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WORKING TOGETHER FOR BETTER CITIES

SECURITY IN PUBLIC SPACES

Security in Public Spaces Partnership

Approaches and tools to assess and measure security and safety in urban areas

Disclaimer

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List of acronyms

A	Asset
AI	Artificial Intelligence
Brå	Swedish National Council for Crime Prevention
CATI	Computer Assisted Telephone Interview
CCTV	Closed Circuit TeleVision
CON	Concern
COVID	COrona VIrus Disease
CPTED	Crime Prevention Through Environmental Design
CP-UDP	Crime Prevention through Urban Design and Planning
CRI	Crime
CURiM	Collaborative Urban Risk Management ICT platform
DEM	DEMografic conditions
DKK	Danish Krone
E	Expenditure
EC	European Commission
ECO	ECOnomic Conditions
EFUS	European Forum for Urban Security
ENSU	Encuesta Nacional de Seguridad pública Urbana
ERDF	European Regional Development Fund
ESM	European Security model
EU	European Union
FEA	Fear
FEE	Feeling
GDP	Gross Domestic Product
GP	Good Practice
HCP	Historic Centre of Porto
HFCT	Horizon 2020 Fighting against Crime and Terrorism
HINFRA	Horizon 2020 protecting INFRAstructure of Europe
I	Investment
IBA	Insta Blue Aware

ICCS	International Classification of Crime for Statistical Purposes
ICPC	International Centre for Prevention of Crime
ICT	Information and Communication Technology
ICVS	International Crime Victims Survey
INEGI	Instituto Nacional de Estadística y Geografía
INST	Institutional context
IoT	Internet of Things
IRB	Index for the Ranking or Benchmarking of more urban areas
ISA	Index for Self-Assessment of one urban area
ISCED	International Standard Classification of Education
ISFP	Internal Security Fund Police
JRC	Joint Research Centre
L	Large cities (250,000 - 500,000 inhabitants)
LAU	Local Administrative Unit
LCCP	Local Council for Crime Prevention
LEAs	Law Enforcement Agencies
LRAs	Local and Regional Authorities
M	Medium cities (100,000 - 250,000 inhabitants)
MD	Municipal Department
MIT	MITigation
MS	Member State
MSB	Swedish Civil Contingencies Agency
NGO	Non-Governmental Organization
NTU	Nationella trygghetsundersökningen
NUA	New Urban Agenda
NUTS	Nomenclature of Territorial Units for Statistics
O	Opportunity
OBJ	Objective
OECD	Organisation for Economic Co-operation and Development
OCR	Optical Character Recognition
PCA	Principal Component Analysis
PM	Particulate Matter

POL	POLice
POP	POPulation
Q	Question (of the survey)
R&D	Research and Development
RPAS	Remotely Piloted Aircraft System
S	Small cities (50,000 - 100,000 inhabitants) or strength
SALAR	Swedish Association of Local Authorities and Regions
SCI	Safe Cities Index
SD	Standard Deviation
SDG	Sustainable Development Goal
SER	SERvices/infrastructures
SI	Service and Infrastructures
SKR	Sweden's Municipalities and Regions
SMUA	Survey addressed to citizens of More Urban Areas
SOUA	Survey addressed to citizens of One Urban Area urban areas.
SUB	Subjective
T/THR	Threat
TEIU	The Economist Intelligence Unit
TRU	TRUst
UA	Urban Agenda
UAV	Unmanned Aerial Vehicle
UIA	Urban Innovative Action
UN	United Nations
UNICRI	United Nations Interregional Crime and Justice Research
UNODC	United Nations Office on Drugs and Crime
UPSI	Urban Public Safety Index
VAT	Vulnerability Assessment Tool
VIC/VICT	VICTimisation
W	Weakness
WHO	World Health Organisation
XL	Extra-Large cities (500,000 - 1,000,000 inhabitants)
XXL	Extra-Extra Large cities (1,000,000 - 5,000,000 inhabitants)

Abstract

The Action Plan of the Urban Agenda Partnership on Security in Public Spaces foresees in the context of its Action1 the development of a self-assessment tool in the field of urban safety and security to support policies of EU cities and regions of all sizes. This study contributes to the main aim of the Action 1 through two steps, which are presented in this study.

The first step comprised an analysis of needs as well as existing practices to measure security and safety across cities. The precise identification of the needs and resources of urban authorities is deemed crucial for the development of feasible and sustainable self-assessment initiatives that can be successfully adopted. To this end, a survey addressed to representatives of local and regional authorities and the other actors operating in the urban safety and urban security domain was organised. The analysis of its results was complemented with the review of existing instruments and practices in EU-funded research and innovation projects in urban security, in order to identify and compare relevant features and dimensions of existing approaches and tools.

The second step involved the definition of a new conceptual framework, aiming at supporting European cities in their self-assessment exercises related to urban security. The proposed conceptual framework relies on precise definitions of urban security, sense of safety and public space. The proposed framework is structured around six dimensions (i.e., *quality of life, social cohesion, public space liveability, sense of safety in public spaces, urban security* and *background conditions*) and takes into account almost 200 indicators. Availability of data is the cornerstone of the successful implementation of such a framework. Considering the operationalisation challenge, the conceptual framework has been designed to be modular and adaptable for its application to different urban settings. Finally, a question-based checklist was compiled to guide cities in defining their self-assessment method for measuring urban security.

Future research should consider a pilot application of the proposed conceptual framework with data collections performed by urban authorities. This will aim to evaluate the practical and effective applicability of approaches and tools based on the proposed conceptual framework.

Executive summary

This study is carried out in the context of the Action 1 of the Urban Agenda's Security in Public Spaces Partnership. It aims to define a holistic framework to assess urban safety and measure urban security addressing the specific needs of European urban authorities of cities of all sizes. It is also meant to provide indications on how to implement approaches and tools for city's self-assessment based on the proposed framework.

Urban authorities have a leading role in improving urban security in their territories. Clear situational awareness is crucial to design effective policies in this direction. Two main knowledge gaps might prevent urban authorities from defining effective policies towards improved urban security and/or urban safety: ***1. what is needed to know in order to assess and measure urban safety and/or urban security? 2. How to make practical and effective assessment and/or measurement of urban safety and/or of urban security?*** This study addresses the first question by developing a conceptual framework composed by six core dimensions and related indicators. The second question is partially addressed by a checklist, that may support urban authorities in operationalising the framework.

In Chapter 1, the overview of approaches and tools used to assess safety and security in urban areas highlights the **relevance of data**. Local, regional and national authorities, as well as third parties, implement diverse approaches to collect data on safety and/or security to gain the situational awareness of territories. Several tools including indexes are used to analyse and synthetise these data. Although safety and security have been considered from different perspectives, all instruments from the mapping exercise have been designed on the basis of more or less defined conceptual frameworks. In the last decade, **attempts to standardise methods to fill in knowledge gaps of urban authorities** and guiding them in assessing and measuring urban safety and/or urban security have been pursued by international organisations active in the domain. Nevertheless, also ready-to-use standard instruments have been rarely adopted autonomously by more than one urban authority.

An extensive mapping of the already adopted approaches and tools was deemed essential to get evidence on existing conceptual frameworks and their operationalisation. Three main sources have been used: the **analysis of answers to a survey** addressed to representatives of local and regional authorities, of police forces and of research institutions/international organisations (*Chapter 2*); a **desk review of 12 selected approaches and tools** (*Chapter 3*); and the **analysis of 10 ongoing and recent EU-funded research and innovation projects** (*Chapter 4*). All

these sources provided evidence useful to build and make operational a conceptual framework able to fill the urban authorities' knowledge gaps.

The survey, conducted by the Urban Agenda's Security in Public Spaces Partnership, investigated the experience of respondents about the assessment and measurement of safety and security in the cities for which they are answering. Data types, sources, approaches to collect them and tools for their analysis have been the focus of most of the questions.
The desk review aimed at reporting the core features of the conceptual frameworks behind some selected approaches and tools. Among them, dimensions investigated (e.g., perception of insecurity, urban safety, crime, victimisation) and indicators used to represent them. According to their type and purpose, approaches and tools were classified in four families: surveys addressed to citizens of one urban area (SOUA); surveys addressed to citizens of more urban areas (SMUA); indexes for self-assessment (ISA) of one urban area; indexes for the ranking or benchmarking (IRB) of more urban areas. Among the selected approaches and tools, six were considered good practices to be investigated in detail in terms of methodology, strengths, weaknesses, opportunities and threats. The analysis of projects participated by local authorities has stressed the importance of EU funding programmes (i.e., the Urban innovative Action initiative, the Internal Security Fund Police, Horizon 2020) in supporting research and innovation actions aimed at comprehensively improving urban security; protecting public spaces against terrorism; securing infrastructures and people in European smart cities; and facing crime and terrorism taking into account the societal dimension. Among the implemented activities in these projects, some pilots of approaches and tools used to assess urban safety and to measure urban security are of particular importance as giving evidence of practical collaborations between the actors in the domain.

Chapter 5 presents the proposed **conceptual framework** as result of the evidence collected in the mapping exercise, of the gaps and needs highlighted by the respondents of the survey, of the weaknesses and strengths points of the deep investigation of good practices in terms of approaches and tools and of the limitations and added value of what is implemented in the research and innovation projects. Such framework aims at addressing the first knowledge gap of urban authorities: ***1. what is needed to know in order to assess and measure urban safety and/or urban security?*** The framework is built around **five activities** among which are the selection of the main concepts related to urban security in public spaces, the identification of the actors and their objectives in terms of urban safety and urban security, and the involvement of stakeholders of the domain (i.e., representatives of urban authorities, of police forces, of EU institutions and of international organisations) to validate the proposed conceptual framework. **Six dimensions** (i.e., *quality of life, social cohesion, public space liveability, urban security, sense of safety in public spaces, background conditions*) and their

indicators are the building blocks of the comprehensive, modular and adaptable conceptual framework developed by this study. A future challenge to be addressed in future work is a pilot data collection run by a selected sample of urban authorities to validate the proposed indicators against availability and quality of data.

Finally, Chapter 6 presents the **checklist** responding to the second knowledge gap of urban authorities: ***2. How to make practical and effective assessment and/or measurement of urban safety and/or of urban security?*** The checklist includes nine questions that are meant to support urban authorities in operationalising the conceptual framework. The resulting method would be aimed to provide effective support to European cities of different size when assessing and/or measuring urban safety and/or urban security, taking into account their specific needs and their available resources.

1 Chapter 1 - Introduction to this study

Urban safety and urban security have been largely accepted as preconditions *"for urban economic and social development"* (Van Den Berg et al., 2006, p.2). So far, in the last two decades, a large number of initiatives to assess and measure safety and security in urban areas have been implemented in many countries and by different organisations. These initiatives have aimed to address knowledge gaps of authorities acting at the local, regional and national level; of local police forces or law enforcement agencies operating at the local level; and of organisations or individual researchers studying aspects of urban safety and urban security. Such gaps are related to retrieve knowledge and answer the following two main questions: ***1. what is needed to know in order to assess and measure urban safety and/or urban security? 2. How to make practical and effective assessment and/or measurement of urban safety and/or of urban security?*** The present work aims at building a framework to help addressing such challenging demands.

This study aims at providing a holistic method for cities of all sizes for assessing and measuring urban safety and urban security. In order to answer to the first research question, an analysis of dimensions (e.g., quality of life) and elements adopted in initiatives and projects having the same scope is carried out, and a conceptual framework of reference for the specific goal of this analysis is proposed. The second research question is addressed through the analysis of methodologies adopted in other initiatives and projects taking also into account the potential challenges related to their operationalisation. Finally, a checklist is prepared to support urban authorities in understanding what is concretely needed.

1.1 An overview of approaches and tools used to evaluate safety and security in urban areas and the relevance of data

Knowledge for the assessment and measurement of urban safety and urban security strictly depends on availability of data. When data on crime recorded by police forces or law enforcement agencies are not available or not suitable for the investigation scope of the urban authorities, citizens become a crucial source of primary data. Among the approaches designed and implemented by urban authorities, surveys addressed to population in urban areas have a primary role. In 2008 the Municipality of Bari (Italy) run a neighbourhood-based survey aimed to collect data on victimisation, perception of security and citizens' satisfaction of the work of law enforcement agencies (UNICRI, 2008). In 2009, the Municipality of Copenhagen (Denmark) carried out a survey on sense of unsafety,

Tryghedsundersøgelsen. The Municipality is still continuing such annual collection of data to properly get informed on the city security's perception of its citizens (case SOUA03). The Municipality of Piraeus (Greece) has taken the occasion of an Urban Innovative Action (UIA) project (project UIA01) to carry out a survey addressed to residents, business owners and employers in order to understand the state of fear of crime, insecurity and victimisation in specific urban areas, and their potential reduction thanks to the activities foreseen by the project (case SOUA02). Direct data collection activities have been used also in other UIA projects to gather information from citizens. In its inception phase, the ToNite project run a survey (around 500 people) and interviews (more than 50 stakeholders) for a qualitative data collection. They served for an ethnographic and social investigation aimed at understanding the culture and the perception of security and their dependencies from the demographic, social and economic conditions of the people living in the areas addressed by the project activities (project UIA03). Within the SURE project, around 800 interviews have been carried out with participants (not only residents) in occasion of different events to investigate general sense of safety (e.g., in the usual life), dynamic sense of safety (e.g., during events) and sense of safety in extraordinary cases (project UIA02).
Common are also cases of urban authorities that have benefitted from investigations carried out in their cities by third parties. Among them, for example, is the research carried out in the Historic Centre of Porto (Portugal) where people living, working or studying were interviewed about their perception of insecurity (case SOUA01). More frequent are examples of surveys carried out by authorities at a higher administrative level than the urban one. In 2019, the Tuscany Region (Italy) has conducted interviews with individuals from different municipalities on crime and on perception of safety after having relied on data drawn by the two surveys at national level realised in 2002 and in 2009 (case SMUA01). Regular surveys at the national level provide time series of data. Some of them prioritize specific dimensions of urban safety and urban security. For example, the annual *Swedish Security Survey (Nationella trygghets-undersökningen*) has since 2006 investigated crime and citizens' experience on crime taking into account also the degree of urbanisation (case SMUA02). Others aim at providing an overview of the safety and security situation. This is the case of the *Encuesta Nacional de Seguridad Pública Urbana (ENSU)* carried out quarterly in Mexico with a questionnaire aimed at collecting data on security, feeling of insecurity and victimisation from citizens of 85 selected cities (case SMUA03).

To a variable extent, the approaches adopted to collect data foresee a second step for the analysis and synthesis of information and, in some cases, a third one aimed at presenting and disseminating results to general public. Descriptive statistics are the easiest and most common way to inform policymakers and officials belonging to urban authorities as well as to share with citizens the status and perception of safety and security to the assessment and measurement of which they contribute. Multivariate statistics allow to combine data related to crime, nuisances and their

perceptions with other social and economic features of territories, features of urban environment and characteristics of citizens. Some of the cities participating to the survey launched by the Urban Agenda's Security in Public Spaces Partnership reported to use tools for data analysis. Two of them referred to a generic data analysis tool, two are developing a web-based business intelligence platform and one is already using an intelligent management platform (*Paragraph 2.2*). *Close dashboards* are often used by urban authorities as tools to structurally carry out data analysis. For example, at the time of the publication of this study, the City of Helsinki (Finland) is developing an analytical tool similar to a dashboard. Other fewer authorities provide *open dashboards* to allow residents to directly understand and monitor urban safety and urban security. An example in this sense is the *Securidad Map* of the Government of the Mexican State of Jalisco, that allows users to investigate the occurrence of specific types of crimes by city over a period of eight years.

Indexes have been used as primary tools to analyse and synthesize data collected on urban safety and urban security. This especially has occurred in large cities. The Municipality of Rotterdam (The Netherlands) started to measure safety at the district level in 2002 with a *Safety Index* that was replaced in 2014 by the *Wijkprofiel* (neighbourhood profile). The neighbourhood profile maintains the safety index as one of the three indexes considered for the assessment of liveability of the districts of the city (case ISA02). The city of Tel-Aviv tested a security sensitivity index identifying hot spots on the city map that, according to 2010 data, can be correlated with certain types of crime (Shach-Pinsly and Ganor, 2014). Public urban safety in Shanghai is synthetised by an index combining assets, investments and expenditures made available by the urban authority to foster urban development, to reduce urban crime and instability, to improve urban housing and liveability and to mitigate urban disasters (case ISA01).

Indexes rely on conceptual frameworks whose adoption has offered to urban authorities the advantage of comparability of safety and security measurement over time. In addition, in a number of initiatives benchmarking between cities in the domain of safety and security has been exploited through indexes. The *Sweden's Municipalities and Regions* (SKR) and the *Swedish Civil Contingencies Agency (MSB)* rank 290 Swedish municipalities in terms of urban safety and urban security on the basis of the weighted value (similar to an index) of several indicators. Quantitative data (e.g., from crime statistics) are combined with qualitative data (e.g., feeling of safety and security of citizens outside at night) gathered through a national survey (case IRB01). As a component of *quality of life*, safety is compared in 266 cities worldwide in the Telereport ranking created on the basis of indicators relying on quantitative data (case IRB02). More than 6,000 cities worldwide (this number relates to the end of March 2021 but is increasing daily) are compared through the crime index and the safety index on the NUMBEO website. Visitors of the website can freely fill in an online questionnaire on worries

about crime, experience with crime and perception of safety about the city they live in. The two indexes for the city are updated accordingly in real time and, if the city has got a certain number of completed questionnaires, regardless of its size in terms of inhabitants, is included in the two NUMBEO rankings (case IRB03). Overall safety of 60 (large) cities is measured every two years in terms of digital security, health security, infrastructure security and personal security by the *Safe City Index*. A conceptual framework relying on almost 60 indicators based on quantitative data and on experts' assessment allows to synthesize available information through the index and to generate a ranking in terms of safety of some of the most relevant cities in the world (case IRB04).

Comparison between cities on specific issues in terms of safety and security is done through indexes and other tools. An example is the *Index of Youth Vulnerability to Violence* developed within the National Programme of Public Security and Citizenship (2007-2011) as a mean to measure the level of safety (intended as social vulnerability) of the youth (age group 12-29 years) in Brazilian cities (International Centre for the Prevention of Crime and UNODC, 2011). In 2014, the index was then transformed into the *Youth Violence and Racial Inequality Vulnerability Index* (Abramovay et al., 2015) with the objective to measure violence among young people (homicides and traffic accidents), school attendance and employment status, poverty level of the city and inequality conditions in Brazilian cities with more than 100,000 inhabitants. With the occurrence of the COVID-19 pandemic the need of deeper investigations and of renewed approaches and tools raised (Box 1).

Box 1 - Crime and violence on youth in the context of the COVID-19 pandemic

On 6 April 2021, within the framework of the 10th Economic and Social Council Youth Forum, UNICRI, the Permanent Mission of the United Arab Emirates to the United Nations and the Ministry of Interior of the United Arab Emirates have organised the side event "*Protecting Vulnerable Youths from Crime and Violence in the Context of the COVID-19 Pandemic.*" Among the main evidence, the fact that the pandemic has exacerbated pre-existing vulnerabilities of certain groups. *"For instance, UN-Women reported an unprecedent increase in gender-based violence, including against young girls since the beginning of the pandemic. INTERPOL has found that, with both victims and perpetrators confined to their homes and connected to the internet for extended periods, there has been a worrying rise in child sexual exploitation and abuse globally. Strains brought on families during the pandemic have also weakened the integrity of the family unit, which plays an integral role in tackling substance abuse and addiction in youths.".* The event focused on the youth perspective and addressed the emerging threats associated to the COVID-19 pandemic, including their impact, possible solutions to mitigate it and priority areas of intervention to increase protection of vulnerable groups in the post-COVID-19 world.

Source: Webpage of the event on the UNICRI website. The event was attended by the author.

Tackling high-impact of petty crime is the aim of the four toolkits to be developed to promote a safer environment in the cities of the Cutting Crime Impact (CCI) project. One of these toolkits aims to build a model to understand and mitigate feelings on insecurity by properly measuring it through data such as those related victimisation, fear of crime, assumed situational vulnerability, situational anxiety, shock, anger and distress (project HFCT02). Creation and implementation of wide-scope tools to be used against terrorist threats in public spaces by urban authorities and law enforcement agencies (LEAs) are the goal of projects funded by Internal Security Fund Police such as PACTESUR and PROTECT (project ISFP01, project ISFP02). Juvenile delinquency, trafficking and organised crime, radicalisation and violent extremism and safe public spaces are addressed by the IcARUS project through specific tools supporting the implementation of a strategic approach to urban security combining crime prevention, sanctions and social cohesion. Exploitation of technological tools will serve to the purpose of the project (project HFCT03).

Approaches to collected real-time data about safety and security in urban context are designed and demonstrated in the Horizon 2020 projects focusing on smart cities. Proposed data-driven approaches rely on information gathered through grids of sensors deployed in the cities (especially surveillance camera systems) and/or on social media platforms. The SURE project aims to adopt a data- and user-driven urban security tool for analysis, monitoring and simulation of crowd-concentrated situations and specific events (project UIA02). In some cases, artificial Intelligence and big data analysis are also exploited to synthesize information collected (project HINFRA01, project HINFRA02). Technologies were also used to develop tools (e.g., apps for citizens' mobile devices) to allow sharing in real-time crime information among citizens and with authorities as in the City.Risks project (project HFCT01). The short-term alerting function for interventions and actions of citizens and LEAs in these types of data collection usually prevails on the strategic mid-term crime prevention strategies of urban authorities. The potential of real-time data collection approaches still remains under-exploited to fill in knowledge gaps of urban authorities when assessing and measuring urban safety and/or urban security.

1.2 The need of standard approaches and tools to fill in the knowledge gaps of urban authorities

Standardisation is a long-lasting perceived need of urban authorities in terms of tools for data analysis and approaches for data collection. It is more than a decade that international organisations active in the domain have been providing support to territorial authorities in the design and implementation of instruments to fill in their knowledge gaps in terms of safety and security in cities.

A ***Guidance on Local Safety Audits*** was published in 2007 (EFUS, 2007). A safety audit is defined as "*a systematic analysis to gain understanding of the crime and victimization-related problems in a city, to identify assets and resources for preventive activity; to enable priorities to be identified; and to help shape a strategy that will enable those priorities to be tackled.*" (p. 10). Such guidance provides standardised indications to urban authorities on topics to be investigated at the city level as well as on the instruments for data collection and analysis. When referring to topics, investigation is suggested to relate to environment (e.g., size of city, land use, economic structure, political situation), demography (e.g., total population, gender balance age structure, ethno-cultural diversity, employment/unemployment), crime and disorder (e.g., offences types, occurrences, offenders, victims, target, distribution), impact and economic cost of crime (e.g., on individuals and communities, demand on hospital emergencies services, value of the property stolen, cost of security and justice), perceptions (e.g., of risk, of vulnerability, of police, of justice, of other services), risk factors (such as relative poverty, violence, growing up in care, dropping out of school, mental illness), services (e.g., providers, range, quality, access, usage), initiatives (e.g., existing projects and programmes, effective practices), stakeholders (e.g., interest, capacities, resources). Additionally, the guidance suggests a four-stage implementation audit process including: a wide and shallow analysis, a narrow and deep investigation, the identification of priorities and opportunities, the definition of consultation and communication activities. Examples of approaches and tools already existing are also described with hints for practitioners.

In 2010, focusing on a standard approach for data collection, the United Nations Office of Drugs and Crime (UNODC), with the aim to complement police reported data, published the ***Manual on Victimization Surveys*** to assist in the design of crime victimisation surveys and to provide indications on how to analyse survey results (UNODC, 2010). Practical indications were provided on the basis of examples of crime victimisation surveys already adopted. Among the aspects to be investigated, especially when international comparability is taken into account, are: measure of victimisation in the past 12 month (for specific crimes, e.g., theft of vehicles, robbery, physical assault, sexual offences), measure of repeat victimisation in the past 12 months (for specific crimes), reporting to the police, crimes involving weapons, victims who suffered physical injury, victim-offender relationship, public confidence/trust in police, feelings of safety and basic socio-demographic conditions.

The guidebook on ***Methods and Tools for a Strategic Approach to Urban Security*** published by EFUS in 2016 (EFUS, 2016) aims to support European urban authorities *"to build and review their security policies using reliable information and data collected on the ground"*. A strategic approach to urban security by exploiting local security audits is proposed as the solution to fill in the knowledge gaps of urban authorities. Similar to what was suggested in the *Guidance on Local*

Safety Audits published in 2007, relevant data to be collected should be related to context, demography, crime and disorder, impact and economic cost of crime, perceptions, risk factors, services and initiatives, and stakeholders. More attention in the guidebook is given to *assets* intended as *social capital, civil society, buildings, land and other resources.* Recommendations to urban authorities in terms of governance and sustainability aim at supporting a manageable and effective implementation of the proposed strategic approach. Involvement of the stakeholders in the domain (citizens in particular) as well as integration of the security prevention policies with other long-term policies for the city are amongst the most important suggestions. An overview of available methods and tools for implementation with related advantages and disadvantages allows urban authorities to identify what better fit their needs in order to fill knowledge gaps.

In May 2019, the ***United Nations System-Wide Guidelines on Safer Cities and Human Settlements*** were adopted by the first United Nations Habitat Assembly with the aim to provide a reference standard approach for urban authorities to respond to the challenges of guaranteeing safety and security in cities. Key element of such an approach is *"a vision of urban safety and security that makes society more cohesive and improves quality of life for everyone. This vision should integrate the participation of the community and be inclusive of all residents, especially the most vulnerable groups."* (UN–HABITAT, 2020a). Furthermore, UN-Habitat started to develop a ***global Monitor of Urban Safety*** expected to be implemented in 2021. A series of events attended by high-level experts was initiated with the aim to support the investigation of ongoing initiatives. These include the online Expert Group Meeting on *"Global Urban Safety Indicators and Monitoring Tool",* held in Madrid on 17 December 2020, and the online webinar on *"Tools for Urban Safety Monitoring: A comprehensive perspective",* organised on 21 January 2021 by UN-Habitat with the Madrid City Council. Both events served at sharing experiences on tools for urban safety monitoring with the aim to contribute to the progress of the Urban Safety Monitor prototype. The Guidelines and the global Monitor of Urban Safety aim also to support the implementation of the 2030 Agenda for Sustainable Development as well as the New Urban Agenda (NUA). Within the NUA Monitoring Framework, that complements the Sustainable Development Goal (SDG) monitoring framework, 77 indicators for monitoring the Transformative Commitments of the New Urban Agenda are proposed (*Annex 1*). Among these indicators, the *Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with Disabilities* (indicator 19) includes the main concepts related to security in public spaces and aims at measuring progress towards the achievement of Target 11.7: *By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities* (within the *Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable*) (UN-HABITAT, 2020b).

2 Chapter 2 - The mapping exercise: looking for adopted approaches and tools through a survey

A preliminary mapping exercise of what is currently implemented was carried through a **survey**. On 10 February 2021, the Urban Agenda Partnership on Security in Public Spaces launched an online survey[1] aimed at collecting information about the current approaches and tools adopted especially by Local and Regional Authorities (LRAs) in Europe to assess their territories' safety and security. The identification of the data and indicators used in these approaches and tools contributes to build a knowledge basis for a conceptual framework for urban safety and/or urban security. Such framework will be at the basis of self-assessment instruments made available to urban authorities in the EU Member States. Through the proposed method, cities and town would be able to reflect on their own status, progress made, or weaknesses to overcome in terms of urban safety and/or urban security.

The survey was a semi-structured questionnaire composed by 28 questions (Q), none of them mandatory (*Annex 2*). The structure of the survey (i.e., in three sections) mirrored the three main underlying research questions:

1) What kind of **data** are currently using LRAs to assess safety and security in their territories?
2) Which **tools** LRAs are currently using or developing to manage safety- and security-related data?
3) What kind of **gaps or needs** LRAs face regarding the assessment of safety and security in their territories?

At the closure of the survey on 24 March 2021, 16 questionnaires with useful information were received. The respondents included **representatives of urban authorities dealing with prevention/security, civil protection or urban planning** (8), r**epresentatives of local police or law enforcement agencies** (5) and **researchers/experts working on approaches for urban safety/security** (and their governance) adopted in one or more cities/regions (3).

[1] https://futurium.ec.europa.eu/en/urban-agenda/security-public-spaces/news/survey-action-1-developing-framework-self-assessment-tool-dedicated-urban-authorities

Respondents to the survey
Evidence useful to fill in the knowledge gaps

• **Urban safety and/or security measurement needs a multi-stakeholder approach.** Identified stakeholders benefit from the outcomes of a situational awareness in terms of urban safety and urban security in their city as well as have a role in contributing to the identification, collection and analysis of data needed for this awareness exercise. Such stakeholders can be classified in:
  • **urban authorities governing the territory of interest** (e.g., municipalities). Departments are those dealing with urban security, urban safety, resilience, civil protection, prevention and planning.
  • **local police or law enforcement agencies operating at the local level**. Direct involvement of officials in charge of collecting data related to official crime statistics is suggested.
  • **researchers/experts.** They play a crucial role in **defining/improving approaches for the data collection** and may have a role in **operationalising tools for the data analysis**. Their contribution could be also valuable in terms of recommendations based on evidence addressed to decision markers at the urban level.

Respondents are kept anonymous including the name of the cities they represent. Cities are characterised only by size in terms of inhabitants: S (small) cities between 50,000 and 100,000 inhabitants; M (medium) cities between 100,000 and 250,000 inhabitants; L (large) cities between 250,000 and 500,000 inhabitants; XL (extra-large) cities between 500,000 and 1,000,000 inhabitants; XXL (extra-extra-large) cities between 1,000,000 and 5,000,000; Global cities of more than 5,000,000 inhabitants (European Commission, 2012). Respondents represent cities of different sizes in terms of inhabitants: from **small cities** to **global cities** from 10 Member States (namely Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Portugal, Spain and Sweden). Among them, one of the respondents represents an **aggregation of various municipalities** with less than 100,000 inhabitants in total. Four respondents represent cities **out of the European Union** (one in Iceland, one in the United States and two in Chile).

Cities contributing to the survey
Evidence useful to fill in the knowledge gaps
• Assessment of the urban safety and/or urban security is a need of **cities.** And this need is perceived by **urban authorities managing cities and towns of any size** (i.e., LAU, NUTS3) and **also by entities grouping various municipalities**. Approaches for such assessment should be scalable and/or modular.

2.1 Data to assess and measure safety and security in cities

When asked which data are actually used to evaluate safety and/or security in cities (Q7) all the respondents mention **crime statistics** (16) as the primary source followed by information on **abuse of substances such as alcohol and drugs** (13), **on damage to property as those caused by vandalism** (12) and on disturbances (e.g., on public transports) (8) (*Figure 1*). The number of officials (that can be intended as a proxy of the capacity to discourage/fight crime) is considered important as well (8). Other information related for example to **social cohesion** through statistics on homelessness (7), inequalities (6), integration of immigrants (5), segregation of urban areas (5) and wellbeing (5) are **less frequently considered**. Statistics related to terrorism are directly taken into account in six city cases: among them are four capital cities and one medium-size city suffering a relevant terroristic attack in the last five years. Further data considered in evaluating safety and/or security are: incivilities, victimisations, traffic accidents and damages. **Citizens' perspective** is taken into account by considering sense of safety, experiences with vandalism, fear of terrorism and experiences with crime.

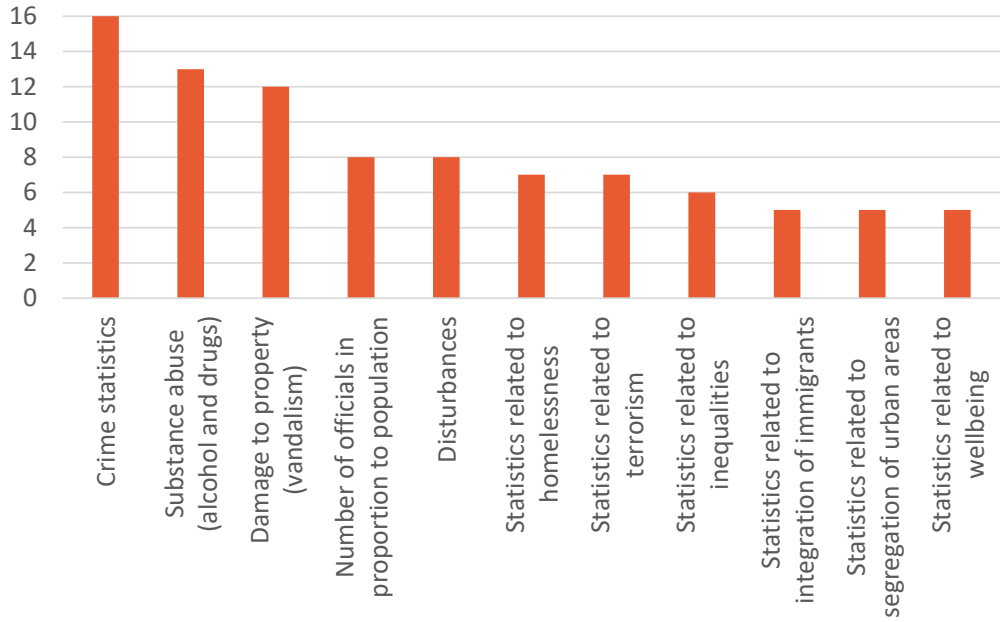


Figure 1 – Data used to evaluate safety and/or security in cities

Data used to evaluate safety and/or security in cities
Evidence useful to fill in the knowledge gaps
• **Crime statistics**, regularly collected by local polices or law enforcement agencies operating at the local level, are a crucial input for the assessment of urban safety and/or security. Among the other relevant information: **abuse of substances** and **damage of property**.

- **Information on social cohesion and economic prosperity** are only **partially considered.** Nevertheless, most of the cities contributing to the survey include at least one aspect representing the socio-economic conditions of the concerned urban area.
- **Terrorism-related indicators** are considered **relevant only for certain types of cities:** those of a certain size and/or having strategic social/economic/ cultural assets.

Referring to sources of data **to assess and measure urban safety and/or urban security** (Q8), in most of the cases (11), cities use **data from both internal and external sources.** Among them, one city explicitly refers to **citizens** as a source of information. In two cases no types of data are indicated. When external sources are taken into account, main sources are **regional/national statistics** (5) and **police data** (4). In one case, *Eurostat* is explicitly mentioned as external source of statistics. Another case refers to open data sources.

Sources of data used by local authorities

Evidence useful to fill in the knowledge gaps

- **Assessment and measurement** rely on **both internal and external data**. Police forces are a crucial source for crime-related data at the local level.
- A **balance** should be found between using **data provided by citizens** (reporting perception of security instead of security itself) and **data with a geographical scope larger than the concerned urban areas** (providing an average value for the territory they are referring to).
- **Open data acquisition** as well as **data fusion from different sources of information** (e.g., other municipal departments, police forces, sensors deployed in the city, citizens by means, for example, of mobile devices) are **still underexploited.**

About frequency of collection/analysis of data (Q9), 11 respondents report that **data are regularly collected**. In four cases data are collected annually while in other three cases **frequency** is strictly **related to the specific type of data**. *"It depends, some are updated daily, others every 2 years, and everything in between." "Some quarterly, others at six-year census periods." "This varies by source some data is updated on monthly basis, some on yearly basis."* In two cases updates are carried out on a monthly basis and in another case bi-annually. In some cities the most recent data are available **"on demand"** and/or used to define strategies/plans and to take actions/decisions. One of the researchers/experts highlights that non systemic collection/analysis of data depends on **resources and capacities to guarantee *"consistency and quality of data collection and analysis*** *for policy and programming within local authorities".*

Frequency of collection/analysis of data
Evidence useful to fill in the knowledge gaps
• **Regular collection of data** allows cities a continuous monitoring of urban safety and/or urban security that is crucial **to evaluate effectiveness** of adopted measures and/or of taken actions. Different frequency of data updates should not be seen as a negative aspect. • **Regular and coherent collection/analysis of data** may be affected by limited resources and capacities within the smallest urban authorities. • **Assessment of urban safety and/or urban security** should be **performed on a regular basis** as well as be **available "on demand"** to understand if events (e.g., an international fair) or structural changes (e.g., closure of small shops in suburbs) affect **safety and/or security of specific urban areas.**

When asked if standardised ways for identifying threats in public spaces were adopted (Q10) half of the respondents positively answered (8). One expert highlights that, especially in several developing countries, standardised approaches and tools are adopted at the national level and not at the local one. Instruments largely vary in terms of methodology, objectives, stakeholders involved and type of risk. Two of them use **surveys addressed to citizens** (i.e., a victimisation survey, a survey to detect unsafe areas within the city). In another case the **feeling of safety of population** is considered as well as crime facts. One city includes threats in public spaces in a **wider risk assessment approach of the urban area**, another refers only to terrorist threats that are managed by the local police in liaison with the national one. One city evaluates **urban planning** also in terms of prevention of crime and nuisance. **Focus on specific districts/neighbourhoods** is common in three cases.

Adoption of a standard approach for identifying threats in public spaces
Evidence useful to fill in the knowledge gaps
• **Cities adopt their own specific approach**, focused on identifying effects of threats in public spaces instead of threats themselves. • **Citizens' input** as well as **specificities by urban area** are taken into account.

Among the main gaps in terms of data related to urban safety and/or security and their availability (Q11), four types are identified: 1) **lack/incompleteness of data at the local level** as collection is managed at a higher/different administrative level (2); b) **lack of detailed data at the neighbourhood level** (e.g., existence of conflicts in specific areas of the city)(3); c) **lack of data for specific socio-economic aspects** (e.g., statistics related to integration of migrants, homelessness, segregation of

urban areas, wellbeing, inequalities) **and for crime** (especially unreported crime, drug trafficking, gender violence, vandalism)(6); d) **lack of data on evolving perception of citizens in terms of safety and/or security** (1).
Availability of existing data remains an issue because of **limited interactions between data owners**. In three cases the reason is the lack of cooperation between different offices/agencies of the city (as there is not centralised data collection). Data protection law is also mentioned as a reason that limits sharing. In other four cases, regular exchange of statistics between the city and the police forces (especially the national ones) is reported as an issue.

Gaps in safety and/or security data and issues on their availability
Evidence useful to fill in the knowledge gaps
• **Data on safety and/or security** are in a limited way **systematically and regularly collected at the local level** including, where the size of the city requires, the **neighbourhood dimension** (using also geo-located information). • A respondent asserts that urban planning deserves to be considered more. **Lack of standards in urban planning** is considered a weakness. *"Urban planning needs to integrate security and safety approaches, namely the need for joint **training on CPTED[2] and CP-UDP[3]** approaches targeting **multidisciplinary teams** (e.g., beneficiaries, police officers, municipal geographers, sociologists, architects)".* • The collection approach should be designed through a **participative process involving all the offices/agencies of the city and the police forces acting at the local level.** • A **qualitative data collection** (e.g., for perception of safety and/or security) should complement the quantitative data gathering.

When referring to specific **data deemed relevant to measure urban safety and/or urban security** (Q12, Q13), respondents mention a number of **statistics about crime** (e.g., number of criminal acts, number of detained, number of murders, crimes against property) (5) as well as **data on socio-economic aspects** of the concerned areas (e.g., segregation of urban areas, services to/activities of public access such as bars, games rooms, nightclubs, involvement of voluntary associations in public life, involvement of citizens in "neighbourhood watch groups"). One of the respondents refers to **safety indicators**. **Perception of the citizens** is relevant for seven respondents in terms of feelings of insecurity, use of public space and complaints. **Surveys** are considered the reference approach to collect perception of people living in the concerned urban areas. Other data

[2] CPTED = Crime Prevention Through Environmental Design (Cozens and Love, 2015).
[3] CP-UDP = Crime Prevention through Urban Design and Planning (Schubert H. et al., 2016).

considered relevant are: level of threats (e.g., terrorist threats including locations defined as 'dangerous areas'), attractiveness of/accessibility to events as well as buildings or critical infrastructures, availability of public transports and the related passengers' flow.
One respondent suggests the necessity to **define and implement coherent activities for collection and analysis of data** related to criminal activity, perception of security and design of public spaces with the aim to avoiding insecurity. One city refers to its **municipal strategy** aiming at enhancing safety and reducing crime in specific urban areas and with a special focus on the youngest.
Only five respondents declare to have **data on unreported crimes available**.

Data considered relevant to evaluate urban safety and/or urban security
Evidence useful to fill in the knowledge gaps
• **Relevant data on safety and/or security** refer to **crime, socio economic-aspects** and **perception of citizens. Surveys** serve to measure the perception of safety and/or security of citizens and to fill the knowledge gap due to unreported crimes. • **Approaches for data collection** are only **partially guided by pre-defined strategies of urban authorities**. • **Lack of data on unreported crimes** may affect the **proper assessment of the safety and/or security level of an urban area** and the effectiveness of the actions taken to increase them/it.

When asked about data collected through surveys for residents (Q14), investigation about urban safety and/or urban security focuses on the **sense of safety** (14), on **trust towards the police** (13) and on **victimisation** (11) (*Figure 2*). In nine cases (56.3%) all the **three aspects are considered together** and in four of them further aspects are investigated. Namely: worries/fears of people, residents' know-how/awareness, experience with police services, anxiety of becoming a crime victim, suggestions on what can improve the city safety, trust towards neighbours and fellow citizens, involvement in the neighbourhood life, neighbourhood vulnerabilities, opinion about specific aspects of the neighbourhood and of the urban area (e.g., layout, atmosphere, streetlights, and renovation status) and about its safety perception (e.g., weather the neighbourhood is a good place to raise your kids). Only in three cases surveys collect data on only one of aspects of interest (i.e., sense of safety, trust towards the police, victimisation). In the first case, collection of data on victimisation is coupled with those on use and perception of urban spaces. In the second case, the sense of safety is investigated together with the perception of presence of criminal associations. In the third case, the survey for residents asks only for trust towards the police.

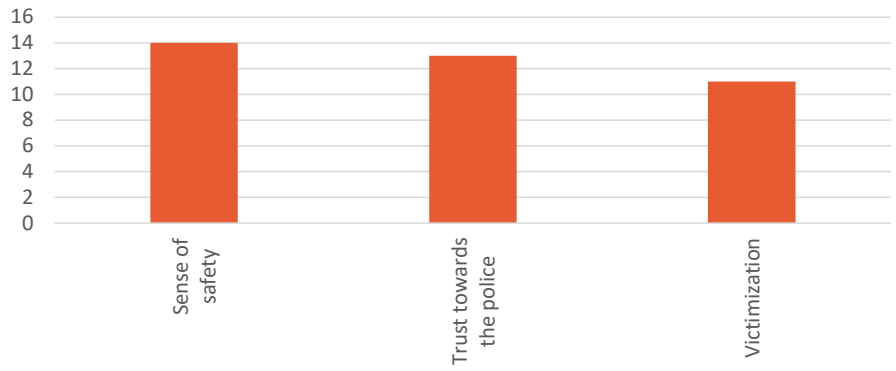


Figure 2 – Data collected through surveys for residents

Data collected through survey for residents
Evidence useful to fill in the knowledge gaps
• **Surveys for citizens** provide a relevant added value when structured for a **multi-purpose data collection.**

In all the 16 cases, **sense of safety is taken into account** through surveys (Q15). The most frequent type of survey is the one developed **by the city** (10) followed by **national surveys** (8) and by the ones run **by local police** (5) (*Figure 3*). In seven cases sense of safety is investigated through more than one survey type. Among them, six cases rely on both city surveys and national surveys and three cases on combination of city survey with local police surveys. **In 13 cases, surveys are run at local level**: by the city, by the local police or by both. In one of the cases relying on a single type of survey, sense of safety is not assessed at the local level and investigation focuses on the perception of the action of the municipal police.

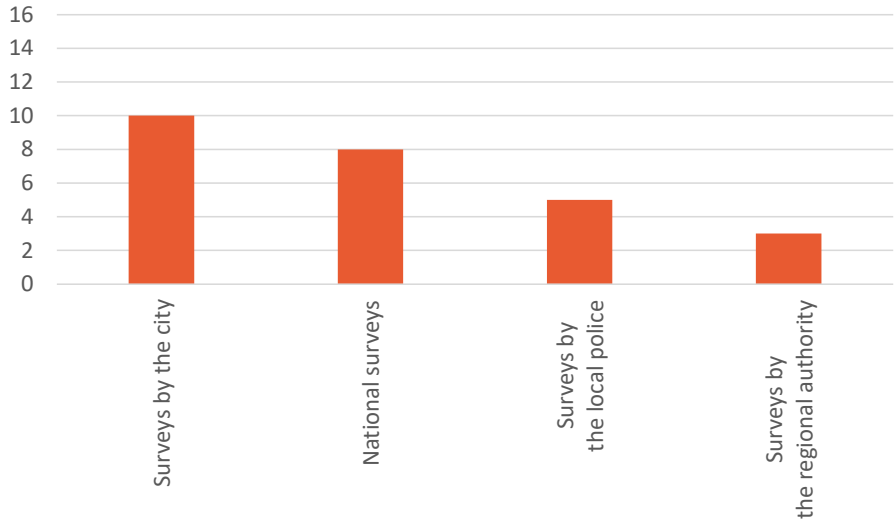


Figure 3 – Types of surveys for residents

Surveys as approaches to assess the sense of safety
Evidence useful to fill in the knowledge gaps
• Surveys designed and run at the local level allow cities to focus on **territorial-specific safety/security issues** affecting the residents' sense of safety. • Surveys designed and run at the local level offers the opportunity to urban authorities to take into account the **neighbourhood/district perspective when evaluating the sense of safety.**

When asked about the frequency in evaluating the sense of safety (Q16), 11 respondents declared that it is **regularly evaluated**. In five cases assessment of the sense of safety is carried out on a yearly basis, in four cases less than once a year (i.e., every two years, every three years, every five years), and in the remaining two cases more than once a year (i.e., every three months, every six months). One of the researchers/experts indicates that the sense of safety is evaluated, on average, every two years, but, in many cities, it is done irregularly. Surveys addressed to residents are on average less frequent than the other data collection approaches (i.e., frequency in collecting data on urban safety and/or security reported in point 5). Among cities answering to the survey, only in three cases frequency of the two data gathering activities (i.e., data on safety and/or security and data on sense of safety) is the same.

Frequency in assessing the sense of safety
Evidence useful to fill in the knowledge gaps
• **Frequency of the assessment of the sense of safety** can be aligned with the data collection process for urban safety and/or urban security making **the assessment comprehensive and consistent.** • **Unregular assessment of the sense of safety** may lead to delayed/ineffective actions by the city/local police in addressing the issues behind it.

Interesting evidence on the trend of sense of safety in recent years and its correlation with crime was collected through the survey. A summary of this evidence is provided in Box 2.

Box 2 – The trend of sense of safety in recent years and its correlation with crime

To representatives of the cities answering the survey two specific questions asked about the sense of safety: the trend in recent years (Q17) and its correlation with crime (Q18).

Evidence from the survey indicates that the **sense of safety in recent years is highly variable**. A positive trend has been declared by the respondent of one of the largest cities which evaluate the sense of safety in terms of **increase of the feeling of security** of citizens. Another city reported a reduction of fear (before the COVID-19 crisis). The sense of safety of the residents in one of the XL cities, measured as **people feeling the city safe or somewhat safe,** has improved reaching 92% of the respondent citizens in 2018. **Decrease in the sense of unsafety** has been detected at the neighbourhood level in another XL city from 2009 to 2016, followed by a small increase of the sense of unsafety (probably due to gang conflicts) and by a small decrease again. The level of the sense of unsafety is considered stable (since 2019). One of the small-size city having 25% of its **inhabitants feeling always or often insecure** 20 years ago (as resulted in the analysis of a crime victim survey) experienced a positive trend with the drop of the percentage of inhabitants feeling insecure (always and often) to 4.5% in 2018. In parallel with this achievement, the city gained also the reputation of one the cleanest cities of the region. A survey carried out in 2019 about the **perception of security of the population** of the small-size aggregation of municipalities (one of the respondents in the sample) found that 70% of the respondents expressed to live in "quite" safe municipalities with the perception of security remaining unchanged over the years. 20% of the respondents reported conditions of risk and concern with an increase of the perception of criminality while 10% of the respondents claimed the perception of security to be lower. An increase of the sense of safety is perceived by one of the respondents through **the increase in the use of public open spaces** in general and of spaces with accessibility improvements in particular (before the lockdown periods associated with COVID-19). An expert/researcher links the trend of the sense of safety to **improvements in walkability in the city** and in terms of **night-time policies**. For a XL city the sense of safety is perceived stable but also dependent on **demographic features of citizens** (e.g., gender, age, disability level). In another case, the respondent refers to stability in crime figures but highlights also the **increase of violence** and of the number of large **social manifestations with vandalism**. In one of the XXL cities the respondent declares that **people feel less safe**. A respondent for a large-size city highlights a negative trend of the sense of safety at national level based on **public anguish at delinquency** and on the **sense of impunity**, real or not, shown by offenders. The rise in crime and spikes in number of murders throughout undeserved neighbourhoods with a high predominance of minorities is indicated as a proxy of the sense of unsafety in an XXL city outside Europe.

Also, opinions about correlation between crime and sense of safety do not agree. Six respondents assert a **correlation**. Although not having any data to support this assumption, one of them supposes that an increase in the sense on unsafety in 2017-2018 was due to an ongoing gang conflict. A data analysis carried out in the same city for 2020 shows that the number of burglaries and robberies in local stores statistically affects the sense of safety in the neighbourhood. Another respondent from a large city claims that *"There is necessarily a correlation even if insecurity should not be confused with the feeling of insecurity. Various factors, not necessarily criminogenic, can nourish this feeling."* In two cases (one XL-size city and one XXL-size city), respondents highlight that the correlation between crime and sense of safety **depends on the urban area under investigation**. *"In many places where people feel safer is where more crimes are committed and vice versa"* one of them states. Among

the other respondents, five do not answer or do not have an opinion on this (e.g., not having any evidence) while the other three (i.e., one expert/researcher and representatives of cities outside Europe) have **doubts on the existence of this correlation**. One of them asserts *"Not usually. Sense of safety is not directly correlated to crime statistics."*

Source: The survey on approaches and tools adopted by Local and Regional Authorities to assess their territories' safety and security launched by the Urban Agenda's Security in Public Spaces Partnership.

2.2 Approaches and tools to collect and/or analyse safety- and security-related data

About the adoption of indexes or similar tools to evaluate the alignment of the actual urban safety and/or urban security situation with strategic objectives at city level, among the 13 respondents replying to this question (Q19), four of them assert to have **no strategic objectives set at the city level that are evaluated through an index.** Among the cities declaring to take decisions and actions in urban safety and/or urban security according to strategic objectives, three declare to assess achievement of such objectives **through indicators or statistics**. An XXL-size city has defined the number of crimes (to be reduced) and the feeling of security (to be increased) as strategic targets. One of the small cities in the sample has strategic objectives linked to a local safety diagnostic, with numbers and statistics from different sources. A percentage reduction each semester of specific crimes is the objective of an XL-size city while SDGs are the reference point for a plan set by another XL-size city to improve urban safety and/or urban security.
Worth to be mentioned are the municipal strategies of two XL cities in Europe that couple the achievement of the strategies' objectives with a regular monitoring of indicators or statistics. In the first case, the strategic approach was initiated with a program aiming at making the city safer in 2010 and is currently implemented through a 3-year strategy (i.e., 2018 – 2021). The overall goals of the strategy are a) to increase the sense of safety and b) to reduce crime in the city. The strategy sets the framework for crime prevention and efforts to improve safety in specific areas of the city. The main purposes of the strategy are: 1) ensure political and strategic anchoring of the municipality's crime prevention and the efforts to enhance safety locally in the city; 2) ensure common goals in the crime prevention efforts across the municipality units (e.g. for education, for social issues), and with police; 3) support cross-cutting collaboration on complex challenges related to crime and safety; 4) focus on cross-cutting challenges and create a basis for a political decision to be made to initiate relevant solutions across departments and organisations. Monitoring the two overall goals of the strategy (i.e., increase of the sense of safety and reduction of crime) is carried out through a regular survey addressed to city residents. The ongoing four-year strategy in the other XL-size city focuses on the sense of safety. The main goal is making all residents feeling safe in

the city, in general, and especially in the neighbourhoods recognised *"as the ones at the bottom of the 'sense of safety list'"*. To assess achievements of this strategy specific indicators are still to be developed and statistics/data still to be collected (e.g., data on young people conducting crimes to be collected by local police; residents' safety feeling to be collected through surveys).

City strategic objectives in terms of urban safety and/or urban security and indexes to evaluate them
Evidence useful to fill in the knowledge gaps
• **No specific indexes or ad-hoc scoreboards** are mentioned by the respondents as tools used to measure safety and/or security and related strategic objectives at the city level. Descriptive statistics and indicators are used by some cities. • The predominant approach seems to be more focussed on "addressing the current issues" **rather than on defining and implementing a medium-term integrated strategy for urban safety and/or urban security.**

Among the respondents, eight of them mentioned an approach or a tool of reference to collect and/or to analyse data about urban safety and/or urban security (Q20, Q21, Q22, Q23, Q24, Q25, Q26). Identified instruments can be classified as: **surveys** (3), **data analysis tools** (2); **web-based business intelligence platforms** (2); and **intelligent management platforms** (1). Six cities are already using such instruments while in the other two cases approaches or tools are under development. In the templates below are reported some of the features of the eight approaches and tools (i.e., scope[4]; type of data; outcomes of the data analysis; users or beneficiaries; availability of results to public; reference to safety and/or security measures of the city; technology involved, in general, and artificial intelligence; other data are not considered).

Case SU01 – A survey adopted by a global city (with more than 5,000,000 inhabitants) out of the European Union

Type of approach or tool	**Survey** developed at national level and addressed to residents in the country.
State of the art	Already adopted. Implemented since almost 20 years.
Scope	Urban security. In detail: crimes affecting residents' and feeling about crime. E.g., fear

[4] The scope of the approach or of the tool is reported as indicated by the respondent. Such definitions (e.g., urban security, perception of insecurity) can differ from those used in this study for the development of the conceptual framework (*Chapter 5*).

	to be victims of theft, injury, vandalism, crimes of economic nature, cybercrime.
Type of data	Quantitative data and qualitative data.
Outcomes of the data analysis	Comparison between regions in the country. Comparison between periods of time.
Users or beneficiaries	National, regional and local authorities dealing with public security.
Open to public	Yes. On demand.
Reference to safety and/or security measures of the city	No, at the city level. Yes, at the regional level. Cities of the region may use/refer to it.

Technology involved, in general, and artificial intelligence, in particular: surveillance camera systems in public areas.
Other data useful to assess urban safety and/or urban security that at present are not considered: gender violence, existing violent gangs, white collar crime.

Case SU02 – A survey adopted by an XL city (between 500,000 and 1,000,000 inhabitants) out of the European Union

Type of approach or tool	**Survey** developed at national level and addressed to residents in several cities in the country.
State of the art	Already adopted.
Scope	Urban security.
Type of data	Quantitative data and qualitative data.
Outcomes of the data analysis	Comparison between cities in the country. Comparison among variables. Various correlations.
Users or beneficiaries	Researchers. National authorities dealing with public securities. Cities directly involved.
Open to public	No. Official annual reports available on-line discloses results of the analysis to public.
Reference to safety and/or security measures of the city	Yes.

Technology involved, in general, and artificial intelligence, in particular: not specified.
Other data useful to assess urban safety and/or urban security that at present are not considered: not specified.

Case SU03 – A survey adopted by an XL city (between 500,000 and 1,000,000 inhabitants) in the European Union

Type of approach or tool	**Survey** developed by the city (and managed by a private company that provides data to the municipality on demand).

State of the art	Already adopted.
Scope	Sense of unsafety and experience with crime.
Type of data	Quantitative data and qualitative data.
Outcomes of the data analysis	Comparison between places/areas in the city. Comparison between day-time/night-time. Comparison between age groups, genders, employment, ethnicity and other demographic aspects. Comparison between periods of time. Analysis of a possible new safety/security related phenomena. Analysis of citizens' experiences with crime/homelessness/vandalism/fear of terrorism. Analysis of citizens' trust toward police and towards neighbours. Analysis of the connection between citizens' opinion about neighbourhood and sense of safety. Other options according to what should be analysed.
Users or beneficiaries	The municipality (using it in the planning of crime prevention actions).
Open to public	No. The yearly report available on-line discloses some information to public. Data can be handed out by request, (e.g., to journalists, students).
Reference to safety and/or security measures of the city	No.

Technology involved, in general, and artificial intelligence, in particular: in March 2021, no technology based on artificial intelligence is adopted.

Other data useful to assess urban safety and/or urban security that at present are not considered: the existing survey do not cover "why" people have a sense of safety but only "when" they are safe and "how" the level of safety has developed over time. A qualitative study to be carried out in 2021 hopefully will cover some of the grey spots in the current survey.

Case SU04 – A data analysis tool adopted by an XXL city (between 1,000,000 and 5,000,000 inhabitants) in the European Union

Type of approach or tool	**Data analysis tool.**
State of the art	Already adopted.
Scope	Trust of citizens towards the police; crime at city level and at district level; feeling of security
Type of data	Quantitative data and qualitative data.

Outcomes of the data analysis	Comparison between city districts, age groups, evolution of crime; Comparison between periods of time.
Users or beneficiaries	Public officials.
Open to public	No. Some results of the analysis are publicly disclosed.
Reference to safety and/or security measures of the city	Yes.

Technology involved, in general, and artificial intelligence, in particular: closed circuit television (CCTV) systems, optical character recognition (OCR) technologies, unmanned aerial vehicles (UAV) or remotely piloted aircraft systems (RPAS).
Other data useful to assess urban safety and/or urban security that at present are not considered: not specified.

Case SU05 – A data analysis tool adopted by an L city (between 250,000 and 500,000 inhabitants) in the European Union

Type of approach or tool	**Data analysis tool** allowing representation on the maps of the city (with limitations defined by the national law in terms of usage information technology when privacy/ethics issues of citizens may arise).
State of the art	Already adopted.
Scope	Crime (e.g., reasons of arrests).
Type of data	Quantitative data (e.g., type of criminal events, timing of criminal events). Aggregated data provided by the municipal police and located on maps of the city.
Outcomes of the data analysis	Recurrence of criminal events in time and in space allowing to define operational approaches and take actions accordingly.
Users or beneficiaries	Municipal and National Authorities, Municipal Police.
Open to public	No. An official annual Municipal police report discloses some information to public (e.g., general data such as number of arrests and offences).
Reference to safety and/or security measures of the city	No.

Technology involved, in general, and artificial intelligence, in particular: technologies authorised by the current legislation such camera surveillance systems in public areas for groupings, perimeter protection, etc. Algorithms allow

the definition of exclusion zones, the identification of several people in one place for a certain time, the abandonment of an object in public spaces.
Other data useful to assess urban safety and/or urban security that at present are not considered: not specified.

Case SU06 – A Web-based business intelligence platform under development in XXL city (between 1,000,000 and 5,000,000 inhabitants) in the European Union

Type of approach or tool	**Web-based business intelligence platform** that provides non-technical users with instruments for aggregating, analysing, visualizing and sharing data (e.g., Microsoft Power BI)
State of the art	Under development.
Scope	Crime; road safety; citizen coexistence.
Type of data	Quantitative data and working to include qualitative data.
Outcomes of the data analysis	Comparison between city areas, age groups, genders. Comparison between periods of time. Analysis of a possible new safety/security related phenomena.
Users or beneficiaries	Team in charge of the analysis.
Open to public	No.
Reference to safety and/or security measures of the city	No.

Technology involved, in general, and artificial intelligence, in particular: not specified.
Other data useful to assess urban safety and/or urban security that at present are not considered: not specified.

Case SU07 – A Web-based business intelligence platform under development in XL city (between 500,000 and 1,000,000 inhabitants) in the European Union

Type of approach or tool	**Web-based business intelligence platform** that provides non-technical users with instruments for aggregating, analysing, visualizing and sharing data (e.g., Microsoft Power BI)
State of the art	Under development.
Scope	Urban safety. Urban security.
Type of data	Quantitative data and qualitative data.
Outcomes of the data analysis	Comparison between age groups, genders (if specified in the data). Comparisons between

	periods of time. Text analysis carried out by safety/security specialists.
Users or beneficiaries	City safety officials and city leaders.
Open to public	No.
Reference to safety and/or security measures of the city	Yes.

Technology involved, in general, and artificial intelligence, in particular: use of camera-based technologies for identifying the amounts of people in public areas is under evaluation. For now, the technology has been piloted and tested.
Other data useful to assess urban safety and/or urban security that at present are not considered: structured data about different phenomena that affect urban safety and/or urban security that the different city actors might detect. This city has no instruments to allow reporting events that the people i.e., working in the streets, schools etc. might notice while conducting their work. There is a lot of information that could be useful but that never gets reported anywhere.

Case SU08 – An Intelligent Management Platform adopted by an L city (between 250,000 and 500,000 inhabitants) in the European Union

Type of approach or tool	**Intelligent Management Platform** that aggregates multiple sources of information at city level.
State of the art	Already adopted.
Scope	Urban safety and urban security together with other information of the city with the aim to improve the quality of the municipal services and to enhance citizens' quality of life.
Type of data	Mainly quantitative data. Geographical data also.
Outcomes of the data analysis	Analysis of descriptive statistics.
Users or beneficiaries	Municipal services and agencies.
Open to public	Yes.
Reference to safety and/or security measures of the city	No.

Technology involved, in general, and artificial intelligence, in particular: not specified.
Other data useful to assess urban safety and/or urban security that at present are not considered: not specified.

Approaches and tools adopted to collect and analyse data about urban safety and/or urban security
Evidence useful to fill in the knowledge gaps
• **Few existing tools exploit opportunity of data analytics** and do **not integrate aspects of urban safety and/or urban security with citizens' perception**. • **No existing tools** allow **sharing of data with other local stakeholders involved in improving urban safety and/or urban security** (e.g., users/beneficiaries). • Lack of inclusion/consideration of safety and/or security measures taken by the city in the adopted approaches or tools may also **prevent users to monitor safety and/or security level or progress against pre-defined targets/milestones.**

2.3 Gaps and needs of urban authorities regarding the assessment of urban safety and/or urban security

A number of respondents highlight existing gaps in their current approach to evaluate urban safety and/or urban security (Q27). Identified gaps can be grouped in three categories. **Access to existing instruments and data.** For one respondent from an XXL-size knowledge gap could be solved by accessing to the instrument adopted by the national Ministry of Interior. Two respondents directly refer to data collected and held by police forces at local level. **Collection of new types of data** especially in terms of people's feeling of safety is the gap identified by one respondent from an XL-size city**. Coverage at neighbourhood/district level of the current approach** is mentioned by two respondents.

Concerning needs (Q28), two respondents agree on **the necessity to have standardised approaches or tools.** Two of them appreciate the idea of a joint effort from a team of European cities to identify a common vision for the assessment of urban safety and/or urban security. One of the researchers/experts highlights the need to *"have **crime and violence prevention integrated into broader urban strategies and interventions**"* following what is indicated in the New Urban Agenda (UN-HABITAT, 2017) in terms of crime and public spaces (par. 100) and in terms of prevention of crime (par. 103) (Box 3) and the need to take into account the Urban Monitoring Frameworks proposed for the 2030 Agenda for Sustainable Development.

Box 3 - Crime in the New Urban Agenda – HABITAT III

Crime and public spaces. *Para. 100. We will support the provision of well-designed networks of safe, accessible, green and quality streets and other* ***public spaces that are accessible to all and free from crime and violence****, including sexual harassment and gender-based violence, considering the human scale, and measures that allow for the best possible commercial use of street-level floors, fostering both formal and informal local markets and commerce, as well as not-for-profit community initiatives, bringing people into public spaces and promoting walkability and cycling with the goal of improving health and wellbeing.*

Prevention of crime. *Para. 103. We will integrate* ***inclusive measures for urban safety and the prevention of crime and violence****, including terrorism and violent extremism conducive to terrorism. Such measures will, where appropriate,* ***engage relevant local communities and non-governmental actors in developing urban strategies and initiatives****, including taking into account slums and informal settlements as well as* ***vulnerability and cultural factors in the development of policies concerning public security and crime and violence prevention****, including by preventing and countering the stigmatisation of specific groups as posing inherently greater security threats.*

Source: UN-HABITAT (2017).

What else is needed to better evaluate urban safety and/or urban security

Evidence useful to fill in the knowledge gaps

- **Lack of knowledge/poor involvement of the urban authorities in the acquisition process of data on safety and/or security**, especially in the case of crime statistics and data collected by local police/LEAs operating at the local level.
- **Need to integrate prevention of crime with other policies of the urban authorities**. The New Urban Agenda could be a reference point.

3 Chapter 3 - The mapping exercise: looking for adopted approaches and tools through desk review

The main sources for this part of the mapping exercise to find adopted approaches and tools to assess and measure urban safety and/or urban security was an **extensive desk review** through public available sources such as methodological reports of international organisations focusing on techniques for data collection and methodologies for data analysis, collection of practices about information used to assess urban safety and urban security, peer-reviewed papers published on journals describing cases of assessment and measurement initiatives carried out in cities, supporting documents of authorities at local, regional and national level detailing outcomes of data collection activities and methodologies behind.

Desk review of approaches and tools served, in particular, to gather evidence on **dimensions (i.e., categories)** and the **elements (i.e., indicators) in conceptual frameworks already operationalised** to assess and measure urban safety and urban security. This part of the mapping exercise was carried out:

- according to specific **criteria to select approaches and tools**
- classifying approaches and tools by **type** and on the basis of their **purpose**
- aiming at identifying **core features** of selected approaches and tools to be considered for building the conceptual framework of this study and make it operational.

3.1 The selection criteria

The identification of approaches followed seven criteria:

1. **Wide geographical coverage.** Approaches and tools have been identified also outside Europe on the assumption that non-European experiences can provide novel insights in terms of features or reference frameworks for assessing safety and security at the urban level.
2. **Long-term perspective.** In the last 20 years, a large number of initiatives to assess safety and security in urban areas has been initiated at the local, regional, national and international level. Some initiatives experienced relevant changes over time, others failed. For the purpose of this study, only initiatives carried out in the last 10 years were considered. Those radically changed or failed have not been excluded as potentially able to inform on lessons learnt for the definition of a conceptual framework.

3. **Various extent of coverage of safety or security.** Some initiatives exclusively focus on security and safety while others consider them as part of a broader assessment exercise at the urban level and/or for cities. Initiatives in which safety or security are a limited part of the assessment (for example, those related to quality of life at city level) were studied.
4. **Emphasis on specific issues in terms of safety or security.** Some initiatives focus on assessing crime, others concentrate on information about victimisation. They have been considered because European urban authorities may have diverse safety or security investigation needs, including very specific ones.
5. **Different perspective on safety or security.** In the last years, most of the initiatives aimed to measure and assess safety and security based on quantitative data were enriched with instruments collecting qualitative data on citizens' perception. Approaches and tools focusing on either the "objective" or the "subjective" perspective as well as those mixing them have been considered.
6. **Monitoring purpose in the medium-term**. Particular attention was given to approaches and tools relying on structured conceptual frameworks built to provide effective and sustainable instruments to be used by urban authorities in the mid-term (e.g., guided by strategic objectives).
7. **Priority to tools such as indexes and other structured sets of indicators.** Initiatives defining indexes and, in particular, those focusing on the analysis of data based on sets of indicators classified by category have been considered key for the mapping exercise as they are at the basis of the development of conceptual frameworks.

3.2 Classification of identified approaches and tools

The mapping exercise has led to a classification of approaches and tools into three **types**:

- **Surveys or similar** (e.g., carried out through questionnaires or interviews), intended as **approaches to collect data** (mainly primary sources).
- **Indexes or similar,** intended as **tools to analyse and synthesize data collected** through various sources (both primary sources and secondary sources).
- **Other instruments,** including other types of approaches and tools aimed at contributing to assess or measure safety or security at the urban level. They include, for example, instruments for statistics data analysis, web-based business intelligence platforms, intelligent management platforms, dashboards.

In addition, according to the **purpose**, approaches and tools are distinguished into:

- Approaches and tools **for self-assessment**. These are usually created/adopted by a city to assess or measure its urban security or safety.

- Approaches and tools **for ranking or benchmarking**. These are usually created/adopted by other parties than cities that are interested (for various reasons) in making comparison of urban security or safety across a number of cities.

Combination of types of approaches and tools and their purpose has led to classify them in **four *families*** to be considered in this mapping exercise:

- **Surveys addressed to citizens of one urban area (SOUA).**
- **Surveys addressed to citizens of more urban areas (SMUA).**
- **Indexes for self-assessment (ISA)** of one urban area.
- **Indexes for ranking or benchmarking (IRB)** of more urban areas.

3.3 Core features of identified approaches and tools

Once identified and classified, an approach or a tool was analysed using a standard template reporting the core features to be considered when developing a conceptual framework.

- **Title of the approach or tool.**
- **Cities, regions or country.** This refers to the territories for which data related to urban safety and/or urban safety have been collected and/or analysed. When relevant, the geographical scope or the number of inhabitants of the territories are indicated.
- **Scope of the assessment or of the measurement.** The subject of the assessment or measurement is reported as defined by the developers of the tools or by the implementers of the approach. Such definitions (e.g., urban security, perception of insecurity) can differ from those used in this study for the development of the conceptual framework (*Chapter 5*).
- **Type of approach or tool** (*Paragraph 3.2*).
- **Purpose of approach or tool** (*Paragraph 3.2*).
- **Categories.** Dimensions investigated to assess safety or measure security.
- **Indicators.**
- **Type of data.** They are differentiated in qualitative and quantitative data.
- **Sources of data.**
- **Methodology.**
- **First year and frequency.**
- **Users or beneficiaries.**
- **Evidence useful to fill in the knowledge gaps.** This refers both to aspects relevant for the design of the conceptual framework as well as for its operationalisation.
- **Sources.** Sources used for the description of the core elements are reported at the end of the template. The reference section includes only articles referenced throughout the study with the name of the authors and the year of publication.

When a tool or an approach is considered a **good practice (GP)** to take inspiration for the conceptual framework, **the methodology behind is described in detail** and **strengths (S), opportunities (O), weaknesses (W) and threats (T)** are highlighted.

This part of the mapping exercise has led to the **identification, classification and analysis of 12 approaches and tools**, out of which **six** are considered **good practices.** Such approaches and tools are presented in the following sections by *family* according to the classification presented in Paragraph 3.2.

3.4 The 12 approaches and tools and their core features

3.4.1 Case SOUA01_The diagnosis of local security of the Historic Centre of Porto

Cities, regions or country	The City of Porto (Portugal) (215,000 inhabitants in 2016). The Historic Centre of Porto (HCP) (covering an extension of 5.43 km^2).
Scope	Perception of insecurity.
Type of approach or tool	Diagnosis of Local Security through a questionnaire composed by 61 questions organised into five sections.
Purpose	Assessment of the perception of insecurity of people living/working/studying in HCP.
Categories	Five categories: 1. sociodemographic information, 2. perception of (in)security, 3. victimisation, 4. social control, and 5. community participation.
Indicators	**Perception of (in)security**: feeling of safety in HCP (and explanatory reasons); perception about the trend of crime (and explanatory reasons); perception of occurrence of 14 selected types of crime (e.g., fraud, robbery, sexual offense, domestic violence); fear of crime by type (e.g., fraud, robbery, sexual offense, domestic violence); opinion on 12 conditions able to encourage crime (e.g., poverty/unemployment, poor lighting); perception about the most common incivilities from a list of seven options (e.g., urinating on public roads, produce noise). **Victimisation**: relationship with victims of crime in the preceding five years (i.e., direct and indirect victims). **Social control**: adequacy of policing; satisfaction with policing; seeking for formal support; seeking for informal support. **Community participation**: number of years a participant attended the HCP; proposed measures to improve quality of life and security, willingness to collaborate in security measures; strength of attachment to HCP.

Type of data	Mainly qualitative data. Quantitative data relate to features of the respondents (gender, nationality, marital status, age group, education, professional status, years living/working/studying in HCP).
Sources of data	People recruited in streets, squares, shops, offices, schools, green parks, and other public and private spaces in HCP. Aged more than 18 years and speaking Portuguese fluently (i.e., 554 participants). Data was collected through face-to-face interviews undertaken by trained interviewers.
Methodology	Univariate descriptive statistics (i.e., relative and absolute frequencies, means, and standard deviations) computed for variables assessed in the (in)security perception's section. Inferential statistics (e.g., chi-squares to test associations between variables, independent t-tests to compare groups) computed between the question *"Do you feel safe in HCP?"* and variables assessed in other sections. Qualitative data (e.g. explanatory reasons) coded through thematic analysis and further analysed quantitatively. Data were analysed through the IBM Statistical Package for Social Sciences (IBM SPSS for Windows, version 25.0).
First year and frequency	One-shot diagnosis of local security. The questionnaire was developed and validated among the Portuguese population and widely used, even in other studies and research works.
Users or beneficiaries	Researchers. The City of Porto, in general and of the HCP, in particular (i.e., authorisation for data collection was obtained from the Parish Council of the HCP).
Evidence useful to fill in the knowledge gaps	
• The questionnaire adopted for the interviews in the sub-area of the city can be easily replicated at the city level as well as in other areas. • The investigation targets were not only residents but more widely people living/working/studying in the area. The distinction between residents living in the area for a long time and occasional people living/working/studying in the area could be relevant in the analysis of data. • The evolution of perceptions of insecurity over time can be measured by repeating regularly the survey. --- Inclusion of the reputation of the area (e.g., lighting) and of the socio-economic characteristics of the respondents (e.g., employment status) may add value of results. • Data collection occurred in private space (e.g., shops) and public spaces (e.g., streets).	

Sources: Azevedoa V. et al. (2021).

3.4.2 Case SOUA02 (GP)_Survey about the fear of crime and victimisation at the neighbourhood level within the BeSecureFeel Secure project

Cities, regions or country	The Municipality of Piraeus (163,000 inhabitants in 2011). Focus on the 2nd Municipal Department (Agios Dionysios area) and on the 5th Municipal Department (Piraeus Centre) (hereafter, MD2 and MD5).
Scope	Fear of crime, insecurity, victimisation
Type of approach or tool	Survey composed by two questionnaires: one for residents of MD2 and MD5 (including 33 questions); the other for shop owners and employees of MD2 and MD5 (including 14 questions). Interviews via Computer Assisted Telephone Interviewing (CATI).
Purpose	Self-assessment of two municipal departments; indexing of the perception of residents (i.e., households).
Categories	Five categories applied to a different extent to the two target groups: 1. perception of safety; 2. fear of crime; 3. individual participation in community-based crime policy (MD2 and MD5); 4. intention to participate in community-based crime policy (MD2 and MD5); 5. citizens' trust in local authorities regarding urban security.
Indicators	For residents. **Perception of safety**: opinion about the area of residence (safe/unsafe); intention to move from the area of residence; reasons for moving from the area of residence. **Fear of crime**: feeling of safety walking alone at night-time in the area of residence; opinion about the most insecure area of the municipality; assessment of specific factors affecting the feeling of unsafety in the area of residence. **Individual participation in community-based crime policy**: participation in a crime prevention programme in the area of residence; indication of the local actors (i.e., police forces, municipality, non-governmental organizations - NGOs) involved in the crime prevention programme (if any). **Intention to participate in community-based crime policy**: intention to participate in a crime prevention programme organised by the municipality. **Citizens' trust in local authorities regarding urban security**: assessment of the municipality public services in dealing with citizens' daily life; opinion about utility of services of a specialised agency to help victims of crime; opinion about the areas of the municipality in which a victim support service would be more useful.

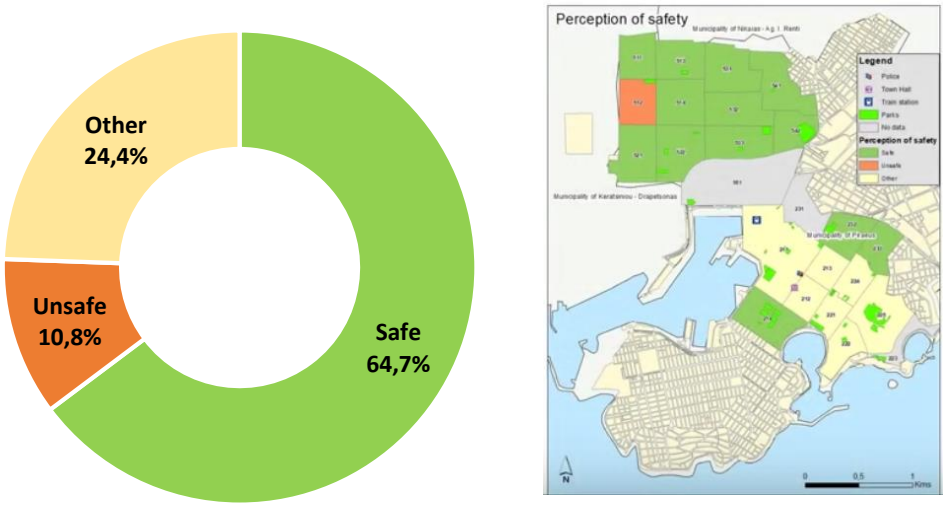
	For shop owners and employees: feeling of insecurity; fear of crime; experience with crime (with detail about the types of crime); experience in reporting a crime to police; trust about types of police interventions to guarantee security (e.g. patrolling, presence of police stations at neighbourhood level, presence of police officers at neighbourhood level;) satisfaction about police/justice effectiveness; satisfaction about municipality and local police in dealing with crime prevention; intention to participate in a crime prevention programme.
Type of data	Qualitative data.
Sources of data	Sample estimated in 525 households. Interviews carried out: 539 for residents (265 from MD2 and 274 from MD5); 100 shop owners and employees from both Municipal Departments.
Methodology	For each of the five categories of the survey, an index is built by grouping a number of questions.
First year and frequency	The first round of the survey was run in the second half of 2020. A second round of the survey is expected to be carried out before the end of the BeSecureFeelSecure project (in July 2022).
Users or beneficiaries	The Municipality of Piraeus, not only within the framework of the BeSecureFeelSecure project.
Description of the methodology	
With regard to the survey addressed to residents, the information collected in the five categories (i.e., 1. perception of safety; 2. fear of crime; 3. individual participation in community-based crime policy; 4. intention to participate in community-based crime policy; 5. citizens' trust in local authorities regarding urban security) has led to indexes (called indicators). Baseline values for all the five indexes have been defined *(Figure 4)*.	

Indicator	Description	Baseline Value
Perception of Safety	• The perception about the reputation of the area, and the satisfaction from the social and physical elements of the area	• Safe (64.7%)
Fear of Crime	• Fear of crime will be captured by (a) the level of insecurity in the neighborhood of permanent residence of the respondents, (b the number of occurrence of the type of the most insecure areas and (c) the factors that contribute to the creation of the feeling of insecurity	• High (20.2%)
Individual participation in community-based crime policy	• The number of citizens participating in the organization, planning and implementation of crime prevention measures	• 3
Intention to participate in community-based crime policy	• The willingness of citizens to participate in the organization, planning and implementation of crime prevention measures	• Yes, I would participate (68.6%)
Citizens' trust to local authorities	• The level of trust to the local authorities that they can ensure a safer urban environment	• High trust (44.9%)

Source: YouTube video on the statistical analysis and mapping research carried out by the Laboratory of Urban Criminology of Panteion

Figure 4 – Indexes and related baselines values within the BeSecureFeelSecure project.

Results of the survey, by index, are represented in graphs (e.g. percentage of the respondents feeling safe in their own area) and on detailed maps of the municipal departments (i.e., reporting information by area within each department)*(Figure 5)*.



Source: YouTube video on the statistical analysis and mapping research carried out by the Laboratory of Urban Criminology of Panteion

Figure 5 – Graph and map of the index related to the Perception of safety according to the answers of residents of the two municipal departments of Piraeus.

Strengths/Opportunities

- **S.** Data collection is carried not only among residents but also among shop owners and shop employees. This allows including the perspective of **businesses as territorial stakeholders suffering from specific types of crime** (for a large part, unreported). An ad-hoc survey has been designed and conducted for businesses.

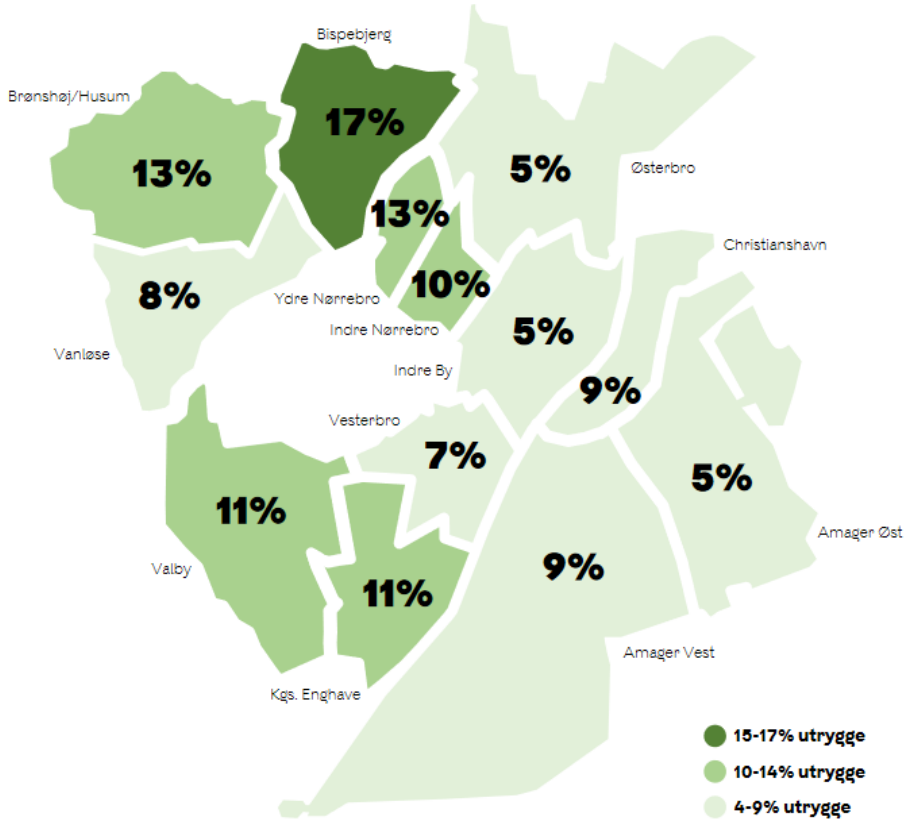
• **O. The assessment of the actual and desired participation** of residents and shop owners/employees to **crime prevention strategies** sets the basis for designing and implementing effective bottom-up actions to favour security and reduce fear of crime. • **O.** A **second round of the survey** carried out after two years from the first round will allow assessing if the actions carried out by the project have affected the fear of crime, insecurity, victimisation of residents and of shop owners/employees. • **O. Reporting of the citizens' survey results on maps of the municipal department** allows the design and the implementation of targeted actions on the territory.
Weaknesses/Threats
• **W.** As designed and proposed, **indexes** (referred to as 'indicators') synthesize only the results of the survey and do not include elements of the **structural socio-economic-urban conditions** of the two municipal departments that could add **value in interpreting outcomes of the survey.**

Sources: YouTube video on the statistical analysis and mapping research by the Laboratory of Urban Criminology of Panteion; website of the BeSecureFeelSecure project.

3.4.3 Case SOUA03 (GP)_The safety survey (Tryghedsundersøgelsen) of Copenhagen

Cities, regions or country	The Municipality of Copenhagen (600,000 inhabitants in 2017) and its 13 districts (some of them further divided, for a total of 16 areas of investigation).
Scope	Sense of unsafety and experience with crime.
Type of approach or tool	Survey running for two months (February-March 2020) addressed to a representative sample of 14,400 Copenhageners. 4,880 participated (response rate of 34%).
Purpose	Self-assessment of the city by district in terms of sense of safety.
Categories	Four categories: unsafety, concerns, experience, trust.
Indicators	From the survey. **Unsafety**: overall perception of unsafety in the neighbourhood; perception of unsafety in the evening and at night hours in the neighbourhood. **Concerns**: concern about types of crime and other nuisances (e.g., violence, threats, selling of hashish, shouting on the street, embarrassment when walking out). **Experience**: experience on specific types of crime and other nuisances (e.g., violence, threats, drug trafficking, burglary, theft, bicycle theft, vandalism on property, vandalism, graffiti, harassment in driving, in

	green areas, parks, playgrounds, stations); experience of specific events influencing perception of safety in terms of timing and places when moving in the city. **Trust**: trust in help and in personal assistance in the neighbourhood in case of crimes and other nuisances and confidence in support from the authorities; experience in the neighbourhood (e.g., atmosphere, urban space used for leisure activities, street lighting, rubbish, graffiti) and assessment about the neighbourhood as a good place to grow up children. From crime statistics reported to police: number of crimes (i.e., specific types) per year.
Type of data	Qualitative data and quantitative data.
Sources of data	Questionnaire of the survey and crime reports of the police.
Methodology	Descriptive statistics of the survey results and of crime statistics by district and over time. Graph representation. Correlations/dependencies analysis between the survey results, the crime statistics and the characteristics of respondents.
First year and frequency	The first survey was carried out in 2009; starting from 2016, it was outsourced to a consultancy company. Last edition in 2020 (August). The survey is run every year.
Users or beneficiaries	The Municipality of Copenhagen. More precisely, the municipality sets a target in terms of (a lower) percentage of residents feeling unsafe. The municipality's goal for 2021 is that the percentage of feeling unsafe residents must not exceed 10% in any district.
Description of the methodology	
Unsafety is defined as the perception of unsafety of Copenhageners in their district in general and in their district in the evening and at night (respectively questions 2 and question 3 of the questionnaire). Options for respondents are *“Very safe”, “A little safe”, “Neither safe nor unsafe”, “A little unsafe”, “Very unsafe”*. The respondents who have answered to feel *"very unsafe"* or *"a little unsafe"* have been included in the group of *"unsafe Copenhageners"*. Sense of unsafety of Copenhageners (i.e., in their district in general and in their district in the evening and at night) is reported by district on a map of the city. For example, the map below shows that in 2020 in 6 out of 13 districts there are more than 10% citizens feeling unsafe *(Figure 6).*	



Note: light green: 4%-9% unsafe; green: 10%-14% unsafe; dark green: 15%-17% unsafe.
Source: summary of results of the Tryghedsundersøgelsen 2020

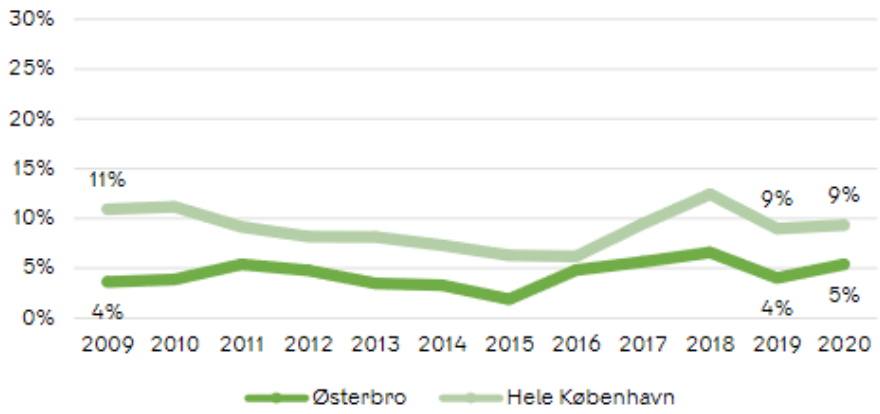
Figure 6 – Overview of the percentage of unsafe Copenhageners by district in 2020.

Descriptive statistics of the survey results are presented by district taking into account the specific features of the district (i.e., area in square kilometres, number of residents, percentage of Copenhageners living in the district, *percentage* of children, percentage of older people over 65 years). Security and crime data are also analysed over time highlighting positive or negative trends with respect to the previous year and, when possible, compared to the average value of the city.

Trust is measured by percentage of respondents (in the district compared to the average of the city) asked to *"strongly agree", "agree", "neither agree/or disagree", "disagree"* or *"strongly disagree"* on three statements: *"If a crime is going on in the neighbourhood, it can be expected that the residents in the area will react and call the police", "If I were to be victim of a crime in my neighbourhood, I would get help from those who pass by or live here in the area", "If I experience repeated problems with unsafety in my neighbourhood, I have confidence that the authorities will take care of such problems."*

Graphs are used to describe in each district the trend of percentages of respondents feeling unsafe; trend of percentages of respondents feeling unsafe during evening and night; relevance of specific events (e.g. gang

conflicts/shootings) influencing respondents to think more about where and when it is safe to move in the city; relevance of specific places (e.g. stations) that are perceived as unsafe; respondents' concern for crime types and other nuisances (e.g. bicycle theft, noise nuisance from neighbours, vandalism in the neighbourhood); which crime types and other nuisances the respondents state they have been exposed to for the past 12 months; comparison between concern for crime types and other nuisances and related exposure perceived by respondents; relevance of reported crime types and other nuisances; trend in the last 10 years of reported crime in the district (respect to the city)*(Figure 7)*.



Source: summary of results of the Tryghedsundersøgelsen 2020

Figure 7 – Trend of the percentage of unsafe residents in the Østerbro district compared to the trend of the average percentage of unsafe residents in Copenhagen.

Correlations/dependencies are investigated through regressions when assessing unsafety at individual level, at neighbourhood level and at district level. Such analysis takes into account: a) relevance of the characteristics of the respondents in terms of demographic features (i.e., age, gender, citizenship, employment condition, household income, education level), family composition (i.e., presence of adults, presence of children) and judgement on the neighbourhood (about trust, quality of the area and lighting); b) relevance of the characteristics of the population of the specific area (i.e., district and neighbourhood) in terms of composition, age, income, public support beneficiaries, country of origin, gender distribution, education level and relevance of crimes.

Strengths/Opportunities

- **S. Sense of unsafety** in the evening and at night hours of Copenhageners is analysed against some **features of the respondents** such as education, age and gender. These features provide potential explanations for differences in sense of unsafety among citizens (e.g., 18% of the citizens who in 2020 had primary school as the highest completed education are unsafe while the same feeling is experienced by only 10% of the citizens with higher education).

• **S.** Within the **municipal budget allocations** defined in 2020, DKK0.5 million (around €70,000) was proposed annually to continue the **Copenhagen Safety Survey** for the period 2020-2023. • **O.** The survey foresees some open answers. The answers are subsequently categorised on the basis of an **open coding**. **New categories** are possible every year. For example, in 2020 answers about specific events influencing respondents to think more about where and when it is safe to move in the city included new options such as harassment, sale of cannabis and drugs, traffic conditions. • **O.** The municipality sets **a goal in terms of percentage of unsafe residents in any district** for the forthcoming year according to the result of the survey carried out in the current year.
Weaknesses/Threats
• **W.** The respondents included in the analysis of a specific district live in the district, but **the concept of "neighbourhood"** is left to their understanding (i.e., they are not asked what they consider a "neighbourhood").

Sources: Questionnaire used in the Tryghedsundersøgelsen 2020; report of results of the Tryghedsundersøgelsen 2020; summary of results of the Tryghedsundersøgelsen 2020.

3.4.4 Case SMUA01_Survey on the perception of safety in Tuscany

Cities, regions or country	Tuscany Region (IT) (3,730,000 inhabitants in 2019)
Scope	Perception of safety.
Type of approach or tool	Regional survey addressed to citizens through phone interviews (i.e., CATI, Computer Assisted Telephone Interview)
Purpose	Assessment of the perception of safety by citizens living in different areas of the region.
Categories	Six categories: 1. Urban and social degradation; 2. perception of safety and concern about crime; 3. crime and victimisation of citizens; 4. trust in authorities and effectiveness of actions against crime; 5. social profile of the respondent (e.g., age, gender, education level, working conditions, family); 6. religious, ethnic or political orientation of the respondent.
Indicators	**Urban and social degradation**: relevance of the urban and social degradation in terms of difficulty in moving around with public transport; waste on the streets; traffic, noise, air pollution; bad conditions of the road pavement; night-time noises (e.g., loud music, people screaming, people abusing of alcohol); crime risks; poor street lighting; degraded areas (e.g., abandoned or decaying buildings,

	abandoned green areas, abandoned or burnt cars, dirty roads, waste outside bins). **Perception of safety and concern about crime**: 2.1 Presence of syringes on the ground; drug dealers; people who take drugs; drunk people who harass people; beggars and homeless people; acts of vandalism against public goods (e.g., burnt bins, damaged benches, smeared walls); prostitutes. 2.2. Perception of safety walking alone during daylight; perception of safety walking alone at night; fear of leaving home alone at night; fear of staying home alone at night; having home something for self-defence/to call for help. **Crime and victimisation of citizens**: 3.1. Concern about suffering crime (by type); extent to which fear of crime affects habits. 3.2 Types of crime against individual suffered in the last year; types of crime against vehicles suffered in the last year; types of crime against property suffered in the last year. **Trust in authorities and effectiveness of actions against crime**: opinion on presence of police forces in the area; feeling of safety given by the presence of police forces; opinion on the effectiveness of the police forces' actions against crime; actions suggested to improve effectiveness of fight against crime (e.g. strengthening of law enforcement at the national level; strengthening of local police in order to better control the territory; improvement and increase of social, cultural and recreational services availability; improvement of degraded neighbourhoods; installation of video surveillance systems; involvement of citizens in the surveillance of the territory; involvement of "street social workers" able to interact with problematic people; increase of penalties severity; guarantee of penalties); opinion on the role of citizens for the safety in their areas and on the liveability of the territory. **Social profile of the respondent**: citizenship; education level; employment condition; household family composition; satisfaction about the household family income. **Religious, ethnic or political orientation of the respondent**: opinion on the priorities to be addressed at the national level in the short-time; the main source of daily news; feeling with religion; feeling with political parties.
Type of data	Mainly qualitative data.
Sources of data	Citizens of the Tuscany Region. 1,700 individuals (aged more than 18 years).

Methodology	Sample design taking into account information on the population of the region (i.e., regional area, municipalities to individuals belong to and their size, age, gender). The template for the interviews is based on the questionnaire used by the Italian national statistics institute (ISTAT) for the survey on safety of citizens (*Multiscopo sulle famiglie: Sicurezza dei cittadini*) carried out countrywide every 5 years. Descriptive statistics of the answers are organised by question, category and by areas (10 areas in the region are defined ad-hoc for the survey).
First year and frequency	The first edition of the report on crime and on perception of safety in Tuscany based on a regional survey is dated 2019. Previous analyses of the crime and of the perception of citizens were carried out based on the results for the region drawn by the two national surveys in 2002 and in 2008/2009. For the 2019 edition, interviews were carried out between September 2019 and October 2019.
Users or beneficiaries	Cities/areas in the survey. Statistics are available by area (i.e., 10).
Evidence useful to fill in the knowledge gaps	
• Urban degradation through the perception of citizens is one of the key dimensions. • Clustering of citizens by their perception of safety into: apprehensive people, indifferent people, quiet people, disheartened people, circumspect people (in the 2002 edition and in the 2008/2009 edition). • The questionnaire implemented at the regional level is an adaptation of the national one (carried out every 5 years). This data collection approach allows to have more detailed information on the territory and with a higher frequency. • The survey is one of the instruments used by the Regional Authority to collect security data on the territory and data on safety perception by residents. Desk research on initiatives and projects undertaken by local authorities and aimed at increasing security has been carried out for more than 10 years.	

Sources: Marinari and Sciclone (2019); Regione Toscana (2011); Regione Toscana (2020).

3.4.5 Case SMUA02_The Swedish Security Survey (Nationella trygghets-undersökningen - NTU)

Cities, regions or country	Swedish municipalities (10,230,000 inhabitants in Sweden in 2019).
Scope	Crime and citizens' experience on crime.

Type of approach or tool	National survey addressed to Swedish citizens (aged 18-64 years). For the 2020 edition, approximately 74,000 people participated out of the 200,000 people included in the sample.
Purpose	Assessment of the experience of the citizens with crime and its consequences in different Swedish municipalities carried out by the Swedish National Council for Crime Prevention (Brå).
Categories	Five categories. 1. Victimisation; 2. Property offences against households; 3. Fear of crime; 4. Confidence in the criminal justice system; 5. Crime victims' contact with the criminal justice system.
Indicators	**Victimisation**: Offences against an individual; Assault; Serious assault; Threats; Sexual offences; Serious sexual offences involving the use of force; Serious sexual offences involving the exploitation of a defenceless condition; Robbery; Harassment; Pickpocketing; Sales fraud; Card/credit fraud; Online harassment. **Property offences against households**: Burglary; Car theft; Theft out of or from a vehicle; Bicycle theft. **Fear of crime**: Feeling unsafe outdoors late at night; Perception of crime development; Concern about crime in society; Concern about close friends and family; Concern about assaults; Concern about rape/sexual assault; Concern about robbery; Concern about fraud on the Internet; Concern about burglary; Concern about theft/vandalism of vehicle; Consequences of feeling unsafe. **Confidence in the criminal justice system**: Confidence in the criminal justice system as a whole; Confidence in the police; Confidence in the public prosecutors; Confidence in the courts; Confidence in the prison and probation service; Confidence that the criminal justice system as a whole treats suspects fairly; Confidence that the police treats suspects fairly; Confidence that the criminal justice system as a whole treats crime victims well; Confidence that the police treats crime victims well. **Crime victims' contact with the criminal justice system**: Experience of the police in connection with reporting a crime to the police; Experience with public prosecutors and courts.
Type of data	Mainly qualitative data. Among the quantitative data, the background information collected in the survey (e.g., gender, marital status, type of housing, level of education) and data to draw the sample (i.e., municipalities to which

	citizens belong to taken from population register administered by Statistics Sweden).
Sources of data	Swedish citizens.
Methodology	Descriptive statistics of the answers organised by question or category. In some cases, trends are reported starting from 2006. In 2017, there was a change of the methodology behind the survey, thus a robust comparison of statistics is possible only for the last years.
First year and frequency	2006. Annual.
Users or beneficiaries	Results are available for each of the categories and in terms of degree of urbanisation, based on sectioning by the Swedish Association of Local Authorities and Regions (SALAR). Among the users of the survey results are the same municipalities.
Evidence useful to fill in the knowledge gaps	
• Confidence in the criminal justice system (not only police) and experience of crime victims with the criminal justice system (not only police) are key sessions in the questionnaire. • Background information about citizens responding the questionnaire (gender in particular) is used to better characterize specific phenomenon under investigation. • The data collection approach (i.e., the questionnaire) and the data analysis (based on descriptive statistics) are suitable for small cities with minor adaptions.	

Sources: English summary of Brå report 2020; webpage of the NTU for accessing survey data.

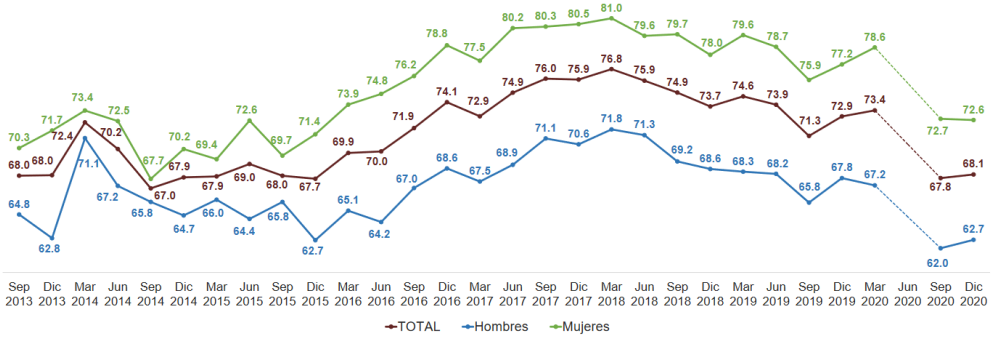
3.4.6 Case SMUA03 (GP)_Encuesta Nacional de Seguridad Pública Urbana (ENSU)

Cities, regions or country	85 selected cities in Mexico. Including at least one city for each federal entity and the 16 territorial districts of Mexico City (127,600,000 inhabitants in Mexico in 2019).
Scope	Security; Feeling of insecurity; victimisation.
Type of approach or tool	National survey addressed to Mexican citizens. The questionnaire can be filled in online (e.g., through a mobile device).
Purpose	Assessment of the experience of Mexican citizens with crime and its consequences carried out by the Instituto Nacional de Estadística y Geografía (INEGI).
Categories	10 categories: Feeling of insecurity due to fear of crime; expectation about the trend of crime; witnessing of criminal or antisocial behavior; change of routines due

	to fear of being a victim of crime; sources of information to be updated about public security; criminal victimisation; performance of the police as a public security authority; conflicts and antisocial behavior; government performance; acts of corruption; experiences of violence. Within the survey indicators of categories are grouped in seven main topics.
Indicators	Topic 1. **Perception of public security**: 1.1 Feeling of insecurity in your city and places where daily activities are carried out (14 variables); 1.2 Witnessing criminal and antisocial behaviour (7 variables); 1.3 Crime prevention actions (5 variables); Topic 2.1 **Sources or means of information**: Identification of sources or means of information (13 variables); Topic 2.2 **Victimisation**: Criminal events and when are occurred (6 variables); Topic 3 **Institutional performance of the authorities** (33 variables); Topic 4. **Victimisation**: Incidents related to incivilities (31 variables); Topic 5: **Experience of corruption**: Perception of acts of corruption by public security authorities (4 variables); Topic 6. **Family Relations**: Violence at home and when is occurred (14 variables); Topic 7. **Harassment**: Violence in public spaces in the last six months (9 variables).
Type of data	Mainly qualitative data.
Sources of data	Mexican citizens (addressed to 25,500 citizens).
Methodology	Descriptive statistics of the answers organised by question, category and cities.
First year and frequency	1998. With methodological changes over time. Robust comparison for all the investigated categories starting from the 2010 edition. Carried out every 3 months. The IV Quarter 2020 ENSU is the twenty-ninth edition of the survey.
Users or beneficiaries	Cities in the survey. Statistics are available over time, by city (also with graphical representation on a map of Mexico).
Description of the methodology	
Among information collected through the surveys, quarterly reports include the analysis on perception of public security, expectations about crime, witnessing incivilities, changing habits for fear of crime, victimisation at home, performance of the authorities, trust in the authorities, conflicts and their consequences, problems in the city, government effectiveness in addressing problems, corruption of authorities with respect to public security, personal harassment and sexual violence. Such information is reported aggregated, along	

the timeline; and on geographical maps when comparing cities and territorial districts of Mexico City.

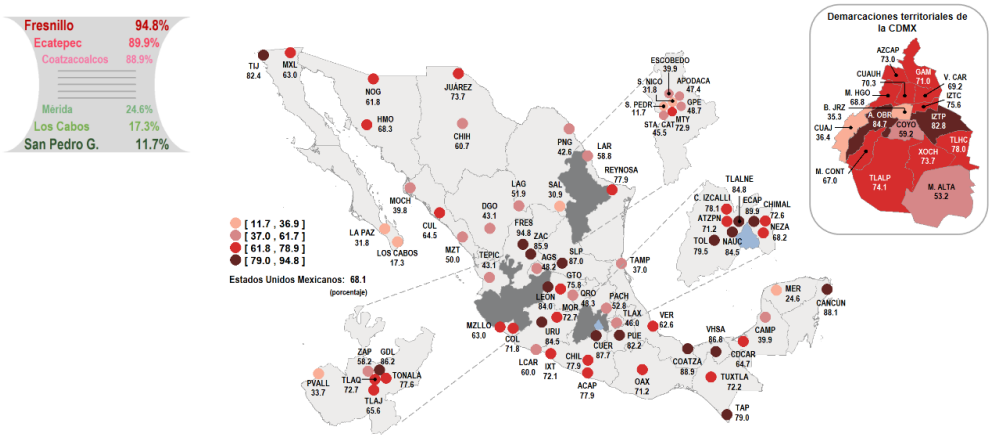
Within the IV Quarter 2020 ENSU, for example, information on the percentage of population (aged 18 years and over) considering unsafe living in their city due to crime is available since September 2013. Gender perspective is considered *(Figure 8)*.



Source: Encuesta Nacional de Seguridad Pública Urbana - Cuarto Trimestre 2020 - Principales Resultados

Figure 8 – Percentage of Mexican citizens feeling unsafe in their cities (September 2013 – December 2020).

When considering the city level, within the IV Quarter 2020 ENSU, for example, information is reported on a map of Mexico for each city (naming also the best three ranked cities and the worst three ranked cities) and with a detail of the territorial districts of Mexico City *(Figure 9)*.



Source: Encuesta Nacional de Seguridad Pública Urbana - Cuarto Trimestre 2020 - Principales Resultados

Figure 9 – Percentage of citizens feeling unsafe by city and by territorial districts of Mexico City.

Strengths/Opportunities

- **S.** When assessing performance of and trust in the authorities, **all authorities having a role in securing and protecting citizens are considered** (i.e., Marine, Army, National Guard, National police, Municipal Preventive Police).

• **O.** The **high-frequency of the survey** (i.e., every three months) allows to compare short-term variations of the phenomena as well as long-term trends.
Weaknesses/Threats
• **W.** The **high-frequency of the survey** (i.e., every three months) makes this data collection approach feasible, if scaled down from the national level, only for large cities.

Sources: Encuesta Nacional de Seguridad Pública Urbana 2020 - Marco conceptual; Encuesta Nacional de Seguridad Pública Urbana - Cuarto Trimestre 2020 - Principales Resultados

3.4.7 Case ISA01 (GP)_The urban public safety index for Shanghai

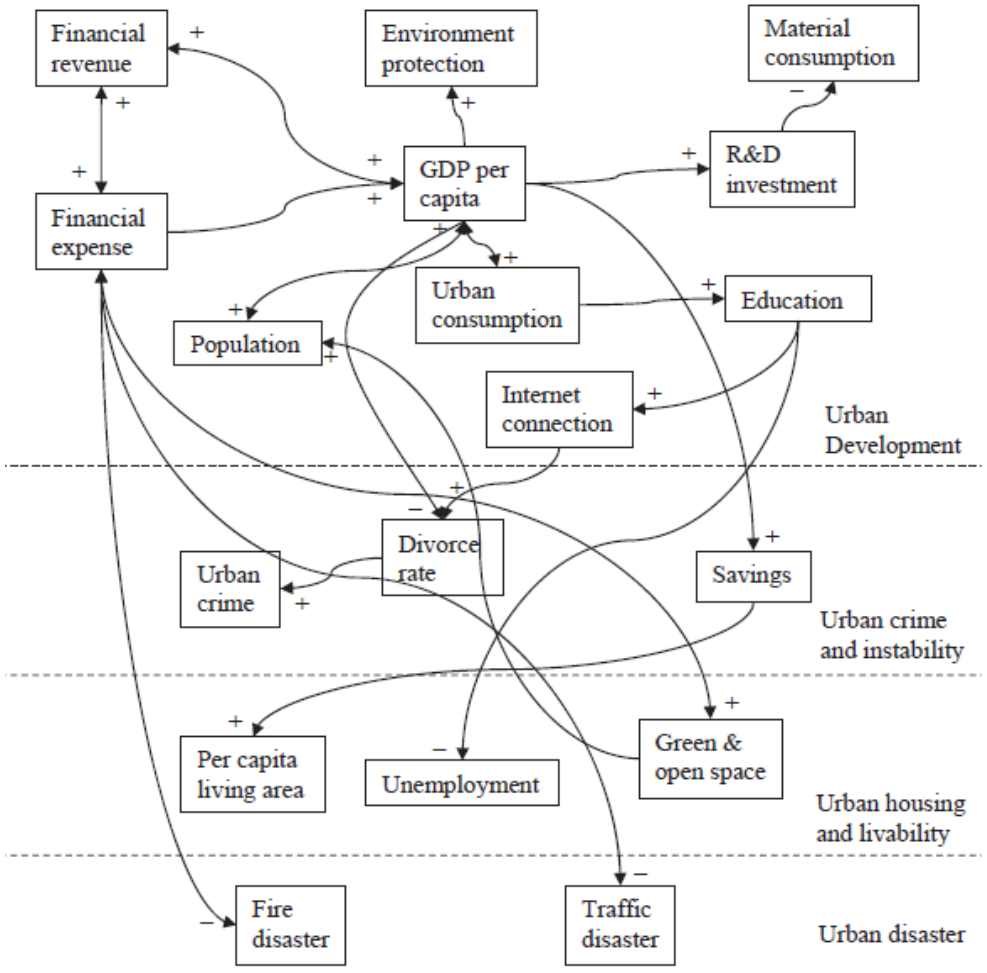
Cities, regions or country	Shanghai (China). 27,000,000 inhabitants (2020).
Scope	Urban public safety.
Type of approach or tool	Index (i.e., the Urban Public Safety Index, UPSI) composed by 35 indicators.
Purpose	Self-assessment and forecasting for one city.
Categories	Four categories: urban development; urban crime and instability; urban housing and liveability; urban disasters.
Indicators	**Urban development**: Real gross domestic product (GDP) per capita; Per capita fixed asset investment; Per capita consumption in urban areas; Total local financial revenue; Total local financial expenditures; Per capita road area; Water consumption per capita per day; Water consumption per 10,000 RMB Yuan GDP; Electricity consumption per 10,000 RMB Yuan GDP; Annual per capita electricity consumption for non-product purpose; Internet connection rate; Population density; Proportion of people aged above 60 years; Number of undergraduates per 10,000; Research and Development (R&D) expenditures as percentage of GDP; Number of doctors per 10,000; Change rate of arable land; Environmental protection investments as percentage of GDP; Waste water process rate; Annual percentage of clean air days; Process rate of industrial solid wastes. **Urban crime and instability**: Number of criminal cases per 10,000; Number of public disorder cases per 10,000; Divorce rate; Proportion of migrant/permanent residents; Per capita savings deposit of urban and rural residents. **Urban housing and liveability**: Per capita living floor; Registered urban unemployment rate; Per

	capita green area; Urban open space coverage. **Urban disasters:** Number of traffic accidents; Loss from traffic accidents; Number of fire accidents; Loss from fire accidents.
Type of data	Qualitative data made measurable through an internal assessment; quantitative data coming from external public statistics.
Sources of data	Official public statistics, field survey, interviews.
Methodology	35 indicators analysed through a principal component analysis (PCA) to create the index. Forecasting is implemented by defining relationships between indicators through a system dynamics approach.
First year and frequency	2010. Data refers to 10 years. From 2001 to 2009.
Users or beneficiaries	Developed for research purpose. Used by the city leaders.

Description of the methodology

To define the state of urban safety, indicators have been grouped in four categories i.e., urban development with 22 indicators; urban crime and instability with 5 indicators; urban housing and liveability with 4 indicators; and urban disasters with 4 indicators. A Principal Component Analysis, conducted for each of the four categories, leads to the definition of three elements i.e., Asset (A), Investment (I), Expenditure (E) from which the Urban Public Safety Index (UPSI) is derived. $UPSI = A + I - E$.

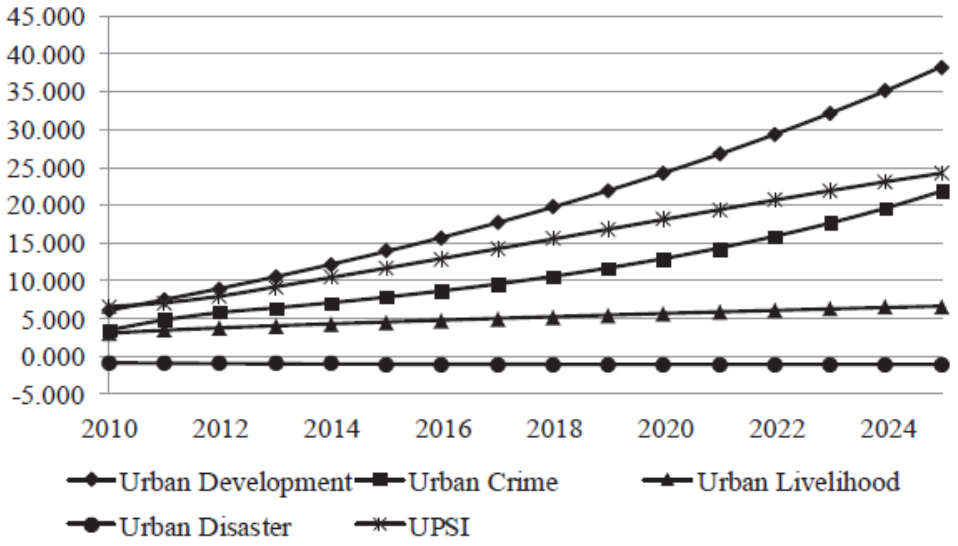
The forecasting is implemented through a grey system simulation coupled with a system dynamic model. System dynamic feedback loops (including positive or negative relationships between the 35 indicators)*(Figure 10)* are defined on the basis of the understanding of Shanghai's public safety and on data analysis (i.e., curve fitting and multivariate regression approaches).



Source: Yu and Fang (2017).

Figure 10 - Feedback loop for Shanghai's public safety.

The entire system dynamic model has been run and tested for over 100 times within STELLA® to ensure that all the feedback loops among indicators produce stable and reasonably well-fit data series in line with the original data (i.e., intended as validation of the model). To attempt a forecast to 2025 for Shanghai, a PCA is then applied to all 35 indicators to define the predicted changes of the *Urban Public Safety Index* until 2025 *(Figure 11)*.



Source: Yu and Fang (2017).

Figure 11 - Predicted changes of Shanghai's UPSI.

Strengths/Opportunities
• **S.** The **positive and negative relationships between the indicators** are investigated in order to better understand the dynamics of urban public safety. • **S. Social and economic aspects potentially affecting citizens' safety** are included in the assessment of urban safety with the same relevance of crime and violence. The assumption behind this methodological choice is that the urban public safety of the city gradually increases along with the to continuous economic growth leading to increasing investment in public safety preparedness and prevention. • **O.** The methodology on which the UPSI is based allows **to measure, monitor and forecast** the level of urban public safety. • **O. Lack of data** has been addressed by asking **experts to assess values of specific indicators**. Interviews have been used.
Weaknesses/Threats
• **T.** The methodology behind the computation of the index requires **advanced statistical competences** that may prevent its adoption by small cities.

Sources: Yu et al. (2013); Yu and Fang (2017).

3.4.8 Case ISA02 (GP)_The Neighbourhood Profile (Wijkprofiel) of Rotterdam

Cities, regions or country	Rotterdam (The Netherlands). 640,000 inhabitants (2019). 14 districts and 71 neighbourhoods.
Scope	Urban safety.
Type of approach or tool	A neighbourhood profile composed by three indexes.

Purpose	Self-assessment of one city by neighbourhood, by index, by domain (i.e., clusters of indicators).
Categories	Three categories: safety domain (i.e., through the Safety Index, VI), social domain (i.e., through the Social Index, SI), physical domain (i.e., through the Physical Index, FI).
Indicators	The **safety domain** is related to the facts and perception about safety and includes five clusters of indicators. **Theft (objective):** registered thefts per 1,000 inhabitants in the district of motor vehicles (car/motorcycle, etc.), of bicycles and mopeds and mopeds, of belongings or parts from cars, or parts stolen from them; pickpocketing. **Theft (subjective):** residents' opinion on theft as a problem in their neighbourhood and residents' experience (i.e., how often they have been victims of theft) in terms of bicycles, cars, belongings outside the home (for example from the garden), pickpocketing. **Violence (objective):** registered violent crimes per 1,000 inhabitants in the district in terms of public violence, threat, abuse, street robbery, robbery, sex crime. **Violence (subjective):** residents' opinion on violence as a problem in their neighbourhood and residents' experience (i.e., how often they have been victims of violence) in terms of violent crimes, threat, bag theft by force and abuse. **Burglary (objective):** registered burglaries per 1,000 inhabitants in the district in terms of houses, garage, shed, garden house, storage room and similar. **Burglary (subjective):** residents' opinion on burglaries as a problem in their neighbourhood and residents' experience (i.e., how often they have been victims of burglaries) in terms of burglary in homes, attempted burglary. **Vandalism (objective):** occurrence in the neighbourhood of destruction or damage to objects, reports of small outdoor fires (with fire brigade intervention), daubing in the outdoor area (e.g., graffiti). **Vandalism (subjective):** residents' opinion on vandalism as a problem in their neighbourhood and residents' experience (i.e., how often they have been victims of vandalism) in terms of destruction or damage to objects, small outdoor fires (with fire brigade intervention), daubing of in the outdoor area (e.g., graffiti). **Nuisance (objective):** occurrence in public space in the neighbourhood through reports of drug trafficking or drug use, reports about conflicts (quarrels) in public space, reports about one or more people causing

	nuisance in public spaces. **Nuisance (subjective):** residents' opinion on nuisances as a problem in their neighbourhood and residents' experience (i.e., how often they have been victims of nuisances) in terms of youth nuisance, drug nuisance, people who are harassed on the street, nuisance from local residents in the neighbourhood. The **social domain** is related to the experience in terms of quality of life and includes four clusters of indicators. **Self-sustainability (objective):** indicators about personal resources (e.g., disability), economic resources (e.g. level of household income), cultural resources (e.g. education level); social resources (e.g. participation in ideological, cultural and sports activities). **Self-sustainability (subjective):** judgment about household income, health conditions, language proficiency, degree of control over life, degree of resourcefulness, perceived societal support, people shyness in demanding support to others. **Cooperation (objective):** indicators about provision of informal care and help from neighbours, about willingness to provide care and help, about social commitment such as voluntary work or active participation in initiatives for the neighbourhood or the city. **Cooperation (subjective):** indicators about social inclusion such as degree to which residents know each other, sharing of common values and norms, about adequacy of socio-cultural facilities, about trust in municipality and other authorities. **Participation (objective):** indicators about economic participation (e.g., professional status), social participation (e.g., active engagement in residents' initiatives), cultural participation (e.g., leisure activities), social interaction (e.g., contacts with family, friends, neighbours). **Participation (subjective):** residents' opinion on own participation in society and on perceived discrimination. **Connection (objective):** indicators about commitment to neighbourhood (e.g., duration of residence in the neighbourhood) and about bond with the city (e.g., duration of residence in the city). **Connection (subjective):** residents' opinion on feeling about their neighbourhood (e.g., degree to which residents are proud of their neighbourhood), on feeling about the city (e.g., confidence of residents in the future of the city and its expected progress).

	The **physical domain** is related to the living experience and includes four clusters of indicators. **Living conditions (objective):** quality of the “housing stock” (e.g., the share of "vulnerable" homes), occupation of the “housing stock” (e.g., vacancy), marketability of the housing supply (e.g., time needed to sale), state of maintenance of the owner-occupied home, the adjacent buildings and the buildings in the neighbourhood. **Living conditions (subjective):** residents’ satisfaction about home in general, about specific housing aspects (e.g., size, outdoor space), about indoor climate conditions (e.g., insulation, ventilation), about safety of the home, about the price-quality ratio and residents’ assessment about the attractiveness of the buildings in the neighbourhood. **Public space (objective):** indicators about cleaning conditions (e.g., presence of trash cans, daubs), integrity conditions (e.g., related to pavement), space for public (e.g., presence of public parks), road safety (e.g., road accidents). **Public space (subjective):** residents’ opinion on cleaning conditions (e.g., rubbish on the street), degradation of street furniture and bus/tram booths, greenery and water use (e.g., availability of greenery for viewing), pavement maintenance (e.g., for sidewalks and cycle paths), road safety (e.g., traffic effects, accidents) and residents’ satisfaction about the accessibility by car and about quality of street lighting. **Services (objective)**: proximity of groceries, of sport facilities, of educational facilities, of primary care facilities, availability of public transport, availability of shops. **Services (subjective):** residents’ satisfaction about available facilities in general, about availability of daily facilities, of primary care facilities, of sports facilities, of educational facilities, of public transport, of parking facilities. **Environment (objective):** air quality (e.g., NO_2 concentration), presence of noise (e.g., average noise exposure). **Environment (subjective)**: residents’ experience with odour nuisance (e.g., from traffic, from sewerage), with noise nuisance (e.g., from traffic, from business), with flooding (e.g., in gardens or courtyards).
Type of data	Quantitative and qualitative data.
Sources of data	Official data at the city level (including police records) and survey data.

Methodology	A neighbourhood profile based on three indexes composed by clusters of indicators relaying on information collected with a survey addressed to residents of the 71 neighbourhoods of the city and on data from official statistics.
First year and frequency	An old version of the Safety Index was used as a separate tool for many years. The new version of the Safety Index became part of the *Wijkprofiel* in 2014. Index scores are available for 2014, 2016, 2018 and 2020 for each of the 14 districts. The neighbourhood profile is published bi-annually.
Users or beneficiaries	The Municipality of Rotterdam with its departments contributing to the implementation of the *Wijkprofiel*.

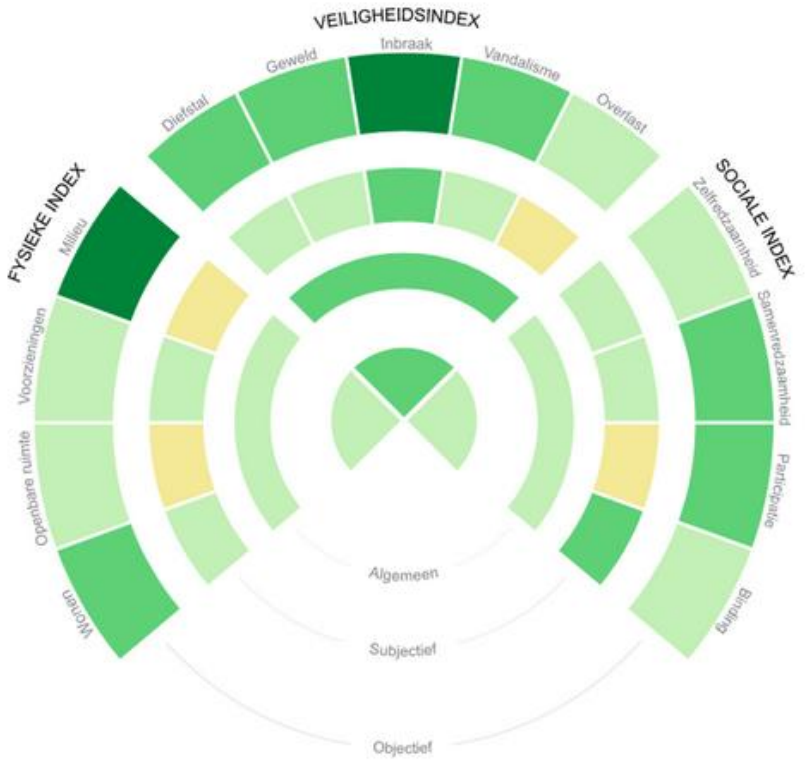
Description of the methodology

Within each domain, the objective and the subjective perspectives are taken into account. The objective perspective is represented through indicators related to facts and figures; the subjective perspective is represented through indicators related to opinions and experience. The "objective score" is made up of indicators that come from various statistics or from survey questions addressed to residents and related to facts (e.g., the level of education). The "subjective score" consists of indicators from survey questions asking about opinions (e.g., trust in municipality and other authorities) and experience (e.g., how often they have been victims of violent crimes).

Most of the values of the indicators are derived from two large-scale surveys based on two samples drawn from the municipal Personal Records Database. In 2019, 30,000 Rotterdammers took part in the survey. Half of the sample was asked to answer questions related to the social and physical domains, the other half was asked to answer questions related to safety. The residents are asked to contribute by filling a questionnaire (i.e., online or paper-based) or by telephone interviews. With a few exceptions for the smaller neighbourhoods, a number ranging from 175 to 300 inhabitants was interviewed per neighbourhood.

Starting from the indicators of each neighbourhood, the scores of the three indexes are computed in three different steps. The first step is to transform the score of the indicator into a score adjusted on the basis of its difference with respect to the average value of the city. The standard deviation (SD) is used to measure the distance from the value of the city (set to 100). The scores of each indicator potentially range from a minimum of 0 to a maximum of 200 and are grouped into six categories: 0 - 20 (more than 2 times SD below the average value); 20 - 60 (from 2 times SD below the average value to 1 time SD below the average value); 60 - 100 (from 1 time SD below the average value to the average value); 100 – 140 (from the average value to 1 time SD above the average value); 140 – 180 (from 1 time SD above the average value to 2 times SD above the average value); 180 – 200 (more than 2 times SD above the average value). The second step is to calculate the average value for each domain for the subjective

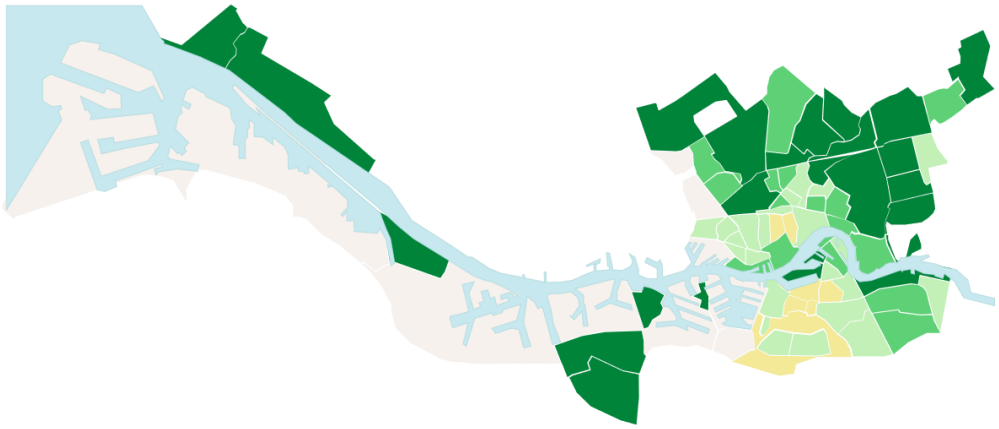
indicators as well as for the objective ones. The last step is to compute the score of the index for each neighbourhood as an average value.
A "horseshoe" graph is used to represent the scores in the three domains. Each domain is represented by the inner quarters of the circle. The left quarter represents the physical index, the middle quarter the safety index and the right quarter the social index *(Figure 12)*.



Source: The Neighbourhood Profile website

Figure 12 – An example of the "horseshoe" graph for a Rotterdam neighbourhood.

The scores indicate also how the neighbourhood stands on average in a subjective perspective (perception) and in an objective perspective (factual). Colors are used to represent the (relative) strengths (dark green) and the (relative) weak points (dark yellow) of a neighbourhood according to its scores. Scores >130 imply that the neighbourhood is far above the Rotterdam average (dark green); scores between 110 and 129 imply that the neighbourhood is above the Rotterdam average (green); scores between 90 and 109 imply that the neighbourhood is around the Rotterdam average (light green); scores between 70 and 89 imply that the neighbourhood is below the Rotterdam average (yellow); scores <69 imply that the neighbourhood is far below the Rotterdam average (dark yellow).
The *Neighbourhood Profile* also represents each indicator's value, each domain, and each index for all the neighbourhoods on a map of Rotterdam *(Figure 13)*.



Source: The Neighbourhood Profile website

Figure 13 – The scores of the Safety Index 2020 for each Rotterdam neighbourhood represented on the city map.

A trend over time is also possible to be computed for most of the indicators, taking the scores related to 2014 as baseline.

Strengths/Opportunities

- **S.** The **objective perspective** (i.e., actual situation) **and the subjective perspective** (i.e., perception of the situation) are taken into account **for urban safety as well as for the physical and social conditions of the neighbourhoods of the city**.
- **S.** The neighbourhood profile has **addressed some of the weaknesses of the *Safety Index*** previously adopted by the city such as the **stigmatisation effect on some neighbourhoods that were labelled as unsafe or inadequate.** First of all, **the colours used to represent scores** range from dark yellow to dark green, maintaining the flagging effect without affecting the neighbourhood reputation of the weakest performers as occurred with the traffic light model (from dark green to dark red) of the *Safety Index*. In addition, against the stigmatisation, the neighbourhood profile is no longer using a scoring system ranging between 1 and 10, but rather by assigning a score below or above the city average (average = 100).
- **S.** The **different departments of the municipality are responsible for the update and monitoring of specific part of the neighbourhood profile**: for instance, the Department of Public Safety of the Municipality of Rotterdam is responsible for the *Safety Index*.
- **O. The Neighbourhood profile** is the **evolution of the Safety Index** that was adopted by the Municipality of Rotterdam between 2002 and 2014 to monitor the safety situation over time of its neighbourhoods. The *Safety Index* included data from police records, concerns and victimisation, as well as neighbourhood characteristics (e.g., property value, number of people moving house) but no **information on social conditions**. *"Over the years, the importance of an integral approach of safety issues – and with it an integral monitor – has become increasingly clear. It is not possible to resolve security*

issues by just focusing on safety, and it is important to also take into account the social and physical aspects. This is why the new integral tool 'neighbourhood profile' was developed and introduced in 2014" (tool description of the *Neighbourhood Profile* carried out by EFUS). • **O.** The safety component of the physical component and of the social component are **integrated in a visual way** (i.e., through the "horseshoe" graph). This creates **a hybrid tool with some elements of indexes and others that belong to dashboards.**
Weaknesses/Threats
• **T.** Using a flagging tool as a management tool and as a means of accountability may generate **the risk to focus on improving the scores rather than the situation in the city**. • T. **Design, implementation and monitoring of a tool** (as the *Neighbourhood Profile*) require: **budget and resources** to conduct regularly a survey to collect the subjective perspective of citizens; **statistical competences**, **IT skills** to create an online version of the tool; **commitment of the municipality and its departments and of all the other local stakeholders** (i.e., local police).

Sources: The Neighbourhood Profile website; tool description of the Neighbourhood Profile carried out by EFUS; Lub and de Leeuw (2017); Noordegraaf (2008).

3.4.9 Case IRB01_The open comparison for safety and security among the Swedish municipalities

Cities, regions or country	290 municipalities (Sweden)(10,230,000 inhabitants in Sweden in 2019).
Scope	Urban safety. Urban security.
Type of approach or tool	A weighted value (similar to an index) of different indicators developed by the Sweden's Municipalities and Regions (SKR) and the Swedish Civil Contingencies Agency (MSB).
Purpose	Ranking of cities of different sizes (also with less than 10,000 inhabitants). In Sweden.
Categories	13 categories with an additional focus on a year's theme (i.e., fire accidents in 2020). A1. **Personal injuries**, A2. **Developed fires in buildings**, A3. **Reported violent crimes**, A4. **Reported theft and assault offenses**, A5. **Reported vandalism crimes**, A6. **Insecurity and anxiety**, A7. **Information and education**, A8. **Collaboration**, A9. **Crisis preparedness**, A10. **Risk and vulnerability analyses**, A11. **Emergency assistance**, A12. **Gender equality**, A13. **Society's costs for accidents**. Categories related to fire

	accidents: T.1 Residential fires, T.2 Developed residential fires, T.3 Residential fires per dwelling type, T.4 Developed house fires by type of house.
Indicators	1. Number of hospitalised people (admitted to hospital for at least 24 hours) as a result of unintentional injuries (accidents) per 1,000 inhabitants; 2. Number of fires in a building per 1,000 inhabitants; 3. Number of reported violent crimes per 1,000 inhabitants; 4. Number of reported theft and assault crimes per 1,000 inhabitants; 5. Number of reported crimes of vandalism per 1,000 inhabitants; 6.1 Average rating 1-10 for *"How do you see how safe and secure you can stay outdoors in the evenings and nights?";* 6.2 Average rating 1-10 for *"How do you see how safe and secure you can feel against threats, robbery and assault?";* 6.3 Average rating 1-10 for *"How do you see how safe and secure you can feel against burglary in the home?"*; 7. Number of people trained by the municipality in preventing or managing fires per 1,000 inhabitants; 8.1 Does the county council cooperate with the municipality on initiatives while waiting for an ambulance? 8.2 In the intervention report, interventions while waiting for an ambulance reported per 1,000 inhabitants; 9.1 Indicator for the collaboration and management of the municipality; 9.2 Indicator for responsibility at geographical level of the municipality; 10.1 Number of aspects included in the municipality's risk and vulnerability analysis; 11.1 Processing time for emergency services, i.e., time from the 112 call arrived at the first alarm (median time in minutes); 11.2 Response time for emergency services, i.e., time from when the 112 call arrived to the first resource is in place (median time in minutes); 11.3 Processing time for ambulance, i.e., time from the 112 call arrived at the first alarm (median time in minutes); 11.4 Response time for ambulance, i.e., time from when the 112 call arrived to the first resource is in place (median time in minutes); 12.1 Percentage of women working as firefighters in emergency services; 12.2 Percentage of men working as firefighters in emergency services; 13 Society's costs for accidents in total per inhabitant in Swedish Kronor. The focus on fire accidents includes: 1.1. Number of interventions for fire in houses, per 1,000 inhabitants; 1.2 of which with fire cause 'stove'; 1.3 of which with fire cause 'soot fire'; 2.1 Number of fires developed in dwelling per 1,000 inhabitants; 3.1

	Number of fires in detached houses, per 1,000 flats; 3.2 Number of fires in apartment buildings, per 1,000 flats; 4.1 Number of fires in single-family houses, per 1,000 flats; 4.2 Number of fires in multi-dwelling buildings, per 1,000 flats.
Type of data	Mainly quantitative data from statistics. Qualitative data from the survey carried out by the national authority.
Sources of data	Statistics collected from different sources ranging from the Crime Prevention Council's official crime statistics to the Sweden's citizen survey, from the municipalities' accounts to the National Board of Health and Welfare's patient register.
Methodology	The value assigning the city position in the ranking is computed giving to each of the four components the following weights: 40% for Personal injury (A1); 10% for Developed fires in building (A2); 40% for Reported violent crimes (A3); and 10% for Reported theft and assault offenses (A4). The weights of each indicator have been chosen taking into account consequences and outcomes, measured in socio-economic costs, of the types of accidents and crime in each category.
First year and frequency	Since 2008. Annual frequency. The last edition of the survey relates to 2020.
Users or beneficiaries	Municipalities in the ranking.
Evidence useful to fill in the knowledge gaps	
Each year, focus of the survey (i.e., specific questions) on a specific theme --- Weights of each indicator chosen taking into account socio-economic consequences and outcomes of the types of accidents and crime in each category.	

Sources: Webpage about the open comparison on the Sweden's Municipalities and Regions website; Webpage about the open comparison on the Mayor.eu website; Open comparison: safety and security 2020 report.

3.4.10 Case IRB02_Safety as part of quality of life in the Telereport ranking

Cities, regions or country	266 cities (worldwide).
Scope	Safety (as one of the 17 components used to define a *Quality of life* score at the city level).
Type of approach or tool	(on safety) Online score of Safety at the city level.
Purpose	Ranking of cities of different sizes for each of the components. Worldwide.

Categories	One category: **guns crime and ownership**.
Indicators	Crime rate [score]; Gun-related deaths per 100,000 residents per year; Guns per 100 residents; Absence of gun related deaths [score]; Absence of guns [score]; Absence of guns and gun-related deaths [score].
Type of data	Quantitative data.
Sources of data	Various sources of public information and data. A mixed basket of various crime and safety indicators like homicide rates and related measures are from the UN.
Methodology	A score ranging from 1 to 10 is assigned to each of the components defining the *quality of life* score of a city. The score is defined aggregating values of the specific indicators in each category.
First year and frequency	Not available.
Users or beneficiaries	Public in general. Citizens interested in collecting information on a city before taking the decision to move there.
Evidence useful to fill in the knowledge gaps	
• Safety is considered a component to define the quality of life in a city. • The assessment of safety in cities is limited to the sole dimension related to the presence of guns. As consequence, safety assessment of a city is in large part affected by regulations/laws on guns applying in the country where the city is located.	

Sources: Telereport website; Webpage on the safest creative cities around the world on the Telereport website.

3.4.11 Case IRB03_The NUMBEO Crime Index and Safety Index

Cities, regions or country	6,151 cities (31 March 2021) (worldwide).
Scope	Crime. Safety perception.
Type of approach or tool	Two indexes (i.e., Crime Index, Safety Index).
Purpose	Ranking of cities of different sizes. Worldwide.
Categories	Two categories: crime, safety.
Indicators	**Crime**: Level of crime, Crime increasing in the past 3 years; Worries of home broken and things stolen; Worries of being mugged or robbed; Worries of car stolen; Worries things from car stolen; Worries of being attacked; Worries of being insulted; Worries of being subject to a physical attack because of your skin colour, ethnic origin, gender or religion; Problem people using or dealing drugs; Problem property crimes such as vandalism and theft;

	Problem violent crimes such as assault and armed robbery; Problem corruption and bribery. **Safety**: Safety walking alone during daylight; Safety walking alone during night.
Type of data	Qualitative data.
Sources of data	Surveys open to the NUMBEO website visitors (i.e., 97,904 people had already contributed to the crime survey on 31 March 2021).
Methodology	Perceptions of the visitors of the NUMBEO website (i.e., visitors of the past 3 years). Information is collected through a survey. Each entry in the survey is saved as a number in the range [-2, +2], where -2 means strongly negative and +2 strongly positive. Each indicator ranges from 0 (*very low*) to 100 (*very high*). Intermediate levels are *low, medium, high.* The number of contributors varies by city. Only cities for which there are at least a certain number of contributors are included in the rankings.
First year and frequency	At least 3 years. Last update: 31 March 2021 (according to the last questionnaire filled in by users)
Users or beneficiaries	Cities over the world, especially those included in the ranking. Citizens contributing by filling in the survey. General public.
Evidence useful to fill in the knowledge gaps	
• Crime Index and Safety Index are elements of a wider framework that includes also a *Quality of life* Index that takes into account: cost of living and purchasing power; affordability of housing; pollution including air, water, etc.; crime rates; health system quality; traffic (commute times). • The Crime Index and Safety index are defined in real time (i.e., through an algorithm in Java), while an historical view (e.g., trend of the performance of each city) is presented by the publication of the scores of each city every six months. • Assessment and ranking of a city by crime and safety is affected by the numbers of visitors filling the questionnaire for that city. Higher is the number of filled questionnaires for a city, more reliable is its positioning in the ranking.	

Sources: Webpage of rankings of the Crime Index and of the Safety Index on the NUMBEO website; webpage on the methodology of the Crime Index and of the Safety Index on the NUMBEO website.

3.4.12 Case IRB04 (GP)_The Safe Cities Index of The Economist

Cities, regions or country	60 cities (worldwide).
Scope	Cities' safety. Urban resilience.

Type of approach or tool	An index (i.e., the *Safe Cities Index*, the SCI) composed by 57 indicators.
Purpose	Ranking/benchmarking of cities of different sizes. Worldwide.
Categories	Four categories: digital security; health security; infrastructure security; personal security. For each category indicators are grouped as "input" or "output" indicators.
Indicators	**Digital security (input):** Privacy policy; Citizen awareness of digital threats; Public-private partnerships; Level of technology employed; Dedicated cyber-security teams. **Digital security (output):** Risk of local malware threats; Percentage of computers infected; Percentage with internet access. **Health security (input):** Environmental policies; Access to healthcare; No. of beds per 1,000 population; No. of doctors per 1,000 population; Access to safe and quality food; Quality of health services. **Health security (output):** Air quality (PM 2.5 levels); Water quality; Life expectancy years; Infant mortality; Cancer mortality rate; No. of biological, chemical, radiological weapons attacks; Emergency services in the city. **Infrastructure security (input):** Enforcement of transport safety; Pedestrian friendliness; Disaster management/ business continuity plan. **Infrastructure security (output):** Deaths from natural disasters; Road traffic deaths; Percentage living in slums; Number of attacks on facilities/infrastructure; Institutional capacity and access to resources; Catastrophe insurance; Disaster-risk informed development; Air transport facilities; Road network; Power network; Rail network; Cyber-security preparedness. **Personal security (input)**: Level of police engagement; Community-based patrolling; Available street-level crime data; Use of data-driven techniques for crime; Private security measures; Gun regulation and enforcement; Political stability risk; Effectiveness of the criminal justice system; Hazard monitoring. **Personal security (output)**: Prevalence of petty crime; Prevalence of violent crime; Organised crime; Level of corruption; Rate of drug use; Frequency of terrorist attacks; Severity of terrorist attacks; Gender safety (Female homicide victims per 100,000); Perceptions of safety; Threat of terrorism; Threat of military conflict; Threat of civil unrest.

Type of data	A mix between qualitative data (i.e., obtained by means of an internal assessment by the team producing the index) and quantitative data coming from external public statistics/sources of data.
Sources of data	Official public statistics, public data, in-depth interviews with experts in the field.
Methodology	An index composed by 4 pillars, each with the same weight (0.25). Each pillar is composed by a different number of indicators.
First year and frequency	2015. 2015 (ranking of 50 cities using 44 indicators). 2017 (ranking of 60 cities using 49 indicators). 2019 (ranking of 60 cities using 57 indicators with a change of the framework). Every two years.
Users or beneficiaries	Cities over the world included in the ranking. Produced by The Economist Intelligence and sponsored by NEC Corporation.

Detailed description of the methodology

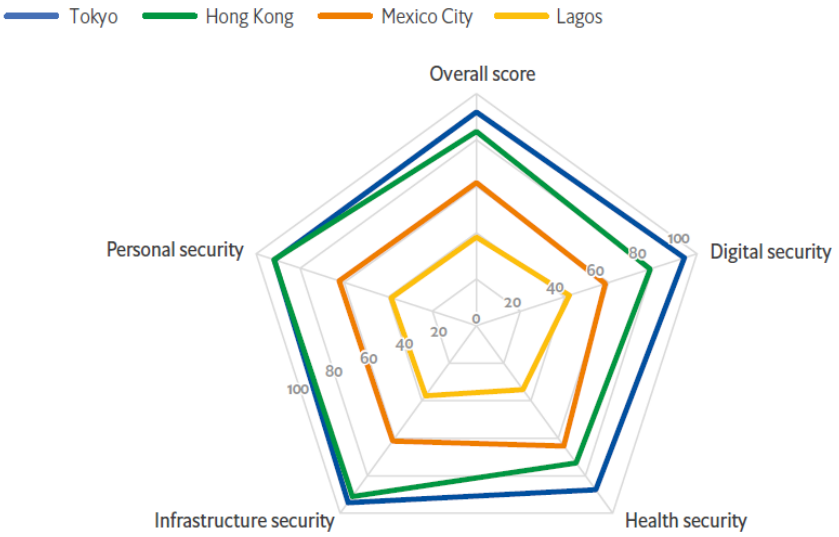
The SCI 2019 comprises 57 individual indicators. 17 of the index's 57 indicators are based on quantitative data, while 40 of the 57 indicators are based on qualitative assessments made according to the methodology of The Economist Intelligence Unit (TEIU). For the SCI 2019, the TEIU team collected data for the 2019 index edition from February to April 2019 using publicly available information for the latest available year from official sources (where applicable). Examples of external sources include the World Health Organisation (WHO), Kaspersky Lab and various others. Where available, the data used is city-specific; otherwise, regional or national data were used as proxies.

To make the gathered data comparable, quantitative indicators were normalised on a scale of 0-100 using a min-max normalisation, where each score represents standard deviation/s from the mean, with the best performing city scoring 100 points and the weakest performing city scoring 0.

Qualitative indicators were normalised as well. In some instances, scores were on a scale of 0-100. In other cases, a scale of 1-5 was used, with 1 being the lowest or most negative score, and 5 being the highest or most positive score. Other indicators were normalised on a two-, three- or four-point scoring scale. For example, the indicator "dedicated cyber-security teams" was normalised as following: a city with neither a national- nor city-level cyber-security team scored 0; a city that had only a dedicated national cyber-security team scored 50; a city with a dedicated city-level cyber-security team scored 100. The SCI generates an aggregate score/ranking across all underlying indicators.

The methodology beyond the index is based on the definition of four pillars: digital security, infrastructure security, health security, and personal security. Each pillar has a potential score ranging from 0 to 100 and includes a number of indicators classified as "inputs" (capacity/preparedness driven) or "outputs" (performance-driven) of the specific security aspect. *"Outputs measure how*

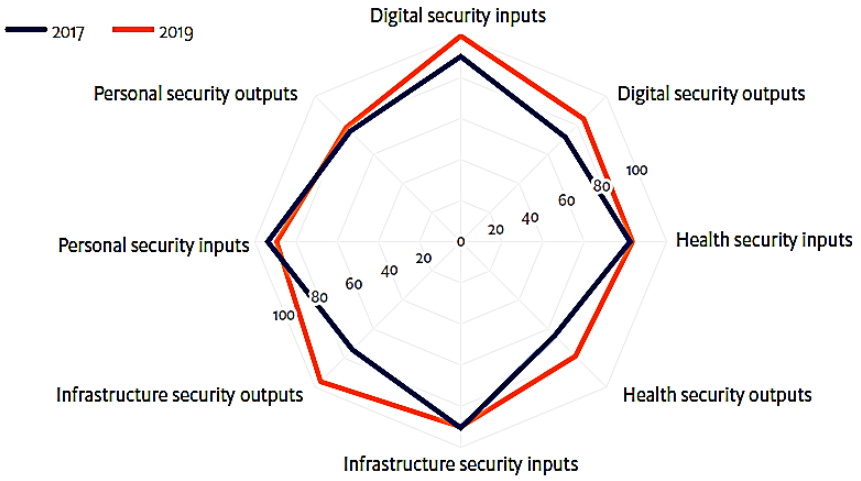
safe a city currently is, while the inputs indicate which cities are doing the right things to enhance safety." In each pillar indicators are all weighted equally.
The digital security pillar includes 8 indicators (5 input + 3 output), the infrastructure security pillar includes 15 indicators (3 input + 12 output), the health security pillar includes 12 indicators (6 input + 6 output), and the personal security pillar includes 21 indicators (9 input + 12 output). To create the SCI the same weight of 0.25 is assigned to each pillar.
Scores of cities are normalised to a scale of 0 (worst) to 100 (best). Cities are then grouped into four categories according to their score: low (0-25), medium (25,1-50), high (50,1-75) and very high (75,1-100). Rankings of the 60 cities have been provided for each pillar as well as for the overall Safe Cities Index. Rankings are also provided for types of cities according to their size in terms of number of inhabitants (i.e., >15 million, 10-15 million, 5-10 million, <5 million).
Comparison among cities is graphically represented through a spider chart reporting the overall score and the ones of each pillar for all the ranked cities *(Figure 14)*.



Sources: The Economist Intelligence Unit (2019).
Figure 14 – Scores of the SCI and related pillars for Tokyo, Hong Kong, Mexico City and Lagos.

Additionally, a spider representation is used to compare input and output scores for each pillar of a specific city across different editions of the SCI[5] *(Figure 15)*.

[5] Some limitations are highlighted by the SCI authors due to change/enlargement of the set of indicators of pillars over time.



Sources: The Economist Intelligence Unit (2019).

Figure 15 – The spider chart for Washington DC reporting scores of the SCI and related pillars in 2017 and 2019.

In addition, a resilience dimension is created selecting 28 indicators from the four pillars. Out of these 28 indicators, 10 are related to damage and threat multipliers, 11 are connected to relevant assets and 7 are intended to measure preparedness.

Strengths/Opportunities

- **S. Security at the city level** is measured according to **different perspectives,** i.e., pillars (digital, health, infrastructure, personal).
- **O. Ranking of cities** is available also **by city size** (in term of number of inhabitants).
- **O.** Indicators in each pillar are **classified as input to the pillar and as output of the pillar**. A cause-effect relation is implicit to this classification.
- **O.** Establishment of a pool of **experts to assess specific indicators for each city when data are missing.** If this is the case, a common methodology has been defined for the assessment.

Weaknesses/Threats

- **W.** Due to **the change of the number of indicators** over time, direct year-on-year comparison between cities is not possible.
- **W.** Due to **the change of the cities** (i.e., the 2019 index includes four new cities and four of the 2017 cities have been removed), even if the total number of cities is unchanged, direct year-on-year comparisons between cities is not possible.
- **W.** Only **some large and capital cities** are selected to be **included in the ranking**.
- **W. Min-max scoring leads to changes in scores from the previous edition of the index**, even without an actual change in raw data. For example, in an indicator with normalised scoring, if the score of the weakest performing city changes respect to the previous edition of the index, the scores of the other cities will be impacted regardless of their actual performance.

- **W.** Lack of city-level data has **sometimes led to rely on national values.** In most of the cases this is unlikely to affect the scoring, but it could if the national value hides largely heterogenous situations in the country.
- **W.** Being the purpose of the benchmarking global, data inevitably come from **information gathered by a number of institutions/countries, each with their own definitions, approaches and methodologies**.
- **W. Scores represent city-wide averages. Conditions can vary broadly within an urban area**, especially between wealthier and poorer neighbourhoods.
- **T.** Scores and rankings reflect the relative performance of a city that should be considered **only for the specific year considered**.
- **T.** Only information with broadly comparable and available data across all 60 cities were included. This **constrained the choice of indicators**. For example, in the case of Washington DC, no longer existence of figures for vehicle accidents and digital identity safety led to a selection of new metrics.
- **T.** Some indicators measure (1 or 0) the existence of policies/strategies/ actions while their **effectiveness may remain untested**.

Sources: The Economist Intelligence Unit (2019); webpage of the Safe Cities Index on the NEC Corporation website.

4 Chapter 4 - The mapping exercise: looking for adopted approaches and tools in research and innovation projects

This part of the mapping exercise has been conducted through **desk review** of projects funded or co-funded at the European level. In some cases, **interviews with project representatives** have been made to deepen the understanding of the initiatives and of the solutions adopted to fill the knowledge gaps.

Because of the increasing attention paid to security in Europe, the number of research and innovation activities focusing on the urban scope has increased in the last years and with structural support through EU funding. The **involvement of local and/or regional authorities as beneficiaries/end users** has been in a number of cases the essential requirement for accessing these funding opportunities. Piloting initiatives in projects aimed to strengthen urban security and/or urban safety and to increase citizens' perception through the involvement of key stakeholders at the city level have substantially contributed to address the knowledge gaps of urban authorities[6].

4.1 Desk review of projects dealing with urban safety and urban security

The desk review of projects dealing with urban safety and/or urban security funded by EU programmes included **only recent initiatives** (i.e., started in the last five years). The **direct involvement of local and/or regional authorities** (not as beneficiaries but as partners of the consortium) was a necessary condition for the project to be reviewed. The review has focused on identifying approaches and tools in the *families* of interest for this study (*Paragraph 3.2*). A standard template was used for each project to report the features of projects. The template specifies: acronym and title of the project; programme; topic; scope[7]; implementation period; budget; cities or region; approaches or tools created/adopted; the objectives of the project (and, where deemed relevant, information on the city); evidence useful to fill in the knowledge gaps; (where conducted) hints from the interview with project representatives; sources (intended as sources of information on the project).

[6] 1. What is needed to know in order to assess and measure urban safety and/or urban security? 2. How to make practical and effective assessment and/or measurement of urban safety and/or of urban security?.

[7] The scope of the approach or of the project is reported as indicated by the respondent. Such definitions (e.g., urban security, perception of insecurity) can differ from those used in this study for the development of the conceptual framework (*Chapter 5*).

This part of the mapping exercise has led to the **identification and analysis of 10 projects under three EU programmes:** the Urban Innovative Actions initiative, the Internal Security Fund – Police, and Horizon 2020[8]. The following sections briefly introduce the programmes before reporting on the identified projects.

4.2 Projects improving urban security in a comprehensive way

Within the Fourth call for proposal of the Urban Innovation Actions (UIA) initiative, Urban Security was included as one of the eligible topics for funding. As the identification of security-related threats in cities requires an evidence-based assessment of vulnerabilities, local authorities take a primary role in terms of collection and analysis of qualitative and quantitative data in different domains. Security is intended as *"a complex issue that should include areas such as social integration (access to good quality and non-segregated basic services including education, social and health care etc.), law enforcement, society's resilience and community empowerment against any forms of violence. It also concerns enhancing the protection of buildings and infrastructure." (*Relevance for and role of urban authorities in the Urban Security page on UIA website). For this reason, involvement of local stakeholders dealing with security in cities, including law enforcement agencies, first responders and urban designers, was considered mandatory for the success of the proposed projects. Urban authorities were invited to consider among the themes on which to develop their project ideas: improvement of spatial design, urban planning and development of security by design concepts, including better protection of public spaces improvement of the resilience of buildings and infrastructure; standardisation of processes and of technical requirements to enhance urban security; empowerment and capacity building of local communities, including enhanced risk awareness, building societal resilience; Increased cross-sectoral preparedness to security threats against public spaces including better coordination among first responders and different authorities; support for victims of crime; assessment of individual needs and support for integration of marginalised people with the view of preventing polarisation which might lead to criminalisation and radicalisation; collection of information on unreported crime; cybersecurity.

Three projects (i.e., BeSecureFeelSecure, SURE, ToNite) were funded under the topic *Urban Security* and started in 2019. As the beneficiaries of the UIA Initiative are urban authorities (i.e., with more than 50,000 inhabitants, or a grouping of urban authorities with a total population of a least 50,000 inhabitants) located in one of the EU Member States, the description of the projects also includes details of the leading cities and hints from the interviews carried out with project's representatives.

[8] Other relevant projects for this study funded within the Seventh Framework Programme have being identified and reported in *Annex 3*. They are not part of the in-depth analysis because terminated more than five years ago.

4.2.1 Project UIA01_BSFS - BeSecure-FeelSecure

Funding programme	Urban Innovative Actions (UIA)
Topic	Urban Security
Scope	Fear of crime; perception of security.
Implementation period	September 2019 – August 2022 (ongoing)
Budget	€3,973,140.00 (Total ERDF budget granted)
Cities or regions involved as partners	The City of Piraeus (EL). Two municipal departments.
Approaches or tools created/adopted	A Local Council for Crime Prevention for the governance of the urban security composed by representatives of the urban authority, police, criminology experts and cyber-security experts; a Collaborative Urban Risk Management ICT platform (CURiM) enabling synergies among local stakeholders towards identifying, modelling, evaluation, forecasting and prevention of security threats in the city and supporting the increase of citizens' perception of safety; three surveys addressed to citizens, municipalities and police forces to understand requirements and needs of the CURiM; a survey for residents to assess fear of crime and victimisation (case SOUA02).

The city and the objectives of the project

Piraeus with around 160,000 inhabitants (2011) is one of the most densely populated cities in Europe (15,065 citizens/km2) and the largest port in Greece. According to what is reported on the UIA webpage of the BSFS project, 88% of the Piraeus citizens believe that the port environmentally degrades the city and 40% of them believe that the port socially degrades Piraeus due to pollution, the movement of polluting/dangerous goods and high passengers' traffic. The city is mainly affected by small scale crime (e.g., pickpocketing), night crime activities, drug and cigarettes smuggling and immigrants' trafficking and large part of these events is neither detected nor reported.

The BSFS project targeted areas (i.e., the 2nd and 5th municipal departments of Piraeus) are characterised by: low social cohesion; high population density; sense of degradation; fear of crime; environmental degradation and urban design problems; weak collaboration among the critical information systems of the urban authority, the police and other key stakeholders. The BSFS project aims to provide a holistic framework against urban security threats, focusing on crime prevention and improvement of the actual and perceived security. *"This can be achieved via efficient collaboration of key urban entities, infrastructures and the citizens, entailing seamless information sharing and increased social cohesion."* Implementation of BSFS implies actions in three layers: in the governance layer, with the establishment of the Local Council for Crime

Prevention (LCCP); in the cyber layer, with the implementation of an evidence-based Collaborative Urban Risk Management (CURiM) ICT platform, and; in the social and spatial layer exploiting the CPTED (Crime Prevention through Environmental Design) approach.

Evidence useful to fill in the knowledge gaps (from desk research)

- Assessment of the actual and perceived security of a specific area of the city.
- Collection and analysis of data on the fear of crime of citizens (at the beginning and at the end of the project).
- Social cohesion as a key driver for targeting interventions of urban security.
- Implementation of a collaborative governance approach for urban security through the establishment of the Local Council for Crime Prevention.
- Adoption of a Crime Prevention through Environmental Design principles.

Hints from the interview with project's representatives

- Inclusion of the environmental physical features of an urban area is essential for the assessment of its actual and perceived security. For example, the presence of a large port positively affects the economic wellbeing of the city but also negatively impacts the security of the closest urban areas.
- Perception of security is a multifaced aspect. The perspective of businesses is as important as the citizens' one.
- Technologies are exploited as information instruments and collaborative tools among the city stakeholders for what concerns security.
- Through technologies (e.g., apps for mobile phones) citizens and businesses can become real-time sensors for situational awareness on crime and perceived security. Technologies can address lack of data and favour a more comprehensive risk assessment and management of the public authorities (i.e., the municipality, the local police).
- The proposed holistic framework of the Municipality of Piraeus aims at raising the actual and perceived security of the most threaten city areas and people (i.e., *"if a city is safe for the most vulnerable categories of citizens, it is safe for all"*.
- Upscaling (e.g., involving other municipal departments), transferability (e.g., to other cities) and sustainability (e.g., continuation of the activities of the Local Council for Crime Prevention after the end of the project) of initiatives to improve urban security are goals that can be achieved through an EU funded project.

Sources: UIA webpage of the BSFS project; website of the BSFS project; interview with project representatives carried out on 24 March 2021.

4.2.2 Project UIA02_SURE - Smart Urban Security and Event Resilience

Funding programme	Urban Innovative Actions
Topic	Urban Security
Scope	Urban security; sense of safety.
Implementation period	September 2019 – August 2022 (ongoing)

Budget	€3,205,722.00 (Total ERDF budget granted)
Cities or regions involved as partners	The City of Tampere (FI).
Approaches or tools created/adopted	Data- and user-driven urban security tool for analysis, monitoring, simulation and training in case of crowd-concentrated situations and specific events (i.e., a situation awareness platform). Data sources are surveillance cameras and video analytics is used for elaboration and, if needed, alerting about security issues. Interviews are carried out to collect data from people attending events (i.e., not only residents) on the sense of safety.

The city and the objectives of the project

Tampere is an inland city in the western part of Finland with a population of almost 240,000 inhabitants (2019), representing the third most-populous municipality in Finland, after of Helsinki and Espoo. Its region is one of the three most rapidly developing in Finland and Tampere is a centre of leading-edge technology, research, education, culture, sport and business at international level. In 2018 4.3 million of visitors participated in events in Tampere. The city centre is surrounded by lake and ridge scenery as Tampere is sited on an isthmus between lakes Pyhäjärvi and Näsijärvi creating a risky urban scenario in case of traffic issues or crowed events. According to what is reported on the UIA webpage of the SURE project, 82% of the citizens has declared an overall sense of safety.

The key challenge of SURE is how to efficiently manage security in crowd-concentrated situations and specific public events in Tampere taking into account a complex and evolving urban environment. Such challenge is divided in: a technology turning point, an operational challenge and an organisational challenge. The technology turning point foresees smart lighting, camera technologies, video analytics, and integrated systems and solutions based on sensors. Operational challenge is the one related to the alignment of roles and responsibilities at the city level avoiding “silos” activities, overlapping actions and non-interoperable systems for urban security. The organisational challenge is the one related to definition of the boundaries of responsibilities between different urban spaces (e.g., residential, commercial) and in exceptional situations (e.g., crowded or public events).

Evidence useful to fill in the knowledge gaps

- In SURE, events are defined as occasions in which people (also a few) meet. The assumption behind the rationale of the project is that crowd-concentrated events potentially raise issues in terms of safety and security.

• The city center and some of its infrastructures are the subject of the urban security assessment as well as of an intervention strategy. • Integration of real-time data through a situation awareness platform (i.e., Insta Blue Aware - IBA) is at the basis of the urban security approach of the City of Tampere.
Hints from the interview with project's representatives
• Although used to prevent and to eventually intervene in case of security issues, social acceptance of technological solutions detecting people and their movements has to be investigated. Engagement of citizens in designing similar solutions may increase social acceptance (i.e., innovative co-creation methods). • Liveability of the urban areas is a key target of the City of Tampere. • A command-and-control room having as users the police forces and various municipal departments allows to continuously monitor the potential security issues in crowd-concentrated events and to promptly intervene (e.g. traffic lights and digital info screen aligned with specific evacuation needs). • Sense of safety has been included in the assessment of the urban security as behaviour of people in events (i.e., especially if they are feeling unsafe) may negatively affect the actual security. Around 800 interviews have been carried out with participants in different events to investigate the general sense of safety (e.g., in the usual life), the dynamic sense of safety (e.g., during events) and the sense of safety in extraordinary cases. • Security social return of investment should be assessed in order to justify the cost of prevention measures adopted to guarantee security at the city level.

Sources: UIA webpage of the SURE project; website of the SURE project; website of the City of Tampere; interview with the SURE project manager, coordinator and SURE UIA expert carried out on 7 April 2021.

4.2.3 Project UIA03_ToNite - Community-based urban security

Funding programme	Urban Innovative Actions
Topic	Urban Security
Scope	Urban security; liveability; perception of urban security.
Implementation period	September 2019 – August 2022 (ongoing)
Budget	€4,643,903.28 (Total ERDF budget granted)
Cities or regions involved as partners	The City of Turin (IT). Two riverfront areas.
Approaches or tools created/adopted	Ethnographic and social research in the target areas with the engagement of key stakeholders to understand the culture and perception of security during night; a baseline study on the enabling role of technologies for urban security in the target areas; a **c**o-design approach (with local community)

	of services aimed at regenerating target areas and improving social cohesion and use of public spaces at night time; an integrated technology platform to understand and analyse urban insecurity phenomena; indicators and guidelines on urban security.

The city and the objectives of the project

Turin with a population of almost 900,000 inhabitants (2017) is one of the most important business and cultural centre in the northern part of Italy. The city is located on the western bank of the Po River and crossed by the Dora River. According to what is reported on the UIA webpage of the ToNite project, 51% of non-emergency calls made by citizens to local police in night hours are related disturbances and vandalism.

The main challenge of ToNite is to enhance the perception of urban security through collaborative policies based on social empowerment and active participation of residents and stakeholders of the Dora riverfront areas. Urban services and public spaces designed mainly for being used during the daytime can become attractive also during the night creating new cultural, economic and civic opportunities. ToNite faces this challenge on the basis of liveability and security of public urban spaces during night through the provision of services and urban regeneration along the Dora river. ToNite aims also to improve the capabilities to monitor the current situation and detect the rise of new phenomena collecting data from the community also in terms of needs.

Evidence useful to fill in the knowledge gaps

- Indicators on urban security (intended as one of the core components of the liveability of an urban area) to be validated at the international level are one of the outcomes of ToNite.
- The project intervenes in two different areas along the Dora river which are characterised by two phenomena: lack of citizens' frequentation and lack of nightlife.
- At the end of ToNite, recommendations are expected in terms of suggested changes of governance at the city level (i.e., needs and opportunities) with the final aim to improve city authorities' capacity in preventing processes of urban blight and better guaranteeing urban security in Turin.

Hints from the interview with project's representatives

- The key outcomes of ToNite are liveability of the public spaces through the adoption of "security by design" concepts in public spaces and social resilience built with a bottom-up approach involving the local community.
- Community engagement (including actors interested in investing in the target areas) is crucial to increase the liveability of urban areas. The project aims at creating (with ad-hoc allocated funds - around €1 million) a critical mass of social and cultural services in the target areas in order to make them

more populated and appealing, for example, for private activities and businesses.

- Perception of safety is affected by the demographic, social and economic conditions of the people living in an area. At the beginning of the project, the ethnographic and social research aimed at understanding culture and perception of security was carried through the collection of qualitative data based on a survey addressed to around 500 people and on a set of interviews (with more than 50 stakeholders).
- A data analysis approach able to integrate crime statistics available to local police would help to create a comprehensive overview of urban security and of its perception.

Sources: UIA webpage of the ToNite project; website of the ToNite project; interview with project representatives carried out on 24 March 2021.

4.3 Projects to protect public spaces against terrorism

The Internal Security Fund (ISF) Police contributes to ensuring a high level of security in the EU. Within this general objective, the fund activities focus on two specific objectives: the fight against crime and the management of risks and crises in Member States and the EU. For the 2014–2020 period, slightly over €1 billion was made available for funding activities under ISF Police, of which €863 million is channelled through shared management and €342 million through direct management. All Member States except Denmark participate in the ISF Police. Examples of beneficiaries include state and federal authorities, local public bodies, NGOs and private and public law companies. Projects funded through ISF Police include a wide range of initiatives, such as setting up and running IT systems, acquiring operational equipment, providing training schemes and ensuring administrative and operational coordination and cooperation (DG Migration and Home Affairs, 2020).
In the call for proposals under the Internal Security Fund – Police for protection of public spaces and critical infrastructure against terrorist threats (worth over €25 million in 2017) out of the 15 selected projects seven focused on the protection of public spaces. A further call for proposals published in 2018 under the Internal Security Fund - Police provided a budget of €9.5 million for projects focusing, inter alia, on public-private cooperation in the protection of public spaces (European Commission, 2020).

Two of the funded projects under ISF Police (i.e., PROTECT, PACTESUR) were deemed relevant to be mentioned for the purpose of this study given the strong involvement of cities and the focus on protection of public spaces. Their key features are described below.

4.3.1 Project ISFP01_PACTESUR - Protect Allied Cities against TErrorism in Securing Urban aReas

Funding programme	Internal Security Fund — Police
Topic	PACTESUR
Scope	Protect Allied Cities against TErrorism in Securing Urban aReas
Implementation period	November 2018 – June 2021 (ongoing)
Budget	€2,899,969.54
Cities or regions involved as partners	Nice (FR), Torino (IT), Liege (BE).
Approaches or tools created/adopted	A well-structured framework defining how cities and local police forces can better protect their vulnerable public spaces.

The objectives of the project

PACTESUR aims to empower cities and local actors' competences in the field of security of urban public spaces facing terrorist threats. Through a bottom-up approach, PACTESUR federates local decision makers, security forces, urban security experts, urban planners, ICT developers, trainers, front-line practitioners, designers and others in order to shape new European local policies to secure public spaces against terrorist attacks. The project is based on four pillars. 1. In-depth reflection on standards, legal frames and local governance; 2. Specialised training for local security practitioners; 3. Awareness-raising among citizens and politicians on their role on prevention and as security actors. 4. Identification of the most adapted local investments for securing open public spaces by sharing field experience. PACTESUR aims also to finance pilot equipment for securing public spaces to be used in urban demonstrators in the three core partner cities according to their priorities (i.e., Nice, infrastructures dissuasive for terrorist attacks; Torino, uncontrolled crowd movements via high-tech tools; Liège, social strategies against radicalisation). *"A specific attention to their integration in the urban landscape, natural and cultural heritage, aesthetics, design and urban mobility to avoid "bunkering" open public spaces. The idea is not to transform cities into fortified castles."*

Evidence useful to fill in the knowledge gaps

- The project addresses the challenge of cities in protecting urban public spaces by terrorist threats based on the cooperation of all the actors at the city level.
- Citizens themselves are considered as security actors.
- The project provides tailored solutions on the basis of the security priorities of the participating cities.
- Equipment to be deployed for securing public spaces should be integrated in the existing urban landscape.

Sources: Website of the PACTESUR project.

4.3.2 Project ISFP02_PROTECT - Public Resilience Using Technology to Counter Terrorism

Funding programme	Internal Security Fund — Police
Topic	PROTECT
Scope	Protection of urban public spaces against terrorist threats
Implementation period	November 2018 – June 2021 (ongoing)
Budget	€1,312,039.35
Cities or regions involved as partners	Brasov (RO), Eindhoven (NL), Larissa (GR), Malaga (ES), and Vilnius (LT)
Approaches or tools created/adopted	A manual to support municipalities by putting in place an approach to increase situational awareness and to improve protection of public places before, during and after a terrorist attack. A *Vulnerability Assessment Tool* (VAT) adopted to evaluate potential targets of a terrorist attack in public spaces (e.g., transport hubs, squares, shopping areas, and cultural, business and institutional venues).
The objectives of the project	
The PRoTECT project aims to strengthen local authorities' capabilities in protection of public spaces by putting in place an overarching concept where tools, technology, training and field demonstrations will lead to situational awareness and improve direct responses pre, in, and after a terrorist threat. The project aims also to test and enhance a self-assessment tool used to determine which public spaces or activities are vulnerable. Among the key activities of the project: five self-assessments conducted by beneficiary cities; five field demonstrations of the selected innovative solutions; five virtual table-top exercise to practice the technology concepts.	
Evidence useful to fill in the knowledge gaps	
• The idea of protection of public spaces developed by PROTECT is mainly related to terrorist attacks. • Support to the municipalities in the adoption of tools and approaches is a key goal of the project that will be achieved through cooperation between urban authorities and law enforcement agencies.	

Sources: Newsletter n.1 of the PROTECT project; Factsheet No. 1: Introduction to the PRoTECT Manual for Vulnerability Assessment.

4.4 Projects to secure infrastructures and people in European smart cities

One of the topics within the Work Programme *"Secure societies - Protecting freedom and security of Europe and its citizens"* 2018-2020 of Horizon 2020 (H2020) focused on security of public spaces boosting the data-driven potential in smart cities. Innovation actions were asked to be designed and implemented for *"Protecting the infrastructure of Europe and the people in the European smart cities (H2020-SU-INFRA02-2019)"* contributing also to the implementation of the measures foreseen in the Action Plan to support the protection of public spaces (COM(2017) 612 final). *"In the cities, public spaces such as malls, open crowded gathering areas and events, and non-restricted areas of transport infrastructures, constitute "soft targets", that is potential, numerous targets spread across the urban area and subject to "low cost" attacks strongly impacting the citizens. The generation, processing and sharing of large quantities of data in smart cities make urban systems and services potentially more responsive, and able to act upon real-time data. On the one hand, smart cities provide for improving the security of open and crowded areas against threats (including terrorist threats) and risks, by leveraging wide networks of detection and prevention capabilities that can be combined with human response to crisis to enhance first responders' actions. On the other hand, the distinct smart technological and communication environments (urban, transport infrastructures, companies, industry) within a smart city require a common cybersecurity management approach."* To project proposal aimed at being funded was asked to *"develop and integrate experimentally, in situ, the components of an open platform for sharing and managing information between public and private service operators and security practitioners of a large, smart city.*" The proposed projects had also to consider how to combine *"methods to detect weapons, explosives, toxic substances; systems for video surveillance; methods to identify, and neutralize crime perpetrators whilst minimizing intrusion into crowded areas".* Active involvement of the security actors of urban areas, their coordination and governance as well as societal and ethics aspects were expected to be included in the successful projects.

Two projects (i.e., IMPETUS, S4AllCities) were funded under this topic. Their key features are described below.

4.4.1 Project HINFRA01_IMPETUS - Intelligent Management of Processes, Ethics and Technology for Urban Safety

Funding programme	Horizon 2020 - Secure societies - Protecting freedom and security of Europe and its citizens.
Topic	Protecting the infrastructure of Europe and the people in the European smart cities (H2020-SU-INFRA02-2019). Innovation Actions.
Scope	Urban safety.
Implementation period	September 2020 – August 2022 (ongoing).

Budget	Overall budget €9,360,000; EU contribution €7,990,275.
Cities or regions involved as partners	City of Padova (IT), City of Oslo (NO).
Approaches or tools created/adopted	A digital tool for collecting data through sensors deployed in the city and from social media. Aimed to be adopted by the two cities in the project to increase security in public spaces and to address physical- and cyber-attacks.

The objectives of the project

The interconnected grid of sensors (i.e., cameras, environmental sensors) proposed by IMPETUS offers a wealth of actionable Big Data. Such data allow to better manage issues about traffic and public transit, to control pollution, to enhance policing and crowd control, and even to monitor public sentiment. However, such smart systems may risk to increase: unethical use of personal data, and attacks to the interconnected city services and infrastructures (e.g. transport, energy, water distribution). To address the growing security and ethical threats on cities increasingly adopting ICT systems, IMPETUS develops an integrated toolkit addressing threats of the complete physical and cybersecurity value chain (through detection, simulation & analysis, intervention).

The project will enhance the resilience of cities in the face of security events in public spaces, by addressing three main aspects of urban security in smart cities:

- Technologies: integrating and developing instruments and processes underlying the capacity of cities to manage both physical security and cyber security, leveraging on the power of Internet of Things (IoT), Artificial Intelligence (AI) and Big Data analysis
- Ethics: ensuring smart city capabilities in balancing potentially conflicting needs to collect, transform and share large amounts of data with the protection of data privacy
- Processes: delivering a multi-tenant solution fully aligned with the operational needs of multiple city stakeholders (e.g., police, first responders, municipalities) supported by a framework gathering deployment guidelines and best practices.

Evidence useful to fill in the knowledge gaps

- Adoption of a smart-city perspective in addressing urban security.
- A data-driven approach based on a grid of sensors deployed in the city (e.g. public CCTV) and on fusion of real-time information collected through social media platforms.
- Focus on events in public spaces that may generate security issues does not require background (demographic, social economic) information on population of the concerned area.

- IoT, AI and Big Data analysis are the only source of information to assess real-time physical security.
- Technologies provide an integrated approach to address operational needs of multiple city stakeholders (e.g., police, first responders, municipalities). Focus on issues related to privacy of citizens when collecting data.

Sources: IMPETUS CORDIS factsheet; website of the IMPETUS project.

4.4.2 Project HINFRA02_S4AllCities - Smart Spaces Safety and Security for All Cities

Funding programme	Horizon 2020 - Secure societies - Protecting freedom and security of Europe and its citizens
Topic	Protecting the infrastructure of Europe and the people in the European smart cities (H2020-SU-INFRA02-2019). Innovation Actions.
Scope	Urban safety, Urban security.
Implementation period	September 2020 – August 2022 (ongoing).
Budget	Overall budget €9,738,317; EU contribution €7,992,479.
Cities or regions involved as partners	The Municipality of Trikala (EL), the Basque Government region (ES), the Municipality of Bilbao (ES), the Municipality of Valencia (ES), the Municipality of Buzau (RO), the Municipality of Pilsner (CZ).
Approaches or tools created/adopted	An Open Platform for sharing and managing information aimed at providing an intelligence support for situational awareness and decision making; an intelligent architecture ensuring the interconnection and integration of the smart systems of the city available for security practitioners; an approach for the improved collaboration across all smart cities' stakeholders: urban planners, infrastructure operators, private service operators, security practitioners, ICT supervisors and providers; an approach for the improved engagement of citizens towards more secure and safe cities.
The objectives of the project	
Smart cities have frontline responsibility to ensure a secure and safe physical and digital ecosystem promoting cohesive and sustainable urban development for the wellbeing of EU citizens. S4AllCities integrates advanced technological and organisational solutions in a market oriented Cyber – Physical Security Management framework, aiming at raising the resilience of cities' infrastructures, services, ICT systems, IoT and fostering intelligence and information sharing among city's security stakeholders. Three pilot cases with	

the engagement of five cities in four countries (i.e., Spain, Romania, Czech Republic, Greece) foresee the deployment and validation of the S4ALLCITIES System of Systems. Real environment pilots aim to test: risk-based open smart spaces security management; cyber security shielding; suspicious activity and behaviour tracking; identification of unattended objects; real-time estimation of cyber-physical risks in multiple locations and measures activation for effective crisis management. S4ALLCities smart components (integrated within 3 Digital Twin Systems) will demonstrate their technological advances in tackling terrorist attacks with high risk for mass casualties, within the complex environment of open crowded spaces. S4ALLCities exploitation phase will promote good practices and guidance material across EU cities so as to enhance capacity building of involved stakeholders, reduce the vulnerabilities of public spaces, mitigate the consequences of adversary attacks, raise public awareness and strike a balance between improving security and preserving the open nature of public spaces as well as citizens' sense of freedom.
Evidence useful to fill in the knowledge gaps
• Security and safety in public spaces are intended as protection of public spaces and citizens from large-scale attacks, especially the terrorist ones. • Information sharing through technologies among actors dealing with urban security in a city is one of the key goals of S4AllCities. • Pilot cases in cities will be testing exercises to understand weaknesses and strengths of a real-time data-oriented security approach at the city level.

Sources: S4AllCities CORDIS factsheet; website of the S4AllCities project.

4.5 Projects to face crime and terrorism taking into account the societal dimension

Given the relevance of the societal dimension in issues related to crime and terrorism, funding opportunities for research and innovation actions have been made available to cities and law enforcement agencies within the Horizon 2020 programme starting from its beginning within theme Secure Societies[9]. The specific challenge of topic *FTC-10-2014 - Innovative solutions to counter security challenges connected with large urban environment* was to support research and innovation aimed at addressing security issues and their citizens' perception in European large urban environments. New approaches and innovative solutions, including sustainable, affordable and transferrable security technologies, including those soliciting citizens' engagement to prevent, mitigate and recover

[9] Within the topic *FTC-10-2014 - Innovative solutions to counter security challenges connected with large urban environment* in Work Programme Secure societies - Protecting freedom and security of Europe and its citizens for the 2014-2015 period, within the topic *SEC-07-FCT-2016-2017 - Human Factor for the Prevention, Investigation, and Mitigation of criminal and terrorist acts* in Work Programme Secure societies - Protecting freedom and security of Europe and its citizens for the 2016-2017 period and within the topic *SU-FCT01-2018-2019-2020 - Human factors, and social, societal, and organisational aspects to solve issues in fighting against crime and terrorism* in Work Programme Secure societies - Protecting freedom and security of Europe and its citizens for the 2018-2020 period.

from the challenges and fostering their direct participation in the improvement of the urban security conditions were deemed relevant to be funded. Among them technologically enhanced platforms allowing citizens *"to share information and experiences in real-time streaming and to receive alerts and messages from security command and control centres"*. The rationale behind is that lack of security as well as perception of lack of security can negatively impact on the economic development and the quality of life in cities. Expected impact of actions funded within this topic has been: *reduce the fear of crime and enhance the perception of security of the inhabitants of large urban environments; better addressing security challenges in large urban environments; increase the perception of security of citizens by empowering them, fostering their sense of belonging to a greater community; facilitating the engagement of citizens to improve the security conditions of smart cities; providing new market opportunities, especially for SMEs and entrepreneurs, to develop and produce innovative technologies for urban security.*

The topic *SEC-07-FCT-2016-2017 - Human Factor for the Prevention, Investigation, and Mitigation of criminal and terrorist acts* in Work Programme Secure societies for the 2016-2017 period was designed to fund research and innovation actions aiming at defining a European Security Model able to include societal factors. In particular, it was conceived to encompass *"the development of a common understanding of security issues among EU security practitioners, as well as of the causes and effects of insecurity among EU citizens"*. Expected concrete outcomes of funded actions should have concerned: *"A policy-making toolkit, for security policy-makers, to advance towards a future European Security Model applicable by European law enforcement agencies and/or; Common approaches, for the long-term, for assessing risks/threats and identifying relevant risk-based security measures, including through acceptance tests; (that take due account of legal and ethical rules of operation) and cost-benefit considerations and/or; Complementing the relevant work of Eurobarometer, better understanding of how the citizens perceive security and how it affects their feeling of insecurity, and in connection with potential limitations to, or risks of violations of privacy, and the consequent challenges for LEAs; Toolkits for law enforcement agencies, based and validated against the needs and requirements expressed by practitioners, and improving the perception by the citizens that Europe is an area of freedom, justice and security."*

The topic *SU-FCT01-2018-2019-2020 - Human factors, and social, societal, and organisational aspects to solve issues in fighting against crime and terrorism* maintained the focus on developing approaches and on creating tools. Among tools, security policy-making toolkits, to support the establishment of a European Security Model and toolkits for EU Law Enforcement Agencies and/or civil society organisations, validated against practitioners' needs and requirements to facilitate their daily operations. Proposals were asked to include in the consortia relevant security practitioners and civil society organisations and to address societal aspects (e.g., perception of security, possible side effects of technological solutions, societal resilience, gender-related behaviours) in a comprehensive and

thorough manner. Among the suggested issues for which to identify instruments for prevention, investigation and mitigation, there were trafficking of human beings and child sexual exploitation**,** cyber criminality, violent radicalisation and terrorism in the EU.

The three projects funded under these topics considered relevant for this study are City.Risks, CCI and IcARUS. Their key features are described below.

4.5.1 Project HFTC01_City.Risks - Avoiding and mitigating safety risks in urban environments

Funding programme	Horizon 2020 - Secure societies - Protecting freedom and security of Europe and its citizens.
Topic	Innovative solutions to counter security challenges connected with large urban environment (FTC-10-2014). Research and innovation Action.
Scope	Urban safety.
Implementation period	May 2015 – April 2018 (closed).
Budget	Overall budget €3,934,811; EU contribution €3,934,811.
Cities or regions involved as partners	Roma (IT), Prato (IT), London Borough of Waltham Forest (UK). Pilot exercise carried out also in Sofia (BG).
Approaches or tools created/adopted	A platform collecting information from a prototype of an application to be installed on mobile devices supporting a variety of use cases: theft of personal belongings; information gathering and dissemination for ongoing events; tourists' and women's safety; citizen engagement; neighbourhood safety.
The objectives of the project	
The main objective of City.Risks is to increase the perception of security in cities by activating mechanisms allowing citizens participation in transparent and sustainable way. Information sharing and interventions have been defined both *"to proactively protect citizens from falling victims to criminal activities as well as to reactively provide more timely and effective response and assistance"*. The City.Risks project has leveraged on available data sources and improved data availability making the citizens' mobile devices tools to increase their personal and collective sense of security. Citizens' mobile devices have been used to collect, visualise and share safety-critical information with the appropriate authorities. Mobile applications have been used in a collaboratively way to prevent or mitigate impact of crime events or other security threats on citizens' perception of security. Pilot trials in cities partners of the project measured the effectiveness of the proposed applications and validated their effectiveness in real-life scenarios.	

Evidence useful to fill in the knowledge gaps
• The IT platform allows interaction with neighbouring communities and officials on experienced criminal events. • Citizens become real-time sensors for criminal activities experienced in the urban environment. • Technologies are used also as a tool to interact with city's stakeholders dealing with security (e.g., police). • Active participation of citizens in reporting is used also as a mechanism to increase the perception of security of the community.

Sources: City.Risks CORDIS factsheet; website of the City.Risks project.

4.5.2 Project HFCT02_CCI - Cutting Crime Impact project

Funding programme	Horizon 2020 - Secure societies - Protecting freedom and security of Europe and its citizens.
Topic	Human Factor for the Prevention, Investigation, and Mitigation of criminal and terrorist acts (SEC-07-FCT-2016-2017). Research and innovation Action.
Scope	Urban security. Feeling of insecurity of citizens.
Implementation period	October 2018 – December 2021 (ongoing).
Budget	Overall budget €3,095,068.75; EU contribution €3,095,068.75.
Cities or regions involved as partners	Lisbon (PT), Catalunya (ES).
Approaches or tools created/adopted	Design, development and demonstration of four toolkits to facilitate: predictive policing; community policing; crime prevention through urban design and planning (CP-UDP); measuring and mitigating citizens' feelings of insecurity. An extension of the European Security model (ESM) to include high-impact crime.
The objectives of the project	
The objective of the Cutting Crime Impact (CCI) project addresses the issue of the significant negative impact of petty crime on European citizens' quality of life, community cohesion and the urban safety and security. The project aims to support LEAs and security policymakers at the local and regional level to adopt a "*preventative, evidence-based and sustainable approach to tackling high-impact petty crime*". CCI aims to design, develop and demonstrate (in an operational setting) four toolkits for: (i) predictive policing by exploiting the application of predictive and analytical techniques across large datasets to enable early identification of potential crime problems; (ii) community policing by fostering trust, confidence and legitimacy; (iii) crime prevention through urban design and planning in order to prevent crime and reduce feelings of insecurity; and (iv) measuring and mitigating citizens' feelings of insecurity by	

taking into account victimisation and including also situational factors. Using social science methods and innovation tools, CCI provides to LEAs practical, evidence-based tools. Developed toolkits will help promote safe and secure cities taking into account ethics and privacy aspects without compromising fundamental human rights. An extended European Security Model including high-impact petty crime and citizens' feelings of insecurity is one of the main outcomes of the CCI project. The adoption of this model by other local and regional authorities in Europe is another objective of the project.
Evidence useful to fill in the knowledge gaps
• A practitioner-led EU-funded research and innovation project focusing on the social impact of specific types of crime. • One toolkit developed for each of the identified urban security issues. • LEAs have a primary role in designing and implementing the proposed solutions. --- Measurement of feeling of insecurity and its evolution over time has a crucial role in the project. • Relevance of practices of crime prevention such as urban design and planning in reducing impact of crime.

Sources: CCI CORDIS factsheet; website of the CCI project.

4.5.3 Project HFCT03_IcARUS - Innovative AppRoach to Urban Security

Funding programme	Horizon 2020 - Secure societies - Protecting freedom and security of Europe and its citizens.
Topic	Human factors, and social, societal, and organisational aspects to solve issues in fighting against crime and terrorism (SU-FCT01-2018-2019-2020). Research and innovation Action.
Scope	Urban security.
Implementation period	September 2020 – August 2024 (ongoing).
Budget	Overall budget €5,326,265.74; EU contribution €5,326,265.74.
Cities or regions involved as partners	Stuttgart (DE), Rotterdam (NL), Nice (FR), Lisbon (PT), Turin (IT) and Riga (LV).
Approaches or tools created/adopted	Expected technologically and socially innovative tools adaptable to specific local contexts and solutions tailored to security challenges of local and regional authorities adopting them (ongoing). Four urban security challenges and four tools.
The objectives of the project	
The main objective of the project is to help local stakeholders understand and better respond to urban security challenges. IcARUS aims at providing an integrated, evidence-based and multi-stakeholder approach to address urban security problems by adapting existing practices in the case of *"a decline of citizens' trust in institutions, local elected officials and other security and*	

prevention actors; drastic budgetary cuts and various contemporary crises that affect local and national authorities; the development of smart cities, which implies the effective inclusion of technological innovations in crime prevention." Evidence from urban security research and practice over the last 30 years has been capitalised to facilitate a transformation in the application and utilisation of knowledge in the design of policies for urban security policies. IcARUS integrates social and technological innovations for strategic approach to urban security combining crime prevention and sanctions and social cohesion. Four are the main security challenges the project is going to address: preventing juvenile delinquency; preventing and reducing trafficking and organised crime; designing and managing safe public spaces; preventing radicalisation leading to violent extremism. Local communities become *"active co-producers of services rather than as passive recipients of public services alongside forms of multi-sectoral governance that deliver beneficial urban safety outcomes in terms of urban security policies"*. The IcARUS vision is supposed to contribute to shaping a common approach for security at the European level.

Evidence useful to fill in the knowledge gaps

- The urban authorities participating in the consortium of IcARUS have identified the security challenges for which tools are needed.
- For each of the identified urban security challenges one tool will be developed.
- The direct involvement of the cities is meant to integrate developed tools into their strategy for urban security. The implementation process of the tools foresees the engagement of the local stakeholders that are directly interested in/concerned by the specific identified urban security challenge(s).
- Training sessions on the adoption and usage of tools are foreseen for practitioners and stakeholders of the involved cities.
- Transferability of tools to other urban contexts will be supported through the specification of guidelines and training procedures.

Sources: IcARUS CORDIS factsheet; website of the IcARUS project.

5 Chapter 5 - Urban security and sense of safety: a conceptual framework for what should be assessed and measured

The mapping exercise carried out through a **survey** addressed to representatives of local and regional authorities (*Chapter 2*), **desk review** of public-available sources (*Chapter 3*) and analysis of **ongoing and recent EU funded research and innovation projects** (*Chapter 4*) has contributed to address the first knowledge gap of urban authorities: ***1. what is needed to know in order to assess and measure urban safety and/or urban security?.*** Evidence on **dimensions (i.e., categories)** and the **elements (i.e., indicators) in conceptual frameworks already operationalised through approaches and/or tools** to assess and measure urban safety and/or urban security was essential to build the proposed conceptual framework for self-assessment.

The reference methodology has been the one presented in the *Handbook on Constructing Composite Indicators* (OECD and JRC of the European Commission, 2008) then updated also including the methodology for scoreboards in the *10 Step Pocket Guide to Composite Indicators & Scoreboards* published by the Joint Research Centre (JRC) of the European Commission (JRC of the European Commission, 2019). As the specific purpose of this study is **to define a conceptual framework behind instruments that allows urban authorities of cities of all size to assess and measure urban safety and/or urban security,** out of the 10 steps in which the methodology to build a composite indicator or a scoreboard is structured[10] (hereafter the JRC methodology) only the first two were targeted (i.e., *Step 1 – Define the concept to be measured; Step 2 – Select the indicators*). A question-based checklist needed to operationalise this framework through one or more approaches and tools is reported in Chapter 6. Anyway, additional refinements of the proposed final conceptual framework in terms of indicators may occur when data would be available (e.g., lack of data itself, redundancy problems, correlation issues). A data pilot collection to be carried out by the selected urban authorities will allow moving to Step 3 of the JRC methodology (i.e., *Step 3 - Analyse and treat the data, where necessary*).

[10] *1 – Define the concept to be measured; 2 – Select the indicators; 3 - Analyse and treat the data, where necessary; 4 - Bring all indicators onto a common scale; 5 - Weight the indicators and dimensions; 6 - Aggregate the indicators and dimensions; 7 - Assess the statistical and conceptual coherence; 8 - Assess the impact of uncertainties; 9 - Make sense of the data; 10 - Present the data visually.*

5.1 The five activities within this study to build a conceptual framework

Given this study's specific purpose, some deviations from the JRC methodology in approaching the first two steps were applied. From the four main actions[11] defined in Step 1 and from the four main actions[12] defined in Step 2 of the JRC methodology, the following **five activities** have been carried out within this study:

- A1 - Clear definition of the objectives and of the actors and the other stakeholders involved in the assessment and measurement of urban safety and security;
- A2 - Mapping of the adopted approaches and tools and assess the added-value of the proposed method;
- A3 - Structuring of the concepts into a framework of dimensions and candidate indicators taking inspiration from the mapping exercise on already existing approaches and tools based on specific criteria (such as relevance and credibility);
- A4 - Involvement of stakeholders in a roundtable for the validation of the preliminary framework (i.e., its dimensions and the draft list of indicators);
- A5 - Finalising the framework (i.e., its dimensions and the list of indicators) after its revision on the basis of the feedback of the stakeholders involved during a roundtable.

5.2 A1 - Clear definition of the objectives, of the end-users and of the other stakeholders

The main objective of the solution based on the conceptual framework is to allow cities of all sizes to assess and to measure urban safety and urban security focusing on factors caused by intentional human actions and highlighting relevance of public spaces. Boundaries of investigation of the concepts of urban safety and of urban security have been clearly set by means of definitions. End-users of the instruments are urban authorities, but other actors deemed to be considered for their role-playing in safety and security in urban context and their potential contribution to inform the proposed tool: local police forces/law enforcement agencies operating at the local level and citizens.

5.2.1 Concepts and definitions

Concepts of urban safety and urban security are intended in many different ways and affected by the cultural background, change from one language to the other and are differently addressed in the world. Citizens' security, urban security, urban

[11] *1.1 ¬ Clearly define the objectives and the end-users of the index; 1.2 ¬ Map existing literature, indicator frameworks and definitions and assess the added value of your index; 1.3 ¬ Involve stakeholders, e.g., via workshops; 1.4 ¬ Structure the concept into framework of dimensions.*

[12] *2.1 Assemble a pool of candidate indicators from the literature review; 2.2. Choose indicators based on criteria such as: relevance, data availability/reliability and credibility; 2.3 - Keep track of all indicator decisions and characteristics in a summary table, e.g., coverage, type, descriptive statistics, source and year; 2.4¬ - Scale indicators by an appropriate size measure to have an objective comparison across countries, e.g., population, GDP, etc.*

safety, human security are terms used to address the same issue affecting citizens where they live. Regardless of the adopted concept, key aspects behind it of interest for this study are related to citizens' rights to health as well as the quality of life. *"It takes into consideration how to enhance a person's individual rights and well-being, in terms of their physical, social and psychological integrity, in addition to addressing the prevention of crime and violence, emphasizing the role of all urban inhabitants – regardless of socioeconomic status, gender, race, ethnicity or religion – to be able to fully participate in the social, economic and political opportunities that cities have to offer, in particular at all levels of planning and decision-making, in the development and implementation of policies contributing to the realization of safety and security in cities."(*UN–HABITAT, 2020a). This makes urban safety and urban security public goods.

In the current study the main concepts of interest are urban security, urban safety, sense of safety in a city/perception of urban security, public space. The following distinct definitions for these concepts are adopted:

Urban security: the overall condition of territory (e.g., a neighbourhood, a city) of being protected from **harm caused by intentional human action/behaviour**[13]. It includes harms to **assets, infrastructures and citizens** in the concerned territory. Possible harms to citizens range from **reduction of quality of life to casualties**. Urban security applies in case of crimes and terrorist attacks. For example, a city is secure because a number of measures have been set to protect its assets, infrastructures and citizens against crime.

Urban safety: the condition of citizens in a territory (e.g., a neighbourhood, a city) of being protected from **harm caused by both intentional human action/behaviour and/or not intentional failure**[14]**.** It includes harms to **citizens** in the concerned territory. Possible harms to citizens range from **reduction of quality of life to casualties**. Urban safety applies in case of natural disasters (such as earthquakes and pandemics) as well as in case of crimes and terrorist attacks. For example, a city is safe because a number of measures have been set to protect its citizens against flooding.

Although urban safety applies also in case of natural disasters (such as earthquakes and pandemics), for the purpose of this study we will ***focus only on harms caused by intentional human actions/behaviours***[15]*. As consequence,* ***the definition of urban security encompasses the definition of urban safety***[16]***.***

[13] Part of the definition of "urban security" adopted in this study is an adjustment of the definition of "security" provided in the on-line course of the Leiden University (NL) on *"Security & Safety Challenges in a Globalized World"*.

[14] Part of the definition of "urban safety" adopted in this study is an adjustment of the definition of "safety" provided in the on-line course of the Leiden University (NL) on *"Security & Safety Challenges in a Globalized World"*.

[15] In line with the Orientation Paper of the Urban Agenda's Security in Public Spaces Partnership, when considering urban safety, actual or perceived effects of natural disasters will be not considered in this study. *"Nevertheless, it [the Partnership] will marginally tackle the issue of natural disasters, only in connection with smart and safe cities' approaches and cooperation among security practitioners/first aid responders."* (Urban Agenda's Security in Public Spaces Partnership, 2019).

[16] The idea about the notion of "security" broader than the one of "safety" is commonly adopted in literature in the domain from different perspective. For example, in Van Den Berg et al. (2006)(p.7) *"Safety concerns particularly physical protection (for example, against*

Sense of safety in a city/perception of urban security is then defined as the feeling of people about safety/security of territory. Perception can be expressed by people living in the territory as well as by people never been in the concerned territory. Sense of safety in a city/perception of urban security can importantly vary across people (given their socio-economic conditions, direct experience with safety/security issues, etc.) and overtime.

Public space as common good implies its accessibility to all with no direct cost to the user, and also its spirit of "public service" without any purpose other than contributing to the overall quality of urban life. These spaces can then be categorised into streets (not highways), open spaces (parks, gardens, pocket parks, plazas, squares, riverbanks, beachfront, etc.) and public facilities (social halls, libraries, municipal buildings, schools, health facilities, etc.). Also places, not strictly considered as public spaces, but that have a considerable impact on public and city life (e.g., private spaces contributing to public utility, in which public services are provided) such as tourist sites, transport infrastructures, shopping malls, places of worship, concert halls are included in the adopted definition[17].

5.2.2 Actors

In the domain of urban security and of sense of safety in the city urban authorities, local police forces/law enforcement agencies operating at the local level and citizens have precise objectives.

5.2.2.1 Urban authorities

Urban authorities have the objective **to increase urban security and sense of safety in the city** acting on **prevention of crime and violence** leveraging on improvements of the **social cohesion** and of the **quality of life of citizens** as well as on improvements of the **liveability in public spaces.**

Their final goal is the **reduction of the actual and of future levels of criminal activities and violence**. **Policies,** defined by **strategies** and operationalised by **plans**, set targets/milestones over time in terms of social cohesion, quality of life of citizens and liveability in public spaces. Urban authorities have:

- **situational awareness** in terms of:
  - **Background conditions of the urban area** (internal sources)
  - Level of **social cohesion and quality of life of citizens** (data from citizens/residents, internal sources)
  - Level of the **liveability of public spaces** (data from citizens/residents, internal sources)
  - **Threats, crime (reported and unreported) and violence** (data from citizens/residents, police forces) with an overview of **urban security**

robberies, violence and traffic accidents). Security also concern more tangible threats, such as terroristic attacks, natural disasters and war."

[17] This definition of "public space" is in line with the one adopted in the Orientation Paper of the Urban Agenda's Security in Public Spaces Partnership (2019).

- **Fears about threats, concerns about crime and feeling about safety** of citizens (data from citizens/residents) with an overview of the **sense of safety in the city**

- **monitoring capacity** about **urban security** and **sense of safety in the city** in terms of:
  - levels over time (i.e., self-assessment)
  - achievements of pre-defined targets/milestones (i.e., benchmarking)

5.2.2.2 Local polices/Law enforcement agencies operating at the local level

Local polices/law enforcement agencies operating at the local level have the objective **to increase urban security fighting crime and violence** as per institutional role. Their final aim is the reduction of the actual and future levels of crime and violence with **continuous work based on investigations and related actions.**

Local polices/law enforcement agencies operating at the local level have **situational awareness** in terms of threats, crime (reported) and violence (data from citizens/residents, internal sources) with an overview of **urban security** without information on unreported crime.

Knowledge sharing allows local polices/law enforcement agencies operating at the local level to cooperate **with urban authorities** to achieve pre-defined targets/milestones (i.e., benchmarking).

5.2.2.3 Citizens

The main objective of any citizen is the increase of its **quality of life** that is in turn affected by **social cohesion, liveability of public spaces and urban security.** Fears about threats, concerns about crime and feeling about safety of all the citizens provide the level of the **sense of safety of a city**. Citizens are the final beneficiaries of policies aiming at preventing crime and violence defined by the urban authorities and of effectiveness of actions to fight against crime and violence carried out by police forces. Collaboration in terms of knowledge sharing with urban authorities permits the design and the implementation of informed policies.

5.2.2.4 Engagement of actors to achieve strategic objectives in terms of urban security

A common and shared objective of urban authorities, local polices/law enforcement agencies operating at the local level, and citizens is urban security. Urban authorities have the institutional role in defining mid/long-term strategic objectives to improve the level of security in the city by leveraging on prevention. Still, crucial remains the engagement of all the actors to achieve them. Urban authorities should also favour collaborative mechanisms involving police forces and citizens.

5.3 A2 - Mapping of the adopted approaches and tools and assess the added value of the proposed conceptual framework

The mapping exercise, presented in Chapter 2, Chapter 3 and Chapter 4, has led to the identification of approaches for data collection and of tools for data analysis. Reported examples rely on more or less articulated conceptual frameworks for which **dimensions (i.e., categories)** and the **elements (i.e., indicators)** were analysed together with other features. The resulting evidence served as input to the definition of the preliminary conceptual framework which purpose is the self-assessment of a city interested in measuring its urban security or assessing the sense of safety of its citizens.

With respect to what inferred from the analysis of the answers to the questionnaires, identified in the desk review and derived from the analysis of the EU funded projects, **added value of the proposed conceptual framework** is in:

- **the objective perspective** (i.e., status) and **the subjective perspective** (i.e., perception) of the dimensions of the framework. *Urban security* is taken as the status of security, while *sense of safety in public spaces* is the perception of security by citizens;
- the inclusion of a dimension related to the **quality of life of residents;**
- the inclusion of a dimension related to **social cohesion;**
- the focus on **public spaces;**
- the inclusion of **background conditions** of the urban area under investigation;
- the goal to address **the assessment and measurement needs of cities of any size** (e.g., targeting small cities as well as **administrative units of large urban areas**);
- the opportunity to make a **comparison over time, within the city** (i.e., by administrative unit) **and between the cities** (i.e., a standard approach).

5.4 A3 - Structuring of the concepts into framework of dimensions and of a pool of candidate indicators

The preliminary conceptual framework was structured in six dimensions: *1. Quality of life; 2. Social cohesion; 3. Public space liveability; 4. Sense of safety in public spaces; 5. Urban security; 6. Background (Figure 16).* For dimensions 1, 2, 3 both the status (i.e., the objective perspective OBJ) and the perception/experience/ behaviour of citizens (i.e., the subjective perspective SUB) were considered. *Urban security* and *Background of the area* referred only the status while *Sense of safety in public spaces* included only *the* perception/ experience/behaviour of citizens.

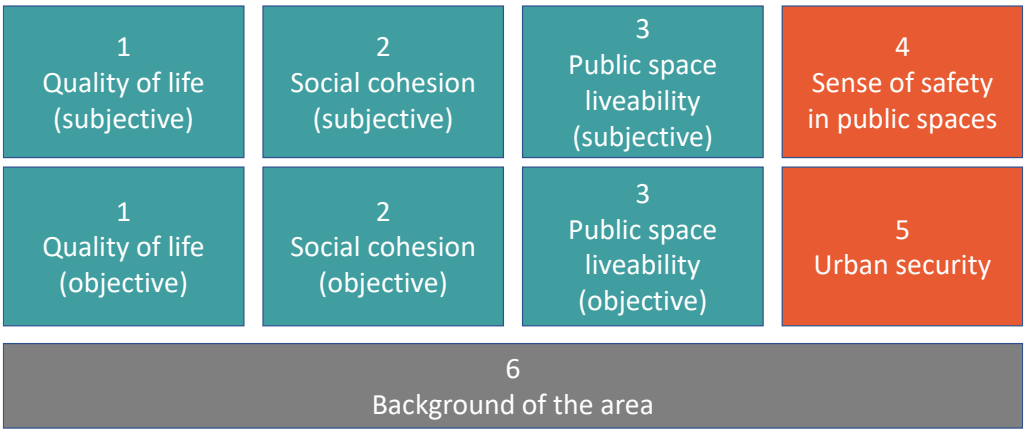


Figure 16 – The preliminary conceptual framework and its six dimensions.

Quality of life **(dimension 1)** was composed of 15 indicators. The 8 OBJ indicators were proposed to measure the quality of life in terms of distance to relevant services and in terms of occurrence of events supposing contributing to it. The 7 SUB indicators referred to citizens' satisfaction about the identified services and to attractiveness factors of the city. Data owners are the urban authority and citizens (mainly residents).

QL01	**OBJ**	Average distance from home to the closest food store
QL02	**OBJ**	Average distance from home to the closest primary school
QL03	**OBJ**	Average distance from home to the closest public transport station/stop
QL04	**OBJ**	Average distance from home to the closest hospital
QL05	**OBJ**	Average distance from home to the closest sport/leisure facility
QL06	**OBJ**	Services for leisure/entertainment (resturants, bar, clubs)
QL07	**OBJ**	Large events/activities for leisure/entertainment
QL08	**OBJ**	Events/activities for leisure/entertainment organised by volounteers/third sector
QL09	**SUB**	Satisfaction about access to safe and quality food
QL10	**SUB**	Satisfaction about education
QL11	**SUB**	Satisfaction about public transport (on time, clean, crowded)
QL12	**SUB**	Satisfaction about health care (public/private)
QL13	**SUB**	Satisfaction about access to sport/leisure facilities
QL14	**SUB**	Attractiveness of the city to live in (compared to other cities in the country)
QL15	**SUB**	Factors affecting the city attractiveness (crime, unemployment)

Table 1 – Quality of life and its indicators (preliminary version).

Social cohesion **(dimension 2)** was composed of 18 indicators. The 15 OBJ indicators were proposed to measure various aspects of the society and its cohesion such as integration of migrants and refugees, unemployment, segregation, poverty. The 3 SUB indicators were aimed to collect opinion of citizens about some of these aspects. Data owners are the urban authority and citizens (mainly residents).

SC01	OBJ	Integration of migrants/refugess
SC02	OBJ	Segregation
SC03	OBJ	Homelessness
SC04	OBJ	Under-graduate population by sex and by age
SC05	OBJ	NEET
SC06	OBJ	Unemployment by sex (female)
SC07	OBJ	Unemployment by nationality (foreigns)
SC08	OBJ	People living in slums
SC09	OBJ	People at risk of poverty
SC10	OBJ	People at risk of social exclusion
SC11	OBJ	People living in households with very low work intensity
SC12	OBJ	Severe material deprivation rate
SC13	OBJ	Services for vulnerable categories
SC14	OBJ	Services for families
SC15	OBJ	Inequality (difference of economic wellbeing/wealth)
SC16	SUB	Opinion about integration of migrants/refugees in the city
SC17	SUB	Opinion about segregation in the city
SC18	SUB	Opinion about poverty in the city

Table 2 – Social cohesion and its indicators (preliminary version).

Public space liveability **(dimension 3)** was composed of 27 indicators. The 14 OBJ indicators aimed to provide an overview of public space in the city (or in the district) while the 13 SUB indicators referred to the citizen's satisfaction and usage of public space. Data owners are the urban authority and citizens (mainly residents).

PS01	OBJ	Open public space availability
PS02	OBJ	Green areas/public parks availability
PS03	OBJ	Pedestrian areas availability
PS04	OBJ	Cycle paths availability
PS05	OBJ	Traffic congestion
PS06	OBJ	Renovation of public buildings/areas
PS07	OBJ	Cost for maintenance of green areas/public parks
PS08	OBJ	Urban planning design to prevent crime in new buildings/areas
PS09	OBJ	Urban planning design to prevent crime in renovating existing buildings/areas
PS10	OBJ	Environmental protection
PS11	OBJ	Waste water management
PS12	OBJ	Solid waste management/recyclying
PS13	OBJ	Air quality
PS14	OBJ	Exposure to noise
PS15	SUB	Satisfaction about public space availability
PS16	SUB	Satisfaction about public space maintenance
PS17	SUB	Usage of green areas/public parks
PS18	SUB	Satisfation about green areas/public parks availability
PS19	SUB	Satisfation about green areas/public parks maintenance
PS20	SUB	Satisfation about street lighting
PS21	SUB	Usage of pedestrian areas
PS22	SUB	Usage of cycle paths
PS23	SUB	Satisfation about parking availability
PS24	SUB	Practice in solid waste recyclying
PS25	SUB	Satisfaction about clean streets
PS26	SUB	Odor nuisance on streets
PS27	SUB	Noise nuisance on streets

Table 3 – Public space liveability and its indicators (preliminary version).

Sense of safety in public spaces **(dimension 4)** was composed of 36 indicators organised in three sub-dimensions: feeling (FEE, 6), fear (FEA, 3) and concerns (CON, 27). In this dimension, citizens (mainly residents) are the data owners.

SS01	**FEEL**	Unsafety/Feeling of (in)security in public spaces without people
SS02	**FEEL**	Unsafety/Feeling of (in)security in crowdy public spaces
SS03	**FEEL**	Unsafety at night. Feeling unsafe outdoors/walking late at night
SS04	**FEEL**	Unsafety at day. Feeling unsafe outdoors/walking late at daylight
SS05	**FEEL**	Unsafety/Feeling of (in)security at home
SS06	**FEEL**	Unsafety/Feeling of (in)security in the neighborhood where he/she lives respect to other parts of the city
SS07	**FEAR**	Fear of terrorism
SS08	**FEAR**	Fear of being involved in attacks to facilities/infrastructures in public spaces
SS09	**FEAR**	Fear of being involved in public disorder events/manifestions
SS10	**CONC**	Concern about family/friends
SS11	**CONC**	Concern about crime in society
SS12	**CONC**	Concern about homicides
SS13	**CONC**	Concern about assaults/attacks (also because of skin colour, ethnic origin, gender or religion)
SS14	**CONC**	Concern about rape/sexual assault
SS15	**CONC**	Concern about robbery
SS16	**CONC**	Concern about theft/pickpocketing
SS17	**CONC**	Concern about theft/vandalism of vehicle
SS18	**CONC**	Concern about burglary
SS19	**CONC**	Concern about Harassment (online also)
SS20	**CONC**	Concern about Sales fraud
SS21	**CONC**	Concern about Card/credit fraud
SS22	**CONC**	Concern about Hate crime
SS23	**CONC**	Concern about Organised crime
SS24	**CONC**	Concern about Gangs crime
SS25	**CONC**	Concern of being insulted (because of skin colour, ethnic origin, gender or religion)
SS26	**CONC**	Concern to have problems with people using or dealing drugs
SS27	**CONC**	Concern about corruption and bribery
SS28	**CONC**	Concern about homelessness
SS29	**CONC**	Concern about youth nuisance
SS30	**CONC**	Concern about drug nuisance
SS31	**CONC**	Concern about being harassed on the street
SS32	**CONC**	Concern about nuisance between residents in the neighborhood.
SS33	**CONC**	Concern about being involved in traffic accidents
SS34	**CONC**	Concern about being involved in fire accidents
SS35	**CONC**	Concern about natural disasters
SS36	**CONC**	Concern about being contaminated by COVID-19

Table 4 – Sense of safety in public spaces and its indicators (preliminary version).

Urban security **(dimension 5)** was composed of 57 indicators organised in four sub-dimensions: threats (THR, 10), crime (CRI, 25), victimisation (VIC, 16) and police response (POL, 6). In this dimension, local police forces and law enforcement agencies operating at the local level take the role of data owners.

US01	**THR**	Terrorist attacks
US02	**THR**	Severity of terrorist attacks
US03	**THR**	CBRN attacks
US04	**THR**	Severity of CBRN attacks
US05	**THR**	Explosive/bombing attacks
US06	**THR**	Severity of explosive/bombing attacks
US07	**THR**	Attacks to facilities/infrastructures in public spaces
US08	**THR**	Severity of attacks to facilities/infrastructures in public spaces
US09	**THR**	Public disorder events/manifestions
US10	**THR**	Severity of public disorder events/manifestations

US11	CRI	Crimes
US12	CRI	Offences
US13	CRI	Threats
US14	CRI	Intentional homicide
US15	CRI	Intentional homicide victims by sex
US16	CRI	Assault (serious/not serious)
US17	CRI	Sexual assault (involving the use of force; involving the exploitation of a defenceless condition)
US18	CRI	Rape
US19	CRI	Robbery (on street)
US20	CRI	Theft (on street)
US21	CRI	Theft of a private land vehicle (car/motocycle/bicycle/monopeds)
US22	CRI	Damages to a private land vehicle (car/motocycle/bicycle/monopeds)
US23	CRI	Damages to a public land vehicle (car/motocycle/bicycle/monopeds/bus/tram/train)
US24	CRI	Burglary of private residential premises
US25	CRI	Damages to private residential premises (vandalism)
US26	CRI	Damages to public buildings (vandalism). Daubing of walls or buildings (such as graffiti)
US27	CRI	Damages to street forniture (vandalism). Rubbish bins, seating furniture, playground equipment
US28	CRI	Disturbances
US29	CRI	Compliants about noise in public spaces
US30	CRI	Compliants about smelll in public spaces
US31	CRI	Offenders
US32	CRI	Offenders for drug abuse
US33	CRI	Offenders for alcohol abuse
US34	CRI	Offenders for gender violence
US35	CRI	Suspects
US36	VICT	Experience of the police in connection with reporting a crime to the police
US37	VICT	Experience with assaults/attacks (also because of skin colour, ethnic origin, gender or religion)
US38	VICT	Experience with rape/sexual assault
US39	VICT	Experience with robbery
US40	VICT	Experience with theft/pickpocketing
US41	VICT	Experience with theft/vandalism of vehicle
US42	VICT	Experience with burglary
US43	VICT	Experience with Harassment (online also)
US44	VICT	Experience with Sales fraud
US45	VICT	Experience with Card/credit fraud
US46	VICT	Experience with Hate crime
US47	VICT	Experience with Organised crime
US48	VICT	Experience with Gangs crime
US49	VICT	Experience with being insulted (because of skin colour, ethnic origin, gender or religion)
US50	VICT	Experience of problems with people using or dealing drugs
US51	VICT	Experience of corruption and bribery
US52	POL	Police officers in the city (day)
US53	POL	Police officers in the city (night)
US54	POL	Calls to police
US55	POL	Community-based patrolling/watch groups
US56	POL	Private security guards
US57	POL	Surveillance systems

Table 5 – Urban security and its indicators (preliminary version).

Background of the area **(dimension 6)** was composed of 21 indicators organised in four sub-dimensions: demographic conditions (POP, 9), economic conditions (ECO, 2), availability of services/infrastructures (SER, 7), institutional context (INST, 3). In this dimension, the urban authority is the data owner.

BG01	**POP**	Life expectancy years by sex
BG02	**POP**	Infant mortality
BG03	**POP**	Population
BG04	**POP**	Daily commuters
BG05	**POP**	Population density
BG06	**POP**	Living space per capita
BG07	**POP**	Elderly people by sex
BG08	**POP**	Young people by sex
BG09	**POP**	Vulnerable categories
BG10	**ECO**	Economic wellbeing/wealth
BG11	**ECO**	Economic attractiveness of the area
BG12	**SER**	Availability/capacity of public transport
BG13	**SER**	Usage of public transport
BG14	**SER**	Availability of public utilities services
BG15	**SER**	Usage of public utilities services
BG16	**SER**	Availability of internet connection
BG17	**SER**	Usage/access of internet connection
BG18	**SER**	Number of health care structures/services
BG19	**INST**	Gun regulation and enforcement
BG20	**INST**	Effectiveness of the criminal justice system
BG21	**INST**	Corruption

Table 6 – Background of the area and its indicators (preliminary version).

5.5 A4 - Involvement of stakeholders in a roundtable for the validation of the preliminary framework (i.e., its dimensions and the draft list of indicators)

On 9 April 2021, a virtual roundtable meeting (hereafter, the Roundtable) was held in the framework of Action 1 of the Urban Agenda's Security in Public Spaces Partnership. The event was attended by around 30 participants from various urban authorities, police forces, EU institutions and international organisations. The Roundtable showcased the progress made in developing a conceptual framework for self-assessment instruments to assess and measure safety and security in cities. The Roundtable comprised two sessions, whereby the first was dedicated to presenting highlights and main gaps of existing approaches and tools and discussing a possible new and more comprehensive framework.

During this session, participants were asked to provide feedback on the completeness and the effectiveness of the preliminary framework in general and on the completeness and the effectiveness of its six components and their respective sets of indicators. Detailed feedback which served to improve the completeness of the proposed framework and validate the work that had been done was provided through various live polls (*Annex 4*) and designated discussion rounds.

The second session provided a space to debate on the operationalisation of the proposed conceptual framework in order to build a checklist supporting urban authorities in a sustainable and effective adoption of approaches/tools to conduct assessments of sense of safety and measurements of security in their territories (*Chapter 6*).

5.6 A5 - Finalising the framework

The pools and the discussion within the Roundtable and further informal exchanges with participants and other experts in the domain led to the confirmation of the six proposed dimensions of indicators composing the conceptual framework with minor changes. i.e., *status* was preferred to *objective perspective* (OBJ) and *perception* to *subjective perspective* (SUB). Further categorisation was also suggested for *Urban security* and *Background* and a new one is proposed for *Sense of Safety in public spaces.* These adjustments and reshaping led to the following structure:

- ***Urban security*** (4): Crime and other nuisances (CRI), Victimisation and experience with crime and other nuisances (VIC), Threats from unexpected events (THR), Mitigation against crime and other nuisances (MIT);
- ***Sense of Safety in public spaces*** (4): Feeling of unsafety (FEE), Concerns about crime and other nuisances (CON), Fear of threats from unexpected events (FEA), Trust and confidence about mitigation of crime and other nuisances (TRU):
- ***Background conditions*** (2): Demographic aspects (DEM), Services and infrastructures availability (SI).

The **final conceptual framework to assess and measure urban safety and urban security** is presented in Figure 17.

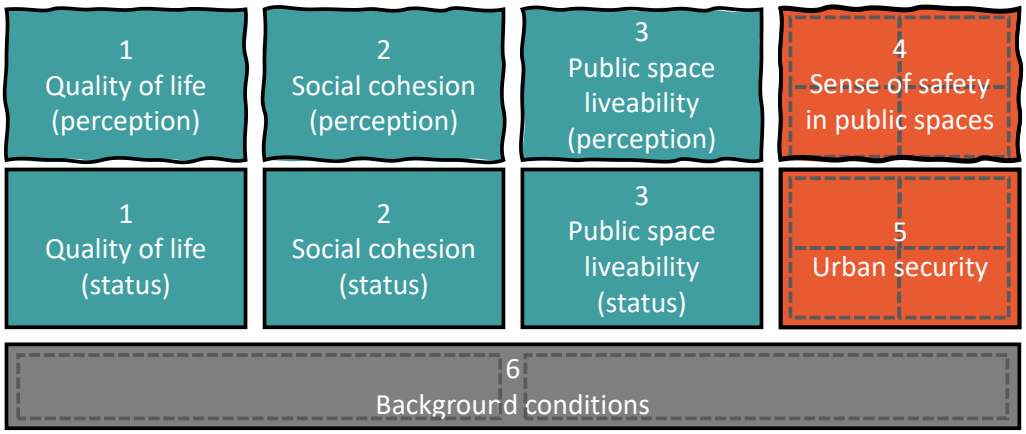


Figure 17 – The final conceptual framework and its six dimensions.

Concerning indicators within each dimension, four types of changes occurred:

- **Substitution of indicators.** This occurred in dimensions less convincing the participants of the Roundtable. One of the cases is *Dimension 1 – Quality of life*. What is proposed is a combination of indicators adopted in the *Eurofund* Survey (i.e., the *European Quality of Life Survey*) and the ones adopted in the tool of the European Commission used to compare quality of life in Member States.
- **Change of dimension to which indicators belong to.** Since the beginning, some doubts were raised about the "proper housing" of some indicators

that could fit in more than one dimension. An example is the indicator related to living space per capita that was moved (and renamed) from *Background conditions* to *Quality of life*.

- **Removal of some indicators.** This occurred to reduce the number of the proposed indicators, especially when they assess similar phenomena or highly correlated ones. This, for example, occurred whit indicators in urban security – crime in which *Eurostat* classification (based on the International Classification of Crime for Statistical Purposes - ICCS) was preferred.
- **Preliminary indication of the effect of change over time of each indicator on the dimension (+ or -)**. For example, an increase in thefts of a private land vehicle negatively affects (-) urban security.
- **Inclusion of examples of data and sources for each of the proposed indicators.** For example, *High-education attainment* (in *Quality of life*) can be measured through *population with high education level (ISCED 5-8)* in terms of *% of the population with an education level ISCED 5-8 of the previous year* as is done by *Eurostat*.

The outcome of this exercise (i.e., the final conceptual framework including almost 200 indicators) is reported in the tables below (from *Table 7* to *Table 22*).

5.6.1 Dimension 1 – Quality of life

01 - Quality of life Status					
		What	**Indicator**	**How to meaure it**	**Possible sources**
S_QoL01	+	**Income**	Equivalised net income	Annual median equivalised net income of the territory (euros)(last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Material living conditions.
S_QoL02	-	**House crowding**	Overcrowding rate	Overcrowding rate (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Housing conditions.
S_QoL03	+	**Employment**	Employment rate	Employment rate (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Employment.
S_QoL04	+	**Work-life balance**	Working time	Average weekly working hours (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Time use.
S_QoL05	+	**Personal relationship**	People who have someone to rely on in case of need.	Percentage of residents (on the population of reference) (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Social relations.
S_QoL06	+/-	**High-education attainment**	Population with high education level (ISCED 5-8)	% of the population with an education level ISCED 5-8 (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Education.
S_QoL07	+/-	**Low-education attainment**	Population with low education level (ISCED 0-2)	% of the population with an education level ISCED 0-2 (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Education.

Table 7 – Quality of life (status) and its indicators (final version).

01 - Quality of life Perception					
		What	**Indicator**	**How to meaure it**	**Possible sources**
P_QoL01	+	**Personal finances**	Average satisfaction with personal finances	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Material living conditions.
P_QoL02	+	**Housing**	Average satisfaction with housing	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Housing conditions.
P_QoL03	+	**Job**	Average satisfaction with job	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Employment.
P_QoL04	+	**Work-life balance**	Average satisfaction with time use	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Time use.
P_QoL05	+	**Personal relationship**	Average satisfaction with personal relationship	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Social relations.
P_QoL06	+/-	**Life satisfaction gap**	Average gap about life satisfaction between people with high and low education level	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis For statistics at higher administrative level Eurostat, Quality of life. https://ec.europa.eu/eurostat/cache/infographs/qol/index_en.html Education.
P_QoL07	+	**Child care services**	Average satisfaction with child care services in the city	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Source for definitions: category of quality of public services from the European Quality of Life Survey of Eurofund
P_QoL08	+	**Long-term care services**	Average satisfaction with long-term care services in the city	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Source for definitions: category of quality of public services from the European Quality of Life Survey of Eurofund
P_QoL09	+	**Health care services**	Average satisfaction with health care services in the city	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Source for definitions: category of quality of public services from the European Quality of Life Survey of Eurofund
P_QoL10	+	**Education services satisfaction**	Average satisfaction with education services in the city	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Source for definitions: category of quality of public services from the European Quality of Life Survey of Eurofund
P_QoL11	+	**Public transport services**	Average satisfaction with public transport services in the city	Residents' assessement. Likert scale. From 1 to 10.	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Source for definitions: category of quality of public services from the European Quality of Life Survey of Eurofund
P_QoL12	+	**Cultural/leisure services/events**	Average satisfaction with cultural/leisure services/events in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis*
P_QoL13	+	**Local administration services for citizens**	Average satisfaction about local administration services for citizens in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis*
P_QoL14	+	**Life**	Average general satisfaction about life	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis*
P_QoL15	+	**Attractiveness of the city**	Average assessment of the city as a place to live in compared to other cities in the country	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis*

Table 8 – Quality of life (perception) and its indicators (final version).

5.6.2 Dimension 2 – Social cohesion

Social cohesion Status					
		What	**Indicator**	**How to meaure it**	**Possible sources**
S_SC01	+	**Social integration of migrants and/or refugees**	Percentage of employed migrants and/or refugees	Number of employed migrants and/or refugees/ Total population of migrants and/or refugees (last year)	*Data already available to the urban authority for what concerns legal migrants/refugees.* *It could be relevant to assess integration only for migrants/refugees with nationalities are more relevant in the territory.*
S_SC02	-	**Homelessness**	Percentage of people living rough in public space/external space	Number of people living rough in public space/external space*1.000/ Total population (last year)	*Data already available to the urban authority or to be obtained as secondary data by third sector organisations.*
S_SC03	-	**Young people without "staus"**	Pecentage of Neither in employment nor in education and training (NEET) on the 20-34 year-old population	Number of NEET aged 20-34 years/ Total population aged 20-34 years (last year)	*Data already available to the urban authority.*
S_SC04	+	**Labour integration of women**	Percentage of employed women	Number of employed women/ Total population of women (last year)	*Data already available to the urban authority.*
S_SC05	+	**Labour integration of foreign people**	Percentage of employed foreign people	Number of people with different nationality employed/ Total population of people with different nationality (last year)	*Data already available to the urban authority.* *It could be relevant to assess iemployment only for foreing people with nationalities are more relevant in the territory.*
S_SC06	-	**Urban segregation**	People living in slums	Number of people living in slums/ Total population (last year)	*Data already available to the urban authority or to be obtained as secondary data by third sector organisations. About definition of slums. Source: UN Human Settlements Programme (UN-HABITAT). A slum household a group of individuals living under the same roof lacking one or more of the following conditions: access to improved water, access to improved sanitation, sufficient livina area. housina durabilitv. and securitv of tenure (MDG Taraet 7.D). The*
S_SC07	-	**Risk of poverty**	Percentage of people with disposable income below the risk-of-poverty threshold	Percentage of people with disposable income below 60 % of the national one/ Total population (last year)	*Data already available to the urban authority. About definition of risk of poverty. Source: Eurostat. Persons are considered to be at risk of poverty after social transfers, if they have an equivalised disposable income below the risk-of-poverty threshold, which is set at 60 % of the national median equivalised disposable income.*
S_SC08	-	**Inequality**	Distance between the perfect distribution of income among the population.	Gini index on income. (last year)	*Data already available to the urban authority or to be proxied with other information available (e.g. tax data). The GINI Index ranges between 0 and 1, where 0 corresponds with perfect equality (where everyone has the same income) and 1 corresponds with perfect inequality (where one person has all the income—and everyone else has no income).*

Table 9 – Social cohesion (status) and its indicators (final version).

Social cohesion Perception					
		What	**Indicator**	**How to meaure it**	**Possible sources**
P_SC01	+	**Social integration of migrants and/or refugees**	Average opinion about achievements in terms of social integration of migrants and/or refugees in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples).* *To be collected on regular basis.*
P_SC02	+	**Labour integration of women**	Average opinion about labour integration of women in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples).* *To be collected on regular basis.*
P_SC03	+	**Labour integration of foreign people**	Average opinion about labour integration of foreign people in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples).* *To be collected on regular basis.*
P_SC04	-	**Urban segregation**	Average opinion about severity of urban segregation in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples).* *To be collected on regular basis.*
P_SC05	-	**Risk of poverty**	Average opinion about severity of the risk of poverty in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples).* *To be collected on regular basis.*
P_SC06	-	**Inequality**	Average opinion about severity of inequality in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples).* *To be collected on regular basis.*

Table 10 – Social cohesion (perception) and its indicators (final version).

5.6.4 Dimension 3 – Public space liveability

Public space liveability Status					
		What	**Indicator**	**How to meaure it**	**Possible sources**
S_PSL01	+	**Public space**	Extension of public space accessible to citizens	Square meters per inhabitants (last year)	*Data already available to the urban authority.*
S_PSL02	+	**Green areas/public parks**	Extension of green areas/public parks accessible to citizens	Square meters per inhabitants (last year)	*Data already available to the urban authority.*
S_PSL03	+	**Pedestrian areas**	Extension of pedestrian areas accessible to citizens	Square meters per inhabitants (last year)	*Data already available to the urban authority.*
S_PSL04	+	**Cycle paths**	Lenght of cycle paths accessible to citizens	kms per inhabitants (last year)	*Data already available to the urban authority.*
S_PSL05	-	**Traffic congestion**	Time in traffic with private car home-work in the morning/in the evening	Average time spent in the home-work travel in the morning/in the evening/ km in the last year (last year)	*Data already available to the urban authority.*
S_PSL06	+	**Renovation of public buildings/areas**	Percentage of investment in renovation of public buildings/areas	Expenditures of the urban authority on renovation of public buildings/areas in the last 3 years/ Total expenditures of the urban authority in the last 3 years	*Data already available to the urban authority.*
S_PSL07	+	**Maintenance of green areas/public parks**	Percentage of investment in maintenance of green areas/public parks	Expenditures of the urban authority on maintenance of green areas/public parks in the last 3 years/ Total expenditures of the urban authority in the last 3 years	*Data already available to the urban authority.*
S_PSL08	+	**Urban planning design to prevent crime in new buildings/areas**	Percentage of interventions in new public buildings/areas adopting CPTED or CP-UDP	Number of interventions in new public buildings/areas adopting CPTED or CP-UDP/ Total number of interventions in new public buildings/areas (last 3 years)	Data already available to the urban authority. CPTED (Crime Prevention Through Environmental Design) or CP-UDP (Crime Prevention through Urban Design and Planning).
S_PSL09	+	**Urban planning design to prevent crime in renovating existing buildings/areas**	Percentage of interventions in renovating existing public buildings/areas adopting CPTED or CP-UDP	Number of interventions in existing public buildings/areas adopting CPTED or CP-UDP/ Total number of interventions in existing public buildings/areas (last 3 years)	Data already available to the urban authority. CPTED (Crime Prevention Through Environmental Design) or CP-UDP (Crime Prevention through Urban Design and Planning).
S_PSL10	+	**Environmental protection**	Percentage of investment in enviromental protection	Expenditures of the urban authority on environmental protection in the last 3 years/ Total expenditures of the urban authority in the last 3 years	*Data already available to the urban authority.*
S_PSL11	+	**Solid waste management**	Percentage of solid waste carried out with differentiated collection	Tons of solid waste carried out with differentiated collection/ Total tons of solid waste (last year)	*Data already available to the urban authority or to be obtained by organisations/operators in charge of it.*
S_PSL12	+	**Air quality**	Percentage of days a year with air of certain quality	Number of days a year with quality of air under the tolerance threshold (e.g. PM 10 levels)/ Number of days a year (last year)	*Data already available to the urban authority or to be obtained by organisations/operators in charge of it.*
S_PSL13	-	**Noise**	Number of compliants about noise during night	Number of call to police forces about noise (more than decibel threshold) during night a year (last year)	*Data collected by police.*

Table 11 – Public space liveability (status) and its indicators (final version).

Public space liveability Perception					
		What	**Indicator**	**How to meaure it**	**Possible sources**
P_PSL01	+	**Public space availability**	Average satisfaction about public space availability	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. In terms of accessibility. Estimation of share of population with access to open public spaces within 400 meters walking distance out of the total population in the city/urban area. Disaggregation of the population with access by sex, age and persons with disabilities (SDG indicator metadata. March 2021)*
P_PSL02	+	**Public space maintenance**	Average satisfaction about public space maintenance	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL03	+	**Usage of public space**	Average frequency of usage of public space	Residents' habits. From once a day to less than once a month.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL04	+	**Green areas/public parks availability**	Average satisfation about green areas/public parks availability	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL05	+	**Green areas/public parks maintenance**	Average satisfation about green areas/public parks maintenance	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL06	+	**Usage of green areas/public parks**	Average frequency of usage of green areas/public parks	Residents' habits. From once a day to less than once a month.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL07	+	**Pedestrian areas availability**	Average satisfation about pedestrian areas availability	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL08	+	**Pedestrian areas maintenance**	Average satisfation about pedestrian areas maintenance	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL09	+	**Usage of pedestrian areas**	Average frequency of usage of pedestrian areas	Residents' habits. From once a day to less than once a month.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL10	+	**Cycle paths availability**	Average satisfation about cycle paths availability	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL11	+	**Cycle paths maintenance**	Average satisfation about cycle paths maintenance	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL12	+	**Usage of cycle paths**	Average frequency of usage of cycle paths	Residents' habits. From once a day to less than once a month.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL13	+	**Parking availability**	Average satisfation about parking availability	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL14	+	**Accessibility of public space for vulnerable groups**	Average satisfation about accessibility of public space for vulnerable groups	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*

P_PSL15	+	**Compliance of public space for family needs**	Average satisfation about compliance of public space for family needs	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL16	+	**Environmental protection**	Average satisfation about investment in enviromental protection carried out by the urban	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL17	+	**Solid waste recyclying**	Average percentage of solid waste carried out with differentiated collection	Residents' habits. From 0% to 100%.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL18	+	**Solid waste management**	Average satisfation about the solid waste collection service in the city	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL19	+	**Street lighting**	Average satisfation about street lighting	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL20	+	**Street cleaning**	Average satisfation about street cleaning	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL21	-	**Odor nuisance on streets**	Average assessement of odor nuisance on streets	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
P_PSL22	-	**Noise nuisance on streets**	Average assessement of noise nuisance on streets	Residents' assessement. Likert scale. From 1 to 10.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*

Table 12 – Public space liveability (perception) and its indicators (final version).

5.6.6 Dimension 4 – Sense of safety in public spaces

Sense of safety in public spaces Feeling of unsafety					
		What	**Indicator**	**How to meaure it**	**Possible sources**
FEE_SS01	-	**Sense of unsafety at home at daylight**	Worries about being victim of harms caused by others when alone at home at daylight	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS02	-	**Sense of unsafety at home at night**	Worries about being victim of harms caused by others when alone at home at night	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS03	-	**Sense of unsafety in public spaces without people**	Worries about being victim of harms caused by others when alone in public spaces	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS04	-	**Sense of unsafety in crowded public spaces**	Worries about being victim of harms caused by others when in crowded public spaces	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS05	-	**Sense of unsafety at daylight in public spaces**	Worries about being victim of harms caused by others when alone outdoors/walking at daylight	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS06	-	**Sense of unsafety at night in public spaces**	Worries about being victim of harms caused by others when alone outdoors/walking late at night	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS07	-/+	**Relative sense of unsafety in the neighbourhood where living respect to the city in general at daylight**	Average assessment of the sense of unsafety of the neighbourhood where living respect to the city in general at daylight	Residents' assessement. Likert scale. 1= largerly unsafer in my neighbourhood; 5 = largerly unsafer in the rest of the city.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEE_SS08	-/+	**Relative sense of unsafety in the neighbourhood where living respect to the city in general at night**	Average assessment of the sense of unsafety of the neighbourhood where living respect to the city in general at night	Residents' assessement. Likert scale. 1= largerly unsafer in my neighbourhood; 5 = largerly unsafer in the rest of the city.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*

Table 13 – Sense of safety in public spaces (feeling of unsafety) and its indicators (final version).

Sense of safety in public spaces Concerns about crime and other nuisances					
		What	Indicator	How to meaure it	Possible sources
CON_SS01	-	**Concern about crime**	Worries about being victim of a crime	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS02	-	**Concern about family/friends being victims of crime**	Worries about family/friends being victim of a crime	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS03	-	**Concern about crime perpetrated by firearms**	Worries about being victim of a crime perpetrated by firearms	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS04	-	**Concern about homicides**	Worries about being victim of an homicide	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS05	-	**Concern about assaults**	Worries about being victim of an assault	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS06	-	**Concern about sexual assaults**	Worries about being victim of a sexual assault	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS07	-	**Concern about rapes**	Worries about being victim of a rape	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS08	-	**Concern about thefts/ pickpocketing (on the street)**	Worries about being victim of a theft/pickpocketing (on the street)	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS09	-	**Concern about thefts/damages of a private land vehicle**	Worries about being victim of a theft/damages of a private land vehicle	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS10	-	**Concern about robbery (on the street)**	Worries about being victim of a robbery (on the street)	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS11	-	**Concern about burglary/damages of private residential premises**	Worries about being victim of a burglary/damages of private residential premises	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS12	-	**Concern about harassment (on the street)**	Worries about being victim of harassement (on the street)	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS13	-	**Concern about hate crimes (on the street)**	Worries about being victim of hate crimes (on the street)	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
CON_SS14	-	**Concern about organised crime**	Worries about being victim of organised crime	Residents' assesement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*

Table 14 – Sense of safety in public spaces (concerns about crime and other nuisances) and its indicators (final version).

Sense of safety in public spaces Fear of threats from unexepcted events					
		What	**Indicator**	**How to meaure it**	**Possible sources**
FEA_SS01	-	**Fear of terrorism**	Worries about being victim of terrorist attacks	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEA_SS02	-	**Fear of attacks to facilities/infrastructures in public spaces**	Worries about being victim of attacks to facilities/infrastructures in public spaces	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
FEA_SS03	-	**Fear of violent public disorder events/manifestions**	Worries about being victim of violent public disorder events/manifestions	Residents' assessement. Likert scale. 1=no worries; 5=extremely worried.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*

Table 15 – Sense of safety in public spaces (fear of threats from unexpected events) and its indicators (final version).

Sense of safety in public spaces Trust and confidence about mitigation of crime and other nuisances					
		What	**Indicator**	**How to meaure it**	**Possible sources**
TRU_SS01	-	**Trust in the police forces**	Assessment of the effectiveness of the police forces against crime	Residents' assessement. Likert scale. 1=very ineffective; 5=vary effective.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
TRU_SS02	-	**Trust in the criminal justice system**	Assessment of the effectiveness of the criminal justice system	Residents' assessement. Likert scale. 1=very ineffective; 5=vary effective.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*
TRU_SS03	-	**Confidence in systems for surveillance**	Assessment of the effectiveness of the systems for surveillance	Residents' assessement. Likert scale. 1=very ineffective; 5=vary effective.	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Taking into account men/women, young people/adults, nationality, education level.*

Table 16 – Sense of safety in public spaces (trust and confidence about mitigation of crime and other nuisances) and its indicators (final version).

5.6.8 Dimension 5 – Urban security

Urban security Crime and other nuisances					
		What	Indicator	How to meaure it	Possible sources
CRI_US01	-	**Crimes**	Number of crimes.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_off_cat)*
CRI_US02	-	**Intentional homicides**	Number of intentional homicides.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_off_cat)*
CRI_US03	-	**Intentional homicides of female victims**	Number of intentional homicides of fermale victims.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_hom_vage)*
CRI_US04	-	**Intentional homicides of young victims**	Number of intentional homicides of young victims (15-29 aged).	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_hom_vage)*
CRI_US05	-	**Intentional homicides perpetrated by firearms**	Number of intentional homicides perpetrated by firearms.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US06	-	**Assaults**	Number of assaults.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_off_cat)*
CRI_US07	-	**Assaults perpetrated by young people**	Number of assaults perpetrated by young people (15-29 aged).	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US08	-	**Sexual assaults**	Number of sexual assaults in the city.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_off_cat)*
CRI_US09	-	**Rapes**	Number of rapes.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_off_cat)*
CRI_US10	-	**Thefts (on the street)**	Number of thefts (on the street).	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US11	-	**Thefts of a private land vehicle**	Number of thefts of a private land vehicle.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.* *Private land vehicles are cars/motocycles/bicycles/ monopeds.*
CRI_US12	-	**Robbery (on the street)**	Number of robbery (on the street).	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US13	-	**Damages to a private land vehicle**	Number of police records about damages to a private land vehicle.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.* *Private land vehicles are cars/motocycles/bicycles/ monopeds.*
CRI_US14	-	**Damages to a public land vehicle**	Number of police records about damages to a public land vehicle.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.* *Public land vehicles are cars/motocycles/ bicycles/ monopeds/buses/trams/ trains.*

CRI_US15	-	**Burglaries of private residential premises**	Number of burglaries of private residential premises.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US16	-	**Damages to private residential premises**	Number of police records about damages to private residential premises.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. E.g. vandalism, daubing of walls or buildings (such as graffiti)*
CRI_US17	-	**Damages to public buildings**	Number of police records about damages to public residential premises.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. E.g. vandalism, daubing of walls or buildings (such as graffiti)*
CRI_US18	-	**Damages to street forniture**	Number of police records about damages to street forniture.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. E.g. Such as to rubbish bins, seating furniture, playground equipment*
CRI_US19	-	**Corruption of public officials**	Number of police records about corruption of public officials.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US20	-	**Offenders**	Total number of offenders, number of young offenders (15-29 aged), number of offenders from foreing countries.	Number per 100000 inhabitants. (Last year)	*Data recorded by police. For definitions and statistics referring to a higher administrative level, source: Eurostat (crim_just_age); Eurostat (crim_just_ctz)*
CRI_US21	-	**Offenders for drug abuse**	Number of offenders for drug abuse.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*
CRI_US22	-	**Offenders for alcohol abuse**	Number of offenders for alohol abuse.	Number per 100000 inhabitants. (Last year)	*Data recorded by police.*

Table 17 – Urban security (crime and other nuisances) and its indicators (final version).

Urban security
Victimisation and experience with crime and other nuisances

		What	Indicator	How to meaure it	Possible sources
VIC_US01	-	**Experience with crime**	Percentage of residents suffering crime.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US02	-	**Experience with crime perpetrated by firearms**	Percentage of residents suffering crime perpetrated by firearms.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US03	-	**Experience with assaults**	Percentage of residents suffering assaults.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Because of skin colour, ethnic origin, gender or religion.
VIC_US04	-	**Experience with sexual assaults**	Percentage of residents suffering sexual assaults.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Involving the use of force; involving the exploitation of a defenceless condition.
VIC_US05	-	**Experience with rapes**	Percentage of residents suffering rapes.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Involving the use of force; involving the exploitation of a defenceless condition.
VIC_US06	-	**Experience with thefts/ pickpocketing (on the street)**	Percentage of residents suffering thefts/pickpocketing (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US07	-	**Experience with thefts/damages of a private land vehicle**	Percentage of residents suffering thefts/damages of a private land vehicle.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Private land vehicles are cars/motocycles/bicycles/monopeds.
VIC_US08	-	**Experience of having witnessed thefts/damages of a public land vehicle**	Percentage of residents having witnessed thefts/damages of a public land vehicle.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Public land vehicles are cars/motocycles/ bicycles/monopeds/buses/trams/ trains.
VIC_US09	-	**Experience with robbery (on the street)**	Percentage of residents suffering robbery (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US10	-	**Experience with burglary/damages of private residential premises**	Percentage of residents suffering burglary/damage of private residential premises.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US11	-	**Experience of having witnessed damages to public buildings**	Percentage of residents having witnessed damages to public buildings.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. E.g. vandalism, daubing of walls or buildings (such as graffiti)
VIC_US12	-	**Experience of having witnessed damages of street forniture**	Percentage of residents having witnessed damages of street forniture.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. E.g. Such as to rubbish bins, seating furniture, playground equipment
VIC_US13	-	**Experience about noise**	Percentage of residents suffering noise night time.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US14	-	**Experience about smell (on the street)**	Percentage of residents suffering smell (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*

VIC_US15	-	**Experience with harassement (on the street)**	Percentage of residents suffering harassement (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Because of skin colour, ethnic origin, gender or religion.
VIC_US16	-	**Experience with hate crimes (on the street)**	Percentage of residents suffering hate crimes (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis. Because of skin colour, ethnic origin, gender or religion.
VIC_US17	-	**Experience with corruption of public officials**	Percentage of residents having problems due to corruption of public officials.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US18	-	**Experience with organised crime**	Percentage of residents having problems with organised crime.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US19	-	**Experience with gangs crime**	Percentage of residents having problems with gangs crime.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US20	-	**Experience with crime related to radicalism/extremism**	Percentage of residents having problems with crime related to radicalism/extremism.	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US21	-	**Experience of problems with people using or dealing with drugs (on the street)**	Percentage of residents having problems with people using or dealing with drugs (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*
VIC_US22	-	**Experience of problems with people using or dealing with alcohol (on the street)**	Percentage of residents having problems with people using or dealing with alcohol (on the street).	Percentage of residents (on the population of reference) taking into account men/women, yong people/adults, nationality, education level. (last year)	*Primary data to be collected with population surveys (statistically significant samples). To be collected on regular basis.*

Table 18 – Urban security (victimisation and experience with crime and other nuisances) and its indicators (final version).

Urban security Threats from unexpected events					
		What	**Indicator**	**How to meaure it**	**Possible sources**
THR_US01	-	**Terrorist attacks relevance**	Number of past terrorist attacks	Average annual number of the terrorist attacks over the past ten years.	*Data recorded by police or first responders.*
THR_US02	-	**Severity of terrorist attacks**	Number of casualties in past terrorist attacks	Average annual number of deaths/injuries due to the terrorist attacks over the past ten years*100.000/ population.	*Data recorded by police or first responders.*
THR_US03	-	**Vulnerability to terrorist attacks**	Assessement of police forces/urban authority on potential future attacks (from 1 to 10)	Experts' assessement. Likert scale. From 1 to 10. (next year)	*Primary data based on the assessment of experts from the police forces/urban authority.*
THR_US04	-	**CBRN attacks relevance**	Number of past CBRN attacks	Average annual number of the CBRN attacks over the past ten years.	*Data recorded by police or first responders.*
THR_US05	-	**Severity of CBRN attacks**	Number of casualties in past CBRN attacks	Average annual number of deaths/injuries due to the CBRN attacks over the past ten years*100.000/population.	*Data recorded by police or first responders.*
THR_US06	-	**Vulnerability to CBRN attacks**	Assessement of police forces/urban authority on potential future attacks (from 1 to 10)	Experts' assessement. Likert scale. From 1 to 10. (next year)	*Primary data based on the assessment of experts from the police forces/urban authority.*
THR_US07	-	**Explosive/bombing attacks relevance**	Number of past explosive/bombing attacks	Average annual number of the explosive/bombing attacks over the past ten years.	*Data recorded by police or first responders.*
THR_US08	-	**Severity of explosive/bombing attacks**	Number of casualties in past explosive/bombing attacks	Average annual number of deaths/injuries due to the explosive/bombing attacks over the past ten years*100.000/population.	*Data recorded by police or first responders.*
THR_US09	-	**Vulnerability to explosive/bombing attacks**	Assessement of police forces/urban authority on potential future attacks (from 1 to 10)	Experts' assessement. Likert scale. From 1 to 10. (next year)	*Primary data based on the assessment of experts from the police forces/urban authority.*
THR_US10	-	**Attacks to facilities/infrastructures in public spaces relevance**	Number of facilities/infrastructures in public spaces attacks	Average annual number of the facilities/infrastructures in public spaces over the past ten years.	*Data recorded by police or first responders.*
THR_US11	-	**Severity of attacks to facilities/infrastructures in public spaces**	Number of arrested people in past attacks to facilities/infrastructures in public spaces	Average annual number of arrested people in past attacks to facilities/infrastructures in public spaces over the past ten years*100.000/population.	*Data recorded by police or first responders.*
THR_US12	-	**Vulnerability to attacks to facilities/infrastructures in public spaces**	Assessement of police forces/urban authority on potential future attacks (from 1 to 10)	Experts' assessement. Likert scale. From 1 to 10. (next year)	*Primary data based on the assessment of experts from the police forces/urban authority.*
THR_US13	-	**Violent public disorder events/manifestions**	Number of violent public disorder events/manifestions	Average annual number of the violent public disorder events/manifestions over the past ten years.	*Data recorded by police or first responders.*
THR_US14	-	**Severity of violent public disorder events/manifestations**	Number of arrested people in past violent public disorder events/manifestations	Average annual number of arrested people in past violent public disorder events/manifestations over the past ten years*100.000/population.	*Data recorded by police or first responders.*
THR_US15	-	**Vulnerability to violent public disorder events/manifestations**	Assessement of police forces/urban authority on potential future events (from 1 to 10)	Experts' assessement. Likert scale. From 1 to 10. (next year)	*Primary data based on the assessment of experts from the police forces/urban authority.*

Table 19 – Urban security (threats from unexpected events) and its indicators (final version).

Urban security Mitigation against crime and other nuisances					
		What	**Indicator**	**How to meaure it**	**Possible sources**
MIT_US01	+	**Police control (on the street) during the day**	Average number of police officers on the street during the day	Average number of police officers/100.000 inhabitants every day. (last year)	*Data available to police.*
MIT_US02	+	**Police control (on the street) during the night**	Average number of police officers on the street during the night	Average number of police officers/100.000 inhabitants every day. (last year)	*Data available to police.*
MIT_US03	+	**Request of police interventions during the day (on the street/in public space)**	Number of calls to the police for crimes or other nuisances during the day (on the street/in public space)	Average number of calls/100.000 inhabitants every day (last year)	*Data available to police.*
MIT_US04	+	**Request of police interventions during the night (on the street/in public space)**	Number of calls to the police for crimes or other nuisances during the night (on the street/in public space)	Average number of calls/100.000 inhabitants every day (last year)	*Data available to police.*
MIT_US05	+	**Community-based patrolling/watch groups**	Number of citizens in community-based patrolling/watch groups	Average citizens in community-based patrolling/watch groups/100.000 inhabitants. (last year)	Data already available to the urban authority or to be obtained as secondary data by external organisations/associations.
MIT_US06	+	**Private security guards (on the street)**	Number of private security guards (on the street).	Average private security guards (on the street)/100.000 inhabitants. (last year)	*Data already available to the urban authority or to be obtained as secondary data by external private organisations (e.g. organisations providing private security services).*
MIT_US07	+	**Adoption of systems for surveillance (on the street)**	Number cameras (e.g. CCTV cameras) managed by urban authorities/local police (on the street)	Average number of cameras (on the street)/100.000 inhabitants. (last year)	*Data already available to the urban authority/police.*

Table 20 – Urban security (mitigation against crime and other nuisances) and its indicators (final version).

5.6.10 Dimension 6 – Background conditions

Background Demographic aspects					
		What	**Indicator**	**How to meaure it**	**Possible sources**
DEM_BG01	-/+	**Life expectancy**	Number of years of life expectancy	Average numbers of years (last year)	*Data already available to the urban authority or to be obtained by Eurostat (statistics referring to a higher administrative level). By sex.*
DEM_BG02	-/+	**Population**	Number of inhabitants	Total numbers of inhabitants (last year)	*Data already available to the urban authority.* *By sex, by age.*
DEM_BG03	-/+	**Daily commuting**	Number of daily commuters	Numbers of daily commuters (last year)	*Data available to the urban authority*
DEM_BG04	-/+	**Population density**	Average population density	Total number of inhabitants/ square kms (last year)	*Data already available to the urban authority.* *By sex, by age.*
DEM_BG05	-/+	**Young people**	Percentage of young people on total population	Number of young people/ Total number of inhabitants/ (last year)	*Data already available to the urban authority.* *By sex.*
DEM_BG06	-/+	**Elderly people**	Percentage of elderly people on total population	Number of elderly people/ Total number of inhabitants/ (last year)	*Data already available to the urban authority.* *By sex.*
DEM_BG07	-/+	**Vulnerable people**	Percentage of vulnerable people on total population	Number of vulnerable people/ Total number of inhabitants/ (last year)	*Data already available to the urban authority. For definitions, source: DG HOME. Vulnerable persons. Minors, unaccompanied minors, disabled people, elderly people, pregnant women, single parents with minor children, victims of trafficking in human beings, persons with serious illnesses, with mental disorders and who have been subjected to torture, rape or other serious forms of violence.*

Table 21 – Background conditions (demographic aspects) and its indicators (final version).

Background Services and infrastructures availability					
		What	**Indicator**	**How to meaure it**	**Possible sources**
SI_BG01	+	**Availability of roads**	Lenghts of roads in the city	Kms of roads (last year)	*Data already available to the urban authority.* *By type of roads*
SI_BG02	-/+	**Usage of private transport**	Number of private transport means	Number of private cars per inhabitants (last year)	*Data already available to the urban authority or to be obtained by other external public sources.*
SI_BG03	+	**Availability of public transport**	Capacity of public transport	Public transport capacity in terms on passengers/ Total number of inhabitants (last year)	*Data already available to the urban authority or to be obtained by operators in charge of public transport. It includes metro, local trains, trams, buses*
SI_BG04	-/+	**Usage of public transport**	Average number of passengers of public transport every day	Number of passengers of public transport per day (last year)	*Data already available to the urban authority or to be obtained by operators in charge of public transport. It includes metro, local trains, trams, buses*
SI_BG05	+	**Availability of public utilities services**	Capacity of public utilities services	Public utility services capacity in terms of users/ Total number of inhabitants (last year)	*Data already available to the urban authority or to be obtained by operators in charge of public services. It includes drinkable water and energy*
SI_BG06	-/+	**Usage of public utilities services**	Average number of users of public utility services	Number of users (last year)	*Data already available to the urban authority or to be obtained by operators in charge of public services. It includes drinkable water and energy*
SI_BG07	+	**Availability of internet connection**	Households with broadband access in the city	% of households (with at least one member aged 16 to 74) (last year)	*Data available to the urban authority or to be obtained by operators in charge of digital services or by Eurostat (statistics referring to a higher administrative level).*
SI_BG08	-/+	**Usage/access of internet connection**	Frequency of internet use, 2019 (% of individuals aged 16 to 74)	% individuals (aged 16 to 74) using internet daily (last year)	*Data available to the urban authority or to be obtained by operators in charge of digital services or by Eurostat (statistics referring to a higher administrative level).*
SI_BG09	+	**Availability of health care structures/services**	Capacity of the hospitals	Number of beds in hospitals per inhabitants (last year)	*Data available to the urban authority or to be obtained by operators in charge of health care structures/ services or by Eurostat (statistics referring to a higher administrative level).*
SI_BG10	-/+	**Usage of/access to health care structures/services**	Unsatisfied demand for health care structures/services	Percentage of people with unmet needs for medical examination over the population (last year)	*Data available to the urban authority or to be obtained by operators in charge of health care structures/ services or by Eurostat (statistics referring to a higher administrative level).* *Source: Eurostat (hlth silc 21)*
SI_BG11	+	**Availability of educational services until primary education**	Capacity of schools for early childhood education and primary education (ISCED 0-1)	Number of pupils that can be hosted in schools for early childhood education and primary education (last year)	*Data already available to the urban authority.*
SI_BG12	-/+	**Usage of/access to educational services until primary education**	Pupils attending schools for early childhood education and primary education (ISCED 0-1)	Pecentage of pupils in schools for early childhood education and primary education (ISCED 0-1) over the population aged 3-12. (last year)	*Data already available to the urban authority.*

Table 22 – Background conditions (services and infrastructures availability) and its indicators (final version).

5.7 The main characteristics of the proposed conceptual framework

Comprehensiveness is an essential characteristic of the conceptual framework proposed to measure urban security and assess the sense of safety in cities of all sizes. The mapping exercise was important for understanding which dimensions (i.e., categories) and elements (i.e., indicators) are actually used for a specific scope (e.g., the assessment of the feeling of insecurity) and a predefined purpose (e.g., the self-assessment of a city).

The result of this work is a conceptual framework for self-assessment of cities investigating six dimensions. Two of these dimensions relate to the key concepts investigated in this study (i.e., *urban security* and *sense of safety in public spaces*), while the other four (i.e., *quality of life, social cohesion, liveability of public spaces and background conditions*) serve for a better understanding of the first two and can also be excluded in the evaluation process if not needed by urban authorities or if the lack of capacities/resources prevents their investigation.

The proposed framework is characterised by:

- **Modularity.** This implies that it remains robust also when not all the dimensions are considered (e.g., because a city needs only to measure urban security and correlate it with the social cohesion dimension).
- **Adaptability.** This implies that it can be scaled-down or -up in terms of territorial scope (e.g., because a city needs to assess the sense of safety and measure urban security only for some of its districts).

Selected indicators for each dimension are the result of a large collection exercise carried out during the mapping work on what is used in already adopted approaches and tools; and of an expert-based, consistent and coherent choice of the most appropriate ones. As data for the suggested indicators are unlikely to be available for all cities, the final conceptual framework (i.e., the outcome of activity 5) may require further refinements depending on actual data availability and quality (e.g., lack of data, redundancy problems, correlation issues). For this reason, a pilot data collection needs to be carried out by urban authorities before moving on to Step 3 of the JRC methodology (i.e., *Step 3 - Analyse and treat the data, where necessary*). The larger is the number of participating cities, the more robust will be the set of selected indicators[18].

[18] Differences in methodologies for data collection due to definitions (e.g., metadata) adopted at national level may represent an additional issue.

6 Chapter 6 - Urban security and sense of safety: a question-based checklist to operationalise the conceptual framework

Once dimensions and core elements of the proposed conceptual framework are validated, the framework's operationalisation implies answering to the second knowledge gap: ***2. How to make practical and effective assessment and/or measurement of urban safety and/or of urban security?*** Evidence gathered through the various activities of the mapping exercise as well as hints collected at the Roundtable held on 9 April 2021, suggest defining a question-based checklist to operationalise the framework, whose partial or complete adoption (i.e., the inclusion of all the six proposed dimensions) by cities depends on their specific needs and resources.

6.1 Requirements for the applicability of the checklist

The proposed checklist is meant for urban authorities that 1) have high in their policy agenda the improvement of city's security as well as security's perception by citizens; 2) have already one department in charge of policies to increase security and prevent crime in the city; 3) agree on our conceptual framework and its dimensions (i.e., *urban security, sense of safety in public spaces, quality of life, social cohesion, public space liveability* and *background conditions*); and 4) need standard instruments based on a modular and adaptable framework which rely on one or more approaches and/or tools to measure urban security and/or assess citizens' sense of safety (i.e., its self-assessment).

6.2 Nine questions to be answered

The checklist (*Table 23*) is based on nine questions and it does not lead to a unique outcome. The resulting method will be shaped according to the needs and the resources of the urban authorities that decide to adopt it.

Prioritisation in terms of urban security and/or sense of safety
1. Which are the issues in terms of urban security and/or sense of safety that should be measured and/or assessed in the city?
2. Which are the policies that could be implemented to improve urban security and/or the sense of safety?
Detection of external owners/sources of data
3. Who are the external owners/which are the external sources of missing information/data?

Data collection
4. Which approach should be used to collect data?
5. Which are the resources available for data collection?
Data analysis
6. Which tool should be adopted to analyse data?
7. Which are the resources available for data analysis?
Capitalisation of knowledge and its sharing
8. How to use knowledge to inform policies?
9. How to share knowledge with external stakeholders?

Table 23 – The nine questions of the checklist

Each question is presented below, together with concrete hints addressed to the department of the urban authority in charge of policies for the security and prevention of crime in the city (hereafter, the department in charge of urban security).

6.2.1 Which are the issues in terms of urban security and/or sense of safety that should be measured and/or assessed in the city?

Prioritisation in terms of urban security and/or sense of safety

Various are the possible awareness levels of urban authorities on the actual security in their cities, the sense of safety of citizens, their status in specific districts or neighbourhoods, and their evolution over time. Awareness of these issues as well as on the background conditions in the area of interest, on quality of life, on social cohesion and on public space liveability depends on the availability of data. When data are available, knowledge is generated.

➔ The department in charge of urban security should make a **preliminary choice of the dimensions of the conceptual framework that are relevant for investigation** (e.g., the *sense of safety in public spaces*). This choice strongly depends on the strategic goals already defined or to be set by the urban authority in terms of urban security and/or sense of safety. The achievement of these strategic goals should be verified by means of indicators selected to become key performance indicators for which target values are set (e.g., the number of assaults perpetrated by young people reduced by 10% in a year). Dependencies between core indicators and even cause-effect relations between dimensions should be defined (e.g., an increase in the employment rate reduces the number of assaults perpetrated by young people). The complexity of the instruments adopted to collect and analyse data depends on how ambitious in terms of scope are the strategic objectives of the urban authority.

6.2.2 *Which are the policies that could be implemented to improve urban security and/or the sense of safety?*

Prioritisation in terms of urban security and/or sense of safety

On the basis of the gained knowledge, urban authorities can define priorities and focus on the actual security (for example, with strategies for the prevention of crime) and/or the sense of safety of citizens (for example, with plans for the reduction of concerns about crime) but can also act on the dimensions that affect security and sense of safety. For example, a plan to improve night lightening in a district may have a positive impact on the sense of safety of its residents.

➔ The department in charge of urban security should **establish a liaison with other departments** dealing with relevant aspects such city's services and infrastructures or with specific situations such as the integration of migrants. This is needed to take stock of the actual policies (e.g., to increase public transport's availability, to reduce segregation), of the information basis on which they have been designed, of the type of data that are eventually available for sharing, and the data that are actually missing. Key performance indicators could also be set, taking into account strategic objectives and targets of other departments.

6.2.3 *Who are the external owners/which are the external sources of missing information/data?*

Detection of external owners/sources of data

Once dimensions to be investigated are defined, data are needed to compile the proposed indicators. There are several possible problems related to data: they do not exist, they are not available at the city level, they are not updated, or they belong to owners external to the urban authorities. Within the proposed framework, the main owners/sources of data needed to compile indicators are citizens and local police and/or law enforcement agencies operating at the local level. When data are not available at the city level (or at the district level), data at the regional or even national level can be considered as proxies. In addition to traditional sources of data, real-time data collected through sensors in the city (citizens included) may be considered to inform some indicators. In this case, the attitude of the city of being "smart" needs to be taken into account.

➔ The department in charge of urban security should identify **the external owners/the external sources related to the selected indicators.** For example, within the urban security dimension, the owners of the data on the *number of intentional homicides* are police forces, while *vulnerability to explosive/bombing attacks* requires the ad-hoc evaluation of experts from police forces/urban authority. Concerning background conditions, data on the availability of internet connection in terms of households with broadband access may be provided by an external source like *Eurostat*, and its data at the regional level (NUTS2) be used as a proxy.

6.2.4 Which approach should be used to collect data?

Data collection

For existing data not belonging to the urban authority (i.e., secondary data), a liaison with external owners is needed. Matters of privacy, confidentiality and, in some cases, costs may prevent their availability. Regular interaction with police forces is required for what concerns crime. If it is not possible to obtain existing data, an approach to generate them should be defined. For data that do not exist, are not available at the city level and/or are not updated, the first option is to rely on available proxies (taking into account the limits proxies have). The second option is to carry out an ad-hoc direct data collection activity. The types of approaches to collect data are various and also go beyond the *families* identified in Paragraph 3.2. Questionnaires, interviews, focus groups are only some examples (EFUS, 2016). The choice of the approach depends on a number of features such as the categories of interest (e.g., threats), the type of data that should be collected (i.e., quantitative data, qualitative data), the owners of the data (e.g., citizens, residents), and the size of the sample. Evidence from the survey conducted by the Urban Agenda's Security in Public Spaces Partnership and from identified initiatives in the *SOUA and SMUA families* indicate that these approaches usually combine different scopes such as perception of insecurity, victimisation, and trust in the authorities.

➔ The department in charge of urban security should define **the approaches to be adopted, taking into account the selected set of indicators and the data owners**. When, for example, the sense of safety is investigated in a district, a survey based on a semi-structured questionnaire with interviews by phone is one of the options. If air quality is considered as an essential element of the liveability of public space (e.g., *Number of days a year with quality of air under the tolerance threshold of PM10 levels*), the source of data can be sensors deployed in the city. The efficiency and effectiveness of the data collection activities will strongly depend on the maturity of the collaborative process between the actors dealing with security in the city.

6.2.5 Which are the resources available for data collection?

Data collection

Adequate resources are needed to make data collection activities feasible and sustainable. These include human resources for coordination and implementation of activities and financial resources to meet potential direct costs. Involvement of human resources implies the definition of responsibilities within the urban authority and identification of skills for the coordination of the data collection exercise (i.e., organisational skills) and for its implementation (i.e., technical skills). If technical skills are not available within an urban authority, the involvement of external experts (i.e., for the design of a questionnaire) or an ad-hoc training of its

internal staff could represent an additional cost to be considered[19]. Analysis of the feasibility of a single data collection round should be coupled with the analysis of sustainability over time. Apart from the specific needs of a one-shot exercise, approaches for data collection should aim to build time series able to inform about trends of phenomena and to monitor the effects of the actions taken.

➔ The department in charge of urban security should evaluate **the capacity of the urban authority to carry out regular data collection activities and, according to the available resources, adjust their scope.** Such capacity has to be quantified in terms of dedicated and ad-hoc skilled human resources and direct costs (e.g., as those related to promoting a survey in the city) for each of the foreseen tasks. In the case of direct data collection, a survey should be properly designed. This implies defining the population sample, the questions and the targets in terms of minimum expected respondents/complete questionnaires received. A time plan of data collection activities is also necessary. Added value of the data collection (and analysis) should also be clearly stated and contribution to the policy made explicit. This is necessary in order to "institutionalise" the data collection process and to facilitate the allocation of responsibilities and budget. In the case of a limited budget, the scope of the data collection can be limited, for example, to some districts of the city or focus only on some specific dimensions. A credible outcome of data collection pilots may facilitate additional budget allocations.

6.2.6 Which tool should be adopted to analyse data?

Data analysis

Regardless of the type of data collected, information can be represented through descriptive statistics. Basic applications for datasheet analysis are enough for this purpose. If, for some indicators, data are collected from a representative sample of a population, inferential statistics are useful to generalize evidence. Multivariate statistics can lead to a deeper understanding of the relations between indicators. Dashboards and data analysis/intelligence tools are able to integrate data from different sources (including real-time data) and visually represent them and their relations. Indexes are sophisticated ways to synthesise information and rely on a methodological basis to aggregate information from indicators. The key requirement for any adopted tool is the robustness of its capacity to compare outcomes over time[20].

➔ The department in charge of urban security, on the basis of its strategic objectives and related key performance indicators, should **adopt the tool that better fits the city's investigation needs and their exploitation**. Dashboards and data analysis/intelligence tools are used for operational purposes within

[19] A specific action of the Urban Agenda's Security in Public Spaces Partnership (i.e., Action 4) aims at *Developing a capacity building training scheme on integrated urban security*.

[20] For this reason, the conceptual framework on which activities of data collection and analysis depend on should not be modified over time (e.g. substitution of indicators).

the urban *authority* (e.g., to inform policies of different departments), while indexes are tools adopted when the communication or the derived outcomes are addressed to a wider public. For example, within the proposed conceptual framework, an *index of the sense of safety in public spaces* can be created by the composition of four sub-indexes, each of them aggregating indicators of sub-dimensions (i.e., *Feeling of unsafety, Concerns about crime and other nuisances, Fear of threats from unexpected events, Trust and confidence about mitigation of crime and other nuisances*)[21]. The importance of each sub-dimensions in contributing to the *sense of safety in public spaces* can be assigned through weights that reflect the relevance of the specific dimension within the policies of the urban authority.

6.2.7 Which are the resources available for data analysis?

Data analysis

As for data collection, adequate resources are needed. These include human resources and financial resources to meet potential direct costs (e.g., acquisition of licences for data intelligence applications). Involvement of human resources implies the definition of responsibilities within the urban authority (usually, the same people taking responsibility for data collection also take responsibility for data analysis) and identification of skills. Even stronger than in the data collection case is the need for technical skills for interpretation of the outcomes of the analysis (especially if indexes are used). Regardless of the adopted analytical tool, the cost of monitoring over the years should be taken into account. The overall costs for a self-assessment tool may be justified by proving the higher social return of security investment obtained.

➔ The department in charge of urban security should evaluate **the capacity of the urban authority to carry out regular data analysis activities and, according to the available resources, adjust their scope**. As for the data collection phase, a plan detailing needed resources, responsibilities, the timing of the activities, expected outcomes, and contribution of the analytical tool to policymaking is needed. The value added by monitoring overtime may facilitate the adoption of a consolidated method.

6.2.8 How to use knowledge to inform policies?

Capitalisation of knowledge and its sharing

The adoption of tools for data analysis allows urban authorities to fill in their knowledge gaps about urban security and/or sense of safety. Acquired knowledge allows the verification of the achievement of strategic goals by means of the predefined key performance indicators.

[21] Indexes for each of the six dimensions of the conceptual framework can be furtherly aggregated to create an overall index (e.g. an *Urban Security and Sense of Safety Index*) but methodology behind has to be defined once the indicators included each dimension are confirmed.

➔ The department in charge of urban security should verify **the effectiveness of policies and related actions aimed at improving the city's urban security and/or sense of safety**, and if needed, recommend an adjustment based on the evidence-based knowledge resulting from the key performance indicators and the related data analysis. Such evidence can also be used to critically revise the pre-defined dependencies between core indicators and even cause-effect relations between dimensions. The evidence-based knowledge should be shared with the departments of the urban authority contributing to the data collection phase and/or dealing with the domains subject of the investigation.

6.2.9 How to share knowledge with external stakeholders?

Capitalisation of knowledge and its sharing

Results of the investigation should be properly communicated outside the urban authorities. Being involved as data owners in the data collection phase, local police and citizens are among the first recipients of the knowledge sharing of results. The choice of the tools for data analysis and their synthesis may also be affected by the dissemination purpose of the evidence-based knowledge.

➔ The department in charge of urban security should properly communicate **the evidence-based knowledge and link it to ongoing policies.** A differentiated knowledge sharing approach and related communication are needed according to the type of recipients. A communication plan detailing knowledge and messages to be disseminated by type of recipients should be integrated into the overall method of the urban authority to assess and/or measure the city's sense of safety and/or urban security.

6.3 Challenges for the operationalisation of the conceptual framework

This checklist is meant to suggest the pathway to be followed to make operational a conceptual framework characterised by modularity and adaptability.

Nevertheless, once finalised, the capacity of the conceptual framework to accommodate city-specific aspects related to safety and/or security is challenging. The inclusion of additional indicators in the proposed dimensions may affect the assumption of instruments aimed to be a reference standard for cities in Europe. Tools relying on a strict methodology to synthesise data (e.g., indexes) may lose their coherence and consistency. On the contrary, additional indicators may add value to the knowledge outcomes in methods adopting dashboards. In some cases, a trade-off between adherence to the arising city's needs and the capacity to monitor coherent and consistent dimensions overtime should be found. In addition, also if the conceptual framework fits with the city's needs, the impossibility to collect data remains the main limitation.

Other challenges connected to the operationalisation of the conceptual framework are related to the requirements for its applicability (*Paragraph 6.1*).

Urban authorities could be more focused on other policies than those related to security. The city may have chosen to rely more on response to crime than on its prevention, and/or responsibilities related to urban security and crime prevention policies are not formally defined. This implies low commitment and not enough budget to be invested to properly address safety- and security-related knowledge gaps. It is also unrealistic to assume that cities already measuring urban security and/or assessing the sense of safety will abandon their approach or tool (losing their investment) in favour of new instruments, even if these instruments are EU-wide recognised. On the other hand, a modular and adaptable framework relying on one or more approaches and/or tools could become an opportunity for those cities, especially the small ones, wishing to move a step forward towards the measurement in their territories of urban security and/or citizens' sense of safety and not having resources to autonomously activate a process to create a self-assessment method.

7 Outcomes of this study

This study contributes to the Action 1 of the Urban Agenda for the EU on Security in Public Spaces, supporting European cities in their self-assessment exercises related to urban security.

Two are the concrete outcomes of this study. The first is a **new conceptual framework to assess urban safety and measure urban security** structured around six dimensions (i.e., *quality of life, social cohesion, public space liveability, sense of safety in public spaces, urban security* and *background conditions*), including almost 200 indicators. At the same time, urban security and sense of safety depend on and affect the quality of life of citizens, cohesion at the societal level and liveability of public spaces. Interaction within departments of the urban authorities dealing with these aspects and collaboration with the other actors of the urban security domain (i.e., police forces and citizens) are essential. Cooperation between these actors is crucial to define and implement effective policies for urban security. This structural integration should start in the phase of assessing urban safety and measuring urban security. Such actors are also the owners of the data needed to make operational the conceptual framework. Departments of urban authorities in charge of urban security may refer to the framework as a standard modular and adaptable method. A **checklist based on nine questions** aims to guide cities in defining instruments guaranteeing a feasible and sustainable self-assessment and overtime monitoring of urban security on the basis of their specific needs and their available resources to collect and analyse data.

A further effort is still needed to prove and validate the conceptual framework. Urban authorities have to deal with data availability and their quality for indicators in each dimension. A pilot data collection needs to be performed. Candidates are both cities that have never assessed urban security and/or sense of safety and cities already adopting instruments for these purposes. Such exercise will aim to evaluate the practical and effective applicability of approaches and tools for self-assessment relying on the proposed conceptual framework.

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9 Annexes

Annex 1 – Indicators for monitoring the Transformative Commitments of the NUA

Annex 2 – The questionnaire for the survey on approaches and tools adopted by Local and Regional Authorities to assess their territories' safety and security

Annex 3 - Other projects of interest funded within the Seventh Framework Programme

Annex 4 – Results of the Slido polls conducted during the Roundtable meeting

9.1 Annex 1 – Indicators for monitoring the Transformative Commitments of the NUA

(Draft version: 25 September 2020)

Indicators for monitoring the Transformative Commitments of the NUA		
1.1 Sustainable urban development for social inclusion and ending poverty	1.1.1 Social Inclusion and Ending Poverty	
	1.1.1.1 Eradicate poverty in all its forms	1. Proportion of population below the international poverty line, by sex, age at national urban level
	1.1.1.2 Address inequality in urban areas by promoting equally shared opportunities and benefits	10: Unemployment rate by sex, age, persons with disabilities and by city
		33. Gini coefficient at national/ city /urban levels;
	1.1.1.3 Enhance social inclusion of vulnerable groups (women, youth, older persons and persons with disabilities and migrants).	4 Women's recognized legal right to property inheritance and ownership
		34 Presence of national legislation forbidding discrimination in housing, access to public facilities and social services on the basis of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status
		19: Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities.
	1.1.1.4 Ensure equal access to public spaces including streets, sidewalks, and cycling lanes	35: Percentage of road length that has dedicated bike lanes (excluding motorways).
		36: Percentage of road length that has dedicated sidewalks (excluding motorways).
	1.1.2 Access to Adequate Housing:	
	1.1.2.1 Ensure access to adequate and affordable housing	31: Median amount of money spent on housing and transportation per household as a percentage of the median annual household income of tenants[1]
		32: Ratio of the median free-market price of a dwelling unit and the median annual household income[2]
		38 Percentage of people living in unaffordable housing
	1.1.2.2 Provide access to sustainable housing finance options	37 Mortgage debt relative to GDP
	1.1.2.3 Support security of tenure	2 Proportion of total adult population with secure tenure rights to land with (a) legally recognized documentation; and (b) who perceive their rights to land as secure, by sex and type of tenure
		39 Proportion of cities with slum upgrading programmes
		40 Number of cities having annual budget allocations addressing any of the 5 slum deprivations and inclusive public spaces in known slum areas.
		41 Percentage of cities that have integrated housing policies and regulations in their local development plans[3]
	1.1.2.4 Establish slum upgrading programmes	42 Total investment in housing (in both formal and informal sectors in the urban area), as a percentage of gross domestic product.[4]
	1.1.2.5 Integrate housing into urban development plans	43 Percentage of government budget dedicated to housing subsidies [5]
	Access to Basic Services:	
	1.1.3.1 Access to safe drinking water, sanitation and solid waste disposal	5 Proportion of population using safely managed drinking water services;
		6 Proportion of population using safely managed sanitation services;
		18: Proportion of municipal solid waste collected and managed in controlled facilities out of total Municipal Solid Waste generated by cities;
	1.1.3.2 Access to safe and efficient public transport system	44 Percentage of commuters using public transport.
	1.1.3.3 Access to modern renewable energy	7 Renewable energy share in the total final energy consumption.
	1.1.3.4 Access to Information Communication technology (ICT)	25: Fixed Internet broadband subscriptions per 100 inhabitants, by speed;

Indicators for monitoring the Transformative Commitments of the NUA		
1.2 Sustainable and inclusive urban prosperity and opportunities for all	1.2.1 Inclusive Urban Economy	
	1.2.1.1 Promote productive employment for all including youth employment	11: Proportion of youth (aged 15-24 years) not in education, employment or training
		8: Annual growth rate of real GDP per employed person
	1.2.1.2 Support the informal economy	9: Proportion of informal employment in non-agriculture employment, by sex.
	1.2.1.3 Support small and medium-sized enterprises	45 Small and medium-sized enterprises percentage share of GDP.
	1.2.1.4 Promote an enabling, fair and responsible environment for business and innovation	26: Number of days to register a new business in the country
	1.2.2 Sustainable Urban Prosperity	
	1.2.2.1 Support the diversification of the urban economy and promote cultural and creative industries	46 Employment in cultural and creative industries of as proportion of total employment
		12: Manufacturing employment as a proportion of total employment
	1.2.2.2 Develop technical and entrepreneurial skills to thrive in a modern urban economy	47 Annual number of vocational and technical education individuals trained
	1.2.2.3 Strengthen urban-rural linkages to maximize productivity	20: Does your country have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space. [1]

Indicators for monitoring the Transformative Commitments of the NUA		
1.3 Environmentally sustainable and resilient urban development	1.3.1 Resilience, Mitigation, and Adaption of Cities and Human Settlements	
	1.3.1.1 Address urban sprawl and loss of biodiversity[1]	15: Ratio of land consumption rate to population growth rate.
		48: Proportion of land under protected natural areas.
	1.3.1.2 Climate change mitigation and adaptation actions	49: Percentage of local governments that adopt and implement local disaster risk reduction strategies in line with national strategies.
		50: Percentage subnational/local government with budgets dedicated to climate change mitigation and adaptation actions.
		51: Percentage of cities with multi-hazard mapping
		30: Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
		3: Mortality rate attributed to household and ambient air pollution[2]
	1.3.1.3 Develop systems to reduce the impact of natural and human-made disasters[3]	52: Does the country have a multi-hazard monitoring and forecasting system?
		53: The number of cities that have / percentage of urban population that is covered by multi-hazard early warning systems.
	1.3.1.4 Build urban resilience through quality infrastructure and spatial planning	51 Percentage of cities with multi-hazard mapping
	1.3.2 Sustainable Management and use of natural resources	
	1.3.2.1 Strengthen the sustainable management of natural resources in urban areas[1]	21: Material footprint, material footprint per capita, and material footprint per GDP.
		22: Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP.
		27: Green Area per capita
	1.3.2.2 Promote resource conservation and waste reduction, reuse, and recycling	23: Recycling rate, tons of material recycled.
	1.3.2.3 Implement environmentally sound management of water resources and coastal areas	54 Existence of an enforced coastal and/or land management plan in the country.
	1.3.2.4 Adopt a smart-city approach that leverages digitization, clean energy and technologies [2]	55: Percentage reduction in annual final energy consumption in homes using smart monitoring systems.
		56: Share of street junction with traffic lights connected to traffic management systems

Indicators for monitoring Effective Implementation		
2.1 Building Governance Structure: Establishing a supportive Framework	2.1.1 Decentralization to enable subnational and local governments undertake their assigned responsibilities[1]	57: Is supervision of local authorities exercised in accordance with such procedures and in such cases as provided for by the constitution or by law?
		58: Percentage of the total budget that the local / sub-national government have discretion over to decide on priorities (financial autonomy)
		59: Percentage of the local / sub-national government's financial resources generated from endogenous (internal) sources of revenue
	2.1.2 Linking urban policies to finance mechanisms and budgets	59: Percentage of the local / sub-national government's financial resources generated from endogenous (internal) sources of revenue
	2.1.3 Legal and policy frameworks to enhance the ability of governments to implement urban policies	60: Quality of law
	2.1.4 Strengthen the capacity of local and subnational governments to implement local and metropolitan multilevel governance	61: Published performance delivery standards at the sub-national level
	2.1.5 Promote participatory, age- and gender-responsive approaches to urban policy and planning	16: Proportion of cities with a direct participation structure of civil society engagement in urban planning and management, which are regular and democratic.
	2.1.6 Promote women's full participation in all fields and all levels of decision-making	24: Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions
2.2 Planning and Managing Urban Spatial Development	2.2.1 Integrated and balanced territorial development policies	20: Does the country have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space.[1]
		62: Number of countries, regional governments, and cities in which plans and designs are publicly accessible to residents (on-line) and can be consulted at all times
	2.2.2 Integrate housing into urban development plans	13: Proportion of urban population living in slums, informal settlements or inadequate housing
	2.2.3 Inclusion of culture as a priority component of urban planning	17: Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage, level of government, type of expenditure and type of private funding
	2.2.4 Planned urban extensions and infill, urban renewal and regeneration of urban areas	28: Population Density
		29: Land-use mix
		63: Number and percent of new population "accommodated" in a plan or city extension
	2.2.5 Improved capacity for urban planning and design, and training for urban planners at all levels of government	64: Number of urban planners per 100,000 persons
	2.2.6 Strengthening the role of small and intermediate cities and towns	20: Does your country have a National Urban Policy or Regional Development Plan that (a) responds to population dynamics, (b) ensures balanced territorial development, and (c) increase in local fiscal space.
	2.2.7 Promote sustainable multimodal public transport systems including non-motorized options	14: Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
		35: Percentage of road length that has dedicated bike lanes (excluding motorways).
		36: Percentage of road length that has dedicated sidewalks (excluding motorways).

Table 24 – Indicators for monitoring the Transformative Commitments of the NUA

9.2 Annex 2 – The questionnaire for the survey on approaches and tools adopted by Local and Regional Authorities to assess their territories' safety and security

GENERAL INFORMATION

Q1. Name: *[Open answer]*_____

Q2. Surname: *[Open answer]*_____

Q3. Email: *[Open answer]*_____

Q4. Profession/position:

- ○ urban planning office
- ○ mobility office
- ○ territorial development office
- ○ prevention and security office
- ○ local police/law enforcement;
- ○ academic
- ○ other: *[Open answer]*_____

Q5. Name of your municipality/city/region: *[Open answer]*_____

Q6. Size of your municipality/city/region in terms of inhabitants:

- ○ less than 100,000
- ○ 100,000 – 250,000
- ○ 250,000 – 500,000
- ○ 500,000 – 750,000
- ○ 750.000 – 1,000,000
- ○ 1,000,000 – 2,000,000
- ○ more than 2,000,000

DATA FOR SAFETY AND SECURITY ASSESSMENT

Q7. What kind of information/statistics do the local authorities use when evaluating the safety/security in their city/region? Examples:

- ☐ Crime statistics (for example homicides, assaults, property crimes, hate crimes)
- ☐ Number of officials (police, fire and rescue officials) in proportion to population
- ☐ Damage to property (vandalism)
- ☐ Disturbances (for example in public transport)
- ☐ Substance abuse (alcohol and drugs)
- ☐ Statistics related to Integration of immigrants

- ☐ Statistics related to homelessness
- ☐ Statistics related to segregation of urban areas
- ☐ Statistics related to wellbeing
- ☐ Statistics related to inequalities
- ☐ Statistics related to terrorism
- ☐ Something else, please specify: *[Open answer]*_____

Q8. Are the local authorities in your city/region using internal or external data (e.g., Eurostat) or both? (please elaborate which external data is used) *[Open answer]*_____

Q9. How often is the data used by the local authorities in your city/region updated? *[Open answer]*_____

Q10. Is there a standardised approach for identifying threats in public spaces? *[Open answer]*_____

Q11. What kind of gaps in safety and security related data have you noticed? (For example: we don't have reliable information about vandalism in the city and neighbourhoods) *[Open answer]*_____

Q12. What kind of information is considered most relevant when assessing the urban security in your city/region? *[Open answer]*_____

Q13. Is there data (e.g., surveys) on unreported crimes at the local authorities' disposal in your city/region? *[Open answer]*_____

Q14. Perceived security/Sense of safety: how do you evaluate the sense of safety in your city/region?

- ☐ Sense of safety
- ☐ Victimisation
- ☐ Trust towards the police
- ☐ Something else, please specify: *[Open answer]*_____

Q15. If you have a survey for the residents, what kind of information is collected?

- ☐ Surveys by the City
- ☐ Surveys by the local police
- ☐ Surveys by the regional authority
- ☐ National surveys
- ☐ The sense of safety is not evaluated
- ☐ Something else, please specify: *[Open answer]*_____

Q16. Sense of safety: How often does the evaluation take place? *[Open answer]*

_____

Q17. Sense of safety: Is there a trend recognised during the past years? *[Open answer]*_____

Q18. Sense of safety: Is there a correlation between crime statistics and sense of safety/perceived security? *[Open answer]*_____

Q19. Do you have strategic objectives in your city/region that are related to some specific safety index? *[Open answer]*_____

TOOLS FOR SAFETY AND SECURITY ASSESSMENT

Q20. Do you have a web-based or other tool where you gather data related to safety and security or are you currently developing one? Please describe the tool in detail (for example: City of Helsinki is developing a web-based tool using PowerBI and it is currently under consideration what kind of information it should contain) *[Open answer]*_____

Q21. What kind of data does the tool contain (quantitative and/or qualitative)? *[Open answer]*___

Q22. What kind of analysis does the tool enable? For example: comparison between cities and/or areas, comparison between age groups and genders etc., comparison between periods of time, analysis of a possible new safety related phenomena *[Open answer]*_____

Q23. Who are the main users of the tool? Is it open for the public? *[Open answer]*_____

Q24. Does the tool contain information on safety measures taken by the city/region? *[Open answer]*_____

Q25. What kind of technology such as tools based on artificial intelligence is used? *[Open answer]*_____

GAPS AND NEEDS IN THE ASSESSMENT OF SAFETY AND SECURITY

Q26. Are there types of data/indicators that the existing tools do not cover? *[Open answer]*_____

Q27. Are there tools and measures you do not have at your disposal and which you would need in order to evaluate the development of safety and security in your city/region? *[Open answer]*_____

Q28. Other needs concerning tools for assessing safety and security in your city/region? *[Open answer]*_____

9.3 Annex 3 - Other projects of interest funded within the Seventh Framework Programme

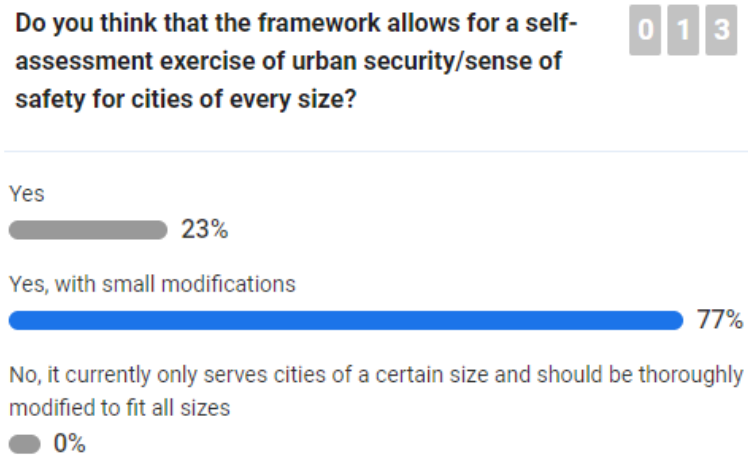
Project Acronym	Project title	Start date End date	CORDIS factsheet Project website
HARMONISE	**Holistic Approach to Resilience and Systematic Actions to make Large Scale UrbaN Built Infrastructure Secure**	01/06/2013 31/05/2016	https://cordis.europa.eu/project/id/312013 http://harmonise.eu/
TACTICS	**Tactical Approach to Counter Terrorists in Cities**	01/09/2012 31/08/2015	https://cordis.europa.eu/project/id/285533 http://www.fp7-tactics.eu/
PROACTIVE	**PRedictive reasOning and multi-source fusion empowering AntiCipation of attacks and Terrorist actions In Urban EnVironmEnts**	01/05/2012 30/04/2015	https://cordis.europa.eu/project/id/285320 n.a.
BESECURE	**Best practice Enhancers for Security in Urban Environments**	01/04/2012 31/03/2015	https://cordis.europa.eu/project/id/285222 www.besecure-project.eu
SECONOMICS	**Socio-Economics meets Security**	01/02/2012 31/01/2015	https://cordis.europa.eu/project/id/285223 http://seconomicsproject.eu/
VITRUV	**Vulnerability Identification Tools for Resilience Enhancements of Urban Environments**	01/05/2011 30/04/2014	https://cordis.europa.eu/project/id/261741 n.a.
DESURBS	**Designing Safer Urban Spaces**	01/01/2011 31/12/2014	https://cordis.europa.eu/project/id/261652 https://www.desurbs.eu/
CPSI	**Changing Perceptions of Security and Interventions**	01/04/2008 31/03/2010	https://cordis.europa.eu/project/id/217881 n.a.

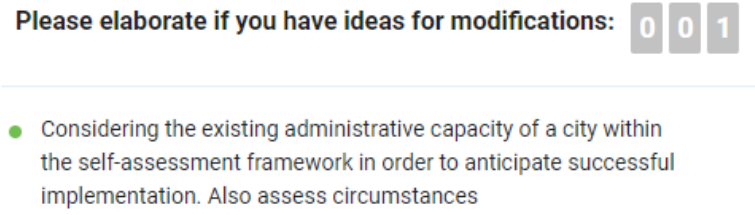
Table 25 – Other projects of interest funded within the Seventh Framework Programme

9.4 Annex 4 – Results of the Slido polls conducted during the Roundtable meeting

Here below answers to the core questions about the preliminary conceptual framework asked through Slido to the participants to the online Roundtable meeting held on 9 April 2021.
A first set of questions (4) concerned the conceptual framework in general and its categories while a second set of questions (6) asked about completeness and significance of the six categories in terms of proposed indicators.

Q1: Do you think that the framework allows for a self-assessment exercise of urban security/sense of safety for cities of every size?



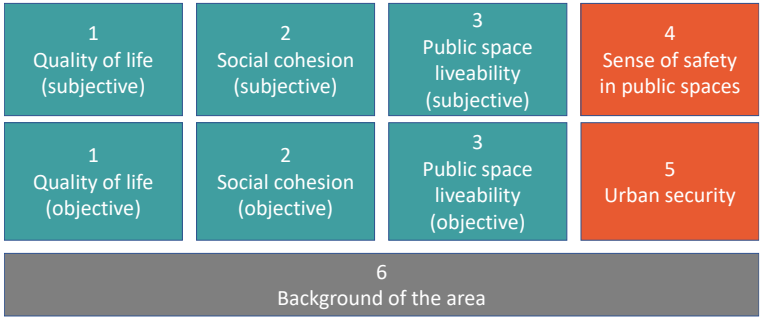


Q2: Is the division between subjective and objective elements suitable for practical use?

In your view, is the division between subjective and objective elements suitable for practical use?

Yes, it works in a self-assessment tool
87%

No, this division does not serve the purpose
13%



Q3: Should the categories be modified in some way?

Should the categories be modified in some way?

No, they are fine as they are
40%

Yes, combine quality of life, social cohesion and public space liveability
7%

Yes, combine quality of life and social cohesion
0%

Yes, combine quality of life and public space liveability
7%

Yes, divide urban security into sub-categories
47%

Other ideas to modify the categories:

While the division is useful subjective/objective can be confusing and reduce validity. I suggest to use the division "perceptions" and actions. Additionally within this context it would be critical to add a category in terms of assessing/capturing A) administrative capacity and or organisation and B) existing actions in the city relative to urban security C) add a clear category about perceptions and actions on existing threats

Also the urban security could be further divided

Q4: Are there any categories that you would like to add?

Are there any categories that you would like to add?

No, they are comprehensive enough

100%

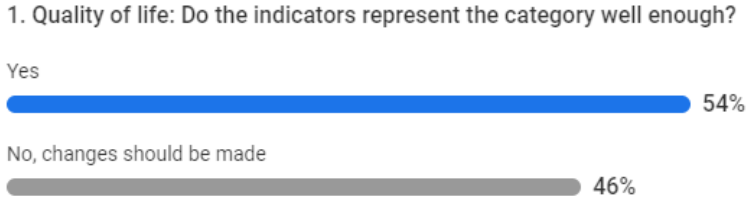
Yes, I think the following should be added:

Adopted strategies

Please see previous response (i entered them there). Given that the tool will be used by urban authority it would be critical to capture the existing administrative management structure and actions.

I would tend to split the background to many sections. At least for the question of terrorism that is needed. The other categories are not so much relevant for terrorism to my experience

Q5: Category 1. Quality of life. Do the indicators represent the category well enough?



Please say which changes: what should be added/replaced/modified?

-Access to quality public spaces -Level of accessibility -Quality of work/employment/access to income in the city - diversity

But not sure what impact it had on security? High quality of life good target for attack?

Household income, OBJ indicators should be referred to the population as well not only to distance, amount of green areas and parks

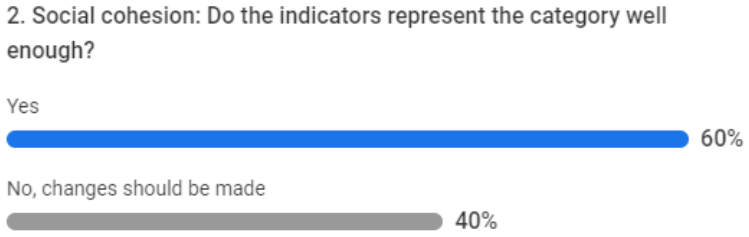
safety could be added in different indicators i.e. transportation.

Is distance the correct question? Maybe 'accessibility' is more suitable.

QL02 should include Early Childhood Development centers as well

General satisfaction about life?

Q6: Category 2. Social cohesion. Do the indicators represent the category well enough?



Please say which changes: what should be added/replaced/modified?

How to define slums?

Include a question SUB about how residents experience trust in others.

Again the ratio of households/density to green public spaces can be added here relative to inequalities and safety Energy poverty?

In the subjective category there could be a indicator on if the citizens feel they have sufficient ways to participate in the decision making in their area

To a certain extent the indicators proposed are fine, but many of these show autocorrelation so they can not be used in the same dimension. A choice must be made to drop some.

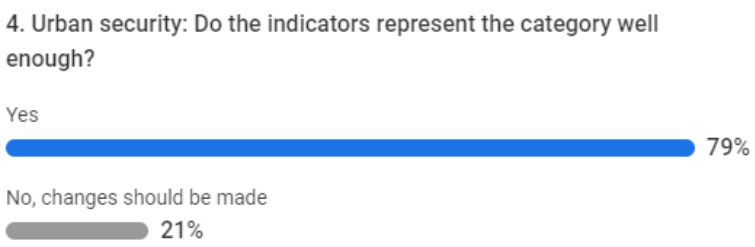
Q7: Category 3. Public space liveability. Do the indicators represent the category well enough?

Please say which changes: what should be added/replaced/modified?

I think the availability/access to public spaces should be included in the quality of life component to ensure that the analysis of component 3 is clear relative to the actual liveability of spaces - consider adding an indicator about climate change considerations ie accessibility of spaces under conditions of high heat for example - satisfaction/perception about security of spaces should also be included (ie the perception of safety) - accessibility for vulnerable groups (for example for people with mobility problems) - family friendly design of spaces? Facilities for vulnerable groups

The Urban Planning design to prevent etc.: what type of indicator is this? Just a 'yes' of 'no'? A proces...?

Q8: Category 4. Urban security. Do the indicators represent the category well enough?



Please say which changes: what should be added/replaced/modified?

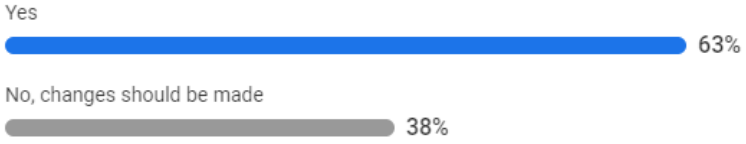
Look at public trust in police. Make sure that data on crime, specifically homicide, is disaggregated by sex and age and perpetrator + % of intentional homicide perpetrated by firearm

But very overloaded, i suggest prioritising the indicators

Indicators should be with reference to city size, what about indicators on vulnerability

Q9: Category 5. Sense of safety. Do the indicators represent the category well enough?

5. Sense of safety: Do the indicators represent the category well enough?



Please say which changes: what should be added/replaced/modified?

Concern about radicalisation, extremism

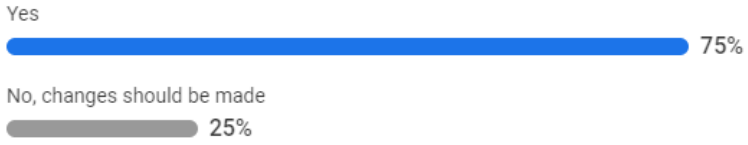
Look also at public trust in the police and possibly other criminal justice actors as well

It is a very long list and will bring data collection burdens

Will there be background variables?

Q10: Category 6. Background of the area. Do the indicators represent the category well enough?

6. Background of the area: Do the indicators represent the category well enough?



Please say which changes: what should be added/replaced/modified?

I think in fact these indicators are critical to a holistic approach of urban safety but most can in fact be integrated in the previous sections. For example living space per capita is an objective criteria for quality of life.

What is effectiveness of criminal justice system? How to define

Accessibility for any attack