

Beyond Ranking: Translating CPTED Indicators into a Park Safety Masterplan for Turin

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Beyond Ranking: Translating CPTED Indicators into a Park Safety Masterplan for Turin

Andrea Nino, Carolina Giaimo

Abstract

Urban safety has become an essential component of urban quality, shaping cities' liveability. In Turin, this issue is particularly pertinent: the city ranks sixth in Italy for the number of reported crimes. Urban green spaces are a prime example of this complexity, combining ecological and social functions with critical conditions such as perceived insecurity, conflicts of use and spatial configurations that may exacerbate vulnerability. This paper applies CPTED-based indicators, developed within the PRIN SeTUP, to Turin to measure the vulnerability and exposure of urban parks, and to analyse their spatial implications. Through on-site audits and GIS analysis, the study provides a comparative analysis of selected parks. It demonstrates the usefulness of these indicators as analytical tools, while also highlighting their limitations when not supported by a device capable of translating results into planning-oriented guidance. The paper therefore examines how these insights can be integrated into a masterplan conceived as a non-binding technical document capable of prefiguring desirable spatial scenarios, connecting objectives with expected performance and acting as a bridge between the structural and operational dimensions of planning. From this perspective, the masterplan incorporates urban safety into transformation processes, avoiding the fragmentation associated with external sectoral plans, and restores a guiding role to urban planning in shaping the public city.

Keywords:

Urban planning, Urban regeneration, Public spaces, Urban parks, Urban safety

Oltre le graduatorie: dagli indicatori CPTED ad un Masterplan per la sicurezza dei parchi di Torino

La sicurezza urbana rappresenta oggi una componente essenziale della qualità della città e della sua capacità di garantire vivibilità e coesione sociale. A Torino, il tema assume particolare rilevanza: la città è sesta in Italia per numero di reati denunciati. Gli spazi verdi urbani rappresentano un ambito emblematico di questa complessità, poiché combinano funzioni ecosistemiche e sociali con criticità legate a percezione dell'insicurezza, conflitti d'uso e configurazioni spaziali sfavorevoli. Il paper applica al caso torinese indicatori CPTED-based del PRIN SeTUP per misurare vulnerabilità ed esposizione dei parchi urbani e valutarne le implicazioni spaziali. Attraverso rilievi in situ e analisi GIS, l'indagine restituisce una lettura dei parchi selezionati, evidenziando sia l'utilità degli indicatori come strumento conoscitivo, sia i limiti della loro applicazione se non supportata da un dispositivo di traduzione progettuale. Il contributo discute quindi come tali evidenze possano essere integrate in un masterplan inteso come elaborato tecnico non vincolante, capace di prefigurare scenari spaziali desiderabili, connettere obiettivi e prestazioni attese, e fungere da ponte tra dimensione strutturale strategica e operativa del piano. In questa prospettiva, il masterplan consente di incorporare la sicurezza urbana nelle trasformazioni, evitando la frammentazione dei piani settoriali esterni e restituendo alla pianificazione un ruolo guida nella costruzione della città pubblica.

Parole chiave:

Pianificazione urbanistica, Rigenerazione urbana, Spazio pubblico, Parchi urbani, Sicurezza urbana

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1. Urban planning as a safety issue: Torino as a case study

Urban safety has progressively emerged as a key concern for urban and regional planning, to the extent that it cannot be treated solely as a matter of public order or as a topic confined to criminological inquiry (Hillier & Sahbaz, 2009). Instead, it necessitates comprehensive incorporation within the prevailing instruments and methodologies of territorial governance (Fasolino, 2024; Alulli 2010). As discussed in the position paper by Coppola, Grimaldi and Fasolino in this Special Issue, urban safety becomes significant for planning when it is approached not simply as a matter of policing, but as a territorial issue that can be addressed through the regulation, design and management of space configuration and land use (Hillier et al., 1983; Cozens & Love, 2015).¹

In the context of large Italian cities, Turin provides a particularly relevant case study for investigating the relationship between urban safety and urban planning, not only because of the scale and spatial unevenness of crime, but also because of the long-standing institutional centrality that safety has acquired within the city's policy and planning agenda (Giaimo & Nino, 2025).

The case in Turin is part of the national debate on safety in Italian cities. In 2023, the Parliamentary Commission of Inquiry on "Safety conditions and the state of urban decay in cities and their suburbs"² began its work; in 2024, it held specific hearings on the Turin case.³ The hearings illustrate a complex and multifaceted picture, in which neighbourhood-level micro-crime, assaults, illegal occupations and drug-dealing dynamics are closely intertwined with urban and territorial factors.⁴ In particular, they emphasise that a significant number of security-related criticalities cannot be explained through a basic centre-periphery geographical dichotomy. Instead, these criticalities are indicative of forms of widespread socio-spatial marginality. These conditions are also present in areas located close to the city centre. They are typically associated with high residential density, an ageing building stock, the presence of brownfield or disused areas, and a concentration of public housing (Camera dei Deputati, 2024a, 2024b, 2024c).

A recurrent theme pertains to the role of urban infrastructure in fostering a sense

¹ The broader theoretical and international framing of urban safety as a planning issue is developed in the position paper opening this Special Issue. To avoid redundancy, this article recalls only the elements needed to situate the empirical analysis and then focuses more closely on the Turin case, where the relationship between CPTED-based indicators, public green spaces and planning instruments can be examined in operational terms.

² "Commissione parlamentare di inchiesta sulle condizioni di sicurezza e sullo stato di degrado delle città e delle loro periferie".

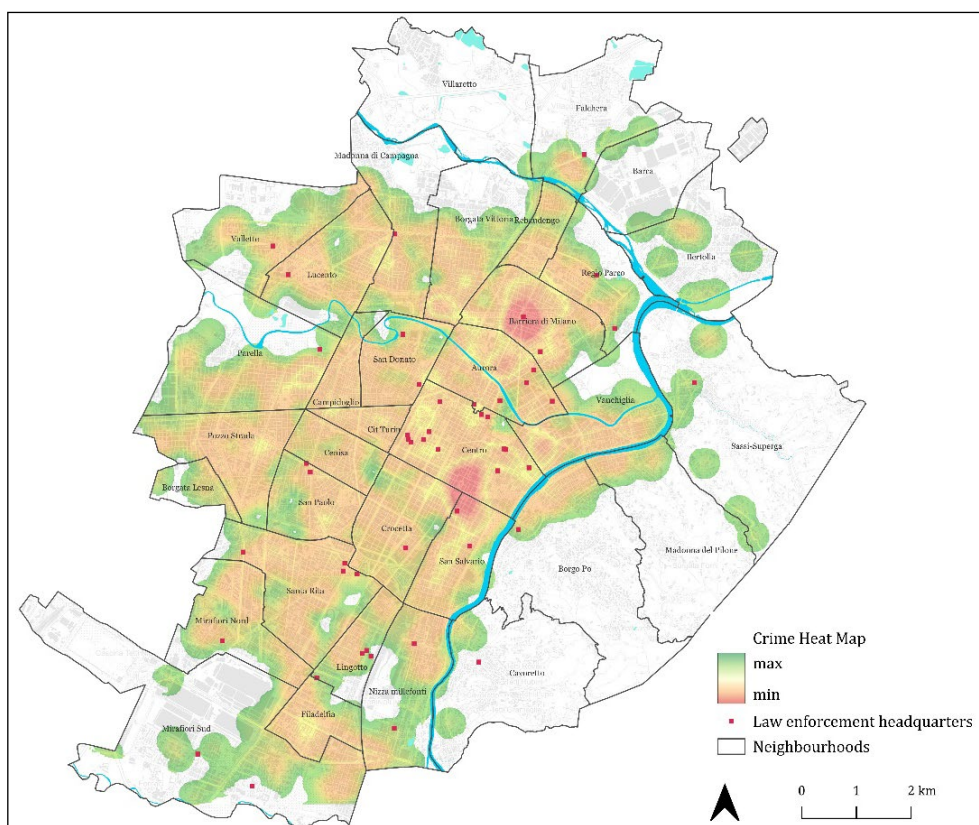
³ In the course of these meetings, the following city council members were allowed to present their views: the councillor responsible for education, school construction, youth, suburbs, and urban regeneration (C. Salerno); the councillor responsible for urban planning (P. Mazzoleni); and the councillor responsible for urban regeneration, law enforcement, and public safety (M. Porcedda); the prefect of Turin (D. G. Cafagna), the regional councillor for social policies (M. Marrone), and the president of the Territorial Housing Agency (ATC Piemonte Centrale) (E. Bolla).

⁴ Although this aspect lies beyond the scope of the present study and will not be addressed here, it is worth noting that, in addition to diffuse forms of petty crime, the context is also characterised by the reported presence of organised criminal activities (Camera dei Deputati, 2024b).

of insecurity. Abandoned or underutilised buildings, occupied housing, neglected public spaces, and a lack of local services are cited as factors that encourage illegal activities and fuel residents' perception of insecurity. At the same time, the difficulty of ensuring effective and continuous policing in the most problematic areas is highlighted, given the complexity of the urban context and the limited resources available (Camera dei Deputati, 2024a).

From an objective standpoint, recent data have placed the Piedmontese capital sixth among Italian cities in terms of total reported offences, with 128,666 recorded complaints – equivalent to 5,827.6 per 100,000 inhabitants (Il Sole 24 Ore, 2025).⁵ The city displays notably high values in specific crime categories: first in Italy for property damage (27,962 reports), second for fraud and cyber fraud (16,154 reports), and seventh for thefts (54,663 reports). Over the period 2006–2024, total reported crime decreased significantly, by –24%. The minimum value was observed in 2020, a period characterised by the implementation of pandemic restrictions, during which reports decreased to 95,335. In the post-pandemic period, commencing from 2022, an upward trend has been observed, with a +13% increase over the 2022–2024 triennium (Il Sole 24 Ore, 2025). As shown by Zanotti (2022), the geography of crime in Turin is highly differentiated, with hotspots located in both central and peripheral areas, including zones around Porta Nuova railway station (Fig. 1).

Fig. 1 – Turin: Crime spatial distribution (author's elaboration). Sources: Crime Heat Map (Zanotti, 2022), Law enforcement headquarters⁶ (Comune di Torino 2017) and Neighborhoods 2026.



However, a merely statistical reading is insufficient to grasp the broader relevance of the Turin case. From this perspective, Turin is particularly pertinent because the

⁵ It should be noted that the data provided by Il Sole 24 Ore (2025) is sourced from the Department of Public Security of the Ministry of the Interior.

⁶ Includes: Carabinieri stations, Finance Police stations, Police and Municipal Police stations.

city has developed, over time, an explicit political and institutional commitment to safety, reflected in both its governance arrangements and its urban transformation programmes. This commitment is evident in the recent renewal (2026) of the “Patto per la Sicurezza Urbana” (Urban Security Pact) between the City of Turin, the Piedmont Region and the Prefecture of Turin, supported by a regional contribution of €1.329 million and aimed at strengthening coordinated territorial control, surveillance systems, inter-institutional cooperation, urban decorum and the quality of life in the city. It is also reflected in the organisational structure of the municipal government, where an alderman’s office specifically dedicated to “Legalità e Sicurezza” is currently held by Marco Porcedda, a former lieutenant colonel of the Carabinieri, with delegated responsibilities that include legality and safety, municipal police and security policies, public procurement, and information systems and cybersecurity.

At the same time, Turin has developed a substantial and long-standing tradition of urban regeneration initiatives (Fedeli et al., 2022; Marra et al., 2016) in which safety has operated, either implicitly or explicitly, as a strategic axis of intervention. This orientation is already evident in the *Programmi di Recupero Urbano* (PRU, 1996-2008), implemented in via Artom,⁷ corso Grosseto and via Ivrea, which were designed to address the physical, functional and social marginalisation of public housing neighbourhoods through integrated approaches to urban regeneration (Camera dei Deputati, 2024a; Quaglio, 2022). Similar policy logics can be observed in more recent regeneration initiatives, such as the Urban programmes implemented in Mirafiori Nord and Barriera di Milano between 2011 and 2015, which further consolidated the use of area-based interventions to tackle socio-spatial vulnerability. More explicitly, the UIA-funded project ToNite (2019-2023) conceptualised safety as a matter of public-space liveability and proximity services during evening and night-time hours, combining spatial interventions along the Dora River corridor with social activation measures and community-based practices of urban care (Bragaglia, 2024).

Within this broader trajectory, the *Case del Quartiere* (Neighbourhood Houses) represent a particularly relevant governance and welfare model. Developed as a networked system of local hubs, these facilities function as territorial reference points providing social, cultural and community services, and are predominantly located in the city’s more fragile and vulnerable areas.

More recently, the Metropolitan City of Turin has promoted additional regeneration initiatives, notably through projects financed by the National Recovery and Resilience Plan (PNRR). Among these, the PINQuA programmes explicitly link the regeneration of public spaces and housing environments to improvements in accessibility, liveability and urban safety, through innovative management tools, social inclusion strategies and participatory processes (Viarengo & Alessandri,

⁷ The via Artom’s PRU is of particular significance for its impact on the adjacent Parco Colonnetti, which underwent a substantial process of landscape and functional renewal triggered by the programme. Historically characterised by severe social marginalisation and safety issues during the second half of the twentieth century, the area became a testing ground for an integrated and multi-scalar regeneration strategy. In the public housing estate of via Artom, the intervention encompassed the extraordinary maintenance of open spaces and six residential blocks, in conjunction with the demolition of two buildings. This operation acquired strong symbolic value for the neighbourhood. These spatial transformations were accompanied by continuous engagement with residents within the framework of the Social Accompaniment Plan (PAS).

2024). A key stated objective of these interventions is the enhancement of accessibility and safety in urban spaces, together with the strengthening of local services and urban infrastructure, further reinforcing the role of planning instruments as operational levers for urban safety policies

This paper is situated at a particularly significant moment for the future spatial and strategic configuration of the city of Turin. On 16 March 2026, the Municipal Council approved the Preliminary Project of the new Municipal Land Use Plan (*Piano Regolatore Generale*, PRG), marking the opening of a new planning cycle – thirty years since the adoption of the 1995 PRG – that explicitly redefines the strategic priorities of urban development. Within this framework, urban safety is not addressed as a stand-alone policy field; rather, it is viewed as a cross-cutting dimension embedded across the main axes of the new planning vision. A central objective of the Plan is the construction of a more connected, accessible and competitive city, in which urban regeneration is conceived as the primary tool for reactivating areas that have exhausted their previous functional and socio-economic cycles. In this perspective, regeneration is not limited to economic revitalisation but is explicitly linked to improvements in spatial quality, accessibility and everyday liveability, all of which are key factors in shaping both actual and perceived safety conditions. The Plan places strong emphasis on welfare and social infrastructure, advancing “city of proximity” model (Moreno et al., 2021). Urban safety thus emerges as an outcome of integrated interventions in regeneration, welfare, services and proximity, rather than as the result of sectoral security measures alone. Coherently with this orientation, the new PRG is structured around four core pillars – development, cohesion, sustainability and care – which together articulate a vision of the city grounded in equal rights, equal dignity and universal access to basic services. By fostering social cohesion and reducing forms of social and spatial marginalisation, this planning framework explicitly frames the reduction of social insecurity as a prerequisite for urban sustainability. In this sense, the Turin case further reinforces the analytical relevance of urban planning instruments as operational devices for addressing urban safety through spatial, social and territorial policies (Città di Torino, 2026).

Within this context, Turin is not selected merely because it exhibits relevant crime levels, but because it offers a cultural-rich and planning-sensitive environment in which the analysis of indicators focused on public spaces – and parks in particular – can inform territorial planning instruments as operational devices for implementing urban safety objectives. This is especially important in public green spaces, where heterogeneous users and uneven socio-spatial relations often amplify both actual and perceived insecurity (Nino, 2025). In such settings, the presence of groups perceived as socially distant may be sufficient to trigger feelings of insecurity among more vulnerable residents, even in the absence of directly harmful behaviours (Pitch, 2013; Lorenc et al., 2013).

In light of the aforementioned context, the present paper aims to address a particular lacuna in the extant relationship between urban safety assessment and planning practice. While CPTED-based approaches and composite indicators are widely utilised to diagnose spatial vulnerability and exposure, their contribution to planning remains limited when they are treated merely as classificatory or evaluative

devices. The central issue is therefore not only how to measure safety-related conditions in urban parks, but also how such measurements can be translated into spatial priorities, design principles and implementation-oriented guidance. In this sense, the paper interprets indicators not as an end point of the analysis, but as projective devices capable of informing spatial transformation.

The perspective under discussion is developed through two complementary analytical and project-oriented steps. Firstly, a set of CPTED-based indicators developed within the PRIN SeTUP project is applied to a sample of accessible urban parks in Turin. This is done in order to assess their spatial, functional and contextual conditions in relation to urban safety. Secondly, it discusses how the results of this assessment can be translated into planning-oriented guidance through a park safety masterplan. In this context, the masterplan is not to be regarded as a mandatory and statutory planning instrument, but rather as an intermediate, non-binding and strategic device. The concept is interpreted as a form of soft-power governance, drawing on Anglo-Saxon and European debates on masterplanning, soft spaces and informal urban design governance (Carmona, Bento & Gabrieli 2023; Cavaco et al., 2023). It is posited as a framework capable of connecting the systemic vision of the city with the spatial prefiguration within which architectural projects can subsequently be developed (Santilli 2026; Ministry of Housing, Communities and Local Government, 2019).

2. Methodology

The empirical application focuses on Turin and is based on a set of CPTED-based indicators developed within the PRIN SeTUP project (Coppola, Fasolino & Grimaldi, 2025), whose objective is to systematically measure risk factors, such as vulnerability and exposure, in urban parks. The quantitative model (Table 1) is organised into 11 criteria and 21 indicators. Due to the unavailability – in the case study of Turin - of disaggregated data on crimes occurring near the parks (S20), this indicator was excluded from the calculation of the final composite index. The selection of parks is guided by the regulatory framework outlined in the Municipal Land Use Plan, which, in accordance with the Regional spatial planning Law n. 56/1977, identifies:

- Public park spaces for play and sport (Art. 21);
- Urban and district parks, Urban and river parks, and Hill parks (Art. 22).

A subsequent selection was made from the set of park areas designated in the PRG. This selection excluded those areas that, although formally designated as parks in the PRG (i.e. legally recognised), have not yet been implemented or are currently unusable (due to a lack of physical realisation). Consequently, the focus was exclusively on park areas that were both effectively existing and accessible. This approach was adopted to ensure consistency between urban planning provisions and the actual conditions of the territory. A further selection criterion concerned the extent of green spaces, with those measuring less than 2 hectares excluded from consideration.⁸

⁸ The 2-hectare threshold was introduced to exclude small neighbourhood green spaces and residual open areas, which tend to exhibit limited spatial articulation and predominantly local patterns of use. Larger parks are more likely to function as urban or district-scale facilities, characterised by internal differentiation, higher user heterogeneity and more complex safety dynamics, thus providing a more appropriate basis for CPTED-based risk analysis.

Tab. 1 – Criteria and indicators used to construct the composite index (source: PRIN SeTUP).

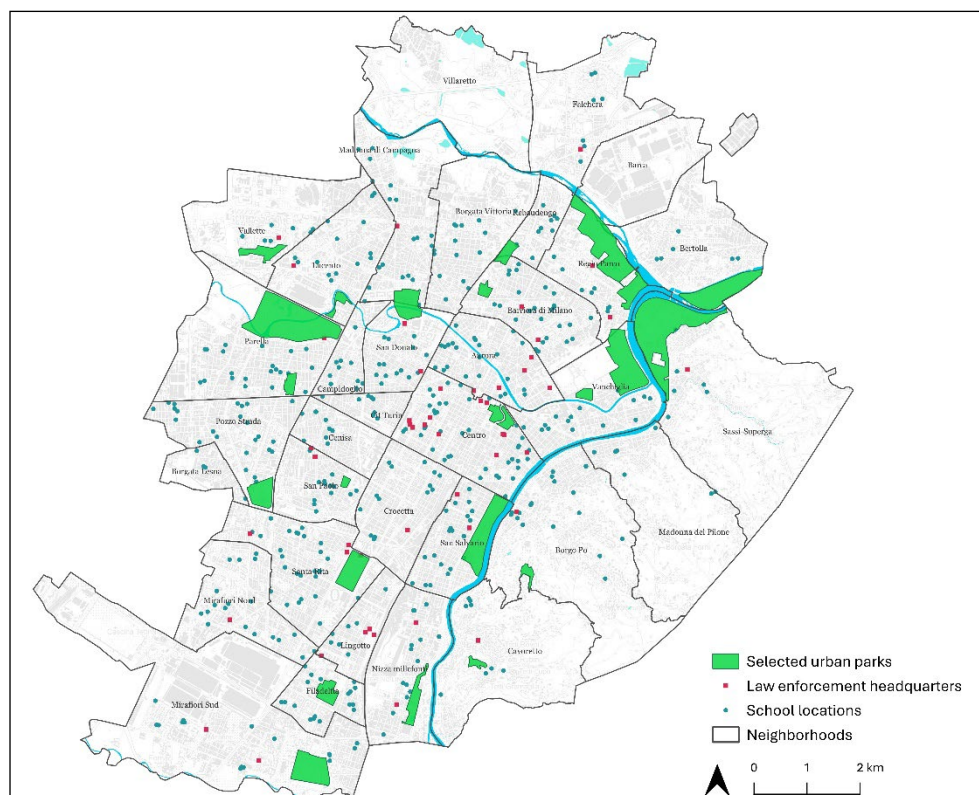
Criteria	Code	Indicator	Type	Score/Formula	Optimum
Surveillance	S1	Control methods	Qualitative	0 Absent; 1 Very poor; 2 Insufficient; 3 Acceptable; 4 Optimal	Max
Lines of sight	S2	Barriers	Quantitative	(Length of impenetrable barriers / Total length of paths) × 100 [m/m]	Min
Lighting	S3	Illuminated paths	Dichotomous	(0, 100)	Max
Perimeter control	S4	Perimeter protection	Dichotomous	(0, 1) ⁹	Min
	S5	Signage	Qualitative	0 Absent; 1 Very poor; 2 Insufficient; 3 Acceptable; 4 Optimal	Max
	S6	Fencing	Qualitative	0 Absent; 1 Very poor; 2 Insufficient; 3 Acceptable; 4 Optimal	Max
Entrances	S7	Formal entrances	Quantitative	Total number	Max
	S8	Percentage of formal entrances	Quantitative	(Number of formal entrances / Total number of accesses) × 100 [Num/Num]	Max
Path design	S9	All paths	Quantitative	Total length [m]	Max
	S10	Paved paths	Quantitative	Total length [m]	Max
	S11	Percentage of dead-end paths	Quantitative	(Number of dead-end paths / Total entrances and exits) [Num/Num]	Min
People flow	S12	Attraction elements	Quantitative	Total number / Area [Num/ha]	Max
	S13	Toilets	Quantitative	Total number / Area [Num/ha]	Min
	S14	Multifunctional spaces	Qualitative	0 Absent; 1 Very poor; 2 Insufficient; 3 Acceptable; 4 Optimal	Max
Maintenance	S15	Park maintenance	Qualitative	0 Absent; 1 Very poor; 2 Insufficient; 3 Acceptable; 4 Optimal	Max
Surrounding neighborhood	S16	Residents within 400 m of the park	Quantitative	Total number [Num]	Max

⁹ The value 0, taken as the optimal value, corresponds to a protective perimeter around the park that regulates access to it.

Surrounding neighborhood	S17	Schools within 400 m of the park	Quantitative	Total number [Num]	Min
	S18	Marked crossings and traffic lights	Quantitative	Total number [Num]	Max
	S19	Condition of streets and properties	Qualitative	0 Very poor; 1 Poor; 2 Acceptable; 3 Good; 4 Optimal	Max
Soft Crime	S20	Crimes nearby	Quantitative	Total number [Num]	Min
Adequate materials	S21	Urban furniture	Qualitative	0 Absent; 1 Very poor; 2 Insufficient; 3 Acceptable; 4 Optimal	Max

As the present study develops a comparative analysis of 23 Turin's urban parks (Fig. 2) through on-site and online surveys and Geographic Information System (GIS) analysis, the application of the methodology enables the analysis of the effectiveness of a multi-indicator approach in interpreting the spatial, functional and contextual conditions that shape perception of safety.

Fig. 2 – Distribution of the 23 parks across the city's neighbourhoods, with the locations of School buildings and Law enforcement headquarters (author's elaboration). Sources: Urban parks, Law enforcement headquarters and Neighbourhoods (Comune di Torino 2012, 2017, 2025).



The dataset for the case study includes indicators across several dimensions of urban and environmental quality: surveillance, lighting, perimeter control, entrances, pathway design, people flow, maintenance, surrounding neighbourhood, and materials/equipment.

These indicators were then aggregated into a composite index, calculated both in an unweighted form – assigning equal value to each indicator – and subsequently in a weighted form (see Tab. 2), following the evidence of relevance provided in the

literature (Cozens & Love, 2015; Ekblom, 2011). It should be noted that the literature does not provide unambiguous and systematically replicable weightings.

Given that the literature does not provide unambiguous and systematically replicable weights for CPTED-based indicators, the weighting process was developed as an iterative and context-sensitive procedure. The final weights were not assigned solely on the basis of theoretical assumptions, but resulted from the combination of three steps: a review of the relative relevance attributed to CPTED criteria in the literature; sensitivity checks aimed at observing how the ranking changed under alternative weighting schemes; and consultation with municipal planning experts and administrative technical staff, who assessed the operational plausibility of the proposed weights in relation to the local planning and management context.

This process made it possible to verify whether the ranking was excessively dependent on a single weighting configuration and to identify which parks were more sensitive to changes in the relative importance of specific criteria. The Lighting criterion was assigned a relatively high weight, given the statistically significant associations between lighting interventions in public spaces and reductions in crime, replicated across multiple contexts and time periods (Welsh, Farrington & Douglas, 2022). In a similar vein, the value of maintenance as a CPTED pillar, and as a lever supported by experimental evidence on environmental improvement interventions (cleaning/greening), has been demonstrated. Such interventions have been shown to reduce crime and improve perceived safety (Garvin, Cannuscio & Branas, 2013). Perimeter control and people flow were assigned a medium-to-high weighting, as they are recognised by the “defensible space” tradition and CPTED as mechanisms for reducing crime opportunities (Newman, 1972; Cozens & Love, 2015). The Surveillance criterion was weighted to a significant degree, albeit not preeminently, in accordance with the prevailing precepts of CPTED, which regard it as a catalyst for informal surveillance and social monitoring. It is, however, acknowledged that the effects of this criterion may be context-sensitive (Ekblom, 2011). The remaining weights were assigned uniformly, ensuring relatively higher values for criteria most closely linked to the morphological design of the space (e.g. lines of sight, path design, entrances) and assigning less importance to criteria less directly controllable in the design of the individual space (e.g. surroundings) and to elements on which it is generally easier to intervene (e.g. appropriate materials) (Cozens & Love, 2015).

Tab. 2 – Weighting of criteria (authors' elaboration).

Criteria	Weight
Surveillance	0.11
Lines of sight	0.06
Lighting	0.17
Perimeter control	0.14
Maintenance	0.19
Entrances	0.06
Path design	0.06
People flow	0.14
Surrounding	0.04
Adequate materials	0.03

This comprehensive approach provides an overview of the spatial configurations that either strengthen or weaken the perception and actual conditions of safety, as measured by the SeTUP indicators. The indicators prove to be useful tools for objectifying aspects that are difficult to detect through perception alone, enabling the identification of recurrent elements such as poor visibility, insufficient lighting, discontinuities in pedestrian trajectories, the presence of barriers, or residual spaces poorly integrated into the park's overall structure (Taylor *et al.*, 2019).

The collection of indicators constitutes an important step in translating safety considerations into a prefiguration of spatial design. The objective is to integrate urban safety within the planning process rather than relegating it to additional sectoral tools. Otherwise, the issue risks being delegated to external sectoral plans, which rarely succeed in influencing real processes of urban transformation. From this standpoint, the development and compilation of the designated indicators serve a dual purpose. Firstly, they are instrumental in supporting the study's analytical component. Secondly, and perhaps more importantly, they offer an operational value for planning and urban design. This is because they facilitate the establishment of a decision-support tool for the Municipal Land use Plan. This tool can identify spatial units that require more meticulous public-space implementation. Furthermore, it can establish performance targets, objectives, and anticipated outcomes based on the indicators.

3. Discussion of the results

The data collection phase also offers an opportunity to reflect on a central aspect of planning: indicator collection is not merely a technical or descriptive stage but a first step in design interpretation. In this case, the methodology relates physical morphological components (lighting, fencing, pathways, edge quality, furniture) to use and context-related components (presence of attractors, residential density, schools, condition of streets and properties). From a design standpoint, the multidimensionality of the indicators is crucial, as it places the interpretation of public space at the core of the urban infrastructure.

The construction of the unweighted composite index – obtained as a simple average of indicators normalised to a 0-100 scale – yielded an initial comparative classification of the selected parks in Turin (see Table 3, third column). In this configuration, the highest values are associated with Parco Cavalieri di Vittorio Veneto (71.84), Parco del Valentino (66.24), Parco della Tesoriera (64.80), and the Giardini Reali (controlled access area) (64.25). At the same time, Parco dell'Arrivore (37.10) and Parco San Vito (36.11) occupy the lowest positions.

These results are useful because they provide a comparative geography of perceived safety conditions; however, they must be interpreted with caution. As clarified in the methodology, this is an index relative to the sample, not an absolute measure of the “safety” of the parks. The ranking should therefore be understood as a representation of the differences within the observed sample.

Subsequently, the criteria were weighted – as reported in Table 2 –. This procedure allows assigning different levels of relevance to the factors under analysis. In particular, the most influential criteria are lighting, perimeter control, maintenance, and people

flow, which show the highest weighting values within the selected set of criteria. The resulting ranking (Table 3, “Weighted index” column) increases the composite index scores of those parks that display higher values in the dimensions considered most influential. Parco Cavalieri di Vittorio Veneto (85.78) and Parco del Valentino (82.06) remain at the top of the list, while the scores of the Giardini Reali (controlled access area) (79.71) and Parco Dora (79.31) also improve significantly.

Tab. 3 – Ranking based on the composite index, using Weighted criteria (authors’ elaboration).

Urban Parks	Weighted index	Unweighted index	Index delta
Parco Cavalieri di Vittorio Veneto	85,78	71,84	13,94
Parco del Valentino	82,06	66,24	15,82
Giardini Reali (controlled access)	79,71	64,25	15,46
Parco Dora	79,31	60,59	18,72
Parco della Tesoriera	76,94	64,8	12,14
Parco Aurelio Peccei	74,02	56,95	17,07
Parco della Colletta	66,96	52,39	14,57
Parco della Pellerina	65,79	62,34	3,45
Parco di via Calabria	64,84	48,23	16,61
Giardini Reali (open access)	61,2	45,28	15,92
Parco Ruffini	60,81	48,24	12,57
Parco Crescenzo	59,36	47,32	12,04
Parco di Vittorio	58,58	53,42	5,16
Parco della Giraffa	58,4	48,86	9,54
Parco Millefonti e Giardino CIL	58,21	47,05	11,16
Parco Europa	55,42	38,81	16,61
Parco Sempione	53,03	47,77	5,26
Giardini Braccini	51,03	38,82	12,21
Parco Colonnotti (Via Artom)	50,16	38,83	11,33
Parco dell’Isolone di Bertolla	42,9	45,12	-2,22
Parco San Vito	38,77	36,11	2,66
Parco del Meisino	34,53	38,88	-4,35
Parco dell’Arrivore	31,79	37,1	-5,31

A comparison between the unweighted and weighted indices reveals that, except for three cases, the latter tends to increase the composite index's value. As shown in Figure 3, this trend is particularly pronounced in central and semi-central parks, where the weighting appears to place greater emphasis on accessibility and integration into the urban fabric.

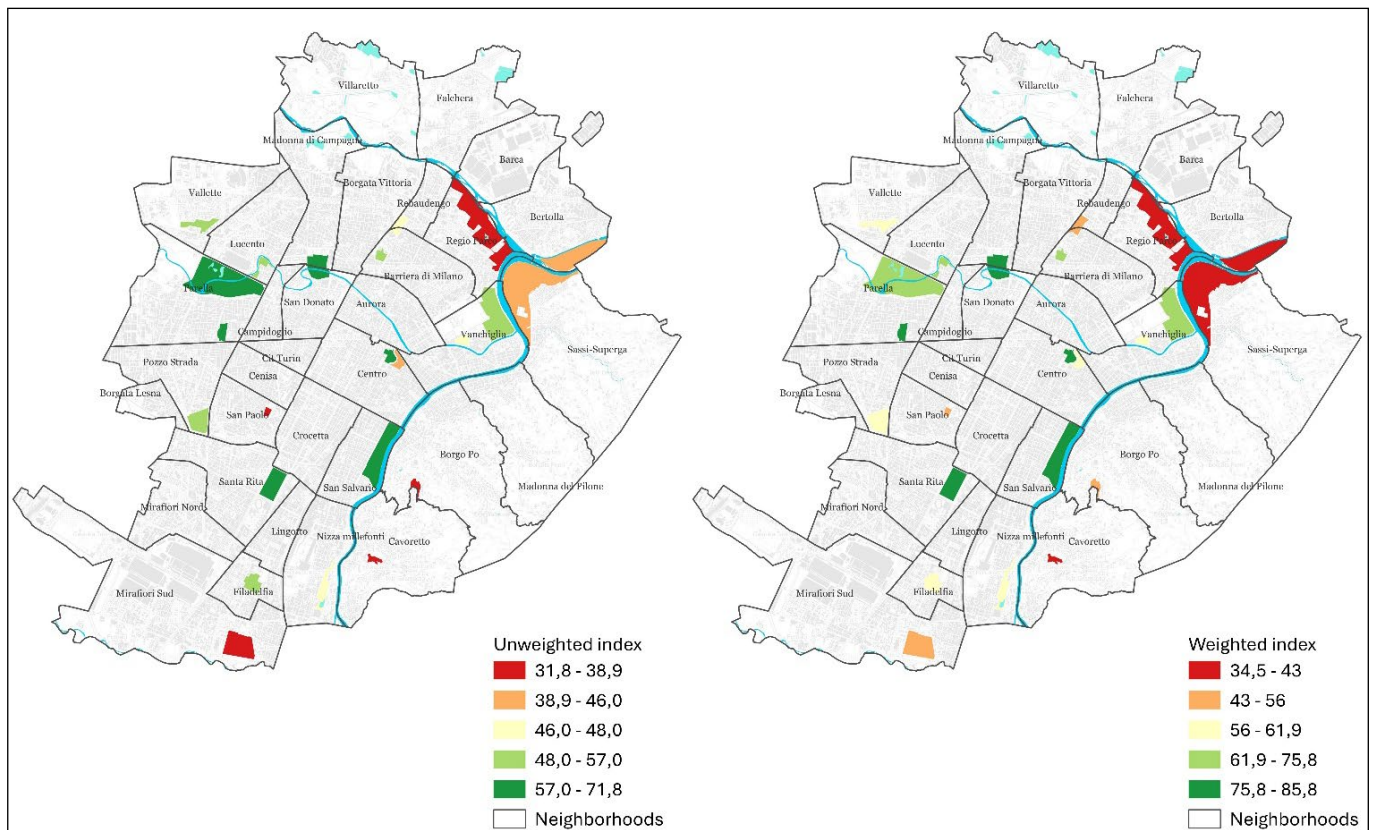


Fig. 3 – Turin's urban parks distribution. Comparison between the unweighted composite index (left) and the weighted composite index (right). (author's elaboration).

Conversely, the parks with the lowest performance values share the presence of specific penalizing factors, such as peripheral location and large territorial extent – as in the cases of Arrivore Park, Meisino Park, and Colonnetti Park – or localized in hilly parts of the city – as in the cases of San Vito Park and Europa Park, which constitutes an additional critical factor. Overall, the comparison between the two indices suggests that the introduction of weights helps to highlight the effects of urban location and morphological characteristics on the parks' overall performance. From a design perspective, the indicators are not merely ex-post classification tools; rather, they represent an important instrument for supporting spatial configuration choices. The aim of this work is not strictly to determine which park performs better or worse, but to understand which components determine its ranking position and, above all, which design levers may alter that position. In this regard, the matrix developed for Turin's urban parks is effective in providing a synthetic evaluation of urban safety and in identifying of critical issues that can be addressed through design interventions. A park positioned in the middle or lower part of the ranking is not simply an unsafe place; instead, it is a space where certain variables – such as accessibility, entrance legibility, pathway quality, maintenance, or weak patterns of everyday use – are problematically layered and thus can be addressed through targeted design strategies.

4. Limitations and challenges

The approach adopted in the Turin case study also reveals several limitations that a mature urban planning interpretation cannot overlook.

The first issue concerns the sensitivity of min-max normalisation to outliers in quantitative values. This phenomenon is particularly evident in the context of two specific indicators, namely: pathway length and the number of residents, both of which exhibit considerable variation within the sample. The second limitation pertains to the nature of certain contextual indicators, which gauge conditions external to the park. An overemphasis on these indicators may result in the inequitable penalisation of parks situated in the city's more peripheral or hilly regions. The third critical point pertains to the classification of S13 (restrooms/ha) and S17 (schools within 400 m) as indicators to be minimised – a decision that is coherent with the adopted matrix but conceptually delicate, as these variables may have different implications depending on the context and the observed patterns of use. Educational institutions, for instance, may be associated with emerging forms of soft crime; conversely, they represent a significant territorial presence, perform a fundamental cultural function, and generate substantial flows of people, thereby contributing to increased natural surveillance in surrounding areas. A further critical issue is the absence of granular, georeferenced data on the hazard component (crime reports), which limits risk analysis to the vulnerability and exposure dimensions alone. In this respect, a possible future development of the research would be to establish a dialogue with the public administration to initiate institutional collaborations aimed at accessing and integrating more detailed, fine-grained datasets. Implementing such a measure enhance the overall performance and reliability. Furthermore, it would facilitate the incorporation of the hazard component in a more robust manner, thereby advancing towards a more comprehensive and operational model.

5. Masterplan: translating the index into planning-oriented guidance

While the composite index provides a comparative diagnosis of Turin's parks and clarifies which dimensions most strongly shape vulnerability and exposure, the results also highlight a practical planning issue: measurement does not automatically produce action. Rankings and profiles remain “external” to planning unless they are translated into priorities, phased interventions, responsibilities and monitoring routines. For this reason, we propose adopting the masterplan—understood as a non-binding yet operational instrument bridging the statutory local PRG and the project/management domain—as the key translation device.

The comparative ranking produced by the SeTUP-based composite index should not be interpreted as a definitive measure of “safety”, but as a decision-support device that makes visible which spatial and management variables are most likely to shape vulnerability and exposure in urban parks. The key methodological and policy issue is therefore not the ranking per se, but the translation of results into actionable guidance. In the current Italian debate, the masterplan is often framed as an non-binding “intermediate” tool capable of bridging strategic planning and project implementation, especially when sectoral actions (security, green management,

social policies, public works) remain fragmented. In this paper, we adopt this interpretation and propose a masterplan structure that is explicitly derived from the index outputs.

We clarify why a masterplan is needed in this framework. The index identifies relative performance and profiles of criticality, but it does not, by itself, specify (i) priorities, (ii) phased interventions, (iii) responsibilities, or (iv) monitoring. A masterplan provides the missing “hinge”: it prefigures desirable spatial scenarios, connects objectives to expected performance, and organizes interventions into coherent packages, without replacing the statutory local PRG or detailed design.

We identify evidence-led priorities for translating weights to “intervention packages”. The weighting scheme (Tab. 2) is used here as an explicit priority-setting device. Weights express the relative contribution of each criterion to the composite score; therefore, improving a highly weighted criterion is—within this model—more likely to produce a meaningful change in overall performance than acting on a low-weighted one, all else being equal. In our case, the highest weights are assigned to Maintenance (0.19) and Lighting (0.17), followed by People flow (0.14) and Perimeter control (0.14), with Surveillance (0.11) providing additional leverage on everyday natural control. Lower-weighted criteria (e.g., entrances, path design, lines of sight, surroundings, materials) are not irrelevant; rather, they tend to act as enabling or reinforcing conditions that make the high-impact levers work better in specific park contexts.

For this reason, the masterplan does not translate the weights into isolated, single-issue measures (“do maintenance”, “add lights”), but into replicable intervention packages that combine design, management and (where appropriate) programming. Each package is anchored to one or more high-weighted criteria and uses lower-weighted criteria as complementary design levers: CARE operationalises maintenance and management standards (maintenance plus materials and repair routines); LUX targets night-time legibility through selective lighting upgrades supported by visibility and path legibility measures; FLOW strengthens everyday presence and natural surveillance by increasing legitimate use, connectivity and attractors (people flow plus surveillance); and EDGE improves perimeter clarity and access regulation, supported by entrance hierarchy and wayfinding (perimeter control plus entrances). This packaging logic turns the index results into planning-oriented guidance: the weights define “what matters most” in the model, while the packages specify “what to do”, “in which combination”, and “with which operational and monitoring implications”.

We therefore propose four integrated packages, each combining physical design, management, and (where relevant) programming:

Table 4. From weighted criteria to masterplan packages, actions and monitoring indicators (authors' elaboration)

Highest-weight criteria (Tab. 2)	Masterplan package	Specific actions (examples)	Monitoring indicators (examples)
Maintenance (0.19) + supporting: Adequate materials (0.03), Surrounding (0.04)	Package A CARE Maintenance & management first	- Differentiated maintenance standards by park typology (central / peripheral / hillside / large-scale) - Rapid "repair protocol" for critical elements (broken lights, vandalised furniture, damaged paving, litter hot spots) - Cleaning and waste-management intensification in recurrent hot spots - Upgrading benches, signage, bins, and "micro-furniture" that supports legitimate presence	% of broken lights repaired within X days N. maintenance tickets/month and median resolution time - Cleanliness score from periodic audits % of critical paths/focal points meeting a minimum "state of repair" standard - User-reported maintenance issues (app / hotline)
Lighting (0.17) + supporting: Lines of sight (0.06), Path design (0.06)	Package B LUX Selective lighting & legibility	- Lighting audit focusing on entrances, primary paths, junctions, conflict points and "dark pockets" - Selective upgrades (not uniform over-lighting) - Vegetation management to preserve ecological value while ensuring visibility in key segments - Wayfinding/legibility improvements along the primary path network	- Average illuminance (lux) on primary paths and gateways (target thresholds) N. of "dark pockets" identified vs. mitigated % of primary path length meeting lighting standard - Night-time perceived safety score (survey) - Audit-based visibility score at key nodes
People flow (0.14) + supporting: Surveillance (0.11), Surrounding (0.04)	Package C FLOW Everyday use, attractors & natural surveillance	- Strengthen daily attractors (playgrounds, sport nodes, small compatible services where appropriate) - Programming/partnerships with local actors (schools, associations, neighbourhood services) to diversify presence across time slots - Improve walkability and connections to public transport stops; safer crossings - Activate edges/frontages where feasible (adjacent uses, "eyes on the park")	- Footfall counts (manual or sensor-based) by time bands (day/evening) - Diversity of users/time slots (observational audit) N. of programmed activities/month and attendance - PT accessibility: walking time to stops; N. of safe crossings added/retrofit - Night-time presence proxy (non-invasive counts)
Perimeter control (0.14) + supporting: Entrances (0.06), Surveillance (0.11)	Package D EDGE Perimeter & access clarity	- Hierarchise and redesign entrances (primary/secondary), improve signage and gateway legibility - Reduce ambiguous or conflict-generating secondary access points (where they undermine safety without real permeability benefits) - Edge treatment to avoid "blind" back sides (fences, opaque barriers, residual strips) "Soft control" options in critical contexts (opening hours, selective closures)	- Entrance legibility score (audit) N. of access points redesigned/managed - Perimeter continuity/porosity ratio (planned vs uncontrolled access) - Incidents/complaints related to specific gates/edges (where available) - Perceived safety at gateways (survey)

Phasing should include: quick wins (maintenance, lighting repairs, entrance legibility), mid-term redesign (paths, edges, junctions, conflict mitigation), and structural measures (governance, data, integration into the local plan and funding cycles). Finally, another important question is the integration into the local PRG and

monitoring. The masterplan can operationalise the PRG by translating “urban safety in parks” into performance requirements (maintenance levels, minimum lighting standards in key areas, entrance clarity, path continuity, activation strategies) and by establishing a monitoring loop. Repeating the SeTUP audit periodically allows the municipality to track whether interventions shift parks from lower to higher performance bands. The masterplan also provides a framework for negotiating improved access to granular hazard data (where possible), enabling future integration of exposure/vulnerability with offence-related indicators.

6. Conclusions

Urban safety in public green spaces is increasingly recognised as a component of urban quality. Yet, it remains difficult to operationalise within planning practice, particularly in contexts where crime data are not available at fine spatial resolution. This paper contributes to this gap by applying SeTUP CPTED-based indicators to 23 accessible urban parks in Turin, combining on-site audits and GIS to construct a composite index of vulnerability and exposure. The results show that a multi-indicator approach can make visible recurrent spatial and managerial conditions associated with insecurity, providing more actionable comparative diagnosis than generic “safe/unsafe” labels.

The weighting scheme clarifies which levers matter most in the current framework: Maintenance (0.19) and Lighting (0.17) emerge as dominant drivers, followed by People flow (0.14) and Perimeter control (0.14), with Surveillance (0.11) reinforcing the relevance of everyday presence and informal control. The comparison between weighted and unweighted rankings suggests that central and semi-central parks tend to perform better, while large peripheral parks and hillside parks are more frequently penalised by combinations of limited flows, weak edge legibility, and challenging morphological conditions. These findings, however, must be interpreted within the limits of the method: min–max normalisation is sensitive to outliers, several proxies require context-specific reading, and—most importantly—the lack of granular hazard data prevents a full risk model.

The paper’s main argument is that evidence alone is insufficient for planning: without a translation device, the index remains a descriptive output. We therefore propose the masterplan as a non-binding technical instrument that bridges the structural logic of the local Municipal Land Use Plan (PRG) and the operational realm of design and management. Anchored to the weights and profiles derived from the index, the masterplan reorganises results into coherent intervention packages—CARE (maintenance), LUX (lighting), FLOW (everyday use and natural surveillance), and EDGE (perimeter and access clarity)—and frames phasing, responsibilities, and monitoring. In this way, the approach supports place-based strategies for Turin’s parks. It offers a replicable pathway for integrating urban safety into planning and long-term management of the public city.

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IMAGE SOURCE

All images are the result of the authors' original work.

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