency in law enforcement, and more efficient incident resolution.

Maintaining strong customer relationships is key to the model's success. The initiative aims to foster trust and engagement through community outreach, public feedback systems, and educational programs. By maintaining open communication with the community and addressing concerns directly, the initiative seeks to build long-lasting, positive relationships between law enforcement and the people they serve.

The channels through which the initiative communicates with and engages stakeholders include digital platforms such as the municipality's website, social media, mobile applications, and SMS alerts. Additionally, more traditional methods such as local media coverage and public meetings will also be used to ensure that all relevant stakeholders are informed about the progress and outcomes of the bodycam program. Channels represent the means by which a business delivers its value proposition to its customer segments, and these diverse channels ensure comprehensive outreach and engagement.

From a financial perspective, the cost structure includes all the major costs associated with implementing and running the initiative. These include the procurement of bodycams and related equipment, data storage and management costs (both initial setup and ongoing maintenance), the cost of officer training, maintenance of equipment, and funding for public engagement campaigns. Managing these costs effectively ensures the initiative's long-term sustainability within the municipality's budget, which is also the sole funding source for this project.

Lastly, the success of the bodycam initiative will be measured through various impact metrics. These include improved public trust and support for law enforcement, better incident resolution, enhanced officer safety, and a reduction in crime rates. By tracking these metrics, the initiative can continually assess its effectiveness and make adjustments as needed to ensure that it continues to meet its goals. One of these key performance indicators (KPIs) is the overall crime rate in the district where bodycams are deployed, the crime rate will be tracked to evaluate the reduction in criminal activity. Crime statistics from official sources, including data on specific crimes like robbery and assaults, will be compared before and after the implementation of the bodycams. The crime data will be collected from police and Serenazgo reports.

Another important KPI is the number of preventive interventions by Serenazgo officers. This will measure how often proactive monitoring prevents crime or illegal activities from escalating. The frequency of these interventions is harder to measure but should be recorded through bodycam footage and logged, with the results showing the effectiveness of the bodycams in empowering officers to intervene before crimes occur. The software used with the bodycams can help create a digital reporting system linked to the bodycam data to categorize and track each intervention, helping identify patterns and areas that need more focus.

Anonymous surveys will play a significant role in measuring the effectiveness of the bodycam initiative, particularly in gathering public perception of security, trust in law enforcement, and the well-being of Serenazgo officers. These surveys will be conducted and distributed through digital platforms, such as the municipality's website or the mobile application, as well as during in-person events to ensure participation. Public perception of safety will be assessed by asking residents about topics like their comfort levels in public

spaces or perception of crime frequency. Trust in Serenazgo officers will also be monitored through the same surveys, alongside feedback gathered via structured interviews, public forums, social media, and direct feedback forms. In addition, the well-being of Serenazgo officers will be evaluated to ensure that they are not only performing their duties effectively but are also receiving the necessary support to manage the challenges of their roles. This holistic approach will allow the initiative to track shifts in public sentiment, trust, and officer well-being, with indicators such as a decrease in complaints, an increase in positive feedback, and improved officer morale serving as measures of success.

An additional but hard-to-measure KPI is officer behaviour and accountability. The bodycams are expected to lead to behavioural changes in officers, particularly in their interactions with the public and adherence to law enforcement protocols. To measure this, bodycam footage should be reviewed regularly by supervisors to identify patterns, particularly in high-risk situations. Metrics such as the frequency of disputes, misconduct, or instances where officers successfully de-escalated situations should be logged and analysed alongside incident reports and citizen feedback.

Each component of this business model works to achieve the initiative's overarching goal of enhancing public safety and fostering greater transparency in law enforcement. By combining the different aspects, this business model lays the foundation for a safer and more accountable environment. This integrated approach ensures that both immediate and long-term benefits are realized, contributing to the overall well-being and security of the Surco district.

4.2 Financial Viability of the Business Model

The financial viability of the bodycam initiative for Serenazgo officers in Surco is supported by several factors, including the reasonable cost structure, the potential for future scaling, and the municipality's existing budget allocations for public safety. The initiative has been designed with cost efficiency in mind while ensuring the necessary tools and technologies are in place to improve law enforcement practices and public trust.

The initial phase of the bodycam initiative, described as a "pilot project", involves the acquisition of 40 bodycams. The cost per pair will lie around PEN 5.000, the whole pilot project will therefore incur acquisition costs of approximately PEN 200.000. The package deal covers not only the bodycams themselves but also essential components like data storage and management software as well as mounting gear and the required equipment for Serenazgo deployment. This ensures that the municipality as well as the officers are able to manage the gear and footage effectively (Municipality of Surco, personal communication, August 14, 2024).

This cost structure is manageable for the municipality, especially given that the project is being rolled out as a pilot, allowing for future adjustments and scaling based on the results of the initial implementation. The contact person from the municipality confirmed that there is sufficient budget to support this pilot project and future expansions if needed. Public safety is a key priority for the municipality, and this initiative has been incorporated into their broader strategy for improving security in Surco. This financial backing ensures that the project is not only feasible but also sustainable in the long term (Municipality of Surco, personal communication, August 14, 2024).

In addition to the initial purchase cost, the bodycam initiative will incur ongoing operational costs like storage and maintenance costs. The data storage solutions included in

the initial purchase are cloud-based, allowing for flexible and scalable storage options. This will minimize the need for costly infrastructure and allow the municipality to pay only for the storage they use (Municipality of Surco, personal communication, September 5, 2024). The operations of the bodycam initiative can also potentially be integrated into a new control centre that the municipality is currently planning, which will serve as a central hub for monitoring and managing various public safety systems. By consolidating the management of bodycam footage with other surveillance tools and systems within the control centre, the municipality can streamline operations and reduce redundancies. This integration can help lower operational costs by centralizing data storage, software management, and technical support, eliminating the need for separate infrastructures for different security initiatives (Municipality of Surco, personal communication, August 21, 2024).

One of the strengths of the financial model is its scalability as also indicated in the following chapter. The pilot project of 40 bodycams serves as a test case, allowing the municipality to assess the effectiveness of the technology before expanding the initiative further. Future expansion can be done in phases, allowing the costs to be spread out over time and adapted to the municipality's evolving needs. Additionally, by starting with a pilot project, the municipality can better forecast the future operational costs associated with data storage, maintenance, and potential additional training for officers. This phased approach ensures that the municipality remains financially stable while scaling the project.

The financial viability of the bodycam initiative is well-supported by the manageable cost structure, the municipality's available budget, and the potential for future scaling. The pilot project provides an opportunity to test the system, control costs, and make informed decisions regarding future expansions. With the clear backing from the municipality's budget the bodycam initiative is both feasible and sustainable in the long term.

4.3 Scalability of the Business Model

Scalability is a crucial aspect of any business model, particularly for systems like the bodycam initiative for Serenazgo officers in Surco. This section will examine the scalability of the bodycam initiative, drawing on the fundamental principles of scalability especially in software systems. According to Hamida et al. (2016) scalability ensures that the system can maintain its performance and effectiveness as it expands, whether that be through increasing the number of devices, expanding geographic coverage, or handling larger volumes of data. This ability to scale is crucial for the long-term viability and success of the initiative, as it allows for growth without affecting the quality or efficiency.

These principles include the ability to adapt to increased loads, the flexibility to integrate with existing infrastructure, and the potential to leverage advanced technologies like cloud computing. By addressing scalability from the outset, it can be ensured that the system can grow and adapt over time, supporting a broader implementation beyond Surco and ensuring long-term sustainability (Duboc, Letier & Rosenblum, 2013).

The scalability of the bodycam initiative for Serenazgo officers in Surco is underpinned by several key factors: modularity, software scalability, training scalability, and the potential for expansion within and beyond the district. Each of these factors ensures that the system can grow and adapt to the increasing demands of the municipality without compromising performance or effectiveness.

The concept of modularity is central to the scalability of the bodycam initiative. By dividing the system into distinct modules—such as the bodycams, data storage, and software management—each component can be independently developed, upgraded, or expanded without affecting the overall system. This modular approach allows for incremental scaling,

where additional bodycams or enhanced software features can be added as needed. According to Baldwin and Clark (2000), modular designs are particularly effective in managing complexity and facilitating parallel development, which are crucial for scalable systems.

Software scalability is another critical factor in this initiative. The software managing the bodycam footage must be capable of handling increasing volumes of data and more complex analytics as the system expands. Scalable software solutions, such as those based on a scalable and application-oriented architecture for video surveillance, allow for the efficient management of data as the number of cameras increases. This scalability ensures that the system remains responsive and effective, even as the volume of data grows significantly (Hamida et al., 2016).

Training scalability is crucial to ensuring that all Serenazgo officers are equipped with the necessary skills to effectively use the bodycam technology. The municipality plans to implement its own in-house training, allowing for greater flexibility and ease in scaling the training process. By conducting these training sessions internally, the municipality can quickly adapt the programs to accommodate an increasing number of officers and introduce new features or policies as they are developed. This approach not only allows for efficient training of large groups but also ensures that the content is consistently aligned with the specific requirements of the initiative. Additionally, once officers have adopted the necessary skills, they can assist in training their colleagues, further enhancing the scalability of the program. Therefore, the training model supports scalability by making the training process more responsive and cost-effective, ensuring that every officer remains proficient as the program grows (Municipality of Surco, personal communication, September 5, 2024).

The bodycam initiative is designed with the potential for expansion throughout the whole district and even beyond Surco, making it scalable across other regions and even cities.

The success of the initiative in Surco can serve as a model for neighbouring districts and municipalities. This potential for replication and regional scaling is supported by the modularity and scalability of the system's components, allowing other municipalities to adopt and adapt the initiative to their specific needs. This expansion can contribute to broader public safety efforts, enhancing the overall impact of the bodycam initiative (Municipality of Surco, personal communication, September 5, 2024).

4.4 Social Sustainability of the Business Model

Social sustainability refers to the ability of the bodycam initiative to promote and maintain positive social outcomes over time, particularly in terms of public safety, community trust, and equitable access to security resources. Ensuring the social sustainability of the initiative means that it must contribute to the long-term well-being of the community, foster strong relationships between law enforcement and residents, and operate in an ethical and inclusive way.

The bodycam initiative is designed to strengthen trust between the Serenazgo officers and the residents of Surco by an enhancement in transparency and accountability. The consistent use of bodycams provides a clear record of interactions between the Serenazgo officers and the public, which can be reviewed to ensure that officers are conducting themselves appropriately. This transparency is crucial in building public trust, particularly in communities where there may have been previous concerns about law enforcement practices (Schumaker & Kelly, 2012).

According to research by Nix et al. (2014), procedural fairness and the perception of collective efficacy are key components in building trust between law enforcement and the community. The bodycam initiative directly addresses these factors by ensuring that officers

are held accountable for their actions, thereby enhancing the procedural justice perceived by the community. This increase in transparency and accountability is expected to boost the collective efficacy of the community, as residents feel more confident in the fairness and effectiveness of law enforcement.

To further support social sustainability, the municipality will engage in regular communication with the community, including public communication, potential workshops, and feedback mechanisms. These efforts are designed to ensure that residents are informed about the initiative, understand its benefits, and have a platform to voice any concerns. By actively involving the community in the ongoing development and evaluation of the bodycam program, the municipality can foster a sense of shared responsibility for public safety, which is essential for long-term social cohesion (Municipality of Surco, personal communication, August 21, 2024).

A key aspect of social sustainability is the ethical use of bodycam technology, which is reinforced by the legislative framework governing the use of surveillance tools in public spaces. The municipality will adhere to strict guidelines, in line with national laws, to ensure the responsible use of bodycams, safeguarding individual privacy and civil rights. Specific legal provisions mandate that bodycam data, such as images and footage, be collected, stored, and used in compliance with regulations aimed at preventing unauthorized surveillance and breaches of confidentiality. Clear policies will be established regarding when and how bodycams should be activated, who is authorized to access the recorded footage, and how long the data will be retained, ensuring that the initiative aligns with the legal standards set forth in the Peruvian legislation on the protection of privacy and data (Congress of the Republic, 2016)

Moreover, the bodycam initiative aligns with broader global objectives, particularly the United Nations' SDGs, by advancing equitable, transparent, and inclusive access to security services across Surco. Specifically, it supports SDG 10, which seeks to reduce inequalities by ensuring that all residents, regardless of their location within the district, benefit from improved safety measures. It also contributes to SDG 16, which promotes peace, justice, and strong institutions by fostering accountability and transparency through the use of bodycams and enhanced surveillance technologies, ultimately building trust between Serenazgo and law enforcement in general and the community (UN, 2021).

The primary goal of the bodycam initiative is to enhance public safety in Surco. By providing a reliable record of interactions between officers and the public, bodycams are implemented to deter misconduct, reduce incidents of violence, and improve the overall effectiveness of law enforcement. The research by Nix et al. (2014) further supports the idea that by improving procedural justice through the use of bodycams, there can be a significant reduction in public safety concerns, as community members are more willing to cooperate with law enforcement if they consider the system as fair and just.

Over time, these improvements should contribute to a safer and more secure community, which is a key component of social sustainability. In addition to their immediate impact on public safety, bodycams also play a role in the broader efforts to improve law enforcement practices and policies. The data collected from bodycams can be analysed to identify trends and guide policy changes that enhance the effectiveness and fairness of law enforcement. This continuous improvement process ensures that the bodycam initiative not only addresses current safety concerns but also contributes to the long-term development of a more just and effective public safety system (Municipality of Surco, personal communication, August 21, 2024).

In conclusion, the bodycam initiative for Serenazgo officers in Surco is designed with social sustainability at its core. By building community trust, ensuring the ethical use of technology, promoting long-term public safety, and fostering inclusivity and fairness, the initiative contributes to the long-term well-being of the community. Through ongoing community involvement, the municipality can ensure that the bodycam program not only addresses current safety concerns but also supports the development of a more just, equitable, and sustainable public safety system.



Conclusion

Although Surco is regarded as one of the safer districts in Lima, a deeper examination reveals critical shortcomings in its public safety infrastructure. The persistent threat of crimes like drive-by robberies contributes to an enduring sense of insecurity among residents. Despite the presence of Serenazgo officers and the Peruvian National Police, resource limitations, outdated technologies, and geographical challenges hinder the district's ability to deliver comprehensive security, especially in high-risk zones like Surco Viejo.

Public perceptions underscore these deficiencies, with residents expressing concerns about navigating the district safely, particularly at night, and fearing theft in public spaces. The limited capabilities of Serenazgo officers, who are legally unarmed, further strain security efforts, prompting citizens to adjust their behaviours in ways that compromise their quality of life.

This report identifies strategic opportunities to address these challenges, with the introduction of bodycams for Serenazgo officers and the integration of advanced surveillance infrastructure emerging as pivotal solutions. These tools not only offer real-time monitoring of law enforcement activities but also foster greater transparency and accountability, essential for restoring public trust.

The scalability of these interventions is particularly promising, beginning with a pilot phase that equips officers in high-crime areas and allows for a phased expansion across the district and beyond. This gradual implementation ensures careful assessment of the initiative's impact on crime rates, public safety perceptions, and law enforcement efficacy, enabling refinements before broader adoption.

Ultimately, the bodycam initiative not only addresses immediate concerns regarding public safety and law enforcement trust but also paves the way for long-term social sustainability and aligns with global frameworks such as the United Nations' SDGs. Through transparent operations, community engagement, and ethical data management, the district can cultivate a more collaborative relationship between citizens and law enforcement. By tackling the root causes of insecurity and adopting innovative tools, Surco has the potential to establish a security model that can be scaled to other regions, fostering a more secure and connected urban environment.

Limitations of the Research

The contact person at the municipality was not reachable for approximately half of the duration of the project. Hence, the initial research on the project was gathered based on a secondary literature review and primary research through interviews with the residents of Surco. Once a new contact person was found at the municipality, the previous work has been revised and additional information gathered throughout multiple interviews with the municipality.

The MVP is going to start with a small number of officers that are going to be equipped with body cameras which might not be a sufficient sample size to present the impact it has on the crime rates. The project, furthermore, assumes that all technological systems, such as data storage and management and thus, real-time analysis will function properly. Any technological malfunctions could result in a reduction in the perceived effectiveness of the project.

Another key limitation of the project was the overall time frame. Proper oversight of the development of the project requires extended periods to be able to collect comprehensive

data, assess the process and make necessary adjustments. This all now lies in the hands of the Serenazgo and the municipality of Surco and cannot be monitored further by the authors.



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Appendices

Appendix A: Interview 1

Resident Perspectives on Safety in Surco

Date: July 21, 2024

Interviewees: Three anonymous residents of Surco

Interviewer: A.Llaja, A.Morgenstern, J. Norman

Summary of the Interview:

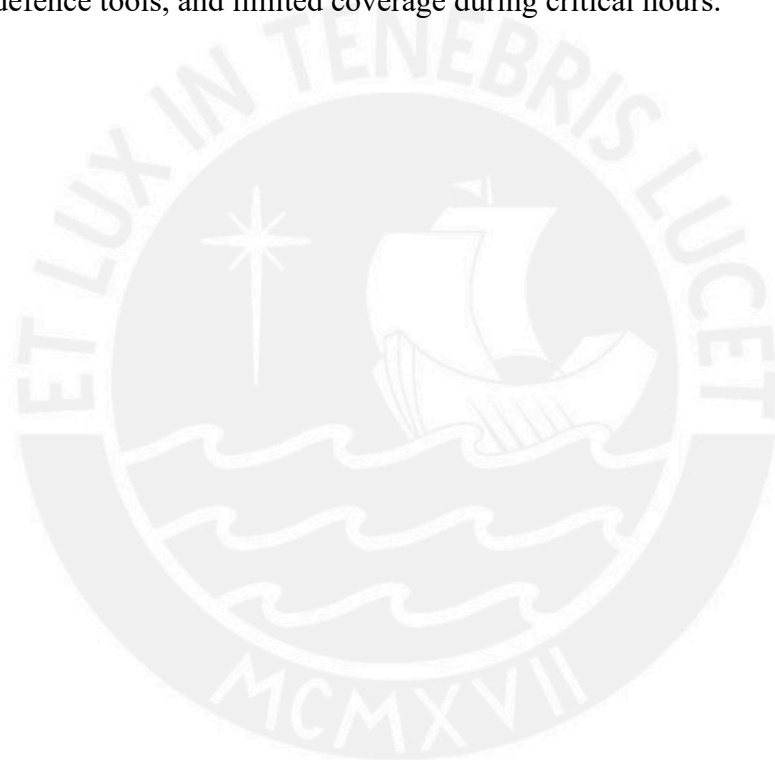
The participants of this interview mentioned that they consider the area where they live in Surco to be quite safe, as they reside in a high-security zone. However, they pointed out that safety largely depends on the specific area of Surco where one lives. One interviewee explained that they are less concerned about their safety because they drive their own car, but they have observed that students who live near the university are often worried about the safety of their belongings. In areas where people have to walk, theft is common, and it is recommended to avoid walking at night, especially in certain parts of Surco.

Regarding the Surco safety app, two of the interviewees had never heard of it, while one had heard of it but never used it. One participant shared their experience of being robbed last year and expressed concern about the lack of resources for Serenazgo, such as defensive tools. They also pointed out that Serenazgo needs to adjust its operational capacity, as there are gaps in coverage during critical hours, which makes them concerned about what could happen during those times.

Main Findings:

- The interviewees live in a safe area of Surco but noted that safety depends on the specific neighbourhood.

- One person is less concerned about their safety because they drive, but they observed that students are often worried about theft.
- Theft is common in areas where people walk, and it is advisable to avoid walking at night in certain parts of Surco.
- There is a general lack of awareness about the Surco safety app, though one person had heard of it but never used it.
- One person was a victim of robbery and criticized the lack of Serenazgo resources, such as defence tools, and limited coverage during critical hours.



Appendix B: Interview 2

The Role and Challenges of Serenazgo in Surco

Date: July 25, 2024

Interviewee: Serenazgo member from Surco

Interviewer: A.Llaja, A.Morgenstern, J. Norman

Summary of the Interview:

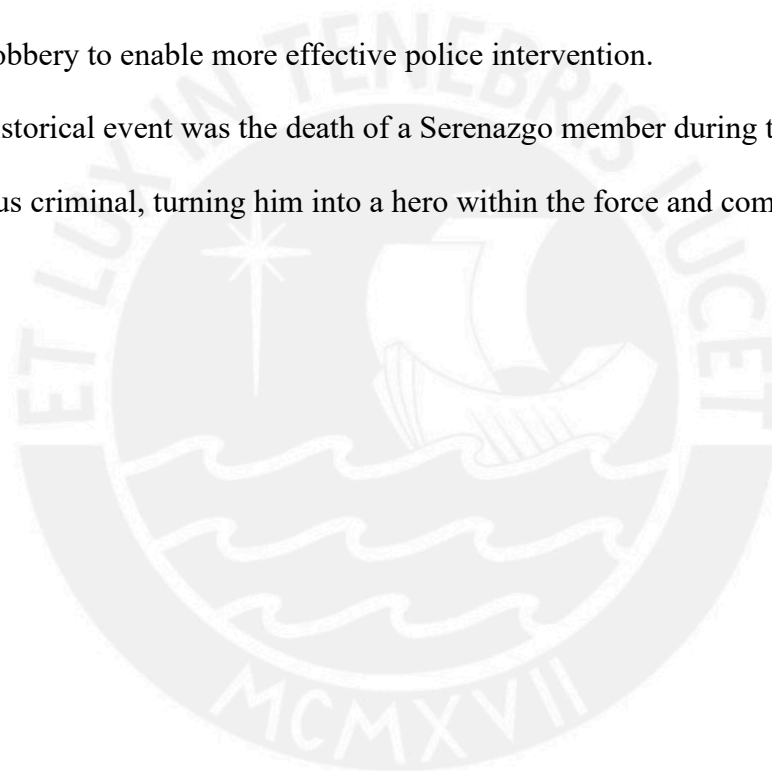
The Serenazgo team in Surco is organized into 94 quadrants to provide comprehensive coverage throughout the district. Each quadrant has a designated team of Serenazgo members responsible for patrolling and monitoring the area to ensure residents' safety. Despite their essential role in maintaining order, Serenazgo members are prohibited from carrying firearms; violating this regulation could result in legal consequences, including imprisonment. Instead, they rely on communication tools like walkie-talkies to coordinate with each other and with the police when necessary.

When Serenazgo members witness a crime or suspicious activity, they immediately inform the police using their communication tools. Although they may not always intervene directly, their cooperation is vital. They work closely with the police to maintain safety in Surco. One example of this teamwork is their role in "sterilizing" areas after a robbery, which means securing the scene so that the police can operate more effectively.

One of the most significant events in the history of Serenazgo in Surco was the tragic death of a Serenazgo member during an attempt to capture a notorious criminal known as "Maldito Cris." The member was fatally shot during the pursuit, and this event became a deeply mourned tragedy within the force. The fallen member is remembered as a hero by his colleagues and the community for his bravery and sacrifice in protecting Surco's residents.

Main Findings:

- The Serenazgo team in Surco is divided into 94 quadrants to ensure effective coverage across the district.
- Serenazgo members are not allowed to carry firearms and instead use walkie-talkies to communicate and coordinate with the police.
- When a crime is witnessed, Serenazgo members notify the police and secure the area until the authorities arrive.
- Serenazgo members collaborate closely with the police, especially in securing areas after a robbery to enable more effective police intervention.
- A key historical event was the death of a Serenazgo member during the pursuit of a dangerous criminal, turning him into a hero within the force and community.



Appendix C: Interview 3

Public Perceptions of Safety in Different Areas of Surco

Date: July 25, 2024

Interviewees: 10 random residents of Surco

Interviewer: A.Llaja, A.Morgenstern, J. Norman

Summary of the Interview:

We conducted interviews with several people from various areas within Surco, providing us with a broad range of perspectives on safety in the district. Many interviewees emphasized that their sense of security is largely influenced by the specific area they live in. For instance, individuals living in the outskirts or near the borders of Surco expressed feeling less safe due to the higher frequency of crimes in those areas. Conversely, those living in safer, more central parts of Surco, such as near the mayor's neighbourhood, reported feeling significantly more secure, thanks to the heightened security presence.

Additionally, many of the interviewees shared the safety precautions they take to avoid becoming victims of crime. One commonly cited measure is avoiding the use of cell phones in public or while walking through poorly lit areas, as these behaviours are considered risky and could attract thieves.

Main Findings:

- People's sense of safety in Surco varies greatly depending on the specific area they live in.
- Those living near the outskirts or borders of Surco feel less safe due to higher crime rates, while those in more central or affluent areas feel more secure.
- A common safety precaution among residents is avoiding the use of cell phones in public or in dark areas to reduce the risk of robbery.

Appendix D: Interview 4

Advances and Limitations of Serenazgo Technology in Surco

Date: August 7, 2024

Interviewee: Carlos Cusicanqui, Serenazgo Officer

Interviewer: A.Llaja, A.Morgenstern, J. Norman

Summary of the Interview:

Carlos Cusicanqui, a Serenazgo officer, discussed the extensive community security efforts in Surco. He emphasized the close coordination between Serenazgo and neighbourhood associations, as well as the joint patrols with the National Police of Peru (PNP). These joint efforts help reinforce the residents' sense of safety by combining the resources and presence of both Serenazgo and the police.

One of the most effective tools at their disposal is the Surco Alert app, which can trigger a response time as quick as three minutes after an alert is sent. However, despite its efficiency, many Surco residents are not aware of the app, and only about 50,000 people have downloaded it due to limited engagement from residents.

Additionally, the officer highlighted the integration of drones with artificial intelligence (AI) into their operations. These drones have played a pivotal role in capturing a notorious criminal near the Atocongo Bridge, marking a major achievement for Surco's security team.

Currently, there are around 600 security cameras installed across Surco, but many of them are outdated. The district plans to expand the network to 1,600 cameras by the end of the year, which will significantly improve coverage and surveillance capabilities.

Regarding police resources, Surco has five police stations with officers assigned by the government. Unfortunately, the number of officers is insufficient to meet the district's

security demands. To address this, in June 2020, the municipality signed an agreement to hire 100 additional officers, financed by the municipality itself, to enhance the fight against crime.

Carlos Cusicanqui also shared details about the "Cerco" strategy, which involves Serenazgo working with the police to surround and contain criminals, given that Serenazgo officers are prohibited from carrying firearms. The focus of Serenazgo is on high-risk areas and peak crime hours to maximize security efforts and prevent criminal activities.

Since 2019, Serenazgo has been prohibited from using lethal weapons. A bill is currently being proposed to allow the use of paralysis guns. However, concerns have been raised about the lack of training for Serenazgo officers if they were to handle lethal weapons in the future.

Main Findings:

- Serenazgo collaborates with neighbourhood associations and conducts joint patrols with the National Police of Peru (PNP).
- The Surco Alert app has a quick response time (as fast as three minutes), but only 50,000 residents use it due to a lack of awareness and engagement.
- Drones with AI are employed in security operations, such as the capture of a criminal near the Atocongo Bridge.
- The current network of 600 security cameras in Surco is expected to expand to 1,600 by the end of the year to improve monitoring and security.
- Surco has five police stations, but the municipality hired 100 additional officers in 2020 to address insufficient government resources.
- The "Cerco" strategy helps contain criminals, with Serenazgo collaborating with the police, focusing on high-risk areas during peak crime hours.

- Since 2019, Serenazgo is prohibited from using lethal weapons, and there is a proposal to authorize paralysis guns. There are concerns about the lack of necessary training to handle lethal weapons.



Appendix E: Interview 5

Proposal for Bodycams as a Security Solution (by zoom)

Date: August 13, 2024

Interviewees: Anonymous residents of Surco

Interviewer: A.Llaja, A.Morgenstern, J. Norman

Summary of the Interview:

In this interview, the proposal to equip Serenazgo officers with bodycams was presented as a potential solution to improve security in Surco. The concept was inspired by successful implementations in the United States, Europe, and districts in Peru, such as Miraflores. Most of the residents responded positively and expressed support for the initiative.

Several respondents appreciated the idea, highlighting that bodycams could help improve the tracking of Serenazgo officers and lead to faster response times from control centres.

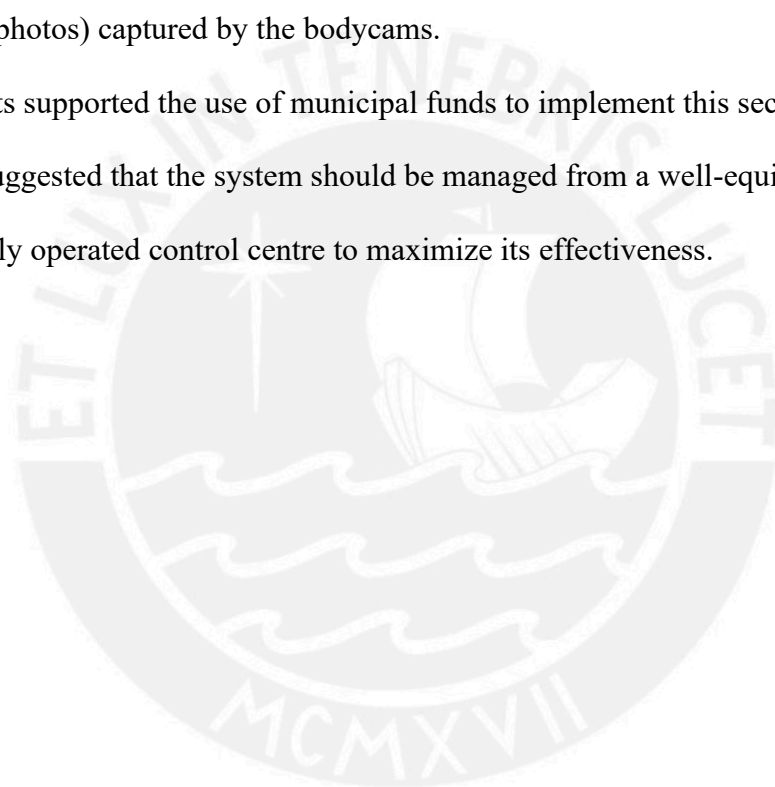
Additionally, they believed that footage captured by the bodycams could serve as valuable evidence in situations where Serenazgo officers need to prove their actions.

However, some concerns were raised about how the information captured by the bodycams, such as videos or photos of individuals, would be handled. Residents questioned how this data would be stored and used to ensure privacy and security. Despite these concerns, they agreed that allocating municipal budget funds for the implementation of bodycams would be a reasonable and necessary step to enhance security in the district.

Furthermore, the residents emphasized the importance of managing the system from a well-equipped and efficiently operated control centre to ensure it functions effectively and as intended.

Main Findings:

- The proposal to equip Serenazgo officers with bodycams was well received, with residents appreciating the potential for better tracking and faster response times.
- Bodycam footage could serve as evidence in cases where Serenazgo officers need to demonstrate their actions.
- Concerns were raised about the proper handling of sensitive information (videos/photos) captured by the bodycams.
- Residents supported the use of municipal funds to implement this security measure.
- It was suggested that the system should be managed from a well-equipped and efficiently operated control centre to maximize its effectiveness.



Appendix F: Interview 6

Planning and Integration of Bodycams in Surco's Security System

Date: August 21, 2024

Interviewee: Carlos Cusicanchi, Municipal Contact

Interviewer: A.Llaja, A.Morgenstern, J. Norman

Summary of the Interview:

In this interview, we discussed the idea of equipping Serenazgo personnel with bodycams with a municipal contact. The conversation centered on how bodycams could be integrated into the existing security system, the necessary infrastructure upgrades, and the associated costs. Although Surco already has a robust surveillance network, integrating bodycam footage would likely require upgrades such as new servers or data centres for storage and analysis. The municipality is currently evaluating these needs and their financial implications.

We also explored how the new control centre will manage and supervise bodycam footage as part of the district's broader technological upgrades. Equipped with the latest technology, the control centre will allow real-time monitoring of footage, enabling faster responses to incidents. Integrating bodycams is part of the municipality's vision to enhance technological capabilities.

In terms of budgeting, we discussed the financial resources allocated for this initiative, including the acquisition of bodycams and related equipment. According to the contact person there is sufficient funding for the implementation of this project. Specific cost estimates for bodycam units, accessories, and operational costs are still being analysed.

We also addressed concerns regarding operational costs, such as storage, maintenance, and monitoring. These expenses are expected to be substantial, and long-term projections are

being developed. While no bodycams have been purchased yet, the procurement process will begin soon, starting with one of the main security divisions in the district.

Looking ahead, there are plans to expand the bodycam initiative, increasing the number of cameras and integrating advanced analytics to further enhance security. Training will be a critical aspect, and specific courses for Serenazgo personnel will be offered on how to properly use and maintain the bodycams. These training sessions, while essential, will also incur additional costs.

In the interview, Carlos from the Municipality of Surco emphasized their commitment to fostering social sustainability by maintaining open communication with the community. He highlighted the importance of ensuring that the public is informed about the ongoing development. Additionally, the municipality underscored the role of bodycams in not only enhancing immediate security but also in collecting valuable data to shape future law enforcement policies, ensuring that public safety measures remain effective in the long term.

Finally, the municipality is preparing to launch a bidding process to acquire bodycams for one of its key security areas, marking the first step in implementing the bodycam project in Surco.

Main Findings:

- The bodycam project requires integration with existing surveillance systems, potentially needing infrastructure upgrades.
- The new control centre will manage and supervise bodycam footage as part of a broader technological upgrade.
- The Municipality of Surco is involving the community in the bodycam initiative while using collected data to improve future law enforcement policies.
- Cost estimates for bodycams, accessories, and operational costs are being analysed.

- No bodycams have been purchased yet, but a procurement process will begin soon.
- Plans are in place to expand the project and introduce advanced analytics.
- Specific training will be organized for personnel, and additional costs are anticipated for these sessions.



Appendix G: 6x6 Canvas

Questions	How can we make residents actively use the mobile app for reporting crimes and safety concerns?	What strategies can we implement to boost overall community engagement in public safety concerns?	How can we integrate Serenazgo officers with the community to improve cooperation and trust?
Brainstorming	Awareness campaign	Community events	Serenazgo open house
	Incentives (local businesses, discounts, promotions etc.)	Neighborhood patrols	Resident advisory board
	Application ambassadors	Engagement workshops	Serenazgo marketing campaign
	Programs at educational institutions	Informational messages via app	Joint activities for community development
	QR-shortcuts to increase user friendliness	Public safety campaigns	Workshops for young people
Selected Ideas	Awareness campaign with incentives/benefits	Community events and workshops	Resident council

Note. 6x6 Matrix Part 1, by A.Llaja, A.Morgenstern, J. Norman, 2024

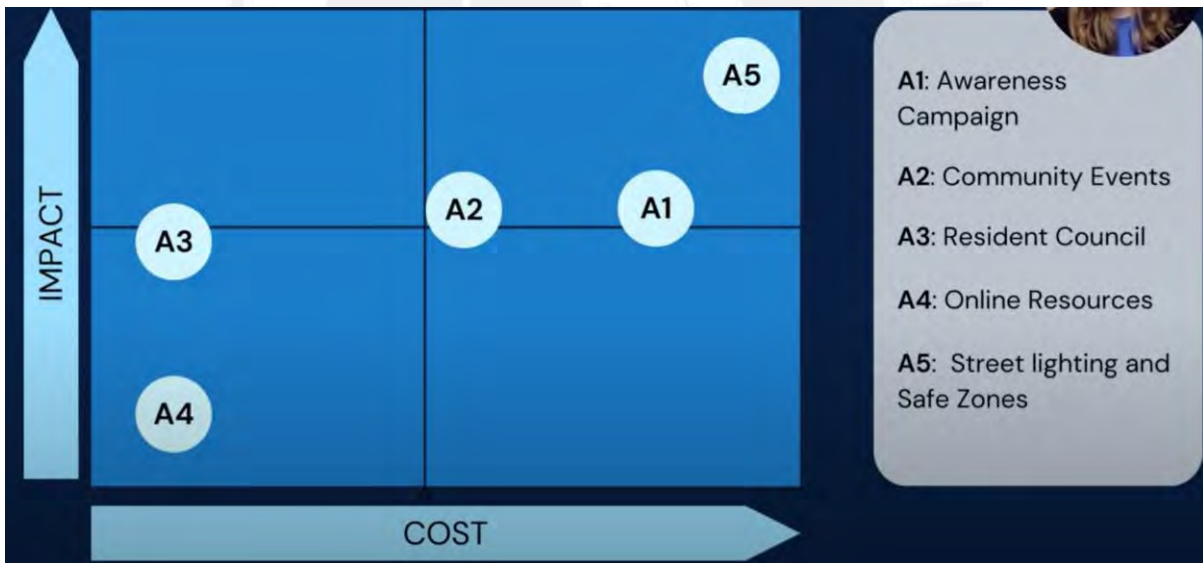
Questions	What innovative measures can we adopt to increase the presence/ effectiveness and visibility of Serenazgo officers in high-risk areas?	How could we create comprehensive educational programs focused on personal safety and crime prevention for residents, particularly targeting women, children, and other vulnerable groups?	How might we utilize public spaces to enhance safety and community well-being?
Brainstorming	Use of technology (drones, more cameras etc.)	Tailored classes and workshops (like self-defense, crime prevention etc.)	Increase lighting (like district of Magdalena)
	Events for residents	Online resources (newsletter, tutorials, webinars, ...)	More cameras
	Mobile command centers	Awareness training for Serenazgo	Safe zones
	Crime data analysis to improve patrolling schedules	Resources for educational institutions	Include citizen ideas
	increased collaboration with police in high risk areas	More funding for leisure activities (preventative measure)	Emergency buttons
Selected Ideas	Open days / Events to inform about Serenazgo safety measures	Online resources for educational and private use	Increased lighting and safe zones

Note. 6x6 Matrix Part 2, by A.Llaja, A.Morgenstern, J. Norman, 2024

Appendix H: Cost-Impact-Matrix

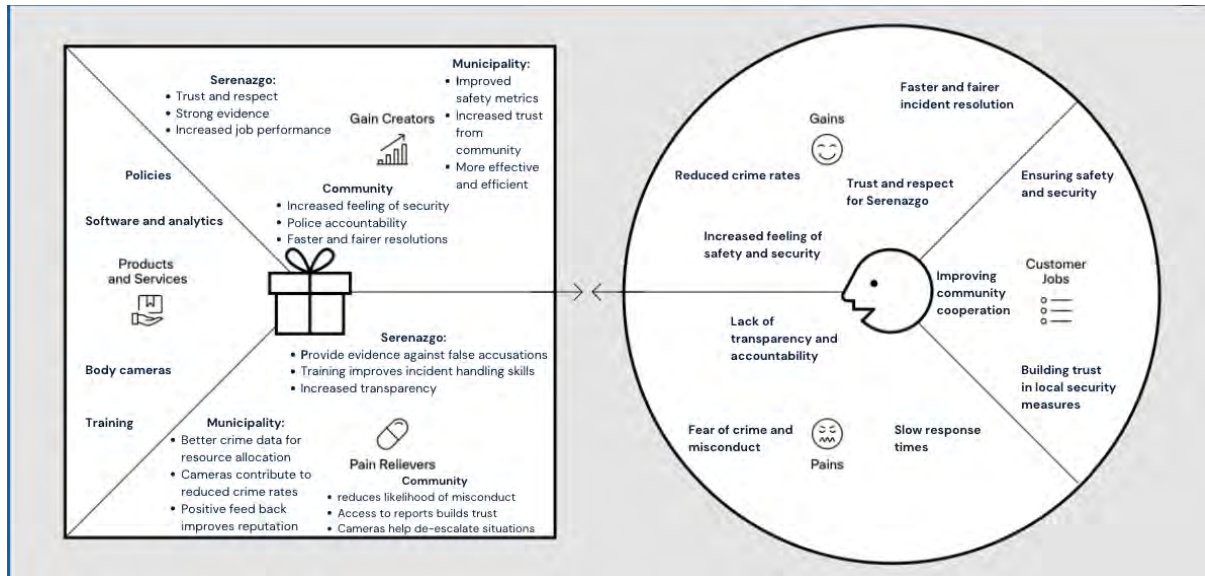
	COST			IMPACT		
	Low	Medium	High	Low	Medium	High
A1: Awareness campaign with incentives/benefits; Increasing marketing activities to improve the overall awareness and usage of the app. Furthermore, to put incentives in place e.g. if you recommend the app to someones else and they get a new user through it, the person who recommended it will receive some benefits (discounts for local shops, giftcard).			x		x	
A2: Community events and workshops; To offer courses for crime prevention at several locations such as parks, educational centers etc, and furthermore to let the local community engage and get to know Seranazgo officers better		x			x	
A3: Resident council; advisory board that cooperates with Seranazgo made out of chosen members of the district that represents the citizens' opinions	x				x	
A4: Online resources for educational and private use; newsletters and additional information about ongoing activities in the district, webinars about crime prevention and self-defense techniques	x			x		
A5: Increased lighting and safety zones; more sources of light in the streets especially since the citizens feel less safe at night, creation of safety zones (children centers, women centers etc.)			x			x
	Low	Medium	High			
Costs intervals:	< \$5,000	\$5,000 - \$10,000	> \$10,000			
Impact intervals (Increase in safety):	1 to 3	4 to 7	8 to 10			

Note. Cost-Impact-Matrix Part 1, by A.Llaja, A.Morgenstern, J. Norman, 2024



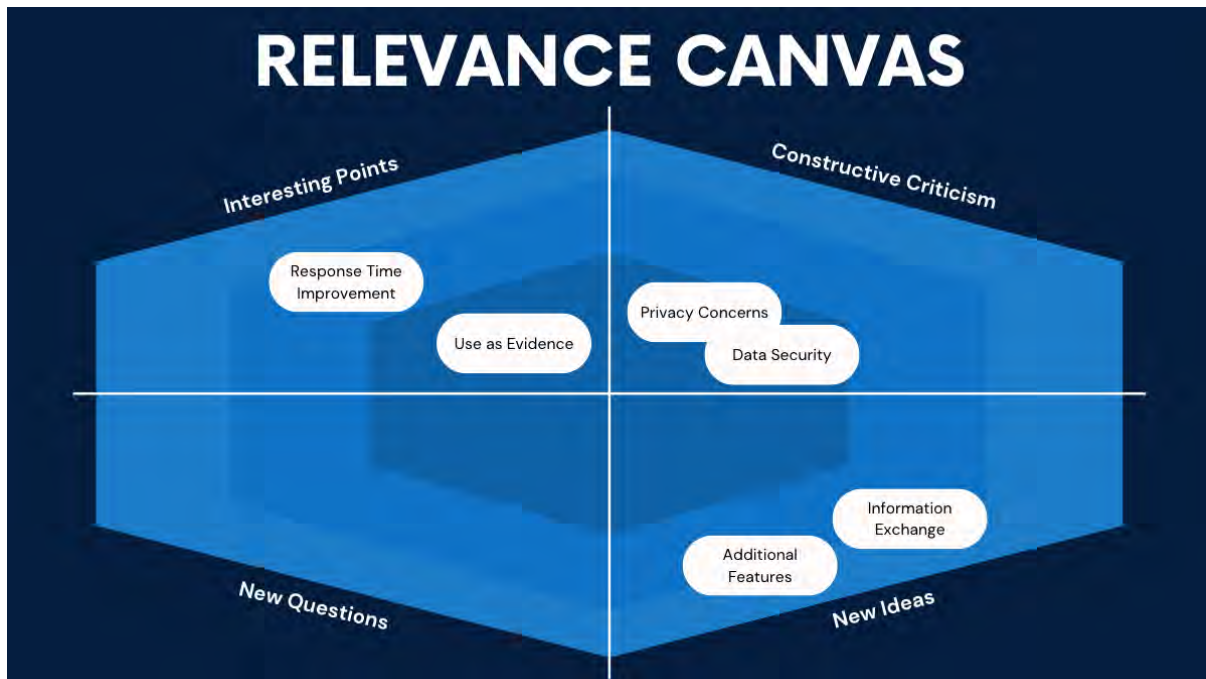
Note. Cost-Impact-Matrix Part 2, by A.Llaja, A.Morgenstern, J. Norman, 2024

Appendix I: Value Proposition Canvas

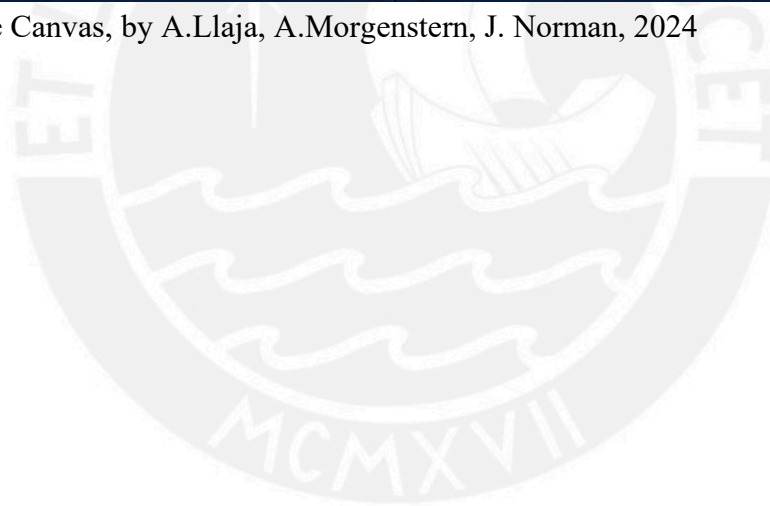


Note. Value Proposition Canvas, by A.Llaja, A.Morgenstern, J. Norman, 2024

Appendix J: Relevance Canvas



Note. Relevance Canvas, by A.Llaja, A.Morgenstern, J. Norman, 2024

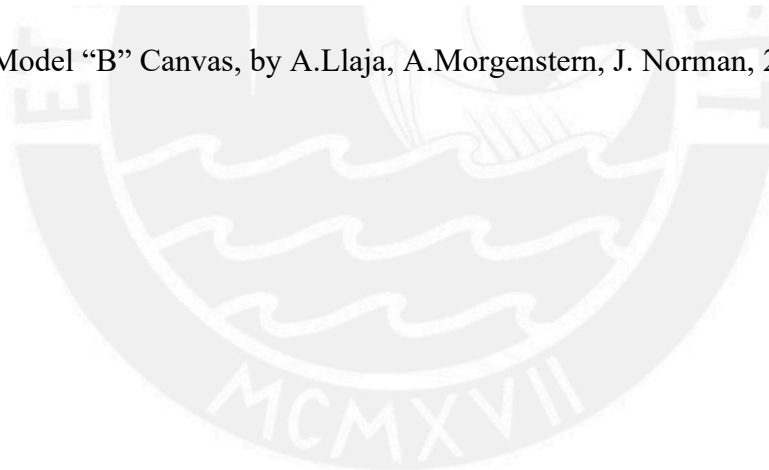


Appendix K: The "B" Canvas Business Model

THE „B“ CANVAS BUSINESS MODEL

Value Chain Bodycam suppliers Software companies Data storage providers Community and civil organisations Serenazgo	Key Activities Bodycams Data storage solutions Software for management and analysis Training programs and materials	Identified Problem Diminished public trust and increased safety concerns in Surco Purpose Enhancing public trust & community safety through transparent and accountable law enforcement	Relationships Support for Serenazgo Public accountability Feedback Community engagement & education	Segments Tourists & visitors Vulnerable population Local businesses Public transport users Schools & educational institutions Serenazgo officers
	Key Resources Bodycams Data storage solutions Software for management and analysis Training programs and materials	Value Proposition Transparency Accountability Enhanced Public Trust Improved Incident Resolution Increased Officer Safety Data-Driven Analysis		
Cost Structure Procurement Costs Data storage & management costs (initial + fixed) Training costs Maintenance costs Engagement campaign funding		Impact Metrics Incident resolution Public trust, support and perception of district security (surveys, feedback) Officer safety and well-being Crime rate	Income Streams Municipality budget	

Note. Business Model "B" Canvas, by A.Llaja, A.Morgenstern, J. Norman, 2024



Tables

Table 1: Types of Crime on Surco

Type of Crime	2017	2018	2019	2020	2021
Crimes Against Personal Integrity and Health	72	109	130	77	92
Crimes Against Liberty	42	34	179	58	27
Property Crimes	1,262	1,629	2,629	1,070	1,029
Crimes Against Public Safety	34	52	69	45	17
TOTAL	1,410	1,824	3,007	1,250	1,165

Note: Retrieved from Plan de Acción Distrital de Seguridad Ciudadana de Santiago de Surco, 2022.

Table 2: Types of Vehicles for Theft

Vehicle Type	Jan - Mar 2023		Jan - Mar 2024		Variation	
	Total	%	Total	%	Absolute	%
Total	7,060	100.0	6,882	100.0	-178	-2.5
Standard Motorcycle	3,196	45.3	2,621	38.1	-575	-18.0
Mototaxi	1,669	23.6	1,695	24.6	26	1.6
Car	1,091	15.5	1,150	16.7	59	5.4
Pickup Truck	262	3.7	311	4.5	49	18.7
Station Wagon	174	2.5	160	2.3	-14	-8.0
Rural Truck	134	1.9	175	2.6	41	30.6
Panel Van	93	1.3	82	1.2	-11	-11.8
Heavy Truck	52	0.7	69	1.0	17	32.7
Other Vehicles	389	5.5	619	9.0	230	59.1

Note: Retrieved from Plan de Acción Distrital de Seguridad Ciudadana de Santiago de Surco, 2022.