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SECURITY, Collaborative Project

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Best Practice Enhancers for Security in Urban Regions

Review of available public and private data in the EU for urban security assessment

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EXECUTIVE SUMMARY

Objectives

The objective of Deliverable 2.2 is to explore the diverse but often inter-related datasets pertaining to urban security across the BESECURE case study areas. Specifically, D2.2 will determine the availability, accessibility and usability of key datasets identifying deficiencies and potential gaps in the data composition at case study level as well as identifying opportunities to augment public and private data sources to in order to develop a more robust evidence base pertaining to urban security.

Description of the work

This report documents the disparate data sources pertaining to urban security across the BESECURE case study cities. Specifically, the report delineates key sources of data provision, data format, time series composition as well as propensity for spatial interpretation. This 'scoping' exercise at 'case study' level has served to determine the availability of key datasets pertaining to urban security as well as highlighting potential deficiencies/gaps in data provision which will be utilised to inform and guide the development of the data framework being developed in D2.3.

Results and conclusions

Deliverable 2.2 has served to highlight the availability and format of datasets pertaining to urban security across the BESECURE case study areas. This scoping exercise served to highlight gaps and deficiencies in data provision deemed necessary to enhance understanding the dynamics of urban security as well as the propensity to effectively monitor and evaluate urban security interventions. Opportunities to augment publically available data with private data in order to develop a more 'complete picture' are also identified.

Additionally, the report serves to highlight a number of important considerations for prospective end-users/future adopters of the BESCECURE framework. Specific considerations include the viability, credibility and transferability of datasets as well as the necessitated protocols/agreements pertaining to confidentiality and disclosure/usage.

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Abstract

Purpose:

The purpose of Deliverable 2.2 is to provide a comprehensible review of the data sets that could be adopted within the BESECURE data framework. The review process determines the availability and accessibility of key urban security indicators as well as identifying potential 'gaps' and 'deficiencies' in existing data provision across the BESECURE case study cities. The review process will encompass both 'publically available' and 'private data' enabling the exploration of opportunities for augmentation in order to generate a more robust evidence base in depicting the urban security issues of greatest pertinence within the selected case study areas.

Methods:

The BESECURE platform utilises (where possible), data disseminated openly in the public domain for the case study areas. Indeed, it also provides the ability for data that is collected through a public organisation (such as local government, police) to be massaged in to the platform, analysed and then visualised for developing the knowledge and understanding of issues. In order to better under the potentiality of the BESECURE platform, it was necessary to undertake a 'scoping exercise' within the case study areas in order to develop a comprehensive understanding of the data that would be available for the analytical components of the project and to inform and guide the development of the data framework. The development of a data framework (D2.1) served (as far as possible) as a guide to ensure compatibility and continuity in data set composition across the case study areas. The transferability of the data framework was conducive in identifying 'gaps' and inconsistencies in data provision across the case studies as well as identifying opportunities to augment (where necessary) private date (in this case Experian datasets) to augment publically available datasets.

Results:

Deliverable 2.2 has 'unearthed' the disparate data sources pertaining to urban security across the case study areas. Specifically, D2.2 has served to identify the source and format of key urban security affiliated datasets, determine availability/accessibility as well as establishing timeline provision across the case study cities. Moreover, limitations or restrictions in use/application have been identified with opportunities to augment public sector data (premised on gap identification) with private data identified relative to case specific deficiencies. The results serve as a robust platform to inform and guide the development of the BESECURE data framework (D2.3).

Conclusions:

Deliverable 2.2 highlights the pivotal role of data in understanding the key dynamics of urban security detailing how the integration of disparate (public and private) data sources might be integrated in a manner conducive to bolstering urban security. Robust and credible data is essential to the identification and understanding the inter-related dynamics pertaining to urban security whilst comprehensive 'picture building' is premised upon the capacity to position urban security data/indicators within the confines of the wider societal fabric. Moreover, the robustness and credibility serves as an evidence base to inform (and justify) decision making, resource allocation as well as affording the opportunity to monitor and evaluate the relative success (or otherwise) of security related interventions. Additionally, and premised on case study experiences D2.2 has served to highlight a series of important

considerations that stakeholders/future adopters need to consider in order to harness the full benefits afforded by the BESECURE product including the need to establish a credible baseline data position pre-intervention and to systematically evaluate interventions against pre-agreed ‘measurable’ parameters.

Introduction

The main purpose of Work package 2 (WP2) is to identify, acquire, analyse and manage data for enhancing urban security and safety for case studies across Europe. It does so, through a series of inter-linked objectives. These objectives are designed to ensure that the BESECURE project fully understands the pertinent data required for the effective and efficient management of security and safety related issues, as well as providing a mechanism for the case study areas to collect, manage, analyse and visualise this data. It achieves this through the fulfilment of the following objectives:

• To establish common best practice baseline indicators relevant to urban security and safety which can be consistently employed across the case study areas of BESECURE

• To identify the data required to underpin the common best practice baseline indicators (including source, format and possible limitations).

• To formulate a common best practice urban security and safety data framework that facilitates secure communication channels for acquisition, storage and sharing of sensitive and privileged data to help direct the case study building exercise.

• To acquire the available data and develop processes for augmenting this data to enhance its utility and address data gaps through the formulation of a GIS based information management system that can store, retrieve, manage and manipulate the data in a manner supportive of EU Directives (such as INSPIRE) including the production of compliant metadata.

• To provide mechanisms whereby the data framework can provide the structure upon which the modelling in WP3 is based as well as facilitating the re-integration of the model results to form the foundation of the end product building exercise in WP4.

The outputs of WP2 are geared towards facilitating the fulfilment of these objectives and are documented in a series of interlinked deliverables. These deliverables include:

D2.1- A common data framework for BESECURE case studies

D2.2- Review of available public and private data in the EU for urban security assessment

D2.3- Operational database for case study development, modelling and final product development.

In the context of BESECURE, Deliverable 2.1 (D2.1) contextualised the development of a common data template for the analysis of quantitative information within BESECURE. D2.1 was not designed to be the finalised data model of the project, but instead facilitate an early knowledge and understanding of how the data for each of the case study areas could potentially be captured, stored and analysed consistently in the platform components of BESECURE. The development of D2.1 was based on the collection of meta-information on the data available in each of the case study areas. This meta-information was premised

upon the data domains identified in Work package 1 as being essential for the better understanding of urban security and community safety related issues across Europe. In the meta-information template, a knowledge was built up of the type and format of relevant datasets that could be utilised in the BESECURE project, with an understanding of their availability, use restrictions, geographic scales and cross-sectional information achieved. The information therefore collected through D2.1 is not explored in great depth and provides little understanding and rationale for the datasets considered fundamental for enhancing evidence based decision making in urban security throughout Europe.

Deliverable 2.2 (D2.2), of which this document fulfils, is premised upon a comprehensive review of available public and private data in the EU for urban security assessment. The principal aim of this deliverable is to provide an authoritive review of the data available for the BESECURE project, identifying the main sources and formats which have driven the data framework design discussed in D2.1. It fulfils this aim by presenting data related findings of the case study areas, identifying key indicators which will be collected in the case study areas, stored and manipulated in the data framework developed in D2.3, modelled under the auspices of WP3 and utilised in WP4 as a core component of the final dashboard product. Indeed, D2.2 discusses issues such as data gaps and alternative data sources to underpin indicators to give guidance on to case study areas and also other potential BESECURE adopters. D2.2 is then used in D2.3 to provide the data that fills the operational database. This data and database underpin the modelling and dashboard display elements of the BESECURE project.

D2.2 is structured in a manner that facilitates the fulfilment of the main aim and objectives of the deliverable. In Section 1, a comprehensive knowledge and understanding of the importance of data is presented and how data is central to the overall picture of the BESECURE. This is essential to ensure that those that may adopt BESECURE understand the importance of data in security and safety related evidence based decision making. It further elaborates the importance and role of data in BESECURE through the highlighting of benefits and challenges that the case studies within BESECURE and potential BESECURE adopt may face when considering the implementation of such a platform. Section 1 also highlights the main data types and sources used within the design of the data framework. Section 2 provides a comprehensive understanding of the data types, sources, formats and coverage of quantitative data that case studies (through WP1) within the project have highlighted as being the key indicators for enhancing urban security and safety. Indeed, Section 2, also details how this data may be applied in an operational setting, as well as depicting how private data sources such as Experian could bridge any gaps that may exist cross jurisdictionally. Section 3 presents an overview of the role of qualitative data in BESECURE and Section 4 highlights general data considerations that future adopters of BESECURE need to be mindful of in advance of any design and implementation of the BESECURE product.

1.1. The importance of data

Data forms the basis for all scientific research with the robustness of that data depicting quality, integrity, completeness and timeliness (if time specific) occupying a pivotal role in the provision of credible and objective information for the problems under study. Additionally, the availability and format of data determines the extent and forms of analytical interpretation and understanding of the problems and hence solutions can be obtained. The relative absence of data mitigates informed decision making (in essence an information vacuum) whilst basing decisions on poor quality data can have profound implications with subsequent analytical interpretation and outcomes decisions unable to be fully substantiated or credibly underpinned. However, there is a growing sphere of influence headed by the European Commission to address the demand and supply of data (particular open source data) and to make data more freely available to encourage greater integration of cross disciplinary data sets.

The work in WP2 of the BESECURE project (*Identification, Acquisition, Analysis and Management of Data for Urban Security and Safety*) is motivated by recent directives such as INSPIRE, and seeks to embrace and fully utilise the analytical capacities brought about by advances in technology that facilitate massive data collection (the 'big data' debate). This work aims to promote the new opportunities that enhanced data-interoperability provides, and to explore how these advances can facilitate the design of decision support systems – especially in the domain of urban security and societal resilience.

Urban Security Data

The last decade has been proliferated by a number of high profile terrorist attacks on key urban centres across Europe. This has resulted in a shift from a focus on crime and crime prevention to security, insecurity and threats to security. It is not just that crime has been re-conceptualized as a security risk (Zedner, 2009); it can also be argued that the very broad definition of security (originally from the context of International Relations) has led to an ever-expanding and increasingly complex field of security. Compared with more traditional crime prevention challenges, several elements turn security governance and threat prevention into a very challenging exercise for practitioners: a) the network structure and model of contemporary governance, b) the nature of security knowledge (preventing the unknown or the unthinkable), c) the pre-crime logic of security, and d) the global and ambiguous nature of the threats and crimes to be prevented (Virta, 2013a). To comprehend the increasing complex risks presented to the functionality of modern cities and to mitigate the extent of threats posed there is a requirement for greater stakeholder collaboration and for much more effective integration, interrogation and comprehension of the disparate data sources which inform and transpose knowledge which underpin urban security.

Data can be collected on a number of important elements pertaining to urban security, such as:

- the nature and extent (prevalence and incidence)
- the consequences and costs related to the incident of criminality
- the help-seeking behaviour of those subjected to the crime;
- the knowledge, attitudes and practices of key stakeholder groups in addressing breaches in urban security.

Systems for regular data collection and analysis can involve partnerships between government, international organizations, civil society and academic or research institutions at both the national and sub-national level as well as process and procedures at both city and neighbourhood level. The collection and analytical interpretation of data is critical to effective advocacy efforts and resource mobilisation, programme development, policy implementation and monitoring of interventions within the urban security domain. Research by Virta (2013b) highlights that one of the inherent deficiencies in urban security interventions within Europe over the last decade has been the relative absence of systematic performance management of partnership structures policy interventions nor credible and meaningful evaluation of policy interventions. It is now widely accepted that interventions need to be 'measured' in order to effectively evaluate their success.

The European Commission has played an important role in promoting not just the harmonization of crime prevention measures, law enforcement practices and urban safety policies but in creating a performance regime for monitoring the development and relative success of crime related intervention measures (Crawford, 2009). Data (both quantitative and qualitative) provide the platform for benchmarking the success or otherwise of intervention measures – if baseline measures are not established pre-intervention it will be impossible to assess the relative success (or otherwise) of interventions/expenditure. Additionally, it is important to recognise that urban security interventions (particularly those that involve capital investment) are very often the source of (political) power and struggle for influence at the 'local' level. Robust and credible data offer an impartial evidence base not just to justify intervention measures and capital expenditure programmes within the area but also to target those resources to the areas of greatest need. Moreover, neighbourhoods and key stakeholder groupings are more receptive of intervention measures if said measures are supported by a clear and robust evidence base justifying their 'need'.

1.2. The Role of Data in the BESECURE project

Measurement and management of urban security is reliant on the effective utilisation of a wide array of security relevant data. Whilst many sources of data undoubtedly exist, the challenge is in identifying, harnessing and analysing the sources. This step facilitates the subsequent operationalisation of the outputs, in a useable set of assessment, monitoring and management tools. Nonetheless, addressing urban security issues requires the compilation of data sets, which are often interlinked in a complex way in order to inform local policymakers and guide policy development, implementation and evaluation. Through the exploration and interpretation of these complex data sets the BESECURE project will serve to enhance understanding of the urban security landscape (factors and actions that have a bearing on urban security) and to make best practices communicable from one urban area to another.

Data forms an integral part of the 'area profiling' of the BESCEURE case study locations. The availability of an area's key baseline data (e.g. socio-economic profiling, incident and types of crime) is fundamental to the 'picture building' exercise in determining the most pertinent issues within the local. The case study data is utilised for comparative analysis between the case cities and forms the basis for model development (WP3). Without data provision there is no capacity to validate the methods and tools developed in the BESECURE project. Indeed the BESECURE toolset largely depends on the capacity to store data and knowledge in a structured manner, and to transpose that data into crucial information to inform policy development and programme intervention. For the best part of two decades there have been calls (most notably amongst criminologists) have called for greater utilisation of technology and in particular GIS based software within the confines of

urban security research. The BESECURE project will support that call by augmenting data to enhance its utilisation through the formulation of a GIS based information management system that can store, retrieve, manage and manipulate the data in a manner supportive of EU Directives (such as INSPIRE).

1.3 Benefits and Challenges for the BESECURE project

Data is a fundamental requirement of evidence-based research. Generally data is considered to be hard facts and figures and quantitative in nature, however, data can also be qualitative in the form of perceptions or behaviour. Irrespective of its form, data is an important resource and provides both a number of benefits and challenges for the ambitions of the BESECURE project.

Data can help us in not only identifying contemporary crime and security problems but also aid in our understanding of them and appropriate responses and solutions to them. The existence of data including the facts of crime and security, namely crime data and police reports together with contextual demographic and land use information can provide us with a clearer picture thereby allowing crime and security problems to be analysed including changes in the distribution and concentration of crime over time. The provision of GIS-mapping technology further allows for the geographic (spatial) and temporal distribution of crime to be both readily identified in terms of hotspots and modelled. Subsequently, such data can provide stakeholders with pertinent information to assist with prioritizing policing resources and crime prevention efforts. Moreover, analysis of relevant data has the potential to aid relevant stakeholders (i.e. local government agencies, councils and the police) with the deployment of resources, their current and future planning and evaluations of existing and ongoing crime prevention measures. Furthermore, data can assist stakeholders in their interaction with the community and local neighbourhoods and assist with the building of cases for investment.

In addition to the benefits outlined above, data also poses a number of challenges for the BESECURE project and with respect to the fitness for purpose of the data there are a number of key characteristics that should be considered.

The first of these is the **accuracy and robustness of data or the quality of the data.** Data will only be as good as the thoroughness of how it was initially collected, measured or observed. This requires consistent and rigorous application of research methods and adherence to definitions. The more fragmented are data sources in terms of the number of suppliers then the less reliability can be attached to such data. There are particular issues concerning both time series and spatial data. In the case of the former, problems arise with using historic data unless consistent methodologies have been rigorously applied over a period of time. Likewise with spatial data inconsistent definitions on boundaries and geographical definitions have impeded spatial analysis, in particular poor address referencing places considerable constraints on any subsequent analysis. Thus accuracy of data is highly complex and this poses real challenges in capturing data that is representative of crime and security problems at a specific point in time.

Second, **data completeness is fundamental**. In those circumstances where there is only partial coverage or there is a key field missing this can severely compromise the quality of any analysis and interpretations made. Whilst software systems can allow for missing values within time series data, gaps in data sets can cause significant challenges in interpreting performance trends and forecasting future activity. An allied problem is the different bases of

analysis where depending upon what is being included or excluded can produce differing results and interpretations.

Thirdly, the **timeliness of data** is an important aspect of concern. For data to be most effective it is important to have information that reflects current conditions. Unfortunately, the publication and availability of official statistics can result in data lags of several months with subsequent revision or updating of data. The outcome being that data can often be dated by the time it is received and published placing constraints on the research impact of such data. Furthermore in some sectors, for example the property market there can be inertia in data sets and anchoring of information on past transactions or historic valuations can limit the effectiveness of such data.

Fourth, **accessibility to data can be restricted due confidentiality reasons**, commercial interests, contractual issues and costs. Access to data can yield considerable commercial benefit and for these reasons there can be barriers to access. While a number of these barriers have been eroded over the past decade, nevertheless several still exist and although there has been a considerable growth in the availability of proprietary databases through specialist databases often this can be at a considerable cost meaning that commercial advantage rests with those organisations with the means of continuing to purchase specialist databases. However, despite such barriers to data sharing, there are also positive aspects of pooling data. By bringing together datasets from a multitude of sources, low-level data collection efforts are reduced, data currency is facilitated, more expedient analytical procedures are emphasized, and professional services are enhanced by a greater certainty and consistency of evidence. This is particularly true in sectors where there has not been a high level of data transparency in the past, such as the urban security domain.

Fifth, **the lack of coordination and management of different data sources poses major research problems**. It is surprising how frequently this can occur not only between countries but also within countries and between different government departments and agencies. This inhibits both spatial and time series analysis. In the case of the former, data must have spatial compatibility requiring input maps to be of the same spatial size and cover identical geographic areas with the same reference points and the resolution of maps. For the latter while analytical functions can be used to recast quarterly into monthly figures, the lack of consistency in the measuring point between data sets impacts on statistical robustness.

One of the most pertinent issues regarding data rests with its security. All major organisations will have clear protocols in place concerning the protection, storage and management of data. Where personal data is concerned it is important that such information is anonymised ideally at the point of collection and stored in a secure manner. In this respect the EU is to adopt a General Data Protection Regulation regarding how personal data are generated and utilised. From a research perspective the use of such data can be highly significant across many sectors but needs to be balanced against privacy relating to the individual. The policy challenge is one of ensuring that regulation strikes the correct balance concerning the use of annoymised personal data, which reflects the benefits to society as a whole.

1.4 Data Types and Sources for the BESECURE project

Given the inherent nature of urban security and the complexity involved in understanding causality and mitigation, the BESECURE project aims to provide analysts and ultimately

decision makers with a comprehensive yet efficient evidence base. It will do so through the coupling of knowledge (quantitative data) and understanding (qualitative information) to develop an overview of the context and issues in an area and the approaches that have been employed in other areas of Europe to mitigate against such issues. The approach adopted by the BESECURE project centres on the use of quantitative and qualitative data sources in the public domain and supplemented where possible by in-house data that decision makers would have access to. The platform also allows the augmentation of this data with private subscription based data in cases where data simply does not exist, or where publically available and in-house data is limited. Where possible, the BESECURE methodology is based on the utilisation of publically available open data and in-house data from case study cities across Europe. This is to ensure the transferability of the end product for other jurisdictions and urban areas outside of those used selected for case study analysis. Where high quality public data does not exist, the BESECURE project has the extensibility to be augmented with private subscription based data. In the BESECURE project, the exemplar private subscription based data used, is that of consortium partner Experian.

The quantitative data used in the BESECURE project will take many forms and is audited in detail in Section 2. As a base, the data framework employed allows for the ingestion, analysis and visualisation of geospatial information, or in more simple terms, data that be attributed to a location. The location component of the data can take many forms, with data at more localised levels (such as census output areas/wards, neighbourhoods and absolute location [use of XY coordinates]) preferred. This more localised information allows for in-depth and accurate analysis to be undertaken to better understand the issues occurring and the context in which those issues are set. It also allows for aggregation up to higher geographies to understand trends in the study area. Indeed, the quantitative information also has a temporal component (where possible) which permits time trends to be identified. Most of the data used, does not have a restriction on use as it is publically available- however the data in-house data provided by end users (such as anti-social behaviour data) is restricted and available only within the confines of the BESECURE project. The private subscription based data provided by Experian is also restricted and only available for use when subscription fees are agreed.

The quantitative and qualitative data that has been identified as being available by the case study areas is audited in Section 2 (quantitative) and Section 3 (qualitative).

2. Role of quantitative data in the BESECURE project

2.1. Introduction

In general, quantitative data is collected and analysed to provide a basis for improved decision making. This is a key justification for its use in the BESECURE project. A key aim of the BESECURE project is to improve urban security practice – this is, essentially, better management of the urban environment. To undertake effective urban management there is a requirement to effectively deal with the key elements of planning, organising, motivating, communicating and controlling. Performance in each of these elements can be augmented with good quality data and robust empirical analysis. The following section will indicate key uses of quantitative data in the BESECURE project context.

A Baseline Position

Any jurisdiction employing results from the BESECURE project will require the establishment of a baseline context. The initial question to be answered may be – how good or bad is our situation against national, regional or international comparators. Whilst improvement is always positive, expenditure on security initiatives can be considerable and must be carefully reviewed. In order to do this it is essential to be able to derive relatively objective and consistent metrics, such as crime rates, economic performance or educational attainment. Production and analysis of such data allows a relative position to be established and provides useful metrics which can be monitored going forward to establish relative levels of improvement. Whilst these metrics are not the only, or necessarily the most apposite to measure urban security performance, they are likely to be consistently collected and form important components of any new metric devised specifically for the task. Whilst qualitative data such as sentiment provides a valuable counterweight, the production of reliable quantitative data can cut through a potential 'fog' of opinion and, over time, help form and alter opinions, sentiment and embedded bias. The BESECURE platform, tools and procedures will form a framework for the efficient and effective harnessing of this security relevant data and the status at first deployment will provide an effective and useful baseline.

Planning and Organising

In order for any improvement to be achieved, it is necessary to undertake planning and organisation activity to establish the ideal future course of action and ensure the personnel, systems and resources are available and deployed appropriately. Effective planning and organising requires the availability of data – such as the number and nature of resources, distances from key administration and control centres to likely trouble spots and associated response times, key temporal patterns of disorder and measures of severity. With such data and a solid baseline position, future strategy can be devised and an appropriate array of operational tactics can be established. The BESECURE platform will provide a useful framework for 'hosting' this activity and its tools will be useful in carrying out the forward planning, 'what if' scenario analysis and resource allocation and management necessary for robust strategic and tactical planning.

Motivating and Communicating

Urban security management can be characterised as a long term 'chronic' activity, punctuated by localised, time constrained 'acute' flashpoints. Motivation can be an issue – with strong communication of a positive message often key to maintaining positive

relationships with concerned communities, their elected representatives and the staff involved in maintaining security. Whilst hard data can sometimes be alarming, properly harnessed and communicated, it can help make the argument for additional resource allocation which will underpin corrective action. Hard data gathered and analysed is therefore essential to motivating effort in tough conditions and providing a basis for control. The BESECURE platform and tools will utilise quantitative data to produce a variety of analysis and reports which will provide exactly the sort of management information which can underpin a strong information and communication flow.

Control

Any attempt to manage urban security needs control mechanisms in place to establish appropriate levels of performance, identify divergence from planned performance and enforce corrective action. It is necessary to deploy practices and tactics to achieve planned outcomes. It is then necessary to ascertain whether these interventions are working. Without hard data this process will inevitably become more arbitrary, harder to achieve and harder to prove. Quantitative data therefore provides command and control data essential for successful urban security management. The BESECURE platform is designed and specified to provide the necessary infrastructure to command and control activities.

2.2. Use of Public Data Sources

As discussed previously, BESECURE utilises (where possible), data disseminated openly in the public domain for the case study areas. Indeed, it also provides the ability for data that is collected through a public organisation (such as local government, police) to be massaged in to the platform, analysed and then visualised for developing the knowledge and understanding of issues. In order to better under the potentiality of the BESECURE platform, it was necessary to gain knowledge of the information that would be available for the analytical components of the project in each case study area. This was to ensure that there would be consistency in approach of the modelling and visualisation framework and to allow the project team to develop a product that was meaningful, effective, efficient and accountable and not restricted by geography and data. Therefore, the project team audited the data that would be available consistently across the case studies to inform the transferability of the finalised toolbox. The mass use of public data also facilitated the limitation of cost for the project and demonstrates the potentiality that public and open data has for understanding the issues that exist in urban areas and the context in which they are set. The audit of available data is demonstrated in Table 1.

Case study Area: BELFAST, UK							
Data Provider:	POLICE SERVICE OF NORTHERN IRELAND						
Type of Organisation:	PUBLIC SECTOR						
Description	The Police Service of Northern Ireland (PSNI) is responsible for policing within Northern Ireland and was established in 2001 following the recommendations of the Patten Report; it had previously been known as the Royal Ulster Constabulary. The PSNI has some 7,000 full-time officers supported by 2,400 police staff. The province is divided into 8 policing districts (A – H) and operates a policing with the community approach whereby both the police and local community work pro-actively together.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Recorded Crime (Number and Rate per 10,000 population)	csv	1998-2012	Irish grid	Electoral wards, PSNI Areas, Local Government Districts	Acknowledge Data Source	Crime
	ASB (Number and Rate per 10,000 population)	csv	1998-2012	Irish grid	Electoral wards, PSNI Areas, Local Government Districts	Acknowledge Data Source	Crime
	Violence against the person (Number and Rate per 10,000 population)	csv	1998-2012	Irish grid	Electoral wards, PSNI Areas, Local Government Districts	Acknowledge Data Source	Crime
	Criminal Damage (Number and Rate per 10,000 population)	csv	1998-2012	Irish grid	Electoral wards, PSNI Areas, Local Government Districts	Acknowledge Data Source	Crime
	Other theft offences (Number and Rate per 10,000 population)	csv	1998-2012	Irish grid	Electoral wards, PSNI Areas, Local Government Districts	Acknowledge Data Source	Crime
	Burglaries (Number and Rate per 10,000	csv	1998-2012	Irish grid	Electoral wards, PSNI Areas, Local Government Districts	Acknowledge Data Source	Crime

	population)						
Source:	http://www.ninis2.nisra.gov.uk/						
Potential Use in BESECURE	The data could be used to visually present crime data as recorded by the Police Service of Northern Ireland at different geographic scales. This information could be used to understand crime patterns in different electoral wards over time.						

Case study Area: BELFAST, UK							
Data Provider:	NORTHERN IRELAND STATISTICS AND RESEARCH AGENCY (NISRA), AN AGENCY WITHIN THE DEPARTMENT OF FINANCE AND PERSONNEL IN NORTHERN IRELAND						
Type of Organisation:	PUBLIC SECTOR						
Description	The Northern Ireland Statistics Research Agency (NISRA) is the primary source of official statistics and social research on Northern Ireland and is tasked with the collation and publication of statistics related to the economy, population and society of Northern Ireland. Additionally, it conducts the Northern Ireland census. NISRA is an executive agency of the devolved Northern Ireland government and is located within the Department of Finance and Personnel.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Employment and Support Allowance Claimants	csv	2011-2012	Irish grid	Electoral Wards, Local Government Districts	Acknowledge Data Source	Economic
	Child Benefit Claimants	csv	2000-2011	Irish grid	Electoral Wards, Local Government Districts	Acknowledge Data Source	Societal
	Disability Living	csv	1999-2012	Irish grid	Electoral Wards, Local	Acknowledge	Societal

	Allowance				Government Districts	Data Source	
	Housing Benefit Claimants	csv	1999-2012	Irish grid	Electoral Wards, Local Government Districts	Acknowledge Data Source	Societal
	Income Support Claimants	csv	2000-2012	Irish grid	Electoral Wards, Local Government Districts	Acknowledge Data Source	Societal
	Job Seekers Allowance Claimants	csv	1999-2012	Irish grid	Electoral Wards, Local Government Districts	Acknowledge Data Source	Societal
	Median Age of Death	csv	2005-2011	Irish grid	Electoral Wards, Local Government Districts	Acknowledge Data Source	Societal
	Population Change	csv	2001-2011	Irish grid	Electoral Wards, Super Output Areas, local Government Districts	Acknowledge Data Source	Societal
	Population Totals	csv	1999-2011	Irish grid	Electoral Wards, Super Output Areas, Local Government Districts	Acknowledge Data Source	Societal
	Employee Jobs	csv	2001-2011	Irish grid	Electoral Wards, local Government Districts	Acknowledge Data Source	Economic
	Gross Weekly Pay (£)	csv	2004-2012	Irish grid	Electoral Wards, local Government Districts	Acknowledge Data Source	Economic
	Redundancies Confirmed	csv	2002-212	Irish grid	Electoral Wards, local Government Districts	Acknowledge Data Source	Economic
	Deprivation Measure	csv	2001,2005, 2010	Irish grid	Electoral Wards, Super Output Areas, Local Government Districts	Acknowledge Data Source	Societal
	Higher Education Qualifications	csv	2002-2011	Irish grid	Electoral Wards, local Government Districts	Acknowledge Data Source	Societal
	Further Education Enrollments	csv	1999-2011	Irish grid	Electoral Wards, local Government Districts	Acknowledge Data Source	Societal
Source:	http://www.ninis2.nisra.gov.uk/						
Potential Use in BESECURE	The data obtained from NISRA would provide an official socio-economic and demographic picture of the City of Belfast. The data is available at most geographic levels with the exception of absolute location.						

Case study Area: BELFAST, UK							
Data Provider:	Police.uk						
Type of Organisation:	PUBLIC SECTOR						
Description	Official Web Service providing local crime, policing and criminal justice data for England, Wales and Northern Ireland.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	ASB	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Burglary	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Criminal Damage and Arson	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Drugs	csv	September2011	Irish Grid/	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest	Acknowledge	Crime

			To July 2013 (Monthly Data)	WGS1984	street)	Data Source	
	Other Theft	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Public Disorder and Weapons	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Robbery	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Shoplifting	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Vehicle Crime	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
	Violent Crime	csv	September2011 To July 2013	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime

			(Monthly Data)				
	Other Crime	csv	September2011 To July 2013 (Monthly Data)	Irish Grid/ WGS1984	Local Grid (X,Y Coordinates), Lat/Long (snapped to closest street)	Acknowledge Data Source	Crime
Source:	http://www.police.uk/overview/?q=Belfast,%20UK						
Potential Use in BESECURE	The absolute location of crime (centroid of street that crime occurs on) can be used to get a better understanding of micro level crime trends and hot spots. It can also be used to identify how many crimes (by type) are occurring within distances of certain physical interventions (cctv etc) and amenities and then used to inform where new interventions could be located.						

Case study Area: BELFAST, UK							
Data Provider:	BELFAST CITY COUNCIL- COMMUNITY SAFETY UNIT						
Type of Organisation:	PUBLIC SECTOR-RESTRICTED						
Description	The Community Safety Unit was established in 2003 to develop Belfast Community Safety Partnership (a multi-agency partnership that was to develop a Belfast Community Safety Strategy and initiatives). Around the same time Belfast District Policing Partnership (a body to monitor policing performance, with four area subgroups) was established. These were established as part of the outworking of the Patten Report. Two years ago both of these structures ceased to exist and last year a new Belfast Policing and Community Safety Partnership (with four area partnerships) was established. These new bodies monitor the performance of PSNI against local policing plan and also have to develop community safety plans for their areas.						
Data sets:	ASB (70+ types)	csv	2007-2013	Irish Grid	Local Grid (X,Y Coordinates)	Private Data	Crime

			(updated monthly)			Source/ Project Specific Data	
Source:	Belfast City Council – Community Safety Unit						
Potential Use in BESECURE	The absolute location of crime can be used to get a better understanding of micro level crime trends and hot spots. It can also be used to identify how many crimes (by type) are occurring within distances of certain physical interventions (cctv etc) and amenities and then used to inform where new interventions could be located. Indeed, it also provides the time and date of each report instance of ASB which permits temporal trends to also be identified.						

Case study Area: ARGHILLA, ITALY	
Data Provider:	ITALIAN NATIONAL INSTITUTE OF STATISTICS (ISTAT), CENSUS 2011, STATISTIC SERVICE OF MUNICIPALITY OF REGGIO CALABRIA
Type of Organisation:	PUBLIC SECTOR
Description	The Italian National Institute of Statistics is a public research organisation. It has been present in Italy since 1926, and is the main producer of official statistics in the service of citizens and policy-makers. It manage the Census activities, publishing reports on each Sector (agriculture, population, industry, ...). Since 1989 Istat has been performing the role of directing, coordinating, and providing technical assistance and training within the National Statistical System (Sistan). The System was established n order to rationalise the production and publication of information and to optimise resources allocated to official statistics. Sistan is made up of Istat, central and branch statistical departments of Public Administrations, of local and regional bodies (I.E. Statistic Service of Municipality of Naples and Reggio calabria), Chambers of Commerce, other public bodies and administrations providing statistical information. The Census 2011 is the last statistical framework, now in the process of being published.

Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Population (by age, gender, total, density)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Birth and Death Rates	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Immigrants (by age)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Education level (degree)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Literacy Rate	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Out-of School Children	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Employment/Unemployment rates	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Economic
	Employees (by sector, totals)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Economic
	Housing Density	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Vacant Housing	csv	2011	Italian National	Census geographical areas	Acknowledge Data Source	Societal

				Grid			
	Housing Tenure	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Societal
	Homicide Rates (by type)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Crime
	Burglary	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Crime
	Other theft	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Crime
	Drug Crime	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Crime
	Juvenile Crime	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Crime
	ASB	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	Crime
Source:	Italian National Institute of Statistics						
Potential Use in BESECURE	The data obtained from ISTAT would provide an official socio-economic and demographic picture of Arghilla. The data is available at census geographic levels.						

Case study Area: THE HAGUE, NETHERLANDS							
Data Provider:	THE HAGUE IN NUMBERS						
Type of Organisation:	PUBLIC SECTOR						
Description	Den Haag in Cijfers" (The Hague in Numbers – http://denhaag.buurtmonitor.nl) is a website of the municipality of The Hague that offers various statistical data to the public. The data is gathered and aggregated by the various city council departments, and provided to the public through the Den 'Haag in Cijfers' website.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Violent Theft	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Street Robbery	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other Violent Theft	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Non-violent Theft	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Bicycle Theft	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Moped and Scooter Theft	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime

	Burglary from Companies and Institutions	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Domestic Burglary	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Burglary from Vehicles	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Theft of Motor Vehicles	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Shop Robbery	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Pickpocketing	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other Theft without Violence	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	All non-violent theft	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Violence	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Threats	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime

	Assault	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other Violence	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	All Violence	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Sex Crimes	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	All Sex Crimes	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Destruction of Property	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	All Destruction of Property	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Traffic Crimes	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Leaving place of accident	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other Traffic Crime	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime

	All Traffic Crimes	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other Crimes	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other Crimes within regular law	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Other crimes within special laws	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	All other crime	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Crime
	Unemployment	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Economic
	Population of working age	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Economic
	Population Totals	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Social
	Population by gender	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Social
	Population by age	csv	2006-2013	Amersfoort, EPSG:28992	Neighbourhood (Buurt), District (wijk)	Acknowledge Data Source	Social

Source:	http://denhaag.buurtmonitor.nl/
Potential Use in BESECURE	The data obtained from The Hague in Numbers would provide an official socio-economic, crime and demographic picture of the City of Den Haag. The data is available at most geographic levels with the exception of absolute location.

Case study Area: FREIBURG- GERMANY							
Data Provider:	FR.ITZ ONLINE STATISTICAL SERVICE CITY OF FREIBURG						
Type of Organisation:	Public Sector						
Description	FR.ITZ Online Statistical Service City of Freiburg is an online platform for the publication of communal statistics. The municipal (public sector) 'office for citizen's service' runs the platform to provide citizens, academia and business free access to statistical data about the city of Freiburg.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Employment and Support Allowance	csv	2005-2011	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Economic
	Child Benefit Claimants (Elterngeld, note: Kindergeld is different from Elterngeld)	website	2009-2011	Gauss-Krueger	State Level (Bundesland)	Acknowledge Data Source	Social
	Unemployed	CSV	1999-2012	Gauss-	3-digit microspatial	Acknowledge Data Source	Economic

				Krueger	classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)		
	Housing Benefit Claimants	CSV	2005-2001	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	Income Support Claimants	CSV	2008; 2012	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Economic
	Job Seekers Allowance Claimants	CSVl	2008; 2012	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	Risk of Victimisation	CSV	2006-2011	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Crime
	Population Change (%)	CSV	2012-2030	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	Population Totals (	CSV	1999-2010	Gauss-Krueger	3-digit microspatial classification, statistical	Acknowledge Data Source	Social

					borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)		
	Employed persons	CSV	2001-2010	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	Gross Weekly Pay (£)	CSV	2004-2011	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Economic
	Redundancies Confirmed	CSV	2000-2011	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Economic
	Deprivation	CSV	2010	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	Highest education attainment	PDF, SPSS	2012	Gauss-Krueger	citylevel	non-public	Social
	Further Education Enrolments	CSV	1999-2010	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	private vehicles per		01.01.2012 -	Gauss-	3-digit microspatial	Acknowledge	Social

	1000 inhabitants		31.12.2012	Krueger	classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Data Source	
	inhabitants per apartment	website	01.01.2012 - 31.12.2012	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	population density	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	average living space per person	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	average living space per apartment	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	average period of residence at address in years	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	reproduction rate (childs per woman)	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical	Acknowledge Data Source	Social

					borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)		
	proportion young/old people	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	percentage of foreigners	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	percentage of people with migration background	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
	average age of inhabitants	website	2012-2013	Gauss-Krueger	3-digit microspatial classification, statistical borough/district (Kleinräumige Gliederung, Gemeindeteil, Stadtbezirk)	Acknowledge Data Source	Social
Source:	FR.ITZ Online Statistical Service City of Freiburg and Freiburg Police						
Potential Use in BESECURE	The data obtained from FR.ITZ ONLINE STATISTICAL SERVICE CITY OF FREIBURG would provide an official socio-economic and demographic picture of the City of Belfast. The data is available at most geographic levels with the exception of absolute location.						

Case study Area: POZNAN, POLAND							
Data Provider:	EDUCATION DEPARTMENT IN POZNAN						
Type of Organisation:	PUBLIC SECTOR						
Description	The Education department is responsible for the publishing of education related information for the City of Poznan.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Higher Education Qualifications	DOC	2006-2012	NA	Local Government District, Poznań, Poland.	Acknowledge Data Source	Social
	Further Education Qualifications	DOC	2006-2012	NA	Local Government District, Poznań, Poland.	Acknowledge Data Source	Social
Source:	Education Department in Poznań						
Potential Use in BESECURE	This data can be used to better understand the educational attainment profile of Poznan						

Case study Area: POZNAN, POLAND							
Data Provider:	PUS-STATISTICAL OFFICE IN POZNAN						
Type of Organisation:	PUBLIC SECTOR						
Description	The statistical office in Poznan provides statistical data on the socio-economic and demographic context of the City of Poznan						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Median Age of Death	PDF	2010-2012	NA	District Council; Health & Social Care Trust; Poznań, Poland.	Acknowledge Data Source	Social
	Population Change (%)	PDF	2004-2012	NA	District Council; Health & Social Care Trust; Poznań, Poland.	Acknowledge Data Source	Social
	Population Forecast (up to 2030)	PDF	2011-2030	NA	District Council, Poznań, Poland.	Acknowledge Data Source	Social
	City Development Strategy	PDF	2010-2030	NA	Local Government District, Poznań, Poland.	Acknowledge Data Source	Social
	Population Totals	PDF	2010-2012	NA	District Council; Health & Social Care Trust; Poznań, Poland.	Acknowledge Data Source	Social
	Employee Jobs	PDF	2010-2012	NA	Local Government District Council, Health and Social Services Board, Poznań, Poland.	Acknowledge Data Source	Economic
	Gross Weekly Pay €	PDF	2010-2012	NA	District Council, Poznań, Poland.	Acknowledge Data Source	Economic
	Redundancies Confirmed	PDF	2010-2012	NA	Local Government District Council, Poznań, Poland.	Acknowledge Data Source	Economic

Source:	PUS-STATISTICAL OFFICE IN POZNAN
Potential Use in BESECURE	This data can be used to better understand the socio-economic and demographic profile of Poznan

Case study Area: POZNAN, POLAND							
Data Provider:	POLICE HEADQUARTERS IN POZNAN						
Type of Organisation:	PUBLIC SECTOR						
Description	The Police Headquarters in Poznan provides an overview of the crime context of the City of Poznan						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	State of security and life-saving in the city of Poznań	DOC	2010-2012	NA	District Council, Local Government Council, Poznań, Poland.	Acknowledge Data Source	Crime
	Sate of security and public order in the city of Poznań	PDF	2012	NA	District Council, Local Government Council, Poznań, Poland.	Acknowledge Data Source	Crime
	State of security and public order in the city of Poznań	DOC	2011	NA	District Council, Local Government Council, Poznań, Poland.	Acknowledge Data Source	Crime
	City Guard Annual Report	PDF	2012	NA	Local Government District, Education & Library Board, Poznań, Poland.	Acknowledge Data Source	Crime

	City Guard Annual Report	PDF	2011	NA	Local Government District, Education & Library Board, Poznań, Poland.	Acknowledge Data Source	Crime
	Threats catalogue	DOC	2011	NA	Local District Council, Local Government District, Poznań, Poland.	Acknowledge Data Source	Crime
	Recorded Crime	PDF	2010-2012	NA	District Council, Health and Social Services Board, Poznań, Poland.	Acknowledge Data Source	Crime
	Road Accidents index	PDF	2011	NA	Local Government Council, Poznań, Poland.	Acknowledge Data Source	Crime
Source:	POLICE HEADQUARTERS IN POZNAN						
Potential Use in BESECURE	This data can be used to better understand the crime profile of Poznan						

Case study Area: POZNAN, POLAND							
Data Provider:	ANALYTICAL SERVICE UNIT- POZNAN CITY HALL						
Type of Organisation:	PUBLIC SECTOR						
Description	The Analytical Service Unit in Poznan provides statistical data on the socio-economic and demographic context of the City of Poznan						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Poznan Living	PDF	2010	NA	Local Government District,	Acknowledge	Social

	Conditions - survey among inhabitants				Health and Social Services Board, Poznań, Poland.	Data Source	
	Unemployment rate	PDF	2006-2012	NA	Local Government District, Poznań, Poland.	Acknowledge Data Source	Social
	Inhabitants migrations	PDF	2009	NA	Local Government District, Health and Social Services Board, Poznań, Poland.	Acknowledge Data Source	Social
	City of Poznań state-of-art.	PDF	2006-2012	NA	Local Government District, Health and Social Services Board, Poznań, Poland.	Acknowledge Data Source	Social
	Public gatherings index.	WMS	2011-2012	NA	Local Government District, Poznań, Poland.	Acknowledge Data Source	Social
Source:	ANALYTICAL SERVICE UNIT- POZNAN CITY HALL						
Potential Use in BESECURE	This data can be used to better understand the socio-economic profile of Poznan						

Case study Area: NAPLES, ITALY	
Data Provider:	ITALIAN NATIONAL INSTITUTE OF STATISTICS (ISTAT), CENSUS 2011, STATISTIC SERVICE OF MUNICIPALITY OF NAPLES
Type of Organisation:	PUBLIC SECTOR
Description	The Italian National Institute of Statistics is a public research organisation. It has been present in Italy since 1926, and is the main producer of official statistics in the service of citizens and policy-makers. It manage the Census activities, publishing reports on each Sector (agriculture, population, industry, ...). Since 1989 Istat has been performing the role of directing, coordinating, and providing

	technical assistance and training within the National Statistical System (Sistan). The System was established n order to rationalise the production and publication of information and to optimise resources allocated to official statistics. Sistan is made up of Istat, central and branch statistical departments of Public Administrations, of local and regional bodies (I.E. Statistic Service of Municipality of Naples and Reggio calabria), Chambers of Commerce, other public bodies and administrations providing statistical information. The Census 2011 is the last statistical framework, now in the process of being published.

Data sets:

Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
Population (by age, gender, total, density)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Birth and Death Rates	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Immigrants (by age)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Education level (degree)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Literacy Rate	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Out-of School Children	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Employment/Unemployment rates	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
Employees (by sector, totals)	csv	2011	Italian	Census geographical areas	Acknowledge	

				National Grid		Data Source	
	Housing Density	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Vacant Housing	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Housing Tenure	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Homicide Rates (by type)	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Burglary	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Other theft	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Drug Crime	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	Juvenile Crime	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	
	ASB	csv	2011	Italian National Grid	Census geographical areas	Acknowledge Data Source	

Source:	Italian National Institute of Statistics
Potential Use in BESECURE	The data obtained from ISTAT would provide an official socio-economic and demographic picture of Naples. The data is available at census geographic levels.

Case study Area: LONDON							
Data Provider:	METROPOLITAN POLICE						
Type of Organisation:	PUBLIC SECTOR						
Description	The Metropolitan Police Service (abbreviated to MPS and widely known informally as "the Met") is the territorial police force responsible for law enforcement in Greater London, excluding the "square mile" of the City of London (the responsibility of the City of London Police). The Met also has significant national responsibilities such as co-ordinating and leading on counter-terrorism matters.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Anti-Social Behaviour Incidents Recorded by the Police	csv	12/2010-03/2013	British National Grid	Street Level, LSOA, Ward, Local Government District, London, England	Acknowledge Data Source	Crime
	Domestic Abuse Incidents and Crimes	csv	2007/08-2011/12	British National Grid	Lower Super Output Areas, Electoral Ward, District Council, London	Acknowledge Data Source	Crime
	Crime Survey for England and Wales (formerly British Crime Survey) [for Risk of Victimisation, Domestic Abuse	csv	1981-2012	British National Grid	England and Wales	Acknowledge Data Source	Crime

	Crime Rates in the Metropolitan Police area by Ward	csv	2001/02-2012/13	British National Grid	Electoral Ward, District Council, London	Acknowledge Data Source	Crime
	Recorded Crime Summary Data for London: LSOA Level	csv	04/2011-03/2013	British National Grid	Lower Super Output Areas, Electoral Ward, District Council, London	Acknowledge Data Source	Crime
	Hate Crimes (administrative geographies)	csv	2011-2012	British National Grid	Lower Super Output Areas, Electoral Ward, District Council, London	Acknowledge Data Source	Crime
	Crime Rates (by type)	csv	2008-2013	British National Grid	Lower Super Output Areas, Electoral Ward, District Council, London	Acknowledge Data Source	Crime
	Metropolitan Police Service Recorded Crime Figures and Associated Data	csv	Jun 2010-May 2013	British National Grid	Police Force Area	Acknowledge Data Source	Crime
Source:	http://maps.met.police.uk/ http://maps.met.police.uk/tables.htm						
Potential Use in BESECURE	The Metropolitan Police crime data is extracted from the crime reporting information system (CRIS) every month and therefore it is continuously updated. Also, The Metropolitan Police recorded crime figures are an important indicator of police workload. They can be used for local crime pattern analysis and provide a good measure of trends in well-reported crimes. The data gathered by the Met police informs policy and practice in a constantly changing and dynamic environment that has community safety at its core						

Case study Area: LONDON TOWER HAMLETS	
Data Provider:	OFFICE FOR NATIONAL STATISTICS (ONS)

Type of Organisation:	Public Sector						
Description	ONS is the UK's largest independent producer of official statistics and the recognised national statistical institute of the UK.						
Data sets:	Name	Format	Time Series	Projection	Geocode Type	Restrictions on use	Domain
	Benefit Claimants - Employment and Support Allowance	CSV, Excel	2008-2012	British National Grid	Local Government District,	No restriction on public access/ NONE	ONS
	Child Benefit - London (geographical statistics)	CSV, Excel	2003-2012	British National Grid	Electoral Ward, Local Government District,	No restriction on public access/ NONE	ONS
	Benefit Claimants - Disability Living Allowance	CSV, Excel	2002-2012	British National Grid	Local Government District	No restriction on public access/ NONE	ONS
	Housing Benefit Claimants	CSV, Excel	2002-2013	British National Grid	Local Government District	No restriction on public access/ NONE	ONS
	Income Support - Ward	CSV, Excel	1999-2012	British National Grid	Electoral Ward, Local Government District	No restriction on public access/ NONE	ONS
	JSA Sanctions Office Level	CSV, Excel	2000-2012	British National Grid	Job Centre Plus Group/District, Local Government District	No restriction on public access/ NONE	ONS
	Life expectancy at birth	CSV, Excel	1991-2010	British National	Local	No restriction	ONS

	and at age 65 for local areas in England and Wales			Grid	Government District	on public access/ NONE	
	2011 Census Ward Population Estimates	CSV, Excel	2001-2011	British National Grid	Electoral Ward, Local Government District	No restriction on public access/ NONE	ONS
	ASHE 2012 (provisional) Table 7 - Place of Work by Local Authority	CSV, Excel	1997-2012	British National Grid	Local Government District	No restriction on public access/ NONE	ONS
	RED02: Redundancies by industry, age, sex and re-employment rates	CSV, Excel	1997-2013	British National Grid	London, England, United Kingdom	No restriction on public access/ NONE	ONS
	A level Results by Gender and Location of Residence for Pupils	CSV, Excel	2004-2011	British National Grid	LSOA, Local Government District	No restriction on public access/ NONE	ONS
	Mortgage and Landlord Possession Actions	CSV, Excel	2003-2011	British National Grid	Local District Council	No restriction on public access/ NONE	ONS
	Total Deaths by Ward	CSV, Excel	2002-2011	British National Grid	Electoral Ward, Local Government District	No restriction on public access/ NONE	ONS
	A level Results by Gender and Location of Residence for Pupils	CSV, Excel	2004-2011	British National Grid	LSOA, Local Government District	No restriction on public access/ NONE	ONS
	Further Education and Higher Education destinations of KS5 students, Borough and Institution	CSV, Excel	2009/2010	British National Grid	Local Government District	No restriction on public access/ NONE	ONS

	2012 Round Ward 5 Year Age Bands - Standard Projection (SHLA)	CSV, Excel	2001-2012	British National Grid	Electoral Ward, Local Government District	No restriction on public access/ NONE	ONS
	Indices of Deprivation 2010 (a separate summary for 2007 also available)	CSV, Excel	2007, 2010	British National Grid	Electoral Ward, Local Government District	No restriction on public access/ NONE	ONS
	Household Income	CSV, Excel	2005-2012	British National Grid	Local Government District	No restriction on public access/ NONE	ONS
	Population Density	CSV, Excel	2011	British National Grid	Local Government District, by Ward-London	No restriction on public access/ NONE	ONS
	Economic Deprivation Index Score	CSV, Excel	2010	British National Grid	Local Government District, by Ward-London	No restriction on public access/ NONE	ONS
	Further Education and Higher Education destinations of KS5 students, Borough and Institution	CSV, Excel	2009/2010	British National Grid	Local Government District	No restriction on public access/ NONE	ONS
Source:	http://www.ons.gov.uk/ons/datasets-and-tables/index.html						

Potential Use in BESECURE	The ONS play a leading role in the development of national and international good practice in the production of official statistics. The ONS statistics are crucial for effective debate and decision making in government, industry, academia or by private individuals.

Through auditing the data that case study cities could access for the BESECURE project, it was found that there was consistency in most of the data themes. As it currently stands, the project will be able to have a comparable approach to data analysis and visualisation for each of these areas. Where there is no consistency, the case study areas in partnership with respective end users will seek to address these inconsistencies for the development of the finalised data framework. Where these inconsistencies cannot be addressed, The BESECURE platform has the potential to augment existing datasets with data from the private sector. This ensures that those who do not currently collect information in certain formats are not necessarily excluded from being able to use the BESECURE platform. Instead, they will be able to fill gaps with data from private data sources such as Experian. A matrix showing the complementarities of the data identified by the case study areas as being available for the BESECURE project is presented below (Green = available; Red = Not available at present).

Table 2: Data complementarity of data identified by the BESECURE project case study areas

	Belfast	Tower Hamlets	Lewisham	Naples	The Hague	Poznan	Freiburg	Arghilla
Population Totals (Age and Gender)								
Employment/Unemployment Rates								
Crime (by Types)								
Income Data								
Social Welfare Claimants								
Educational Attainment								
Deprivation								
GIS Boundary Data								

2.3. Augmentation with Private Data Sources

In order to alleviate any issues surrounding transferability and commonality, the BESECURE project has also identified (for the case study cities), the data that may be present from data vendors. In this case, the BESECURE audited the information provided by Experian who operate in each of the jurisdictions that BESECURE is analysis. As a consequence, it was found that a significant data capture exists for each of the urban areas which could be used to enhance the current analytical abilities of BESECURE, remove duplication of effort of data collection for the end users and also remove the need for cost associated with having to collect the data themselves. The issue however was found that most of the data available through private market in Europe is forecast based and therefore not official statistics, although, the forecasts are all informed through official statistical sources and other econometric approaches- thus providing excellent context and commonality for the case study areas. This commonality (in the case of Experian) is based on segmentation of the data.

In the context of the BESECURE project, communicating policies effectively is vital for successfully governing a municipality, area or country. Sending a message that is designed for everyone will not arrive at all. Therefore, the target audience and its needs, characteristics, lifestyle, and other things that are important to them, are the basis for a successful communication strategy and to implement policies effectively. Segmentation is dividing the market into smaller groups, where each subset has other profile characteristics and needs. The basis for successful segmentation requires that the subsets are recognizable (see figure I). If this is not the case, it is impossible to define the population effectively, for example, it is difficult to reach different citizens using cost effective policies.

Figure 1: Customer Segmentation is about identifiable and measurable segments

Creating identifiable and measurable segments is often a difficult process. The airline industry, for example, attempts to apply a different price for business travellers than for tourists, but the identification of each segment is a challenge. A tactic that is used to separate tourists and business travellers is to offer a Saturday night stay as part of the journey. Business travellers are becoming easier to distinguish in the buying process by the increasing use of booking tools, software that companies use to make bookings with airlines, hotels and rental cars.

As soon as the population is segmented, one or more groups can be addressed. These segments can be used to identify differences in behaviours and attitudes of citizens in different municipalities. These differences between municipalities can be used to create different policies in these different municipalities. Because identifying and measuring segments is a difficult process for governments, Experian has developed ready to use consumer segments, called Mosaic Household Segmentation, in 29 countries including most of Western Europe, the United States, Australia and the Far East (see Figure 2). The Mosaic Household Segmentations are specifically tailored to specific countries to account for cultural differences between these countries.

Figure 2: Countries where Mosaic Household is available en in development

The data that is available and can be used (due to regulations) may differ greatly between countries. Profile characteristics, which can be used to segment, may contain the following:

- Geographic: region, city, climate, population density
- Demographic: phase in the life cycle (eg retired), age, children
- Economic: income, education, purchasing power
- Psychographic: attitudes, values, personality, lifestyle
- Behavior: loyalty, purchase behavior, use the time (eg time of day, day of week, or duration of use)
- Needs: funding conditions, product characteristics, delivery, service levels (direct online sales of insurance offers a service other than your local advisor, for example)

Behaviour usually comes from the databases of clients, whereas other characteristics are usually collected by Experian. Data dictionaries are provided with information about the available characteristics in each country.

The initial statistical development of the segmentation of data was led by Professor Richard Webber in association with Experian in the 1980's using K-means Cluster Analysis and it has gone through a number of refreshes and reclassifications since then. Cluster analysis or clustering is the task of grouping a set of objects in such a way that objects in the same group (called cluster) are more similar (in some sense or another) to each other than to those in other groups (clusters).

Cluster analysis itself is not one specific algorithm, but the general task to be solved. It can be achieved by various algorithms that differ significantly in their notion of what constitutes a cluster and how to efficiently find them. Experian specifically looks for clusters with small distances among the cluster members. The appropriate clustering algorithm and parameter settings (including values such as the distance function to use, a density threshold or the number of expected clusters) are chosen in such a way that it maximizes segmentation in our client databases. That is, Experian tries to maximize differences between customers and non-customers for a variety of clients in different branches in order to maximize it use to clients. Cluster analysis as such is not an automatic task, but an iterative process of knowledge discovery and interactive multi-objective optimization that involves trial and failure. It will often be necessary to modify data pre-processing and model parameters until the result achieves the desired properties.

The data available for use in the BESECURE platform is detailed in Table 3.

Table 3: Example quantitative data available from a private sector data provider – Experian.

Country: United Kingdom(Belfast and London)						
Data Provider:	Experian					
Type of Organisation:	Private Sector Data Provider					
Description	Experian is a global information solutions company. It operates in 18 countries around the world and gathers information on more than a billion consumers worldwide. Experian's locations database is the UK's largest and most comprehensive source of information on registered and non-registered companies, and includes data from Goad's detailed survey of retail locations. Experian economic data is used to support national and local government to support the development of public policy in the UK.					
Source Data:	UK Mosaic Data Directory					
	Name	**Data Directory Content**	**Time Series**	**Geocode Type**	**Restrictions on Use**	**Domain**
	Population, Age & Gender Estimates ** Data can be dissected by 5years age bands 0-4, 5-9 etc)**	Total Households Total Population Total Males Total Males 15+ Total Males 18+ Total Females Total Females 15+ Total Females 18+	Not Known	Output Area and Postcode, flat files for use in GIS	Private – subscription service	Demographic
	Person and House Hold Demographics	New household creation Gender of Occupants Age profile of occupants Marital Status	2001-2016	Output Area, flat files for use in GIS	Private – subscription service	Demographic

		Family Name Origin Length of residency Head of Household				
	Family Income Level	Income subdivided into 11 bands at intervals of £4,999 (under £30k) and intervals of £9,999 between £30k and £59,999. Top band £60k+	Not Known	Individual post code level		Demographic
	Household Composition	Comprising 13 Segments: Family by Gender Extended Family Pseudo Family Single Male Single Female Male Home sharers Female Home sharers Mixed Home Sharers Abbreviated Male Families Abbreviated Female Families Multi-Occupancy Dwelling Unclassified	Not Known	Individual post code level	Private – subscription service	Demographic
	Households with Children	Presence of Children at Address.	Not Known	Individual post code level	Private – subscription service	Demographic
	Household Decision Maker	Sub-Divided into 12 segments Male - Young Male - Middle Male - Old Female - Young Female - Middle Female – Old	Not Known	Individual post code level	Private – subscription service	Demographic

		Couple - Young Couple - Middle Couple - Old Sharers – Young Sharers – Middle Sharers – Old Unknown				
	Family Life Stage	Variable is split into 16 segments: Very Young Family Very Young Single Very Young Home Sharers Young Family Young Single Young Home Sharers Mature Family Matures Singles Mature Home Sharers Older Family Older Single Older Home Sharers Elderly Family Elderly Single Elderly Home Sharers Unknown	Not Known	Individual post code level	Private – subscription service	Demographic
	Property Type	Purpose Built Flat Converted Flat Farm Named Building Other Type	Not Known	Individual post code level	Private – subscription service	Demographic
	Residence Type	Terraced	Not Known	Individual post code level	Private –	Demographic

		Semi-Detached Detached Flat Bungalow			subscription service	
	Property Tenure	Owner Occupied Rented from LA/HA Privately Rented	Not Known	Individual post code level	Private – subscription service	Demographic
	Property Value	Split into bands A-H based on open market value as at April 1991. *** Council Tax calculation supplemented by Land Registry data to estimate values as at July 2003. Data only available for England, Scotland and Wales.	Not Known	Individual post code level	Private – subscription service	Demographic
	Property Transactions	Based on Data Supplied by HM Treasury. Experian measure using a price band system: Quarterly House Price Sales Annual Moving Average	2000-Current	Postal Sector with Flat files available for GIS.	Private – subscription service	Demographic
	Unemployment	Total Unemployed Unemployed split by: Gender Age (5 yr intervals up to 55+) Duration (Weekly)	2008-2013	Output Area and Postal sector, flat files for use in GIS	Private – subscription service	Economic
	Quality of Retail Environment	Site Quality Indicators measure of retail provision in terms of: No. of Retail Multiples No. of Service Providers Floor Space of Retail Multiples	Not Known	Centroid of the Goad plan (expressed as grid ref)	Private – subscription service	Economic

		Grid Ref for Retailers				
	Bar Track	Database of all licensed promises in GB.	Not Known	Not Known	Private – subscription service	Economic
Source:	http://www.experian.co.uk/business-strategies/mosaic-uk.html					
Potential Use in BESECURE	The Experian data could be used to augment publically available data and to undertake more detailed exploration at more delineated geographies.					

Country: Italy	
Data Provider:	Experian
Type of Organisation:	Private Sector Data Provider
Description	Experian is a global information solutions company. Established in Italy in 1995, Experian provides information, analytical and marketing services to organisations to enable the management of risk and reward of commercial financial decisions. The Experian Mosaic suite of tools classifies the Italian population into 47 neighbourhoods encompassing 12 distinct groupings. The neighbourhood and groupings classifications are premised upon Demographics, Home and Environment and Economic Characteristics. Consumer behaviours, lifestyles and socio-economic characteristics are also collated.
Source Data:	Italian Mosaic Data Directory

	Name	Data Directory Content	Time Series	Geocode Type	Restrictions on Use	Domain
	Population	Gender Marital Status Age Bands	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Demographic
	Household	Household Size Foreigners Stateless Resident	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Demographic
	Socio-Economic	Education Level Literacy	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Demographic
	Employment	Workers by Occupation Unemployment Housewife Students Retired Moving daily inside/outside usual dwelling 'municipality'	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Demographic
	Dwelling	Nature of Occupancy Number of Rooms Area of Houses Age of Dwelling Number of Floors Number of Flats Sanitary Facilities Heating Facilities Permanent Telephone	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Demographic

		Line				
	10 Mosaic Groups	A Wealthy Elite B Urban Apartment Dwellers C Elderly Households D Service Workers E Middle Class Families F Troubled Families G Comfortable Homeowners H Blue Collar Workers I Small Scale Manufacturers J Tourism and Second Homes K Rural Low Income L Large Farmhouses	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Consumer types
	Commercial & Industrial Over 600 variables in following categories	Agriculture, Hunting and sylviculture Fishing, farming and connected services Minerals extraction Manufacturing activities Production & supply of electricity, gas water Building Wholesale and retail Hotels and restaurants Transport, storing and communication	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Consumer types

		Monetary and financial Real estate, hiring, IT, research, professional and entrepreneurial Education Health and welfare Public, social and personal services				
	Financial Behaviour	Risk score for consumer Credit card propensity Revolving card propensity Loan propensity Consumer credit propensity Mortgage Financial profiles Risk scores for SME's Loan propensity for SME's	From 2001	Census level, average of 60 households, flat files for use in GIS	Private – subscription service	Consumer types
Source:	http://www.experian.it/					
Potential Use in BESECURE	The Experian data could be used to augment publically available data and to undertake more detailed exploration at more delineated geographies. Digital Cartography includes urban areas, shopping centres, parks as well as key infrastructures.					

Country: Germany						
Data Provider:	Experian					
Type of Organisation:	Private Sector Data Provider					
Description	Experian is a global information solutions company. It operates in 18 countries around the world and gathers information on more than a billion consumers worldwide. The Experian Mosaic suite of tools classifies the German population into 38 types encompassing 10 distinct groupings. The neighbourhood and groupings classifications are premised upon Demographics, Home and Environment and Economic Characteristics. Consumer behaviours, lifestyles and socio-economic characteristics are also collated.					
Source Data:	German Mosaic Data Directory					
	Name	**Data Directory Content**	**Time Series**	**Geocode Type**	**Restrictions on Use**	**Domain**
	Population	Gender Marital Status Age Bands		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Demographic
	Purchasing Power	Average purchasing power Purchasing power indices Absolute purchasing power		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Demographic
	Status	Education and income in bands 1-9		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Demographic
	Family structure	Household composition in 9 bands from 1-mainly single households to 9 Family households with children		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Demographic
	Household head	Average age of head of		Building (6-8 houses), flat	Private –	Demographic

		household in 5 bands from <35 to >65 in 5 year intervals		files for use in GIS	subscription service	
	Foreigners	Percentage of foreigners as head of households in 9 bands		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Demographic
	Unemployment rate	Number of inhabitants Unemployment rate		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Demographic
	House type	Size and structure of built environment in 7 bands from 1 – mainly homogenous single family homes To 7 – mainly non residential blocks		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Built Environment
	Street type	Extent of industrial activity in 5 bands 1 – completely residential To 5 – completely industrial		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Built Environment
	Risk	Statistical risk of non payment in 9 bands 1 – low risk of non payment to 9 – very high risk of non payment		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Built Environment
	Basis	Number of buildings Number of private households per building Number of businesses		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Built Environment
	Car structure	Car penetration – 9 bands		Building (6-8 houses), flat	Private –	Economic

		Car size – 3 bands Car power – 9 bands Used cars – 9 bands		files for use in GIS	subscription service	
	Mosaic mobility	Removal volume Removal balance Fluctuation Nearby removal share Long distance removal volume Mover matrix		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Economic
	Commuter travel	Start and destination of commuters Travelling to work Frequency of travel		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Economic
	Car brand penetration	Brand penetration for key marques in 9 bands		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Economic
	Car segments	Car typology in 12 market segments		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Economic
	Car Owner typology	Car ownership typology in 8 types		Building (6-8 houses), flat files for use in GIS	Private – subscription service	Economic
Source:	http://www.experian.ger http://www.microm-online.de					
Potential Use in BESECURE	The Experian data could be used to augment publically available data and to undertake more detailed exploration at more delineated geographies. Digital Cartography includes urban areas, shopping centres, parks as well as key infrastructures.					

Country: Netherlands						
Data Provider:	Experian					
Type of Organisation:	Private Sector Data Provider					
Description	Experian is a global information solutions company. It operates in 18 countries around the world and gathers information on more than a billion consumers worldwide.					
Source Data:	UK Mosaic Data Directory					
	Name	**Data Directory Content**	**Time Series**	**Geocode Type**	**Restrictions on Use**	**Domain**
	Socio-demographic	Age head of household (6 or 11 classes) Children in household Age eldest child in household Age youngest child in household Household size Marital status Life stage	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Demographic
	Socio-economic	Gross family income Education (3 or 4 classes) Working situation Cars in household Social class Purchasing power index	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Demographic

	Property - usage	Housing type Housing tenure	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Built environment
	Property - architectural	Year of building House size Floor Space Land size Parcel size	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Built environment
	Property - value	House transaction price Mortgage House value Surplus value	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Economic
	Property - tax value	Property tax value	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Economic
	Moves	Number of moves at address Year of last move	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Demographic
	Telecommunications	Fixed telephone line presence	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Economic
	Business registrations	Businesses registered	>10 years	Calculated at household level flat files for use in GIS	Private – subscription service	Economic
Source:	http://www.experian.nl/					
Potential Use in BESECURE	The Experian data could be used to augment publically available data and to undertake more detailed exploration at more delineated geographies.					

2.4. Use of Social Surveys

Whilst BESCURE will undertake a limited social survey investigating issues associated with security, it will also endeavour to identify and exploit existing and emerging secondary sources which gather robust data on societal attitudes, opinions and beliefs on crime and security. Of particular note, BESECURE will utilise the data available from the European Social Survey (ESS). This academically driven, cross European research survey is undertaken every two years and gathers a wide array of crime and security relevant data, including some 22 pages of questions relating to crime. A concurrent FP7 Project, FIDUCIA, is working to interpret this data source in a way which will shed new light on key issues of interest to BESECURE, such as fear of crime and public trust in law enforcement and the justice system. BESECURE has established a working relationship with FIDUCIA and will seek to utilise the emerging findings and to augment them with additional interrogation and analysis of the ESS Dataset. This will be an important data source for area profiling and will address a key deficiency in other datasets, such as raw crime statistics which only capture reported and / or discovered incidents of crime and not the societal context (including unreported crime) within which the crime occurred and was reported. This data will facilitate the 'context setting' activities necessary to compare between BESECURE case study areas, to identify appropriate areas to deploy the project and to improve the relative 'ranking' activities associated with performance benchmarking.

The emerging field of social media will also be investigated in terms of its ability to provide rich, time critical data on attitudes and activities, notably in younger and more affluent population segments. The ability of enterprise level platforms to harness and interpret this data is rapidly increasing – hedge funds are reported utilising 'twitter sentiment' to inform stock positions, whilst marketing companies are forecasting future earnings and spending patterns from individual current LinkedIn profiles. There is an obvious merit in seeking to estimate levels of perceived security utilising a similar approach. Of course, monitoring social media for the emergence of self-organising anti-social activity has become a mainstream security concern since being thrown into sharp relief in the 'Arab spring' and 2012 UK riots. This is a rapidly transforming, data rich sector, which is likely to be a key data source for BESECURE in its operational phase. This should of course be caveated by the fact that for some affected communities and sectors, such as the elderly, penetration of 'smart devices' and social media is much lower, highlighting the need for a multi-channel, multi-faceted data gathering exercise to ensure a robust, representative underpinning data foundation.

2.5. Potential Applications of the Quantitative Data

Given the extensive compilation of available data for the BESECURE project, the potentiality of use is practically endless. Indeed, each of the datasets identified can help build up a comprehensive spatial picture of the context in which urban security is challenged. This section will not look at the entire spectrum of possible applications, but instead focus on a narrative that presents a better understanding of the information. We will use data from the Belfast and The Hague case study areas to do this.

The domain structure set out in work package 1 of the BESECURE project highlights that there are a number of key indicators relevant to enhancing urban security policy. These include data from the social, economic, environment, crime and the institutional domain. In the context of the social domain, data from this domain can help policy makers better understand the societal characteristics of the area. In example, the policy makers may want to know the spatial distribution of age-groupings to identify where vulnerability may exist in the urban area. The Figure below (Figure 3) presents the spatial distribution of people aged 65+ in The Hague in 2012. This type of information could then be used by Police and Statutory agencies to provide advice on crime prevention to vulnerable persons, such as those over 65+ years old.

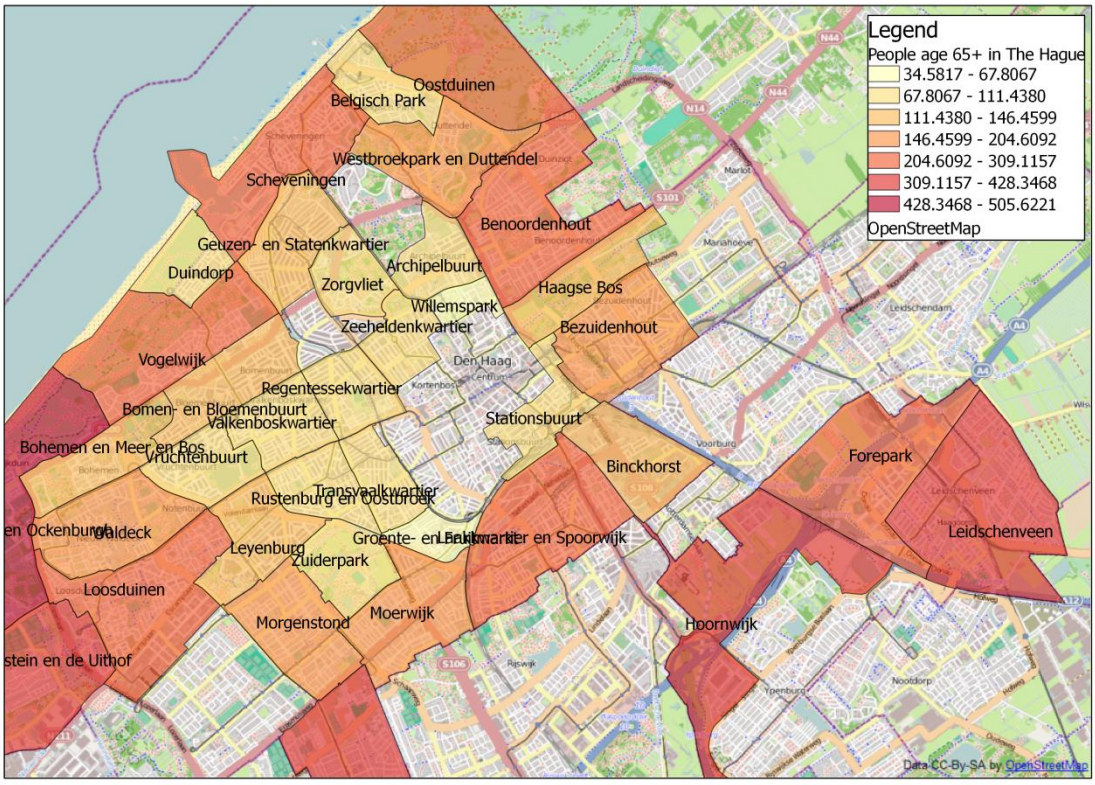

Figure 3: Spatial Distribution of Vulnerable Persons in The Hague

Another example of how the societal data could be used is through better understanding where deprivation is most prevalent in the area. This could be used to identify where fiscal interventions may need to be employed to provide job opportunities, enhance education and quality of life. Most of the literature identifies that issues urban security and safety

issues are most prevalent in highly deprived areas where unemployment is high and educational attainment is low.

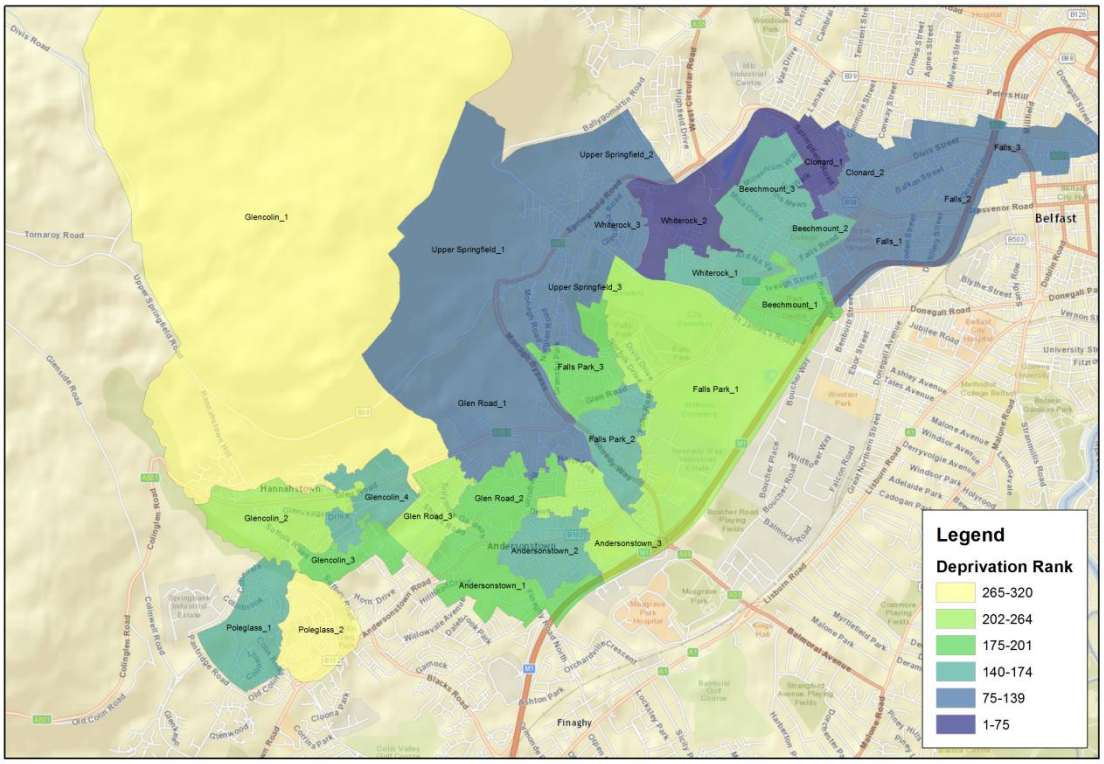

Figure 4: Spatial Distribution of Deprivation in West Belfast

However, where strategic policy decisions are in need of being made, decision makers will use more localised and specific quantitative data to understand any correlations that may exist. These may include whether there are any spatial trends in crime such as proximity of crime to key transport infrastructure (Figure 5).

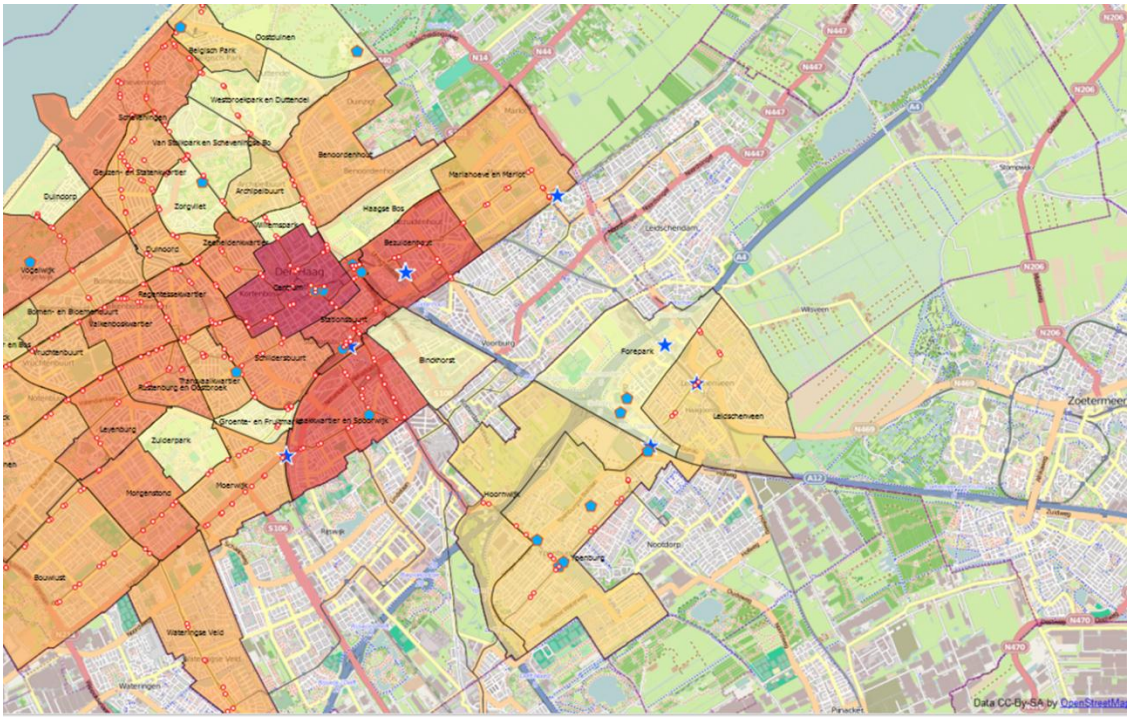

Figure 5: Relationship between Tram and Train Stations and Anti-Social Behaviour in The Hague

Policy makers may also want to know where they are spending a lot of money on things such as emergency repairs to properties (where windows have been broken, secondary fires have been started). The following figures demonstrate how the quantitative data could be used to inform this and provide a better understanding for future approaches.

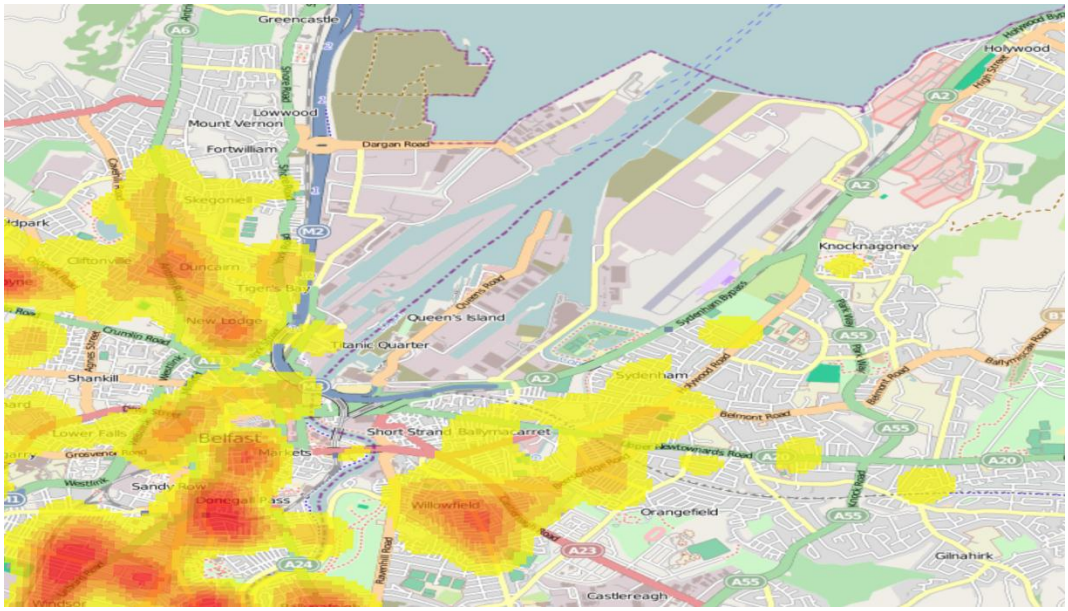

Figure 6: Hotspots of Emergency Repairs carried out in Belfast by a Statutory Agency

The hotspots of emergency repairs could then be analysed against crime (such as anti-social behaviour) in certain hotspot areas (Figure 6)

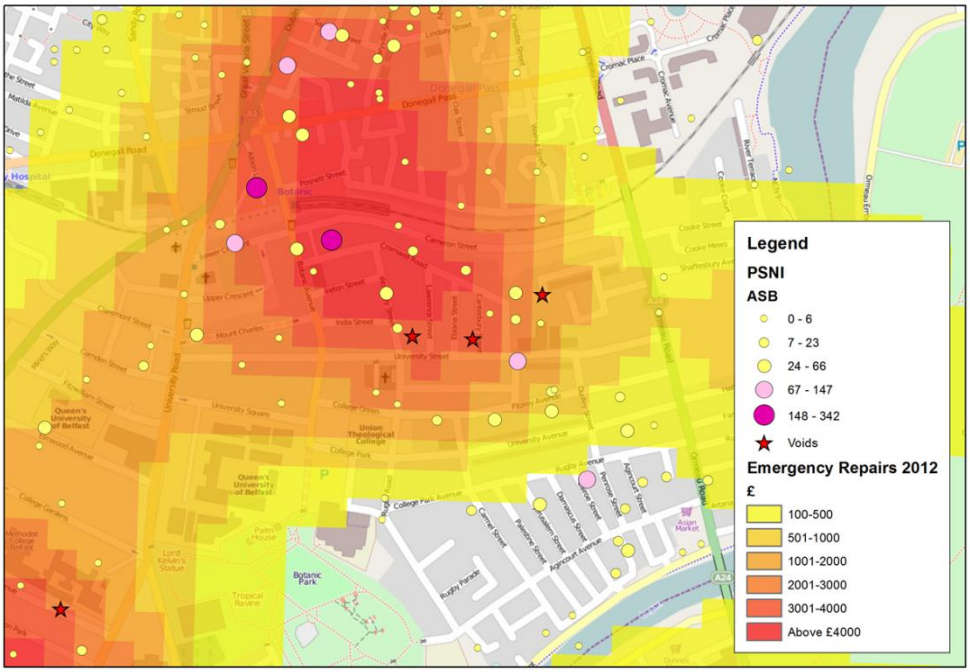

Figure 7: Use of Spatial Analytics for Understanding Trends

Once this is identified, a demographic picture could then be used to see if there is a correlation with age (in this case it was found that most of the anti-social behaviour was being carried out by under 18 year olds, based on statutory agency figures), anti-social behaviour and emergency repairs (Figure ##).

Figure 8: Understanding trends for Informing Interventions

This information could then be passed to school liaison officers within the Police and Local Council to then target educational programs on the risk of offending and its consequences.

3. Role of Qualitative Data in the BESECURE project

3.1 Introduction

The role of qualitative data in the BESECURE project is similar to that of the quantitative data in that it is utilised to provide evidence from which decisions can be made. Whereas the quantitative data is primarily used to inform the context of an area and what issues exist, the role of qualitative data in BESECURE is concerned with furthering the understanding of issues in the case study areas and gaining a knowledge of the approaches that have been taken to mitigate against the urban security issues. Indeed, further research and qualitative data collection from within the BESECURE project has enabled the project to better understand urban security issues elsewhere in Europe (and globally) and what approaches have been adopted in those situations-focusing on what has and/or has not worked. In doing this, the final BESECURE platform, will provide the functionality for urban areas across Europe to better understand what approaches may have the potential to be adopted in their cities to mitigate against specific issues. This is facilitated through an analysis of the issues and approaches in the current literature base.

3.2 Use of Qualitative Data Sources in BESECURE

In contrast to the availability of publically accessible quantitative data and the governance structure in which it is offered, qualitative data is somewhat less coordinated and user-friendly- particularly qualitative information that is needed for the BESECURE toolkit. There is a significant amount of qualitative market research carried out across Europe, however, most of this is released in a quantitative manner, with the majority of research, particularly commissioned by Government, having restricted access. This makes it difficult for a desk based qualitative study to form the basis of the modelling for the BESECURE toolkit. Therefore, the BESECURE consortium will augment the desk based study with structured in-depth interviews at the case study level to better understand the issues experienced and the approaches that have or have not been successful.

3.1.1. Desk Based Qualitative Data

In order to establish good practice approaches to enhancing urban security policy, a comprehensive review of literature is currently being undertaken. This is being done through all available media (books, journals, reports, media and other outlets) across the BESECURE partner structure. Nevertheless, initial findings have indicated that there is a distinct lack of reporting on the mechanisms that have been used to minimise the risk of urban security issues and whether or not they have been successful. This is probably a consequence of two mains factors. First, there is the general appreciation that measures that are employed to reduce high level security and safety issues will not be publically released in detail, this is in order to avoid educating those who are causing the issues with the approaches that have been adopted- something which could then result in the offenders changing their approaches. Second, there is limited performance measurements adopted and presented in the public domain that would facilitate an understanding of what is, or is not working in areas. This can be either strategic (i.e decision makers not wanting people to find out if interventions are not working) or operational (i.e information not being collected on the interventions from either a

performance point of view or a perception viewpoint). Therefore, it is difficult for people to better understand what is, or is not, working in specific areas.

As a consequence of this, and that of a cost-benefit issue, there is no central repository for developing a better understanding of urban security and community safety issues and the approaches adopted. The BESECURE project seeks to overcome this through the development of the 'E-learning platform' and the knowledge gathered from the case study areas and provided to end-users through the 'eGuide' facility.

3.1.2. Case Study Qualitative Data

There are eight case study areas in the BESECURE project from different regions of Europe. The purpose of these case studies are to develop a better understanding of the complex issues that exist in each of the chosen urban areas and to gain a knowledge of how each case study has approached the response to these issues. The case studies themselves are based on three main phases, these include:

1. Understand what kind of issues are prevalent in the case study area and what policies and practices have been adopted for enhancing urban security as a consequence

2. Understand what kind of support the end users need to improve policy development and implementation in the area of urban security and safety

3. Realise how the end product can and will support end users through iterative refinement

In order to fulfil these phases, the BESECURE project adopted a series of generic interview questions that could be utilised across all case study areas. These questions will not be discussed in detail here (See D5.1), but instead synopsised. Each case study area has been using a case file template designed to extract all necessary information from those interviewed. The case files focus specifically on two key elements- the issues and the approaches. In the issues section, the questions have been specifically chosen to develop a knowledge and understanding of what the key issues and their attributes are in each of the case study areas. The approaches section is then used to appreciate the interventions (and policies) that have been adopted in each of the areas. The questions used within the case file can be broken down as follows:

Table 4: Interview questions utilised in BESECURE case study areas

ISSUES
• **What? – Type of issue (e.g. Violent Crime)** • **Where? – Location of issue (e.g. description of the area within the city where the issue occurs such as a clubs / bar district)** • **Who? (Perpetrator/Victim)** • **When? (Time of Day of Incidents)** • **Frequency of occurrence** • **Comments (Any other relevant info, other causational and motivational factors, such as whether the issue is racially motivated, whether the issue is part of a wider national or global trend, and other relevant contextual information).**

APPROACHES

- Colloquial n**ame of** the **approach**

- **Aim/objectives of approach (e.g.** t**o achieve a 20% reduction in the number of incidents occurring)**
- **Timeframe of** the **approach (e.g.** q**uick wins, long term)**
- **Description of approach (details** or **mechanisms of the approach)**
- **Key words/tags to summarise the approach**
- **Rationale for intervention (background information on the motivation** or **trigger**s **for the approach**. W**hy was it** deemed **necessary? On the basis of what information** or **evidence was it decided to implemented this particular approach?)**
- **Nature of intervention** (a s**elect**ion from a number of preset types, with an option to **provide a** further elaboration)

- **Indirect effects** or **side-effects of** the **approach (what other issues does the approach address**, **other than the one(s) detailed in this case** file**? Are there any** known **unintended consequences of this approach?)**

- **Who? (**which parties **initiated the intervention**, and which parties were part of the implementation thereof?**)**
- **Geographical applicability (where has the approach been applied?)**
- **Implementation/evaluation (qualitative description of results and perceived success of the approach)**
- **Requirements for the approach (**what f**inancial** means were required, where there any legal or operational demands?)

Once these questions started to be answered, the information emanating from the interview questions were then input in to a template specific for capturing practices. This was to ensure consistency in approach and to allow the modelling framework of WP3 to be employed. This template is discussed in the next section.

3.3 Template for qualitative data concerning practices

As information concerning practices is a paramount aspect of needed data for BESECURE, the main subject of this section will be the ‘best practice template’. We will highlight what information is needed for the main modelling period and how it should be processed.

Utilizing the qualitative data from the case studies within the security enhancement process in the BESECURE toolbox requires the information to be available in a specific form. To this end we need a canonical way how to process / present the needed information on particular issues. Moreover we need a canonical set of particular information that needs to be known. Fraunhofer EMI, in cooperation with the Albert-Ludwigs-Universität Freiburg, developed a template to capture the required information – the so-called ‘best practice template’. For the modelling activities in WP3, it is crucial that there is well-defined information on the key aspects of the practices. In general this results in several questions, e.g.

- What was done?

- Where was it done?

- How was it done?
- What was the status quo?
- Who was involved or targeted in the execution, planning etc. of the practice?
- What were the results?
- What are associated costs?
- Are there interdependencies that influenced the course of action?

In the 'best practice template' we elaborated this and made boxes for the questions we deem relevant. The present status of the template is still preliminary as although it is piloted in some case study areas there will probably still be some iterative improvement.

The 'best practice template' will be filled from two sources, namely the collection of information from the case studies and the collection of information coming from literature.

The structure of the template is as follows: the item is the object we want information about. What particular information is named as detail and described in the description to minimize ambiguity.

Table 5: A template to collect practices in a way that they can be utilized within a risk management process. Also known as the 'best practice template'.

Item	Detail	Description
The best practice in general	Source	Especially if the best practice is derived from the literature, it is necessary to know its source. For best practices from the case studies, we have to discuss this field.
	Name	If there is no name, we can also numerate the best practices. We hope that there will be the opportunity to name the best practices.
	High level description (very brief)	Very brief description of the best practice, like tags.

	Low level description (explicit)	It is very important to explain what is conducted while application of the best practice.
	Intention / objectives	What is the purpose of this best practice? All objectives of the lead should appear here. As detailed as possible.
	Typing/Categorization of BP (ontology)	**After comparison** with other best practices we should be able to categorize the best practices.
	Role of decision makers	Who (in terms of competence / responsibility) is involved in the execution of the practice?
	Type of research / study	The method of the study that found the practice, e.g. is it qualitative or quantitative?
	Territorial relation	Territorial relation describes the environment the best practice is meant for, e.g. the whole city, a particular quarter or a particular street. The entry in this field should be a tag.
	Outcome	Qualitative description of the outcome of the best practice.

		Reliability of outcome	If possible it would be great to know whether the results of the best practice can be reproduced.
		Quality of outcome	If there is an evaluation maybe some quantitative data is available.
Preliminary situation including key drivers and trends		Status quo	Description of the status quo before application of best practice. Could include pictures or the like.
		Type of city	Short description of the city the best practice was conducted in.
		Type of urban environment	Description of the area within the described city where the best practice is conducted, e.g. quarter or street.
		Problem-explanation	Description of the problem that required the best practice. E.g. is it a personal or spatial / environmental problem?
		Global trends of insecurity	Are there any external, global or general influences with strong impact on the objectives, the city or the organization?
External stakeholders		Direct receivers	Persons or groups that are directly affected by the best practice, e.g.

				NGO or drug addicts or the like. (Could be more than one)
			Measure for direct receiver	How are the mentioned receivers affected?
			Intermediators	Are there groups or persons that act like intermediators?
			Inhabitant groups	Are there special inhabitant groups with interests? If so what are the interests?
			Other stakeholders	We should be aware of all stakeholders with interest in the objectives. If it turns out that there are other types, this should be extended.
Risks, chances	**Risk criteria**		Value and unit	The units in which risks are measured, e.g. crime rates or death per year.
			Threshold	The critical moments that triggered the lead to act.
	Primary risks (hazard- and opportunity risks)		Source of risk (hazard or opportunity)	Element which alone or in combination has the intrinsic potential to give rise to a risk. Sources include objects, situations and conditions that induce risks, e.g. poverty, drugs or beautiful parks. To distinguish the different sources each

				source of risk gets an identifier (s1,s2,...) at the beginning. The notation looks like: s1: source of risk_A
			Areas of impact	Spatial areas which the risk has influence on, e.g. streets or quarters. To distinguish the different areas, each area gets an identifier at the beginning. The identifier at the end of the area refers to the source of risk belonging to the area of impact. The notation looks like: a1: area_A(s1) If there is more than one source which belongs to the area, the notation looks like: a2: area_B(s1,s2)
			Events associated to the source of risks	All events induced by the source of risk, e.g. robberies. To distinguish the different events, each event gets an identifier at the beginning. The identifier at the end of the event refers to the source of risk belonging to the event. The notation looks like: e1:

			event_A(s1) If there is more than one source which refers to the event, the notation looks like: e2:event_B(s1, s2)
		Consequences of risks	Consequences of realizations of risks, e.g. decreasing reputation of quarter or deaths. To distinguish the different consequences each consequence gets an identifier at the beginning. The identifier at the end of the consequence refers to the event which causes the consequence. The notation looks like: c1: consequence_A(e1) If there is more than one event which causes the consequence the notation looks like: c2: consequence_B(e1,e2)

			Measures	Activities which have been conducted by the leading role in order to influence the sources, events and consequences of risk, e.g. capture of drug dealers or the like. To distinguish the different measures each measure gets an identifier at the beginning. The identifier at the end of the event refers to the source of risk, event or consequence which induces the measure. The notation looks like: m1: measure_A(s1) If there is more than one source, event or consequence which causes the measure, the notation looks like: m2: measure_B(e1, s1)
	Secondary risks in implementation		Problems and benefits during implementation of measure	Description of problems and benefits during implementation of measure. To distinguish the different problems each problem gets an identifier at the beginning. The identifier at the end of the problem refers to the measure

				which induces the problem. The notation looks like: p1:problem_A(m1) If there is more than one measure which causes the problem the notation looks like: p2:problem_B(m1,m2)
			Cause of problems and benefits	To distinguish the different causes each cause gets an identifier at the beginning. The identifier at the end of the cause refers to the problem which belongs to the cause. The notation looks like: ca1:cause_A(p1) If there is more than one problem which belongs to the cause the notation looks like: ca2:cause_B(p1,p2)
			Consequence of problems and benefits	If mentioned in the paper, description of the consequence of the problem or benefit. To distinguish the different consequences each consequence gets an identifier at the beginning. The identifier at the end of the consequence

			refers to the problem which belongs to the consequence. The notation looks like: co1:consequence_A(p1). If there is more than one problem which belongs to the consequence the notation looks like: co2:consequence_B(p1,p2).
Secondary risks (hazard- and opportunity risks)		Short term: events, consequences, probabilities	If the best practice itself introduces new risks, these risks should be mentioned here. Possible examples include that e.g. if there are hotspots which are removed, there is the risk that several new (and uncontrolled) hotspots arise.
		Long term: events, consequences, probabilities	
Capabilities and constraints		Financial	To recommend a best practice, it is necessary to know (or at least estimate) the associated costs. In addition to financial costs we have to consider other costs as well. Concerning legal issues it is very important to understand whether there are special Laws that prohibit / allow the practice in different contexts. Explicit information if available, semi-quantitative information
		Technical/infrastructure	
		Organizational	
		Personnel	
		Timeframe	
		Legal	

		otherwise.
Interdependencies		Interdependency is defined as a directed link between two events where the source event influences the likelihood of the target event.
Relevant indicators	Unemployment rate, population density, welfare beneficiaries rate, etc…	All occurring indicators which could be relevant. If possible to be inferred from other sources if not available. Are there particular indicators that point to particular risks?

4. Data considerations for adoption of the BESECURE platform

The vision of the BESECURE project is one that will see the application of the BESECURE platform adopted by many regions outside of the case study areas post-completion of the project. Indeed, the data and information framework will provide a mechanism for any region across Europe and potentially globally to build a model for enhancing urban security and safety. In order to do this, those that are wishing to adopt the BESECURE tools should be mindful of the data needs of the platform and issues surrounding such. These issues include confidentiality, anonymity, access, sources, spatial classifications and quality as well as possible uses. This section will provide a broad overview of these issues. Section 4 provides a detailed overview of the general data considerations that potential adopters of the BESECURE project need to be mindful of when deciding the best available data for enhancing their urban security and safety policy. These considerations are fundamental, particularly when the data are not official government generated datasets that have undergone significant quality assurance through a data development methodology. In the context of D2.2, these considerations are critical for helping case study areas and potential adopters understand the issues that need to be taken in to consideration when addressing any data gaps and quality assuring non-official data sources to fill these gaps.

4.1 Anonymisation and confidentiality

When analysing data and utilising this data as part of an evidence base, one of the primary factors to be considered is the level at which this data is presented. In the EU, the advent of data protection and human rights has resulted in significant due diligence being carried out on data to ensure that privacy and data protection laws are adhered to. Due to privacy and data protection obligations almost all available data is therefore anonimised to alleviate any components that may potentially identify an individual. These components could include (but are not restricted to) the removal of a person's name, the aggregation of data up to a specific geography and or the removal of other components that may identify vulnerability. Therefore, anonymization is usually addressed by aggregating variables or erasing of specific items. To our knowledge, anonymization and disclosure at the EU level are regulated by regulation (EC) No 223/2009 of the European parliament and of the council (Union, 2009). In this document, Article 20, paragraph 3 and 4 states that:

3. Statistical results which may make it possible to identify a statistical unit may be disseminated by the NSIs [national statistical institutes] and other national authorities and the Commission (Eurostat) in the following exceptional cases:

(a) where specific conditions and modalities are determined by an act of the European Parliament and of the Council acting in accordance with Article 251 of the Treaty and the statistical results are amended in such a way that their dissemination does not prejudice statistical confidentiality whenever the statistical unit has so requested; or

(b) where the statistical unit has unambiguously agreed to the disclosure of data.

4. Within their respective spheres of competence, the NSIs and other national authorities and the Commission (Eurostat) shall take all necessary regulatory, administrative, technical and organizational measures to ensure the physical and logical protection of confidential data (statistical disclosure control).

The NSIs and other national authorities and the Commission (Eurostat) shall take all necessary measures to ensure the harmonization of principles and guidelines as regards the physical and logical protection of confidential data. Those measures shall be adopted by the Commission in accordance with the regulatory procedure referred to in Article 27(2).

In paragraph 3 the exceptions when confidential data may be disseminated are stated. Paragraph 4 highlights that the European Union strives for harmonization of anonymisation principles. This implies that the data available for the BESECURE project will be (almost surely) anonimised. Access and protection of confidential data is subject of Articles 22 and 23.

- Protection of confidential data in the Commission (Eurostat)

1. Confidential data shall be accessible, subject to the exceptions laid down in paragraph 2, only to officials of the Commission (Eurostat) within their specific domain of work.

2. The Commission (Eurostat) may in exceptional cases grant access to confidential data to its other staff and to other natural persons working for the Commission (Eurostat) under contract within their specific domain of work.

3. Persons having access to confidential data shall use these data exclusively for statistical purposes. They shall be subject to this restriction even after cessation of their functions.

- Access to confidential data for scientific purposes

Access to confidential data which only allow for indirect identification of the statistical units may be granted to researchers carrying out statistical analyses for scientific purposes by the Commission (Eurostat) or by the NSIs or other national authorities, within their respective spheres of competence. If the data have been transmitted to the Commission (Eurostat) the approval of the NSI or other national authority which provided the data is required.

The modalities, rules and conditions for access at Community level shall be established by the Commission. Those measures, designed to amend non-essential elements of this Regulation by supplementing it, shall be adopted in accordance with the regulatory procedure with scrutiny referred to in Article 27(3).

So, access to confidential data is generally restricted to persons working for the Commission (Eurostat) and may be granted only for statistical purposes. Not fully anonymised data may also be accessible for the means of scientific purposes. The conditions that lead to “only indirect identification” are subject to particular rules for the different surveys.

Therefore, if potential adopters of BESECURE are exploring potential methodologies for supplementing officially recorded data, they must ensure that they are complaint with data protection and privacy regulations in that jurisdiction. Indeed, this must be centred upon ensuring that the public are not able to identify an individual.

4.2 Macro- and Micro-data

There are two categories of data: micro- and macro-data. Data on the level of individual characteristics is called microdata. As stated by Eurostat “microdata are the units of data that aggregate statistics are compiled from. Microdata consist of sets of records containing information on individual respondents or business entities.” (Eurostat, 2013a)

Unfortunately, access to microdata is often restricted or at least subject to further modification to comply with confidentiality regulations. So, aggregation of data is often needed to grant confidentiality and to handle large amounts of data.

Aggregated data is often like headcounts; e.g. the number of unemployed persons or the total number of committed crimes. Aggregated microdata is often called macrodata or aggregated data. Every aggregation of data imposes loss of information. If data is used to draw specific conclusions this is of course favourable, as complexity can be reduced and important features can be shown clearly. Nevertheless aggregated data may forbid drawing conclusions. Consider individual data containing employment status and crime record. From this (micro-) data one could conclude to the total amount of committed crimes as well as the number of unemployed persons (as macrodata). Given only these totals the direct link between employment status and expected proximity to crime would be impossible to infer; for this conclusion the microdata would be needed.

Although access to microdata is normally restricted due to anonymisation reasons, for scientific purposes access may be granted to anonymised microdata. As stated in Regulation (EC) No 1104/2006 (Union, 2006), “anonymised microdata obtained from following surveys or statistical data sources” may be granted accessible without prejudice to the objection of the national authority which provided the data:

- • European Community Household Panel,
- • Labour Force Survey,
- • Community Innovation Survey,
- • Continuing Vocational Training Survey,
- • Structure of Earnings Survey.
- • European Social Survey

Access is restricted to research entities comprising universities, research institutions or research departments in public administration, banks, statistical institutes etc. The forms how to apply for microdata can be found at:

http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/documents/How_to_apply_for_microdata_access.pdf.

4.3 Data quality and validity

In this section we first discuss general principles for data quality with a discussion presented on the criteria for assessing quality.

4.3.1 Criteria for data quality

In relation to assessing quality there are some key factors that should be considered. In the context of the BESECURE project, data quality and validity relate directly to the fitness for use of data for enhancing urban security and safety. Therefore, the term data quality is relative. In this project, fitness for use centres on the need to look beyond traditional concerns with the accuracy of data (Tayi and Ballou, 1998). In example, data relating to security and safety in many organisations may be highly accurate based on a strong data capturing methodology and quality assurance process, however, the data may be unfit for use if it is not available on an updated temporal basis. Therefore, the requirements of the analysis must be taken in to consideration when understanding how data quality may impact upon the development of a new BESECURE project. The BESECURE project would advocate using the following considerations when understanding quality of data for use in BESECURE:

- Relevance
- Accuracy
- Sample related errors containing
    - Random errors
    - Systematic errors concerning
        - Selection
        - Interpolation
- Non sample related errors containing
    - Data collection base related errors
    - Omitted answers
    - Measuring error
    - Pre-processing errors
- Timeliness
- Accessibility and relevance
- Comparability
- Coherence

For the evaluation of data quality we suggest using the “European Statistics Code of Practice” (Committee, 2011) as benchmark. In this document, the “15 Principles covering the institutional environment, the statistical production processes and the output of statistics” are presented detailing the general governance of data quality at the European level. Moreover for each principle there are several indicators that provide a reference for the compliance to the “Code of Practice”. These indicators are of course adjusted to the context of the European statistics, but nevertheless they can serve as inspiration for the assessment of the satisfaction of the principles in the BESECURE context. The 15 principles are (cf. (Committee, 2011)):

1. Professional independence of statistical authorities from other policy, regulatory or administrative departments and bodies, as well as from private sector operators.
2. Mandate for data collection: Statistical authorities have a clear legal mandate to collect information for European statistical purposes. Administrations, enterprises and households, and the public at large may be compelled by law to allow access to or deliver data for European statistical purposes at the request of statistical authorities.
3. Adequacy of resources
4. Commitment to quality: Statistical authorities are committed to quality. They systematically and regularly identify strengths and weaknesses to continuously improve process and product quality.
5. Statistical confidentiality: The privacy of data providers (households, enterprises, administrations and other respondents), the confidentiality of the information they provide and its use is only for statistical purposes are absolutely guaranteed.
6. Impartiality and objectivity: Statistical authorities develop, produce and disseminate European Statistics respecting scientific independence and in an objective, professional and transparent manner in which all users are treated equitably.
7. Sound methodology underpins quality statistics. This requires adequate tools, procedures and expertise.
8. Appropriate statistical procedures, implemented from data collection to data validation, underpin quality statistics.
9. The reporting burden is proportionate to the needs of the users and is not excessive for respondents. The statistical authorities monitor the response burden and set targets for its reduction over time.
10. Resources are used effectively.
11. Relevance: Statistics meet the needs of users.
12. Accuracy and reliability: Statistics accurately and reliably portray reality.
13. Timeliness and punctuality: Statistics are released in a timely and punctual manner.
14. Coherence and comparability: Statistics are consistent internally, over time and comparable between regions and countries; it is possible to combine and make joint use of related data from different sources.
15. Accessibility and clarity: Statistics are presented in a clear and understandable form, released in a suitable and convenient manner, available and accessible on an impartial basis with supporting metadata and guidance.

As mentioned above, the indicators that measure compliance to the principles are context specific, but can serve as inspiration. As an example we state the indicators that are related to the eighth principle (Appropriate statistical procedures, implemented from data collection to data validation, underpin quality statistics.):

1. When European Statistics are based on administrative data, the definitions and concepts used for administrative purposes are a good approximation to those required for statistical purposes.
2. In the case of statistical surveys, questionnaires are systematically tested prior to the data collection.
3. Survey designs, sample selections and estimation methods are well based and regularly reviewed and revised as required.
4. Data collection, data entry, and coding are routinely monitored and revised as required.
5. Appropriate editing and imputation methods are used and regularly reviewed, revised or updated as required.
6. Revisions follow standard, well-established and transparent procedures.
7. Statistical authorities are involved in the design of administrative data in order to make administrative data more suitable for statistical purposes.
8. Agreements are made with owners of administrative data which set out their shared commitment to the use of these data for statistical purposes.
9. Statistical authorities co-operate with owners of administrative data in assuring data quality.

4.3.2 The use of data: validity of interpretation

Measurement or other technical issues are not the only issue that arises when working with data. A very critical issue is the correct interpretation of data. Numbers compiled from data that contain meaning are normally called indicators. For deeper understanding of indicators we should consider the theoretical concept of the indicator development and in particular the validity and reliability of measurement. Measurement validity addresses the question whether the indicators point to the right conclusion, i.e. whether the measured items reflect the background concept or not. To this end we should first consider Figure 9.

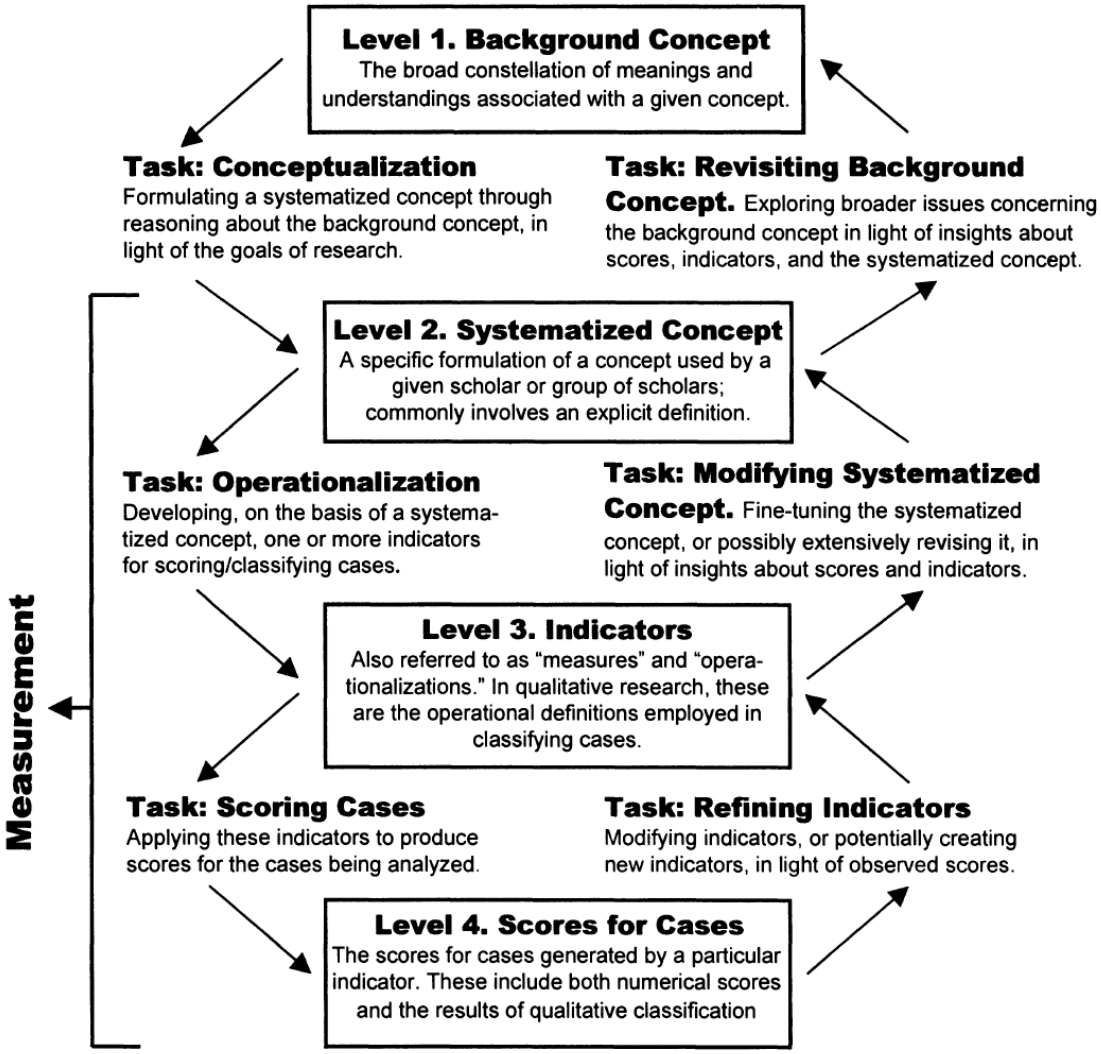

Figure 9: The process to develop an indicator, taken from (Adcock & Collier, 2001).

In level 1, a knowledge and understanding of the research must be achieved. This includes having clear guidance of the goals of the research and an appreciation of what the research is trying to achieve. In level 2, Adcock and Collier (2001) suggest that this stage is associated with the systematized concept, the specific formulation of a concept adopted by a particular researcher or group of researchers. It is usually formulated in terms of an explicit definition. The third level relates to the indicators used as part of the measuring methodology. Indeed, this incorporates not only quantitative indicators but qualitative also. At the fourth level are scores for cases, which include both numerical scores and the results of qualitative classification

Adcock and Collier (2001) suggest that the 'downward and upward movement in Figure 9 can be understood as a series of research tasks.' The processes on the left-hand side, conceptualize the movement from level 1 to the systematized concept in level 2. Once this occurs, operationalization then moves from the systematized concept to indicators, and the scoring of cases applies indicators to produce scores. At the right-hand side of the process, indicators are refined in 'light of scores, and systematized concepts may be

fine-tuned in light of knowledge about scores and indicators'. The authors then highlight that 'Insights derived from these levels may lead to revisiting the background concept, which may include assessing alternative formulations of the theory in which a particular systematized concept is embedded. Finally, to define a key overarching term, "measurement" involves the interaction among levels 2 to 4.' (Adcock & Collier, 2001).

There are several issues regarding measurement validity in particular in the relation between concepts and observations. "Valid measurement is achieved when scores (including the results of qualitative classification) meaningfully capture the ideas contained in the corresponding concept. This definition parallels that of Bollen (Bollen, 1989), who treats validity as "concerned with whether a variable measures what it is supposed to measure." King, Keohane, and Verba (King, Keohane, & Verba, 1994) give essentially the same definition."(Adcock & Collier, 2001). Other important issues are reliability and measurement errors.

One of the goals of the BESECURE project is the enhancement and comparison of differing urban areas, the most important issue might be the context specific validity of indicators. Here it is important to note that of course – as presented in the beginning of this chapter – there are general indicators that very broadly assess performance of policies, but that specificity of the problem and individuality of the indicator should be proportional (the more specific the problem the more individualistic the indicator). As we want BESECURE users to decide on specific courses of action, there should be emphasis on individual indicators for particular problems. This implies that indicators developed within the BESECURE project need lots of attention from all involved partners, especially from the case studies. Moreover it is a strong plea for individual indicators and particular adjustment of indicators for every urban area they are applied to. This could result in a set of example indicators that were applied and tested in the case studies that might serve as inspiration in the BESECUE toolbox for the BESECURE (end-) users.

To summarize: for the BESECURE toolbox it could prove to be expedient to categorize the indicators in three groups

1. general indicators
2. theory based indicators
3. individual indicators.

Here general indicators would denote indicators which base on very general concepts that can be measured canonically – which are very context insensitive – like e.g. unemployment rate or the like. Theory based indicators would be indicators that base on very general concepts but refuse canonical measurement. Theory based indicators would require adaption to specific cases by adjusting the way of measurement. The individual indicators would be indicators that are developed to measure specific issues and that are very context sensitive. Individual indicators had to be developed for every situation following a defined process.

What was stated so far does not only target quantitative indicators, but also holds true for qualitative indicators. The distinction between quantitative and qualitative indicators is not of great significance in the previous reflections. Concerning indicators the distinction in quantitative and qualitative represents a distinction of items that are measured. Quantitative indicators measure quantities or amounts, whereas qualitative indicators

measure subjective judgements or perceptions about subjects (cf. (Church & Rogers, 2006)), e.g. perceived (in-) security.

In qualitative data, it might prove to be easier to infer meaning and from quantitative data it is easier to data mine information. So – especially with respect to the broad spectrum of the BESECURE project – it is highly recommended to use both kinds of indicators. This also aligns with Deliverable 1.1 (*Boundary conditions and options for urban security enhancement*), which highly empathises the importance of perceptions.

4. Summary

Deliverable 2.2 highlights the pivotal role of data in understanding the key dynamics of urban security detailing how the integration of disparate (public and private) data sources might be integrated in a manner conducive to bolstering urban security. Robust and credible data is essential to the identification and understanding the inter-related dynamics pertaining to urban security whilst comprehensive 'picture building' is premised upon the capacity to position urban security data/indicators within the confines of the wider societal fabric. Moreover, the robustness and credibility serves as an evidence base to inform (and justify) decision making, resource allocation as well as affording the opportunity to monitor and evaluate the relative success (or otherwise) of security related interventions. Additionally, and premised on case study experiences D2.2 has served to highlight a series of important considerations that stakeholders/future adopters need to consider in order to harness the full benefits afforded by the BESECURE product including the need to establish a credible baseline data position pre-intervention and to systematically evaluate interventions against pre-agreed 'measurable' parameters. The BESECURE project will utilise the findings of this Deliverable in the development and fulfilment of the requirements of Deliverable 2.3.

5. References

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