technical transactions

No. 2025/005

architecture and urban planning

sciendo

Does Urban Design Influence the Perception of Safety? An Analysis of the Green Axis of Consell de Cent in Barcelona

Antonio Hargreaves-Méndez

antonio.hargreaves@estudiantat.upc.edu

https://orcid.org/0009-0002-9481-5923

Master line in Land and Architectural Management and Valuation, Barcelona School of Architecture

Carlos Marmolejo-Duarte

carlos.marmolejo@upc.edu | https://orcid.org/0000-0001-7051-7337

Center for Land Policy and Valuations, Barcelona School of Architecture, Technical University of Catalonia

Scientific Editor: Mateusz Gyurkovich, Cracow University of Technology
Technical Editor: Aleksandra Urzędowska, Cracow University of Technology Press
Typesetting: Anna Pawlik, Cracow University of Technology Press

Received: February 22, 2025
Accepted: May 30, 2025

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing interests: The authors have declared that no competing interests exist.

Citation: Hargreaves-Méndez, A., Marmolejo-Duarte, C. (2025). Does Urban Design Influence the Perception of Safety? An Analysis of the Green Axis of Consell de Cent in Barcelona. *Technical Transactions, e2025005*. https://doi.org/10.37705/TechTrans/e2025005

Abstract

This research focuses on evaluating the relationship between urban design and perceived safety, using the pacification of the green axis of Consell de Cent in Barcelona as a case study. The main objective is to determine whether the transformation of public space through urban interventions influences residents' and visitor's feelings of safety.

Building upon the theoretical foundations laid by leading figures in urban sociological research, such as Jane Jacobs and Jan Gehl, a comprehensive review of the literature on urban design and perceived safety was conducted. Key elements that could influence this perception were identified. Subsequently, an empirical study was conducted through the application of qualitative and quantitative surveys to residents of the area. The results obtained demonstrate that, while urban design plays a significant role in perceived safety, this effect is mediated by social and subjective factors.

The research concludes that it is necessary to delve deeper into the study of the interactions between the physical environment and individuals' subjective experiences in order to design safer and more livable urban spaces. The findings of this thesis open up new perspectives for future research on the relationship between urban design and public safety.

Keywords: Perception of Safety; Public Safety; Urban Design; Public Space; Safety Perceived

1. Introduction

The interest in understanding and measuring the perception of safety through urban design in this study is grounded in the premise that a city can never be truly safe if its inhabitants do not feel safe. However, perceived safety is not a straightforward phenomenon to measure. It should be noted at the outset that perceived safety is the most subjective aspect of public safety and plays a significant role in the neighbourhood's identity.

Public safety and its relationship to various parameters of the built environment can affect how people perceive these spaces. There is no consensus on the exact definition of public safety, but for the purposes of this research, the United Nations Development Programme definition will be adopted, which defines it as "the personal, objective, and subjective condition of being free from violence or the threat of violence or intentional deprivation (violent or cunning) by others" (UNDP United Development Programme, 2006: 35). This definition suggests certain guidelines to consider when guiding this research, namely that public safety can be both objective and subjective and is directly related to the fear and/or threat of some violent entity that may endanger the physical and psychological integrity of the citizen.

Therefore, public safety refers to the set of measures, policies, and actions aimed at protecting citizens from any threat or risk that may affect their physical, mental, and social well-being in their daily lives. It encompasses aspects such as crime prevention, human rights protection, violence control, emergency management, among others. It is a topic of great importance to society, as it ensures a safe and peaceful environment for individuals and contributes to the strengthening of peaceful coexistence and social peace.

While security and the fight against crime are central to political and social discourse, it is surprising how little comprehensive research has been conducted on the subject. In fact, public debate tends to focus on the criminal act itself, rather than addressing other dimensions of insecurity such as citizens' perceptions of it (Staricco & Vitale Brovarone, 2022).

Contemporary urban environments are characterized by constant change. Countless urban improvement plans are either in progress or in the pipeline, including urban pacification projects who consists, in general terms, of the transformation of a conventional urban street (vehicular street with pedestrian pavement) into a pedestrian corridor, basically, by not permitting motorised vehicles to access it and adapting it completely for pedestrian use and ecological transport (bicycles, scooters, etc.). This urban modification incorporates elements of urban design to mitigate the heat island effect, such as increased tree planting, permeability of pavements, and unpaved spaces. On example of these urban pacification project is the politics about the "super manzanas or super illas" in Barcelona and, more specifically for this study, the project of the Green Axis of Consell de Cent.

The primary goal of urban improvement plans is to enhance the city, encompassing all possible areas of urban development. This study aims to explore whether the urban design implemented in these plans has a direct or indirect impact on citizens' perceptions of safety. The fundamental right to live in secure surroundings underscores the importance of investigating the relationship between urban design and the perception of safety. A neighbourhood can only be considered safe if it is perceived as such by its residents.

https://doi.org/10.37705/TechTrans/e2025005

2. Literature Review

What is Perception of Safety

The notion of a safe city transcends the mere provision of physical security. It encompasses the psychological dimension, where the perceived level of safety is as important as the objective conditions. The concept thus involves creating urban environments that not only protect citizens from harm but also foster a sense of well-being and security.

Jan Gehl, in his book "Cities for People", states that a safe city is achieved by increasing the number of people who reside and circulate within the urban space. If a city wants to encourage its inhabitants to walk, it must have attractions to offer, such as the possibility of making short trips, having attractive public spaces, and a variety of available services. These elements increase activity and the feeling of safety within the city limits, as the human dimension–the need for a new dimension of planning–seeks vital, sustainable, safe, and healthy cities. A vital city is a safe city; the human dimension means that there are more observers in surrounding buildings, who in turn are interested in the movements that occur on the Street (Gehl, 2014).

The argument can be interpreted as suggesting that the gathering of people, motivated and attracted by a high-quality public space, draws more people and thus increases the perception of safety. The more people, the greater the sense of security.

The concept of a safe city is an elusive one, as a city that is objectively safe is distinct from one that is perceived as safe. It is an urban design concept that pertains to the physical security of citizens and their right to move freely throughout the city. However, when approached from a psychological perspective, the concept becomes somewhat more complex.

A fundamental topic to explore is how citizens perceive urban space. Individual behaviour varies significantly depending on the environment: a pedestrian walking down a crowded street exhibits different patterns than those moving through a park. It is crucial to analyse how the urban environment approaches the individual and what elements they interact with most directly.

Manuel Sanchez Gomez-Marelo defines the perception of safety as "the inner sensation resulting from a material impression made on our senses" (Sánchez Gómez-Merelo, 2020).

But what is the perception of safety, really? Simply put, it measures a citizen's feeling in response to conditions of security or insecurity in their environment, both from an emotional standpoint (fear, anger, anxiety, etc.) and an institutional one (ignorance, mistrust, uncertainty, etc.), all within the context of their living environments. Therefore, the perception of safety is an aspect of public policy because it positively or negatively affects the quality of life, citizen behaviour, and the attractiveness and competitiveness of a city.

Empirical Studies: Analysis of EVAMB and ECAMB

The Barcelona Metropolitan Area Victimization Survey (EVAMB) is an annual study that aims to collect information on the population's exposure to everyday manifestations of crime and on the level of security in metropolitan neighbourhoods and municipalities. The Barcelona Metropolitan Area Neighbourhood Relations and Coexistence Survey (ECAMB) aims to collect information on the state of neighbourhood relations and coexistence in metropolitan neighbourhoods.

From Table 1, it can be concluded that most citizens report a lower perception of safety in public spaces compared to other metropolitan areas.

Specifically, when they see vandalized spaces, damaged urban furniture, or, essentially, low-quality public space.

Poor-quality public space attracts groups of people with aggressive attitudes, engaging in activities such as binge drinking or other harmful behaviour.

The metropolitan population expresses feeling safe and secure at home, in facilities (such as sports centres or libraries), and when they see a police patrol. However, there are certain spaces and situations in which the population's attitude becomes one of vigilance or alert, specifically when they see people engaging in binge drinking or when using public transportation.

Table 1. EVAMB 2022 Results Regarding Perceptions of Safety in Specific Places and Circumstances in the Barcelona Metropolitan Area

Place or Circumstance	Safe/Out of Danger	Alert	Unsafe/Not Ever Encountered	NS/NC
In your home	86.2%	11.7%	1.6%	0.0%
In facilities	71.8%	16.3%	2.1%	4.8%
In commercial zones, streets, and spaces	47.8%	42.6%	7.9%	0.3%
In solitary, infrequent streets or parks	17.4%	41.0%	34.3%	3.9%
When you see vandalized spaces, destruction in urban furniture	11.2%	37.7%	44.7%	2.2%
On public transport	38.3%	45.0%	10.1%	4.5%
When you see a police patrol	71.6%	21.3%	3.1%	0.2%
When you see groups of people engaging in "botellones" (public drinking)	15.1%	46.9%	27.2%	4.9%
When you encounter people with aggressive attitudes	3.2%	25.7%	64.9%	2.8%

Source: *The Barcelona Metropolitan Area Victimization Survey (EVAMB)*, (Translated to English from original Catalán) (EVAMB, 2022)

However, it is noteworthy that up to 11.7% of people find themselves in this state of alert in their own home or when they see a police patrol (21.3%). Situations that generate the greatest sense of insecurity are those related to violence, whether perpetrated by individuals (64.9%) or associated with vandalism (44.7%). Infrequently used spaces also generate insecurity (34.3%) (EVAMB, 2022).

It can be observed that these very low percentages of security, ranging from 3.2% to 17.4% concentrated in low-quality public spaces, begin to rise considerably as the environment changes to a zone, street, or commercial space (47%), which are the most successful public spaces in the metropolitan area, finally reaching the total security of one's own home (86.2%), which attests to the fact that the perception of security is very high when the citizen perceives the environment as their home.

Three key findings from this study will guide the present research:

- The perception of insecurity is primarily concentrated in public spaces.
- Commercial public spaces tend to be perceived as safer.
- When the environment is perceived as home, it is perceived as safer.

The ECAMB surveys reveal data indicating that 42.4% of neighbourhood conflicts are caused by noise, followed by a significant margin by a lack of public space (15%) and by arguments due to insults or misunderstandings between neighbours (14%). Another study affirms that between 48.5% and 46.4% of the metropolitan population strongly agrees that vehicular traffic, litter, and the poor condition of public spaces are clearly issues of coexistence, and that 26.7% strongly agrees that the neighbourhood needs to maintain spaces for human interaction (ENQUESTA DE RELACIONS VEÏNALS I CONVIVÈNCIA DE L'AMB, ECAMB 2020, n.d.).

https://doi.org/10.37705/TechTrans/e2025005

Theoretical Studies: the foundations for the investigation of Perception of Safety trough urban design

For the purposes of this study, a comprehensive investigation of various urban planners, sociologists and architects has been conducted, who address the concept of safety in the city. Some do so from a more psychological perspective and others from a more physical one. For example, urban planner Jane Jacobs advocates for people-centred urban planning, where residents have an active role in shaping their neighbourhoods. In her work, she highlights the importance of designing cities that are safe and vibrant, arguing that safety is not solely dependent on policing but also on the creation of public spaces that foster social interaction and natural surveillance. Jacobs proposes that urban planners should consider the daily lives of inhabitants when designing streets, plazas, and other public spaces (Jacobs, 1976).

Another example of a role in the urban safety can be obtained in Jan Gehl's studies who emphasizes the crucial role of urban design in fostering safe and vibrant public spaces. Drawing inspiration from Jane Jacobs, he highlights the importance of 'eyes on the street' and advocates for 'soft edges' that encourage social interaction. Gehl criticizes the dominance of vehicular traffic, arguing that prioritizing pedestrians and creating human-scaled spaces, as exemplified by Copenhagen, is essential for enhancing safety and improving the quality of urban life (Gehl, 2004).

In a more abstract way, Richard Sennett in his book "Designing Disorder" with the collaboration of Pablo Sendra, argues that excessive order and homogeneity in urban planning can create an atmosphere of insecurity. Socioeconomic segregation, by fostering social divisions, exacerbates this problem. Sennett emphasizes the importance of inclusive and diverse public spaces that encourage interaction and social cohesion. By promoting flexibility and spontaneity in urban design, cities can become safer and more vibrant for all inhabitants, demonstrating that urban safety is not solely a matter of policing but is deeply intertwined with the social and spatial fabric of the city (Sennet, 2020).

But, what about the street itself? in a more practical way, Donald Appleyard's framework for analysing street liability remains relevant today. Barcelona exemplifies this with its contrast between high-traffic streets, characterized by limited social interaction, and low-traffic "Woonerf" streets that encourage community engagement. Traffic density significantly impacts street use. On low-traffic streets, pedestrians utilize the entire roadway, fostering social interaction. Conversely, high-traffic streets, with their increased speeds and density, restrict pedestrian movement and inhibit social life. This segmentation of space aligns with Whyte's observations on the impact of traffic on urban social life, demonstrating how traffic density can shape pedestrian behaviour and the appropriation of public space (Appleyard, 1981).

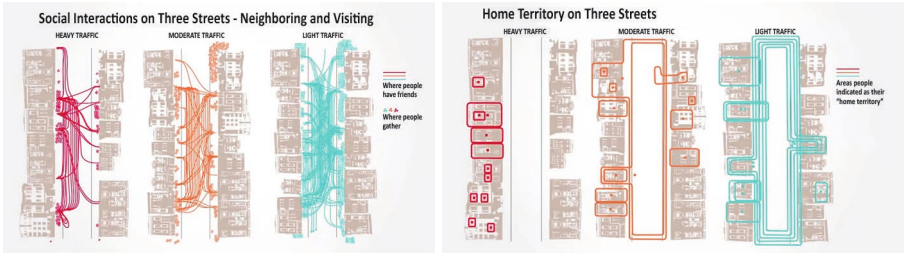


Fig. 1. Donald Appleyard's Streets Diagrams. Source: Diagrams about social interactions and home territory on three streets from the Livable Cities Book of Donald Appleyard (Appleyard, 1981)

Oscar Newman in his work "Defensible Space", from another perspective, explores the relationship between environmental design and perceived safety. Newman argues that by fostering a sense of ownership and control among residents, through the creation of 'semi-private spaces' and clear boundaries between public and private realms, neighbourhoods can become more secure.

This theory emphasizes the importance of community engagement and natural surveillance in enhancing safety within the built environment (Newman, 1972).

And, another thought, similar as the Jan Gehl's one, is a seminal work of Bill Hillier, Space Syntaxis, which, in urban planning, is an introduction of the concept of how the spatial organization of cities influences human behaviour. Hillier argues that the legibility and accessibility of urban spaces are crucial for perceived safety. 'Safe spaces', according to his theory, are highly visible and easily navigated, fostering a sense of exposure and deterring criminal activity. By demonstrating the link between spatial structure and perceived safety, Hillier highlights the importance of urban design in creating safe and inclusive cities.

It was A. Wyżykowski in the study "Safe Space: Urban and Architectural Conditions for Shaping Urban Space to Enhance the Safety of Residents" who explains how the conditions for shaping safe spaces in architecture are crucial at the moment of search the perception of safety. In this study, Wyżykowski explore a multifaceted perspective of how the city must be shape in order to explore safety. Urban and architectural decisions are determinants (Wyżykowski, 2004).

Theoretical Frameworks

Based on the analysed theory and all the authors who reference in their works the perception of safety or, in general, any component related to public safety, three different theoretical lines have been created which group the different authors in relation to the specific topic addressed in their works.

- **Safety through community** (theoretical references in Table 2): One of the fundamental theoretical lines emerging from the vast literature on public safety focuses on the importance of the community as a determining factor in the perception of security. This perspective highlights how social interaction, community cohesion, and citizen participation can influence residents' feelings of safety in urban areas. Some theorists, such as Jane Jacobs and Jan Gehl, have explored how the active presence of people in public space, the promotion of community activities, and the encouragement of informal surveillance can contribute to a greater perception of safety in cities.
- **Safety through a sense of belonging** (theoretical references in Table 3): This is related to citizens' sense of belonging to their urban environment. This approach considers that people feel safer in places where they feel part of the community and have an emotional connection to their surroundings. Authors such as Charles Montgomery, Bill Hillier, and Oscar Newman have highlighted how urban design that promotes local identity, the appropriation of public spaces, and the creation of meaningful places can increase the sense of belonging and, ultimately, the perception of safety.
- **Safety through pacification** (theoretical references in Table 4): this focuses on the idea of urban pacification as a means of improving public safety. This perspective centres on reducing violence and conflict in public space through the urban act of returning the city to pedestrians by reducing the intensity of cars or any other means of transportation in the city. There are different forms of pacification such as green axes, pedestrianization of streets, or even more passive acts like closing some streets on weekends and leaving them exclusively for pedestrians. Theorists such as Oscar Newman, Donald Appleyard, and others have proposed strategies ranging from creating more pedestrian-friendly physical environments to implementing policies that promote peaceful coexistence. Urban pacification seeks not only to prevent crime but also to promote a sense of security among citizens.

https://doi.org/10.37705/TechTrans/e2025005

Table 2. Theoretical Line References: "Security Through Community"

Theoretical Line	Theory	Author(s)	Year	Specific Theory Reference	Work - Ref. Bibliography
Safety Through Community	Eyes on the Street	Jacobs, Jane	1976	The perception of safety in a neighbourhood can be attributed to the shared observation between its residents and the public space. If you can observe and be observed, there is a feeling of security for both the user of the public space and the subject residing in their dwelling. Security is granted by the residents themselves by marking their presence in their public space through visual connections.	The Death and Life of Great American Cities
	Permeable and Impermeable Facades	Gehl, Jan	2014	It discusses permeable and impermeable spaces, the continuous facades of a urbanization, being opaque, reject the public space making the passerby feel unsafe and tend to walk faster until reaching a permeable facade (for example a commercial place or residences) that not being opaque allows mutual observation between different actors, which makes the passerby relax and feel safer.	Cities for People
	Convivialities	Charles Montgomery	2013	The relationship of the residents with the space they inhabit. They study human activity between buildings and in public space in Italian cities; The geometries of the occupied space shape the behavior of people and invite them to gather and stay. (Cites Jahn and Ingrid Gehl)	Happy City
	Making People Visible	White, W.	1980	Whyte examines in "the social life of small urban spaces" human behavior and social interaction in public spaces located in downtown NY. "The planning and design of public spaces should focus on social life and not only on functionality".	The Social Life of Small Urban Spaces

Source: *Compiled by the Author, according to the mentioned authors* (Charles Montgomery, 2013; Gehl, 2014; Jacobs, 1976; Whyte, 1980)

Table 3. Theoretical Line References: "Security Through Sense of Belonging"

Theoretical Line	Theory	Author(s)	Year	Specific Theory Reference	Work - Ref. Bibliography
Safety Through a Sense of Belonging	Space Syntax	Hillier, Bill	1970–1980	It starts from the premise that space, spatial configuration, is important and affects the type of life that will occur in a place. Space Syntax studies the role of spatial configuration as an independent variable in social systems. Configuration is understood as a set of interdependent relationships where each one of them is determined through its relationship with all the others.	Space Syntax
	Defensible Space	Newman, Oscar	1972	Newman firmly believed that through an improvement in the physical environment, greater commitment and empowerment of the inhabitants could be achieved, along with a sense of belonging, which also implies a decrease in crime, because they were ready to defend what is theirs.	Defensible Space
	Broken Windows Theory	James Q. Wilson and George Kelling	1969	Broken windows represent a germ of physical and social disorder that sooner or later leads to an increase in criminal behavior. Police had to get tougher with minor infractions to prevent greater evils in the future.	Broken Windows
	Home Territory	Donald Appleyard	1981	Through this study, Appleyard concluded that by reducing traffic intensity on the streets, residents would gradually increase their sense of home towards public space.	Social Interaction on the Streets
	Spaces Capable of Gathering Instead of Dividing	Richard Sennet	2021	Through this study, Richard Sennet tries to analyze the factors of urban disorder that generate a social advantage in the metropolis. Through these theories, Pablo Sendra tries to replicate them and design them through design assumptions.	Designing Disorder
	The Triangle of John Helliwell	John Helliwell	2019	National surveys (Vancouver Foundation) show a close network that connects trust and satisfaction with a sense of belonging. Helliwell admits a correlation between: Trust – Belonging – Coexistence.	How Happy Are Your Neighbors?

Source: *Compiled by the Author, according to the mentioned authors* (Appleyard, 1981; Sennet, 2020; Hillier 1984; Newman, 1972; Wilson Q & Kelling, 1869; Helliwell, 2019)

Table 4. Theoretical Line References: "Security Through Sense of Pacification"

Theoretical Line	Theory	Author(s)	Year	Specific Theory Reference	Work - Ref. Bibliography
Safety Through Pacification	Mobilicities	Charles Montgomery	2013	Concept Woonerf, Montgomery talks about the shared street as the most optimal result when creating a safe street. A safe street is one that generates social cohesion.	Happy City
	How Traffic Affects Social Life on Streets	Donald Appleyard	1981	Through this study, Appleyard concluded that by reducing traffic intensity on the streets, interactions between residents would begin to expand until generating a network of neighbourhood interactions.	Social Interaction on the Streets
	Necessary, Optional, and Resultant Activities	Jan Gehl	2004	Through this movement, Gehl states that only through an improvement in public space can citizens move from simply using it as a necessary activity to a resulting activity.	The Humanization of Urban Space

Source: *Compiled by the Author* (Appleyard, 1981; Gehl, 2004; Charles Montgomery, 2013)

Translating theoretical frameworks into tangible urban design elements

While the abstraction of these theoretical frameworks from the analysed theory has already been addressed in the theoretical framework, this section aims to emphasize the abstraction of urban design elements from each of these theoretical frameworks and their conversion into explanatory variables for use in future regression models.

Safety through community: The following urban design elements were extracted (specified in Table 5):

- **The presence of ground floor stores:** 'permeable' facades generate a greater sense of security than blind or impermeable facades.
- **Being visible to neighbours from their balconies** supports Jane Jacobs' theory of 'eyes on the street'. She was the first to suggest that the ability to be observed by neighbours from their homes, and vice versa, fosters a sense of security and mutual support, creating a sense of community.
- **Pedestrian traffic:** refers to the number of people walking along the street.

Table 5. Perception of Security Through Community Variables

	N°	Variable	ID Variable	Variable Type	0: No, 1: Yes (dummy)	1: Low (level)	2: Medium (level)	3: High (level)	Mask Activities for Survey
Safety Through Community	1	Presence of stores on the Ground Floor	**PB**	Level	na	The stores on the ground floor are non-existent, the facades are sealed, impermeable.	The presence of stores on the ground floor is medium, these are food or other category stores, also stores or markets. There is activity that is concentrated outside of these.	Large crowds gather outside the facades of these stores on the ground floor, are markets, stores, bars or restaurants, there is also a presence of cultural facilities, etc.	Buy Groceries
	2	View from Balconies	**VB**	Level	na	The balconies facing the street lack visual connection with it.	The balconies have a visual connection with the street.	The balconies have a high visual connection with the street, including social interactions.	I go to the balcony to watch people pass by
	3	Pedestrian Traffic	**TP**	Level	na	The number of pedestrians walking or moving is almost nil.	There is a moderate number of people on the street.	The level of people on the street is so large that it hinders passage and slows down the pace.	Share with my neighbors

Source: *Compiled by the Author*

https://doi.org/10.37705/TechTrans/e2025005

Safety through a sense of belonging: The following urban design elements were extracted (specified in Table 6)**:**

- **Public seating:** The provision of high-quality public seating encourages greater utilization of public spaces.
- **Outdoor dining areas:** The presence of outdoor seating areas associated with bars and restaurants in public spaces signifies a vibrant and communal atmosphere.
- **The cleanliness and maintenance of public spaces:** The cleanliness and upkeep of public spaces are crucial factors in shaping perceptions of safety and well-being.

Table 6. Perception of Security Through a Sense of Belonging Variables

	N°	Variable	ID Variable	Variable Type	0: No, 1: Yes (dummy)	1: Low (level)	2: Medium (level)	3: High (level)	Mask Activities for Survey
Safety Through a Sense of Belonging	4	Benches and/or Public Tables	ByM	Dummy	na	There is no presence of tables and/or chairs and/or public benches that encourage people to stay in the public space by residents and/or passersby.	There is some presence of tables and/or chairs and/or public benches, but they are not enough or are not well located to encourage people to stay.	There is a high presence of tables and/or chairs and/or public benches that encourage people to stay in the public space.	Sit, read, listen to music or spend time
	5	Terrace Bars and/or Restaurants	Tz	Dummy	na	There are no terraces in the public space belonging to bars and/or restaurants on the ground floor.	There are some terraces in the public space belonging to bars and/or restaurants on the ground floor, but they are small or not very busy.	There are many terraces in the public space belonging to bars and/or restaurants on the ground floor, these mark a high presence of the public and encourage community.	Go to bars
	6	Cleaning of Common Areas	LC	Level	na	The public space has a lot of dirt, which encourages dislike and neglect of it.	The cleaning of the public space is fine, you don't see garbage on the street but the garbage cans are full, it looks messy and not very respected.	The public space is very clean, both in terms of street dirt and garbage, as well as order.	Walk

Source: *Compiled by the Author*

Safety through pacification (specified in Table 7): the following urban design elements were extracted:

- **Vehicular traffic:** The presence or absence of vehicular traffic in public spaces acts as a significant catalyst in shaping citizens' perceptions of safety.
- **Public lighting:** Adequate public lighting mitigates the perceived risk associated with nighttime activities.
- **Single-level platform:** A single-level platform, synonymous with a fully pedestrianized street, allows for uninterrupted pedestrian movement across the entire street width.

Table 7. Perception of Security Through Pacification Variables

	N°	Variable	ID Variable	Variable Type	0: No, 1: Yes (dummy)	1: Low (level)	2: Medium (level)	3: High (level)	Mask Activities for Survey
Safety Through Pacification	7	Vehicular Traffic	TV	Level	na	The vehicular traffic within and outside the super--block is practically nil, usually service vehicles pass once or twice a day and some bicycles and scooters.	Vehicular traffic increases, especially when the nodes have more busy streets, the presence of some cyclists is seen.	Vehicular traffic is very high for the standards of a pedestrian street – This is mainly due to the fact that the pedestrian axis crosses through main avenues such as Passeig de Gràcia or Carrer d'Aragó.	Walk
	8	Public Lighting	LP	Dummy	na	The public lighting has been renovated in these sectors, which favors nighttime visibility and a safe 24-hour use of public space.	na	na	Go out at night
	9	Possibility of Walking the Entire Street	Ctot	Dummy	na	Indicates whether the pedestrian can freely use 100% of the street profile and not be limited to a conventional sidewalk.	na	na	Walk

Source: *Compiled by the Author*

State of the Art: studies related to the topic of the perception of safety in urban space

Analytical references related to the topic of perceived safety were studied and analysed, with Daniela Ildrovo's doctoral thesis (Ildrovo, 2017) standing out as a direct reference for this study, providing a basis for continuing the line of research on perceived safety. Additionally, the EVAMB and ECAMB statistical data, whose survey data was useful for a global reading of security in the AMB, provided ideas for methodologies to be applied in the present methodology.

Table 8. Summary of State-of-the-Art Studies. Topics: "Security, Coexistence, and Public Space"

Study Type	Author(s)	Year	Topic	Specific Topic	Methodology Used	Results
Master's Thesis	Idrovo, Daniela	2013	Coexistence--Security-Crime Prevention	Coexistence and security: urban intervention strategies in public space in segregated and conflictive neighborhoods	Bibliographic Analysis-Surveys--Interviews-Field Analysis	Urban Rehabilitation contributes to the reduction of Crime
Doctoral Thesis	Idrovo, Daniela	2017	Coexistence-Habitability-Perception of Security	Urban Regeneration Policies and their Influence on the Perception of Security	Bibliographic Analysis-Surveys-Interviews-Extended Case Comparison	Elements of public space contribute to citizen security and coexistence, leaving open future research that one topic to explore in depth is the perception of security
Grade Thesis	Yepes Resoli, Julia	2018	Mobility Analysis	Mobility Analysis in the Superblocks of Barcelona and Proposal for Improvement	Theoretical Analysis and PMU data source analysis. Field Observation	Improvements are observed, other urban conditions are criticized, the questions are raised: How much are cities improved when urban mobility and public space are improved? From the point of view of a foreigner studying in Barcelona, it is interesting to consider whether the superblocks are an exportable model?

https://doi.org/10.37705/TechTrans/e2025005

Master's Thesis	Arcardini, Alejandro	2020	Urban Habitability	Superblocks and Urban Habitability	Field Observation and data systematization	Sectors that congregate people attract more people. People attract people. There are elements of urban morphology that manage to congregate people and generate social capital
Doctoral Thesis	Morales, Paloma	2023	Urban Morphology and Social Capital	Relationship between Urban Morphology and Social Capital on the Superblocks of Barcelona	Observation and field analysis	It has been shown an increase in neighbourhood conflicts since the low in the 2019-2020 pandemic. It can be interpreted that in several aspects they are related to the quality of public space and its use
Statistical	AMB (Biennial)	2022	ECAMB Surveys of neighbourhood Relations and Coexistence	Relations between Neighbours and residents. Motives of conflicts between them, Personal Relations, etc.	Surveys	There has been an increase in neighbourhood conflicts since the decrease in the 2019-2020 pandemic. It can be interpreted that in several aspects they are related to the quality of public space and its use
Statistical	AMB (Biennial)	2022	EVAMB Victimization Survey	Analysis of reasons, cases and reasons for victimization of the population of the AMB. Experiences of Victimization. Assessment of Police Services and Perception of Security.	Surveys	There has been a slight increase in victimization rates in relation to the low of the 2019-2020 pandemic. Regarding the perception of safety, it can be interpreted that the quality of public space has a direct relationship with it. This yields guidelines of interest for research
Scientific Article	Maldonado--Guzmán Diego J.	2021	Neighbourhood Safety Perception	Spatial Analysis of Perceived Insecurity in Barcelona: The Role of Adjacent neighbourhood and the Psychosocial Factors Involved	Regression models using various variables	When variables are controlled, they are related to the perception of safety. When spatial autocorrelation is corrected, the crime density in the neighbourhood is not related to the perception of insecurity and there is no clear evidence that it is affected by the collective levels in adjacent neighborhoods.
Scientific Article	Gomez Torres J Alexander.	2012	Security and Public Space	Security and Public Space: the use of ICT in the protection of the territory, La Candelaria Case Bogota	Use of ICT tools for cartographic analysis of the place, geo-referencing of crime statistics in areas of geographic concentration, and applications of Space Syntax	It has a correlation effect, associated with other determinants such as the use of the soil, topography or occupation, among others. It does not have a causal effect where integration is equal to security, or segregation equal to insecurity, or vice versa.
Scientific Article	Rueda--Palenzuela, Salvador	2019	The Ecosystemic Urbanism	The dysfunctions of cities and metropolises around the world	Bibliographic Review Theoretical Framework and State of the Art	The super-block is established as the minimum urban ecosystem capable of integrating the set of principles of ecosystemic urbanism.
Scientific Article	Fuentes--Miralles--Guash-Truffella--Deicios--Alio-Flores--Rodrigues	2020	Urban Vitality	Santiago de Chile through the eyes of Jane Jacobs. Analysis of urban habitability conditions.	Correlation of variables and regression models	The results interpreted from the variables of urban conditions in Santiago de Chile yield results that vary in relation to the interpretation they should yield according to Jacobs' theories.
Scientific Article	Muller, Frank	2021	Urban Security	HOME MATTERS: the material culture of urban security	Bibliographic Review Field Observation	Interpretation of public space as HOME in order to seek security.

Source: *Compiled by the Author, according to the mentioned authors* (Yepes Besolí, 2018; Universitario et al., 2013; Maldonado-Guzmán et al., 2021; Ildrovo, 2013; Rueda et al., 2019; Ildrovo, 2017; Rueda et al., 2019; Arcardini Ravera, 2020; Maldonado-Guzmán et al., 2021; Mils Julià & Garola Crespo, n.d.; Müller, 2021; Fuentes et al., 2020; Morales, 2023; ENQUESTA DE RELACIONS VEÏNALS I CONVIVÈNCIA DE L'AMB, ECAMB 2020, n.d.; EVAMB, 2022)
Case of Study – Green Axis of Consell de Cent

Urban Pacification and the elements of urban design that makes it possible

Urban pacification refers to a set of strategies and actions aimed at transforming public spaces by prioritizing pedestrians and cyclists, while reducing the presence and speed of motorized traffic. The objective is to create safer, healthier, and more liveable cities where the quality of life of its inhabitants is at the centre of all urban decisions.

Various complementary urban design elements contribute to urban pacification. Some of the most notable elements are:

- **Pedestrian areas:** The creation of exclusive pedestrian zones, free from vehicles, promotes social and recreational activities and reduces the risk of accidents.
- **Cycle paths:** The implementation of safe and connected cycling networks encourages the use of bicycles as a sustainable and healthy mode of transport.
- **Traffic calming:** Measures such as reducing lanes, installing speed bumps, and creating 30 km/h zones decrease traffic speed and improve road safety.
- **Green spaces:** The presence of parks, squares, and gardens contributes to improving air quality, reducing noise, and creating spaces for meeting and recreation.
- **Street furniture:** The installation of benches, litter bins, fountains, and other urban elements invites people to use public spaces and makes them more attractive.
- **Lighting:** Adequate lighting of streets and squares increases the sense of security and visibility, encouraging night-time mobility.
- **Hierarchy of public space:** Prioritizing space for pedestrians and cyclists over motorized vehicles by redistributing road space.
- **Connectivity of spaces:** Creating a network of connected and accessible public spaces that allows people to move safely and comfortably on foot or by bicycle.
- **Citizen participation:** Involving citizens in the design and decision-making process regarding public space, ensuring that solutions meet their needs and expectations.

Fig. 2. Consell de Cent Street: Before and After of its Urban Pacification (photo by authors)

The Project of Consell de Cent pacification

This project derivates from the Supermanzanas program in Barcelona, one of the newest and largest urbanization programs for the city organization that prioritises more sustainable ways of transport and the public space safety for residents and visitors. It represents a radical and holistic modification of built-up areas (Ministerio de Transportes y Movilidad Sostenible, 2016).

From this program, one of the most iconic projects is the Consell de Cent Street Green Corridor, built at 2023. It includes parts of the streets of Consell de Cent, Rocafort, Comte Borrell, and Girona that have been transformed into green corridors, which means, in addition to its function of pacifying the street,

https://doi.org/10.37705/TechTrans/e2025005

to a narrow strip of urban land, meticulously designed with diverse vegetation and various tree species. At the city level, the objective is to increasingly prioritise sustainability by incorporating a significant presence of greenery in areas where it is not typically found. These green spaces often serve to connect prominent natural zones within the city. Additionally, to the streets, four large plazas, each approximately 2,000 square meters, have been created at the intersections of these green corridors (Consell de Cent with Rocafort, Comte Borrell, Enric Granados, and Girona). The height difference between the sidewalk and the roadway has been eliminated, creating a single platform to encourage social use of the street (Ayuntamiento de Barcelona, 2023).

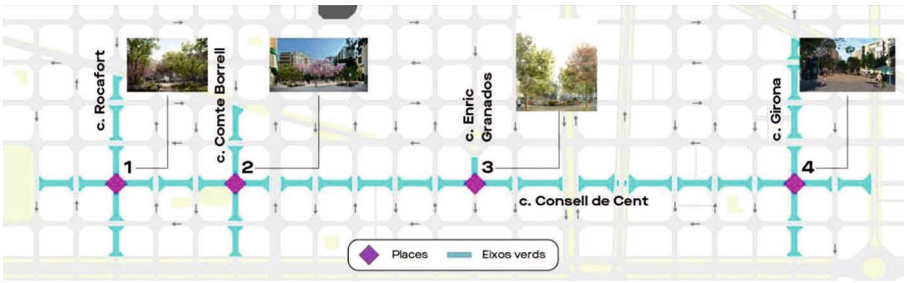


Fig. 3. Scope of action: 4 green axes and 4 squares in l'Eixample neighbourhood (source: Ayuntamiento de Barcelona, 2023)

In total, the green corridor directly affects the facades of 56 blocks in the Eixample district of Barcelona, making it the largest urban pacification intervention ever undertaken in the city. Some of the characteristics of the urban improvement plan include Priority will be given to pedestrians. Cars will only be allowed to circulate at 10 kilometers per hour. Asphalt will be eliminated, and granite and concrete slabs will be used on all axes. Green spaces will be multiplied by ten. We will move from the current streets, which dedicate 1% of the space to green areas, to streets with an average of 14%. 438 new trees will be planted. The streets will have a rich subsoil. There will be almost a thousand new pieces of street furniture (benches, chairs, tables, children's play equipment) and new lighting. There will be a focus on local commerce. Loading and unloading will be permitted at specific times.

Selection of the Consell de Cent Green Axis Case Study. In line with the objectives of this research, the decision was made to adopt the Consell de Cent Green Axis as a case study to evaluate the perception of urban (in)security through urban design for three simple reasons:

Novelty: The Consell de Cent Green Axis was inaugurated in the current year of this research, 2023 and has been the subject of much criticism and controversy due to inconsistencies in its execution, legal loopholes, and alleged political evasions. This has generated rejection and approval form the residents and the public population about this urban renovation. Contributing with a research study, focused on how the neighbourhood is perceived in terms of safety in this urban intervention, can be a positive contribution to the neighbourhood.

Occupational load: Compared to the other two superblocks, the occupational load of the Consell de Cent axis is much higher, and it also encompasses a large amount of tourism, making it a more relevant case study for a larger number of users than if it were conducted in one of the other two superblocks.

Interpretive design: The street section of the Consell de Cent axis, with the specific changes that have been applied in the urban intervention, aligns very well with the theoretical lines mentioned earlier, facilitating the understanding of both the researcher and the citizen to be surveyed when capturing information locally. Not only does the street section include theoretical concepts put into practice, such as the single platform, the possibility for neighbours to be visible from their balconies, and the large amount of street furniture. But it also presents the integration of 4 new 100% pedestrian and recreational plazas, which contributes significantly to the theoretical line of a sense of belonging.

3. Methodology

Field Observation Analysis

A physical field observation study was conducted on the green axis of Consell de Cent, Carrer Girona, Carrer Enric Granados, Carrer Comte Borrell, and Carrer Rocafort during the months of June and July of 2023, employing an observational method to gain an initial understanding of the selected case. This study involved occasional walks along the axis and the development of an observational map. An initial interpretation of the general behaviour of public space users in the sector was extracted, along with a significant amount of illustrative graphic material representing the area

Sample Selection

A Geographic Information System (GIS) was utilized to identify and map each of the city blocks directly connected to the green axis, totalling 16. For each block, the total number of dwellings was obtained. To estimate the total number of residents, a ratio of 3 inhabitants per dwelling (inhab/dwelling) was applied to the total number of dwellings.

It is crucial to note that for each block, a factor of 0.25 or 0.5 was applied to the total number of dwellings based on the amount of frontage directly facing the green axis. For instance, Block M1, with only one facade directly facing the green axis, was considered to have 1/4 of its dwellings significant for the study, hence a factor of 0.25 was applied to the total. Similarly, Block M5, with two facades facing the green axis, was considered to have 1/2 of its dwellings significant, and therefore a factor of 0.5 was applied to the total number of dwellings.

Fig. 4. Analysis Map: Consell de Cent Street and Girona Street (source: Compiled by the Author from a Google Earth image)

Table 9. Sample Table calculated Block by Block over the survey map (own elaboration)

Blocks	Sections	Investigator Code	Total Dwellings	Factor	Adopted Dwellings	People
Block 1	Girona 1	B1	332	0.25	83	249
Block 2	Girona 1	B1	357	0.25	89.25	267.75
Block 3	Girona 2	B2	376	0.25	94	282
Block 4	Girona 2	B2	158	0.5	79	237

https://doi.org/10.37705/TechTrans/e2025005

Block 5	Girona 3 and C. de Cent 2	B3 and A2	376	0.5	188	564
Block 6	Girona 3 and C. de Cent 3	B3 and A3	219	0.5	109.5	328.5
Block 7	C. de Cent 1	A1	329	0.25	82.25	246.75
Block 8	C. de Cent 1	A1	210	0.25	52.5	157.5
Block 9	C. de Cent 2 and Girona 4	A2 and B4	357	0.5	178.5	535.5
Block 10	C. de Cent 3 and Girona 4	A3 and B4	259	0.5	129.5	388.5
Block 11	C. de Cent 4	A4	201	0.25	50.25	150.75
Block 12	C. de Cent 4	A4	280	0.25	70	210
Block 13	C. de Cent 5	A5	121	0.25	30.25	90.75
Block 14	C. de Cent 5	A5	86	0.5	43	129
Block 15	C. de Cent 6	A6	136	0.25	34	102
Block 16	C. de Cent 6	A6	187	0.25	46.75	140.25
Total			3,984		1,36	4,079
					Sample	**140**

With the data obtained, the sample size was calculated using the following formula:

$$n = \frac{(T^2 + p + (1-p) + N)}{(e^2 + (N-1)) + T^2 + p + (1-p)}$$

Fig. 5. Survey sample size calculation equation (source: Cochran, 1977)

Table 10. Sample Size Table calculatet (own elaboration)

Parameter	Value	Description
T	**1.65**	T-score for a 90% confidence level
p	**0.5**	Estimated proportion (assuming maximum variability)
e	**0.07**	Margin of error (7%)

A sample size of 140 individuals was determined, ensuring a 90% confidence level and a margin of error of 7%.

Survey Design

A hybrid survey approach, incorporating both closed and open-ended questions, was adopted to gather both quantitative and qualitative data. This methodology was designed to validate the urban design elements in terms of perceived security. To measure individuals' perceptions within the study area, a set of photomontages were prepared. These photomontages depicted three hypothetical, randomly selected profiles of the Consell de Cent axis, each presented daytime and nighttime versions, and also in a third version, accompanied scenario. Participants were asked to rate, on a scale of 0 to 10, their perceived level of security when walking through these depicted scenarios. These segments were not selected randomly; they were created using a homogeneous distribution of urban design elements identified in the theoretical framework. This ensured that no single element overshadowed others and provided a more robust dataset.

The location was visited, and a substantial amount of photographic material was captured with the aim of documenting the elements of urban design already described, and to establish a foundation for the creation of future photomontages.

Through photomontage software tools and based 100% on a photograph taken by the researcher during the field observation study, an effort was made to visually integrate all the elements of urban design into the images, resulting in a 3 segments photomontage product that is as comprehensive as possible in terms of what this security perception research seeks to obtain from the surveyed individuals. Although, the 3 segments were designed in daytime and in nighttime. The main idea was to explore the best urban design elements combination in each segment photomontage.

Table 11. Segments Photomontages, Daytime and Nighttime (own elaboration, all photos by authors)

	
Segment 1, Daytime Within this image, individuals can be observed traversing the entire length of the street, with the pavement cafés being utilised by patrons. A taxi is depicted collecting passengers, a cyclist is navigating near a father and his daughter, residents are visible observing the street activity from their balconies, and the ground floor premises are bustling with activity	**Segment 1, Nighttime** In this image, it can be observed that, despite the late hour, social activity remains relatively undiminished. While the bar's outdoor seating area has been cleared, some ground floor establishments continue to operate. The presence of residents on balconies is now almost negligible.
	
Segment 2, Daytime This segment exhibits a more tranquil street profile, characterised by reduced activity. No vehicles are observed, and the cyclist is proceeding at a reduced pace. Children can be seen running freely, and an individual with a functional diversity is traversing the street, suggesting that the level surface without gradients benefits wheelchair users. Additionally, the foliage of the trees is noticeably denser, which, in this instance, presents residents with a challenge in observing activities within the public space from their balconies.	**Segment 2, Nighttime** A considerably more quiet section can be observed in comparison to Segment 1 at night. While the pavement cafés remain, they are occupied by very few patrons. The streets are clean, yet somewhat deserted.

https://doi.org/10.37705/TechTrans/e2025005

	
Segment 3, Daytime In contrast to the other two segments, this section presents a somewhat more desolate image, with a significant absence of pedestrians and minimal evidence of residents on their balconies. However, a high degree of cleanliness is apparent, with the exception of graffiti on the walls. The premises are closed, and a large proportion of the facades are blank.	**Segment 3, Nighttime** The rationale behind showcasing this segment is to depict a version of the green axis that is as deserted as possible, in order to facilitate the possibility of respondents noticing other elements of urban design beyond the perception of safety generated by the volume of pedestrian traffic.

The surveys were conducted by randomly presenting each respondent with one of these segments, in both its daytime and night-time versions shown in table 11. Efforts were made to ensure an overall balance of presented segments within the total sample. Respondents were then asked to rate, on a scale of 0 to 10, how safe they perceived themselves to be in this hypothetical situation.

In addition to the three segments that serve the purpose of providing a visual reference of three different compositions of urban design elements, already abstracted from the theory, respondents were presented with a third condition beyond their perception of safety during the **day** and **night**. They were asked how they perceived their safety in the hypothetical scenario of being **accompanied**, specifically referring to walking with someone in their care, such as a child, an elderly adult, or others. This inquiry was conducted by showing the daytime segment.

Subsequently, participants were asked to rate, on a scale of 0 to 10, the influence of specific urban design elements observed in the photomontage on their perception of safety. These photomontages formed the backbone of the survey, which was divided into four main sections:

- **Part I: Neighbourhood Use and Knowledge:**
  This part of the survey aims to assess the general relationship with the Consell de Cent superblock and will present you with some activities commonly carried out in public spaces. This is to gain a general understanding of the respondent's prior satisfaction with the case study.
- **Part II: Interpretation of Perceived Security:**
  The bulk of the survey will present images for interpretation to measure the respondent's perception of security. Additionally, questions will be asked about individual urban design elements to assess their influence on the respondent's perception of security.
- **Part III: Willingness to Pay:**
  This part aims to generate some form of socioeconomic indicator for both residents and visitors of the neighbourhood. It will explore whether this indicator has any correlation with perceived security.
- **Part IV: Personal Questions:**
  Finally, sociodemographic data will be collected to analyse the nature of each response from a generational, age-range, and/or background perspective within the case study.

Variables Dimensions

To construct the regression models and analyses, a preliminary step was taken to group the variables (42 in total) into different dimensions based on the concepts they measured. This allowed for a breakdown of the sample and the creation of various models to interpret perceptions of safety based on different dimensions, thus facilitating a deeper understanding of each model. As shown in Table 12, the dependent variables used to assess perceptions of safety were: **PS_Day**, **PS_Night**, and **PS_Accompanied**. Each of these was correlated with the variables within each dimension using linear regression models, and a final model was created using all variables together. Subsequently, as detailed in Table 12, four dimensions were created for the independent variables based on the concepts they measured: urban design attributes, satisfaction, sociodemographic, and total variables.

Table 12. Variable Tables by Dimension (own elaboration)

Dependent Variables

Variables to be evaluated are concentrated

Variable Name	Variable Type	Variable Description
PS Day	Nominal	Perception of Daytime Safety
PS Night	Nominal	Perception of Nighttime Safety
PS Accompanied	Nominal	Perception of Safety When Accompanied

Design Attribute Dimension

Only variables related to urban design elements are concentrated

Variable Name	Variable Type	Variable Description
TP	Nominal	Pedestrian Traffic
TV	Nominal	Vehicular Traffic (motorized vehicles)
VB	Nominal	View from Balconies
PB	Nominal	Commercial Activity on the Ground Floor
TZ	Nominal	Terraces of Bars, Cafes, and/or Restaurants
Lm	Nominal	Nighttime Lights
Lc	Nominal	Communal Cleanliness of the Neighbourhood
Ctot	Nominal	Single Platform, Use of the Entire Street
ByM	Nominal	Public Benches and Tables, Street Furniture
Dummy T1	Nominal-Dummy	If surveys were conducted based on segment 1
Dummy_T2	Nominal-Dummy	If surveys were conducted based on segment 2
Dummy_T3	Nominal-Dummy	If surveys were conducted based on segment 3

Satisfaction Dimension

Concentrates the variables that refer to the satisfaction level of the people.

Variable Name	Variable Type	Variable Description
Use Frequency	Nominal	Frequency of use in Consell de Cent green axis
Public Space Use Level	Nominal	General use level of public space
Evaluation_General	Nominal	Evaluation of the urban renewal of the Consell de Cent green axis
Opinion_B/A	Nominal-Dummy	Opinion of whether Consell de Cent is better now or was before
Victim Crime	Nominal-Dummy	Having been a victim of a crime in public space
Neighbourhood Level	Nominal	Neighbour of the neighbourhood, level of involvement
Dummy Belong	Nominal-Dummy	If you feel belonging to the neighbourhood
Dummy_Act_Neighborhood	Nominal-Dummy	If you participate in the neighbourhood communal activities

https://doi.org/10.37705/TechTrans/e2025005

Dummy Trust	Nominal-Dummy	If you can trust your neighbours
Dummy_Concern	Nominal Dummy	If you worry that your neighbourhood is in good condition
Dummy_Involved	Nominal-Dummy	If you feel involved in your neighbourhood
WTP_Purchase	Scale	Willingness to pay in relation to the sale price
WTP_Rent	Nominal	Willingness to pay monthly tax

Sociodemographic Dimension
Concentrates the variables that refer to the sociodemographic aspects of the people surveyed.

Variable Name	Variable Type	Variable Description
Study_Dum	Nominal Dummy	If you are studying
Work_Dum	Nominal-Dummy	If you are working
Retired_Dum	Nominal-Dummy	If you are retired
Education Level	Nominal	Level of completed studies
Age Range	Nominal	Age range in relation to the age of each respondent
Genre	Nominal-Dummy	Gender Male or Female
H MonoP Dum	Nominal-Dummy	If you have a Monoparental type of household
H ParCONChildren Dum	Nominal-Dummy	If you have a couple type of household with children
H_ParWTHOChildren_Dum	Nominal-Dummy	If you have a couple type of household without children
H_SharedFlat_Dum	Nominal-Dummy	If you have a shared flat type of household
H LiveAlone Dum	Nominal-Dummy	If you have a Monoparental type of household
H Others	Nominal-Dummy	If you have a Monoparental type of household

Note: In order to strengthen the results of the sample, a regression analysis was conducted with all proposed variables. However, for the purposes of this document, this multivariate analysis will not be presented. Th results of the univariate analysis are sufficient to support the conclusions of this article The regression analysis can be refer to the original thesis repository (Hargreaves, 2023).

4. Results

The data analysis was structured into two main categories: quantitative and qualitative. The former encompassed direct numerical data and binary-coded data (yes/no). The latter included both coded data and open-ended textual data.

Data underwent both univariate and multivariate analysis. Univariate analysis allowed for the examination of the individual behaviour of each variable, while multivariate analysis, specifically linear regression models, was applied to the binary-coded quantitative data to identify more complex relationships between variables.

For this paper, the primary results of the univariate and multivariate analyses will be presented. For a detailed analysis of the regression models and the complete behaviour of the variables, readers are referred to the original UPC thesis (Hargreaves, 2023).

Quantitative Analysis

Following the coding and grouping of variables into dimensions, quantitative analysis was undertaken. This involved both univariate and multivariate analyses. Univariate analysis examined each variable individually under various

conditions, allowing for more general and specific conclusions. Multivariate analysis, on the other hand, employed regression models to explore more complex relationships between variables. The subsequent section presents the key findings from the univariate analysis.

The results of the 141 surveys conducted within the defined study area indicate a generally positive perception of safety regarding the Consell de Cent Green Axis. As depicted in Figure 3, the average perceived safety levels, measured on a scale of 0 to 10, consistently exceeded the midpoint. This represents an overall average across the entire sample.

When averaging the mean responses for the three conditions (daytime, nighttime, accompanied), the overall average perceived safety score was 6.91 out of 10. This initial observation suggests that, in general, the Consell de Cent Green Axis is perceived as a safe space by its users under all conditions.

However, the results also clearly indicate that perceived safety varies depending on the circumstances under which the axis is traversed. As expected, safety perceptions were higher during daylight hours compared to nighttime. Interestingly, while accompanied during the day, individuals reported a slightly lower sense of security, on average, compared to when walking alone. This may be attributed to the perceived responsibility of ensuring the safety of another person.

In summary, as it is illustrated in figure 6, the findings suggest that while citizens generally feel safe during the day (7,53 of 10), they tend to perceive a slightly lower level of security when accompanied by a child or elderly person (7,13 of 10). Additionally, perceptions of safety decrease at night (6,08 of 10), although the overall level of perceived insecurity remains relatively low. These findings highlight the nuanced nature of perceived safety and the importance of considering factors such as time of day and social context.

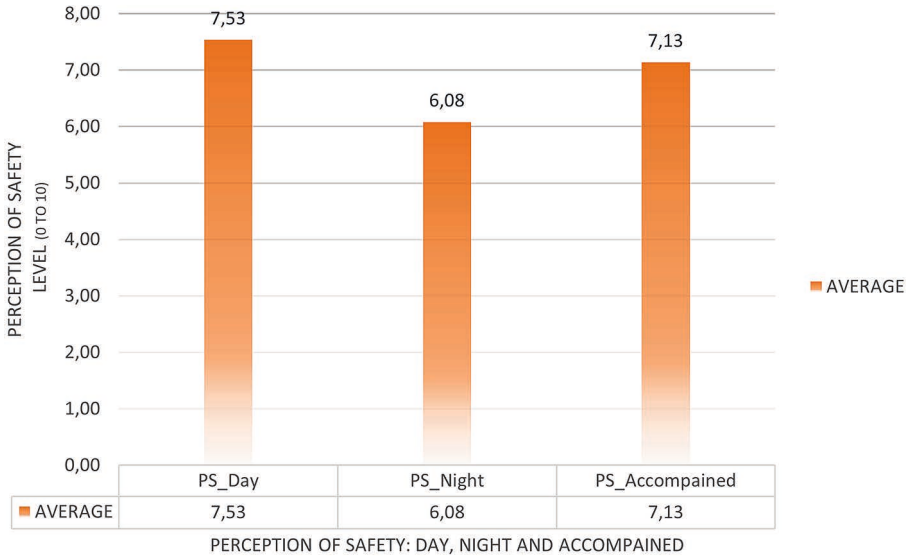


Fig. 6. General average graph of results from the Study of PS_Day, Night and Accompanied (own elaboration based on data obtained from the surveys)

As shown in Figure 6, the percentage of responses for each level of perceived safety was analysed for day, night, and accompanied conditions. The results indicated that:

- PS_Day: 66.7% of respondents rated their perceived safety during the day as 7 or above (29.8% rated it 10).
- PS_Accompanied: 66% of respondents rated their perceived safety as 7 or above when accompanied.
- PS_Night: 48.3% of respondents rated their perceived safety as 7 or above at night. While this is lower than during the day, it still indicates a relatively high level of perceived safety.

https://doi.org/10.37705/TechTrans/e2025005

Figure 7 presents the mean scores for the influence of each of the 9 urban design elements on perception of safety, as derived from the 141 survey responses.

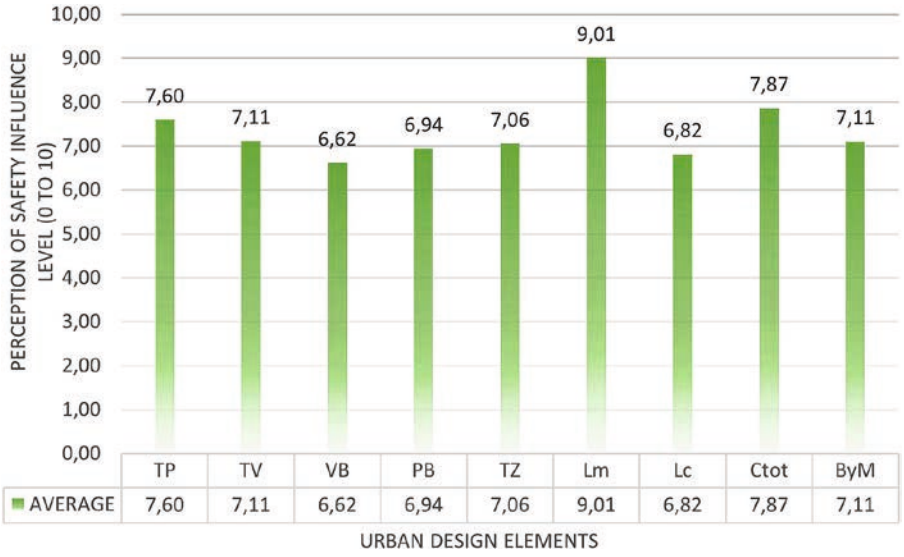


Fig. 7. General average graph of results from the answers about the influence level from the urban design elements (own elaboration based on data obtained from the surveys)

The results clearly indicate that public lighting (Lm) has the most significant impact on perceived security, with an average score of 9.01 out of 10. The presence of a single-level platform (Ctot) and the ability to walk along the entire width of the street also had a considerable influence on perceived safety, scoring 7.87 out of 10. Pedestrian traffic (TP) followed closely with a score of 7.60, while vehicular traffic (TV) and urban furniture (ByM) tied for fourth place with a score of 7.11.

Surprisingly, the results for views from balconies (VB) and ground floor businesses (PB) were contrary to theoretical expectations. While these elements were expected to contribute significantly to perceived security through the concept of 'eyes on the street', they received relatively lower scores. Although still positively associated with perceived security, their influence was overshadowed by the importance of other factors such as lighting and the presence of a single--level platform.

It is evident that while all urban design elements were mentioned by respondents, some were considered more essential than others. Public lighting and single-level platforms emerged as primary factors influencing perceptions of safety, while elements such as views from balconies and ground floor businesses were perceived as secondary attributes.

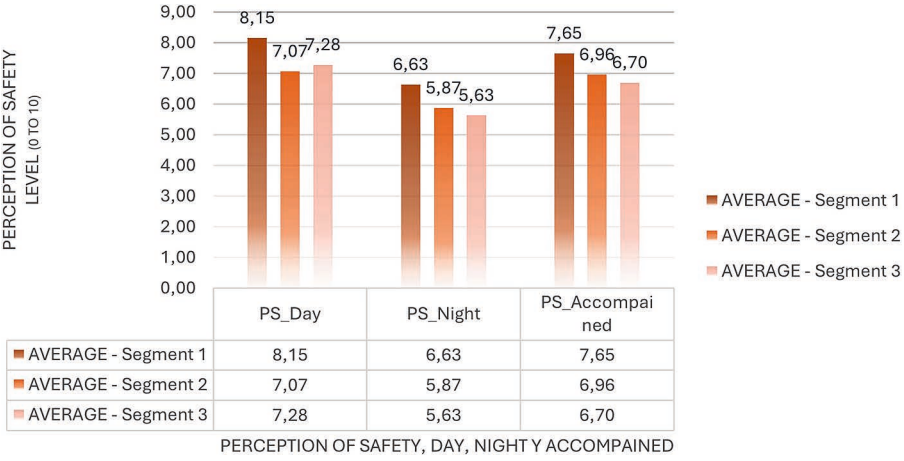
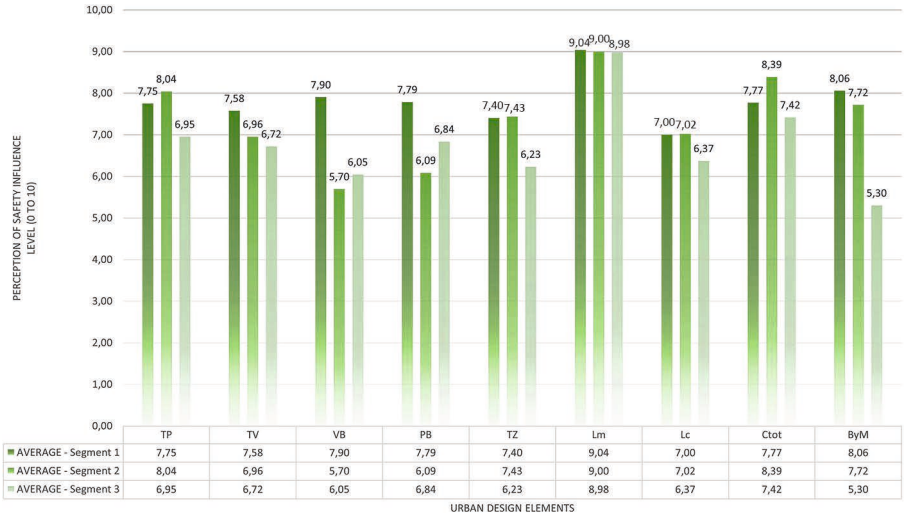


Fig. 8. General average graph of answers according to the perception of safety in the day, night and accompanying condition per segment (own elaboration based on data obtained from the surveys)

Figure 8 illustrates a clear hierarchy in perceived safety across the three segments, with Segment 1 consistently outperforming Segments 2 and 3. This finding is consistent with the intended design of the photomontages. The higher levels of perceived safety associated with Segment 1 can be attributed to its characteristics, such as high foot traffic, visible residential activity, and a vibrant ground floor. In contrast, Segment 2, with its more secluded nature and fewer active spaces, exhibited lower levels of perceived security. Segment 3, characterized by vacancy and a lack of activity, was perceived as the least safe.

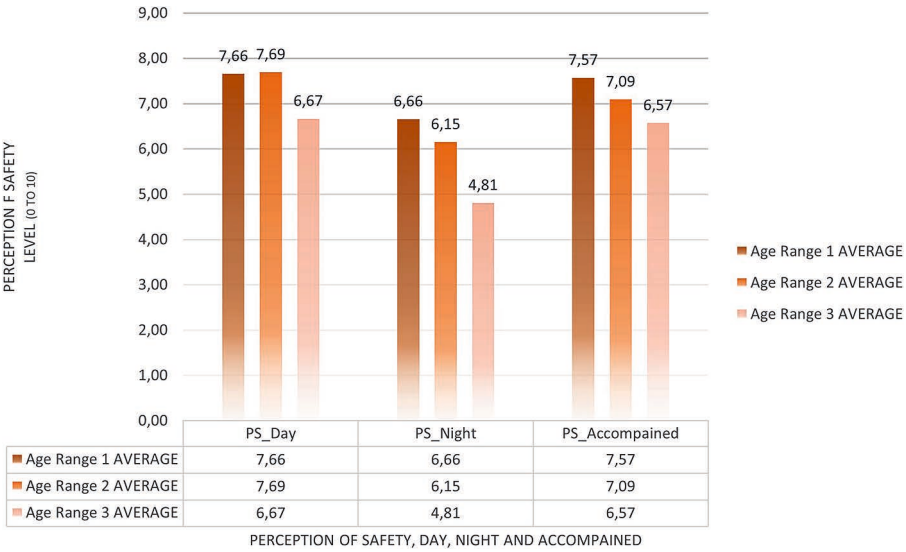


	TP	TV	VB	PB	TZ	Lm	Lc	Ctot	ByM
AVERAGE - Segment 1	7,75	7,58	7,90	7,79	7,40	9,04	7,00	7,77	8,06
AVERAGE - Segment 2	8,04	6,96	5,70	6,09	7,43	9,00	7,02	8,39	7,72
AVERAGE - Segment 3	6,95	6,72	6,05	6,84	6,23	8,98	6,37	7,42	5,30

Fig. 9. General average graph of answers according to the influence of the urban design elements per segment (own elaboration based on data obtained from the surveys)

As illustrated in Figure 9, the urban design elements that exhibited the greatest variation across the different segments were those related to the perception of security through community, such as views from balconies (VB) and the presence of ground floor businesses (PB). However, these elements consistently received lower overall ratings. While there were significant differences between segments in terms of these elements, other factors, such as lighting (Lm), pedestrian traffic (TP), and single-level platforms (Ctot), remained relatively consistent.

Figure 10 highlights the significant differences in perceived safety across different age ranges groups, with the oldest age group (3) consistently reporting the lowest levels of perceived security, particularly at night (with a mean score



	PS_Day	PS_Night	PS_Accompained
Age Range 1 AVERAGE	7,66	6,66	7,57
Age Range 2 AVERAGE	7,69	6,15	7,09
Age Range 3 AVERAGE	6,67	4,81	6,57

Fig. 10. Graph regarding age range perspective per answer average according with the perception of safety in the day, nigh and accompanied conditions (own elaboration based on data obtained from the surveys)

https://doi.org/10.37705/TechTrans/e2025005

of 4.81 out of 10). Conversely, younger adults demonstrated consistently higher levels of perceived security, although these levels also decreased slightly at night. It is important to note that the majority of the sample belonged to the 28–55 age group, making their responses statistically more significant.

The findings suggest that older adults may feel less safe in the study area, particularly at night. While the sample size for older adults was relatively small, this highlights the need for further research to explore this issue in more detail. Future studies could focus on increasing the sample size of older adults to identify more robust differences in their perceptions of safety.

Figure 11 reveals a clear pattern: long-term residents (categorized as 'Neighbour level 1') exhibit lower levels of perceived safety compared to those who are newer to the neighbourhood ('Neighbour level 3'). This suggests that familiarity with a neighbourhood does not necessarily correlate with higher levels of perception of safety.

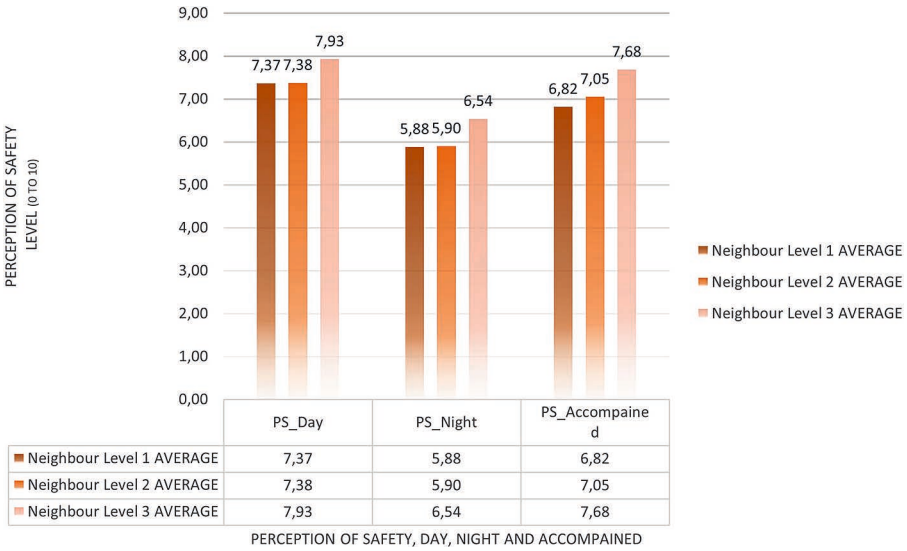


Fig. 11. Graph regarding neighbourhood level perspective per answer average according with perception of safety in the day, nigh and accompanied conditions (own elaboration based on data obtained from the surveys)

The following illustration highlights in red the areas where social activities predominantly take place on streets today. In contemporary vehicular streets that have not been pedestrianized, the perception of safety through community is primarily concentrated around commercial premises (particularly on street corners) and individuals located on their balconies.

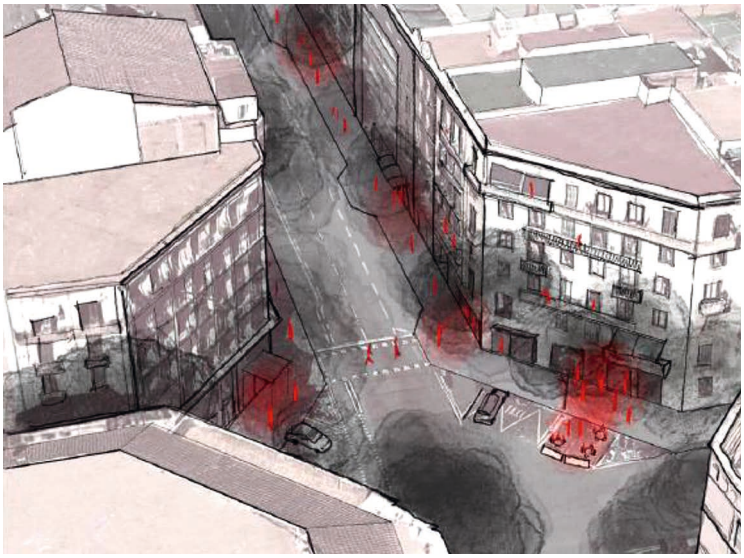


Fig. 12. Illustration about human congregations in public space (own elaboration)

In the absence of any street-level intervention, community-based safety will inevitably be constrained by the significant barrier posed by vehicular traffic.

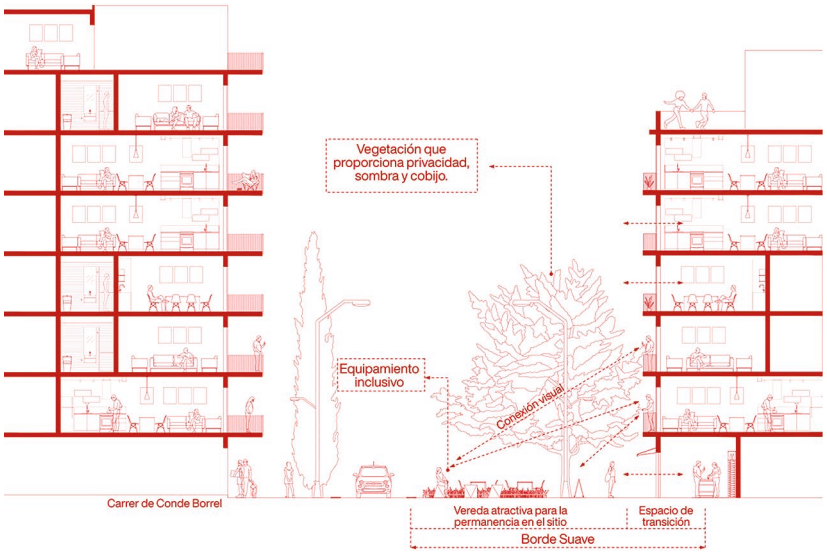


Fig. 13. Scheme regarding the visual connection between pedestrians and residents in their own apartments according to Jane Jacobs theory, Eyes in the Street (source: Bentley, 1999)

When the opportunity of walking by the middle of the street, the angle of sight increase. This significantly improves the possibility of being seen and of seeing, and according to the analysis results, the perception of safety.

Qualitative Analysis

Complementing the quantitative analysis, this section presents a qualitative analysis of the open-ended responses. Through a thematic analysis, we will explore the underlying reasons for the responses that did not align with our initial hypotheses

Respondents were asked open-ended questions to provide explanations for their initial answers about the perception of safety. A detailed analysis of these responses, comparing them to the initial ratings, revealed four main themes, which will be presented in the following sections

Theme 1: “May the motorized vehicles return”

A recurring theme that caught the researcher’s attention was a critique of urban pacification. While the reduction in vehicular traffic associated with these initiatives aims to reclaim public space for pedestrians, it has paradoxically led to unexpected outcomes.

While a sense of community and surveillance is fostered during daylight hours by the presence of neighbours on balconies, this sense of security diminishes at night. Consequently, some residents have suggested that allowing limited vehicular traffic at night could enhance safety. They argue that the constant movement of vehicles would provide a form of ‘eyes on the street’, compensating for the absence of active surveillance from neighbours or businesses. This opinion, particularly prevalent among young women, is often grounded in personal experiences of harassment or victimization.

Interestingly, this perspective is not strongly reflected in the quantitative analysis. This suggests a promising avenue for future research to directly examine the impact of reduced pedestrian traffic on perceptions of safety. While vehicular accidents involving pedestrians have undoubtedly decreased, people’s subjective feelings of security may differ from these objective measures.

https://doi.org/10.37705/TechTrans/e2025005

Some of the comments regarding this topic were as follows:

'There are no cars, it feels very lonely'.

'There are no longer any cars, no one can see you (using the Rambla as an example, which works better)'.

'NO CARS (negative)'.

'There are no longer any cars, no one can see you (using the Rambla as an example, which works better)'.

'There are NO CARS, even though during the day neighbours can see you, at night no one can see you, cars used to help, now anything can happen, and no one would notice'.

'When there are no people walking, you miss the cars passing by'.

'With everything closed, and the neighbours can no longer see me, I feel more scared. Before, when there were cars, at least the cars could see me'.

These responses were often associated with lower ratings of perceived safety at night. However, some participants noted a positive aspect of reduced traffic, particularly when considering the safety of children. They drew comparisons to the Rambla, suggesting that a similar approach, allowing for limited vehicle access, could improve perceptions of safety, especially at night.

Theme 2: "The simple absence of light was often cited as a major contributor to feelings of insecurity"

Many respondents commented that the mere fact of it being night-time reduced their perceived safety.

"The only thing that makes me feel less safe is the fact that it's nighttime, but overall it seems safe".

"Despite reduced activity levels, the space is still perceived as habitable and lively. While the perception of safety is slightly lower at night, it is primarily influenced by personal experiences and pre-existing nighttime anxieties rather than specific features of the space. In fact, the described space is still perceived as safe".

Theme 3: "Our neighbourhood has experienced an influx of tourists due to the recent development of the green corridor"

This sentiment was not universally shared by local residents, but it was a recurring viewpoint and one worthy of further investigation. The promotion and subsequent implementation of such an urban improvement plan is often seen as an attraction for the wider city, including tourists. However, tourists can attract criminals, creating a vicious cycle. Ironically, residents who, in theory, should benefit most from these urban improvements often feel the most negatively impacted in terms of perceived safety. This was a recurrent theme in our discussions.

"It has been a gateway for the rest of the city, for tourists who hadn't been here before".

> "Now there are too many tourists, which means more people coming to steal, and the neighbourhood has deteriorated".

> "Sometimes at the store where I work, we have to be on the lookout for potential thefts and robberies".

Theme 4: "There is an optimal level of activity"

It's not simply a matter of having more or fewer people; the quantity must be just right. This highlights a limitation of the research, which should be studied by introducing three levels of pedestrian traffic or simple activities as binary dummy variables, rather than solely focusing on general night and day distinctions. The dynamics of public space are not black and white; there are nuances to consider and grey areas that would better adjust the results.

> "I believe that the perception of safety is enhanced in spaces with moderate levels of activity where there is still some control over the space, as opposed to large crowds with no control. On the other hand, in areas with no activity, there are no alternatives for assistance, and thus I believe the perception of insecurity increases at the extremes. However, it is important that these activities are not overly visible to residents".

> "As long as there is a certain level of activity, it does not significantly alter the perception of safety. Adequate lighting and visible control over the presence of others contribute to feelings of security".

One of the most significant contributions of this qualitative research is that it has opened up new avenues for further study to better understand whether the opinions expressed by certain respondents could carry statistical weight if examined in more detail.

5. Conclusions

Broadly speaking, the urban design elements studied do influence people's perception of safety. This influence can be both positive and negative, depending on various conditions, including the satisfaction of respondents and sociodemographic factors. According to the average perception of safety, combining the daytime, nighttime, and accompanied condition, the survey respondents perceive themselves secure in the Consell de Cent Green Axis, with a score of 6.91 out of 10.

This research, grounded in urban theory and its relationship to public safety, abstracted specific urban design elements to assess their impact on perception of safety. Through a concise and focused literature review, methodologies were identified to empirically measure and validate these elements. Surveys, data systematization, and analysis were used to answer the research question: Under what conditions does urban pacification influence citizens' perception of safety? Urban pacification, defined in this study as the individual urban design elements evaluated, does indeed influence citizens' perception of safety. When considering the perception of safety in relation to the nine elements of urban design that influence it, the responses were varied, as can be seen in the results section. However, the average influence of all urban design elements on the perceived safety of each survey respondent was scored at 7.35 out of 10. Therefore, it is concluded that the influence of these elements in the perception of safety is evident.

However, this influence is not absolute, as it varies across individuals. Sociological and sociodemographic factors systematically influence these

https://doi.org/10.37705/TechTrans/e2025005

perceptions. Beyond this, the influence of urban pacification on perceived safety occurs under the following conditions:

- **Time of day:** This was a crucial condition, with the responses and results varying significantly depending on the time of day the study was conducted. Daytime and nighttime yielded entirely different perceptions. On the one hand, 66.7% of respondents rated their perceived safety during the day as 7 or above (29.8% rated it 10), The average daytime perception of safety score is 7,53 out of 10. On the other hand, 48.3% of respondents rated their perceived safety as 7 or above at night. While this is lower than during the day, it still indicates a relatively high level of Perception of Safety. However, the average score of nighttime perception of safety is 6,08 out of 10, far below than daytime. Therefore, it is concluded that safety is better perceived at daytime that nighttime. It's important to note that this percentage is an average between all respondents, combining the 3 shown segments.
- **Sociological dimensions:** General aspects of individuals' nature dominated the responses, rather than the objective contributions of urban pacification. This is reflected in the quantitative and quantitative analysis, where satisfaction-related variables exerted the greatest influence in the results explaining a significant portion of the variance in perceived safety across all three conditions. The age range is one of the strongest examples of this condition. As could be seen in the results, the age range number 3 (older people, over 55) has the lowest perception of safety score, with an average of 6,01 out of 10. Standing out worryingly the 4,01 out of 10 score during the nighttime. And, over this, a general score very far from the average of 7,30 out of 10 belonging to age range number 1 (young people).

  These results open doors to severe concerns in relation to the elderly, who are mostly residents of the sector, residents who are not going to use the urban space that was intervened especially with them in mind.

  This conclusion is strengthened when analysing the neighbour level variable, with neighbour level 1 (the one who lives in the sector) being the less safe perceived with an average score of 6,69 out of 10, and again, standing out worryingly, the 5,88 out of 10 score during the nighttime. Out the other hand, the neighbour level 3 (mostly visitors) with an average score of 7,38 out of 10, has a far better perception of safety.

Clearly, there is a secondary phenomenon occurring after this urban pacification, originally designed for its residents. As could be corroborated in some of the responses from the qualitative analysis, it is attracting people from outside the neighbourhood, including many tourists. This has unintentionally caused a rejection of their own neighbourhood by the residents and a clear reduction in their perception of safety.

The abstracted urban design elements, grounded in theoretical frameworks, were found to significantly influence citizens' perceptions of safety. Although the exact mechanisms of this influence require further exploration, the current study provides a solid foundation. The research has not only answered its original research questions but has also opened up new avenues for future inquiry. The exploratory nature of this study has generated a number of questions that warrant further investigation, which are outlined in the chapter "Future Research Directions".

Comparing directly with the perception of Safety, the results clearly indicate that public lighting has the most significant impact on perceived security, with an average score of 9.01 out of 10. Significantly surpassing the scores of other elements of urban design, it is evident that lighting is an element that helps to better perceive safety, especially at night. However, it is worth considering for future studies not to include lighting within the set of elements of urban design since, according to the author's criteria, they are too literal an element when

talking about safety, and what this study seeks is how the elements of urban design influence the perception of safety.

Surprisingly, the results for views from balconies and ground floor shopping were contrary to theoretical expectations. While these elements were expected to contribute significantly to perception of safety through the concept of 'eyes on the street', they received relatively lower scores. Although still positively associated with perceived security, their influence was overshadowed by the importance of other factors such as lighting and the presence of a single-level platform.

It is evident that while all urban design elements were mentioned by respondents, some were considered more essential than others. Public lighting and single-level platforms emerged as primary factors influencing perceptions of safety, and in which way? the act of walking in the middle of the street empowers pedestrians, and when pedestrian priority is emphasized, the perception of safety increases. It is understood that more than the creation of a single platform, it is the accompanying policy that matters, where pedestrian priority is elevated above that of motorized vehicles. While streetlights fulfil an evident visual function at night, the broader the field of vision, the greater the perceived sense of security, while elements such as views from balconies and ground floor shopping were perceived as secondary attributes.

In accordance with the theoretical frameworks and based on the analysis of the results, it is concluded that the three theoretical frameworks carry significant weight in influencing the perception of safety. However, not in the manner that would have been expected according to the theory.

- **Perception of Safety through Community:** It was surprising that the perception of safety through community did not carry the expected weight that had been anticipated according to the theory. The 'eyes on the street' concept of Jane Jacobs and the 'Humanisation of urban space' by Jan Gehl were not clearly reflected in the quantitative results, although they were in the qualitative ones.
- **Perception of Safety through Sense of Belonging:** It does have an influence, but not in the expected way. Those who feel the strongest sense of belonging to the urban space are the residents, who turned out to be part of the group within the sample who perceive themselves as least safe in public spaces.
- **Perception of Safety through Pacification:** The results showed a correct influence by validating the elements of urban design abstracted from this theoretical framework. However, after the qualitative analysis, pacification has its pros and cons, and a major con is related to the perception of safety at night. Regarding the lack of cars as a negative factor as could be seen in the qualitative analysis.

Dividing the variables into three dimensions was a crucial methodological choice that yielded valuable insights. Notably, variables related to satisfaction, which are closely tied to respondents' overall behaviour, emerged as the strongest predictors of perception of safety.

Variables from the design attributes dimension, that is, urban design elements assessed independently, only account for 14% of the variance in perceived safety in public spaces. It is crucial to include variables from the satisfaction dimension as control variables to understand the underlying reasons behind people's perceptions and identify potential interventions to improve safety.

Limitations and future lines of Study

To strengthen the empirical basis of the study, a larger sample size is required, with a particular focus on the following groups:

https://doi.org/10.37705/TechTrans/e2025005

- **Older adults:** Given the valuable insights provided by this demographic, a larger sample of older adults is needed to ensure their perspectives are adequately represented in the statistical analyses.
- **A control group:** A portion of the study should focus on a neighbourhood that lacks visual connections with neighbouring areas, has not undergone pacification, and is not predominantly residential, such as an industrial district. Using this as a control group would significantly enhance the study's robustness and enable comparisons between different contexts.
- **Motor vehicles:** While the analysis did not fully capture the complex relationship between motor vehicles and perceived safety, qualitative data suggested that, particularly for young women, the presence of vehicles at night can enhance feelings of security. Future research could explore the relationship between nighttime traffic and perceived safety in more detail. This could shed light on the potential trade-offs between mobility and safety

A theoretical gap exists regarding the sociological dimension, which has not been fully explored. To fully understand the responses provided by individuals, a sociological dimension underlying each respondent has been identified as a limitation of this study and a potential avenue for future research. This dimension encompasses personal experiences, education, life trajectories, and reasons for resistance to change, among other factors shaping the individual. These factors have significantly influenced the objectivity of the urban design elements. Future research could adopt a more qualitative approach, delving into specific reasons why respondents evaluated each urban design element in a particular way. While the current study included an open-ended question about perceived safety, future research could explore the influence of each design element in more detail. Some underlying theories can be inferred from the respondents' answers, but a more in-depth analysis would be beneficial to understand the reasons behind these perceptions

References

Appleyard, D. (1981). *Livable Streets*. University of California Press.

Arcardini Ravera, A.R. (2020). *Las supermanzanas y la habitabilidad urbana*. http://hdl.handle.net/2117/331825

Ayuntamiento de Barcelona. (2023). *EJES VERDES Y PLAZAS DE L'EIXAMPLE*. SuperIllas Barcelona. https://www.barcelona.cat/internationalwelcome/ca/noticies/las-transformaciones-que-vivira-barcelona-en-2023-1242260 (online: 25/05/2023).

Bentley, I. (1999). *Entornos Vitales. Barcelona*, España: Gustavo Gili. 1st ed. 3rd imp. 05.

Charles Montgomery. (2013). *Happy City*. Farrar, Straus and Giroux. First Edition.

Cochran, W.G. (1977) Sampling Techniques. 3rd Edition, John Wiley & Sons, New York. https://doi.org/10.4236/ojs.2015.51001.

ENQUESTA DE RELACIONS VEÏNALS I CONVIVÈNCIA DE L'AMB, ECAMB 2020. (n.d.). https://bcnroc.ajuntament.barcelona.cat/jspui/handle/11703/123682 (online: 14/05/2023).

EVAMB 2022. (2022). *Encuesta de Victimización del Área Metropolitana de Barcelona 2022 (EVAMB)*. https://www.institutmetropoli.cat/es/estudi/encuesta-victimizacion-area-metropolitana-barcelona-2022-informe-sobre-estado-seguridad-urbana/ (online: 14/05/2023)

Fuentes, L., Miralles-Guasch, C., Truffello, R., Delclòs-Alió, X., Flores, M., & Rodríguez, S. (2020). Santiago de Chile through the eyes of jane jacobs. Analysis of the conditions for urban vitality in a latin American metropolis. Land, 9(12), 1–17. https://doi.org/10.3390/land9120498

Gehl, J. (2004). *The Humanization Of Urban Spaces*. Editorial Reverte. Third Edition.

Gehl, J. (2014). *Cities for People*. Editorial. Island Press. First edition.
Hargreaves, A. (2023). *Percepción de in/seguridad a través del diseño urbano*. http://hdl.handle.net/2117/398810
Helliwell, J. F. (2019). *How happy are your neighbours? Variation in life satisfaction among 1200 Canadian neighbourhoods and communities*. https://doi.org/10.1371/journal.pone.0210091
Hillier, B., & Hanson, J. (1984). *The Social Logic of Space*. Cambridge, New York Cambridge University Press.
Ildrovo, D. (2017). *POLÍTICAS DE REGENERACIÓN URBANA Y SU INFLUENCIA EN LA PERCEPCIÓN DE SEGURIDAD: método de aproximación a entornos conflictivos. Casos de estudio: Bijlmermeer, La Mina y Villa del Socorro*. https://doi.org/10.5821/dissertation-2117-113686.
Jacobs, J. (1976). *The Death and Life of Great American Cities*. Capitán Swing Libros Editor.
Maldonado-Guzmán, D. J., Saldaña-Taboada, P., & Miguel-Alvaro, A. (2021). Análisis Espacial de la Inseguridad Percibida en Barcelona: el Papel de los Barrios Adyacentes y de los Factores Psicosociales Implicados. *Anuario de Psicología Jurídica, 31*(1), 63–73. https://doi.org/10.5093/apj2021a7
Mils Julià, P., & Garola Crespo, À. (n.d.). *Ingeniería de caminos, canales y puertos TRABAJO FINAL DE MASTER Evaluación de proyectos urbanos: El caso de las supermanzanas de Barcelona*. http://hdl.handle.net/2117/107985.
Ministerio de Transportes y Movilidad Sostenible. (2016). *esmovilidad.transporte.gob.es*. Programa Supermanzanas de Barcelona. https://esmovilidad.transportes.gob.es/noticias/programa-supermanzanas-de-barcelona (online: 02/02/2023).
Müller, F. (2021). Home Matters: The Material Culture of Urban Security. *International Journal of Urban and Regional Research, 45*(6), 1028–1037. https://doi.org/10.1111/1468-2427.12879
Newman, O. (1972). Defensible Space; Crime Prevention through Urban Design. New York: Macmillan. Newman, O. (1980). Community of Interest. Garden City, NY: Anchor Press/Doubleday.
Rueda, S., De Fomento 723, M., & Territoriales, C. Y. T. E. (2019). *Revista Ciudad y Territorio Estudios Territoriales, CyTET no 202, invierno 2019. La Agenda Urbana Española. LI*, 2019. https://www.ncbi.nlm.nih.gov/pub-
Sánchez Gómez-Merelo, M. (2020). *La percepción de seguridad y la realidad social*. Cuadernos de Seguridad. – Madrid : Peldaño, 1988- Número 219 – enero 2008.
Sennet, R. & Sendra. P. (2020). *Designing Disorder. Experiments and Disruptions in the City*. Londres-Nueva York: Verso. 160 pp. https://doi.org/10.14350/rig.60442.
Staricco, L., & Vitale Brovarone, E. (2022). Livable neighborhoods for sustainable cities: Insights from Barcelona. *Transportation Research Procedia*, *60*, 354–361. https://doi.org/10.1016/j.trpro.2021.12.046
UNDP United Development Programme. (2006). *Global partnership for development*. https://www.undp.org/turkiye/publications/undp-annual-report-2006-global-partnership-development (online: 11/06/2023).
Whyte, W. (1980). *The Social Life of Small Urban Spaces*. Project for Public Spaces. USA.
Wilson Q., J., & Kelling, G. (1869). *Broken Windows Theory*. The Atlantic Monthly:
Yepes Besolí, J. (2018). *Análisis de la movilidad en las Supermanzanas de Barcelona y propuesta de mejora*. http://hdl.handle.net/2117/118853
Wyżykowski, A., Korbel, W., Kwiatkowski, K., Mizia, M., Racoń-Leja, K., Róg, M., Setkowicz, M., & Wehle-Strzelecka, S. (2004). Safe Space: urban and architectural conditions for shaping urban space to enhance the safety of residents In: A. Wyżykowski, ed. (p. 385). Department of Renewal

and Development of Urban Units. Institute of Urban Design. Faculty of Architecture, Tadeusz Kościuszko Cracow University of Technology. https://cris.pk.edu.pl/info/book/CUT803bd697b6cc4ee48c9410258e73e0fd (online: 11/06/2023).