SEVENTH FRAMEWORK PROGRAMME

SECURITY, Collaborative Project

Grant Agreement no. 285222

Best Practice Enhancers for Security in Urban Regions

Deliverable 7.2 Visual document to showcase the BESECURE approach to a case study area

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4.	TNO

EXECUTIVE SUMMARY

Objectives

Deliverable 7.2 provides a visual document story boarding how a user interacts with the BESECURE Platform in an urban security scenario. The use case presented is for the City of Belfast and examines the identification and proposed intervention targeting for ASB and Burglary related issues.

Results and conclusions

The use case is a step by step illustration of how a user informs decision making in their urban environment. The use case study area is that of Belfast, a case study area in the BESECURE project, and is used in various dissemination activities.

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Coordinator:
Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek – TNO
Kampweg 5
P.O. Box 23
3769 ZG Soesterberg,
The Netherlands

Partners:
TNO, The Netherlands
University of Ulster, Ireland
Fraunhofer, Germany
Albert Ludwigs University, Germany
ITTI, Poland
The Stephan Lawrence Charitable Trust, UK
Downey Hynes Ltd, Ireland
JVM, UK
Crabbe Consulting, UK
Consiglio Nazionale Delle Ricerche, Italy
Universita degle Studi Mediterrane, Italy
Experian, The Netherlands
Stichting dr. H. Verwey Jonker, The Netherlands
Erasmus University, The Netherlands

Coordinator contact:
[redacted]

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1. Declaration

Deliverable 7.2 presents a visual story board and use case of how an urban security professional interacts with the BESECURE platform when they are tasked with understanding, managing and responding to urban security related issues. The use case is intended to be a step by step illustration of how a user informs decision making in their urban environment. The use case study area is that of Belfast, a case study area in the BESECURE project, and is used in various dissemination activities.

2. Introduction

2.1. Purpose and outline of BESECURE project

The project BESECURE (Best practice enhancers for security in urban environments) is working towards a better understanding of urban security through examination of different European urban areas. By examining eight urban areas throughout Europe, BESECURE builds a comprehensive and pragmatic knowledge base that supports policy making on urban security challenges by sharing best practices that are in use throughout Europe, and by providing visualization and assessment tools and guidelines that help local policy makers to assess the impact of their practices, and improve their decision making.

2.2. Purpose and outline of work package 7

The objective of WP7 is to disseminate key findings and outcomes from ‘BESECURE’ in a coherent and structured manner in order to maximise project impact and outreach across key stakeholder groupings. In addition, central to the dissemination, exploitation and education outputs of ‘BESCURE’ will be the development of plans for the use and dissemination of foreground for commercial, academic and end-user implementation and application. The intention is that the outcomes of the project will culminate in the development of a tool kit that conceptualises security issues within urban areas embracing urban and community planning and regeneration on a multi-disciplinary basis.

2.3. Purpose of D7.2

A 'visual document' that showcases the BESECURE approach on a specific case study area, and illustrates the process and practical aspects of security policy enhancement. This document can be used for educational or instructional purposes

3. User Scenario and Approach

3.1. Introduction

This deliverable will provide the reader with a potential real world scenario that urban security professionals face on a daily, monthly and annual basis. It does so by first providing the reader with the narrative on why there is a need to undertake robust, structured and efficient analysis in the scenario study area and how it can be used in informing decisions and supporting policy. It is structured in a process model that is based on first using the urban data platform (UDP) to understand the issues that currently exist (based on evidence and not media speculation), it then moves to the inspirational platform (IP) where the user can understand what has and or has not worked elsewhere (as well as understand what the current literature base is saying) and then finally moves on to the policy support platform (PSP) to develop the evidence needed to inform decision making.

3.2. Context

On the 12th October 2014, local media in Belfast report that an 84-year-old woman was injured in a burglary at her house in the Ravenhill area of the City. The assailants were armed with a hammer and attacked the woman when she confronted them in her hallway. A sum of money was stolen, as was a collection of antique jewellery. Unfortunately, this report was not an isolated incident, but one of many over the course of the past three months. As a consequence of the latest media attention, the local police commander has come under immense pressure from local councillors and community groups across the Belfast area. The police commander for the City, Maria, has promised that she will launch crime prevention initiatives in areas where there is high vulnerability and enhance police visibility at key times and locations when operational intelligence suggests that there is a risk of such events occurring.

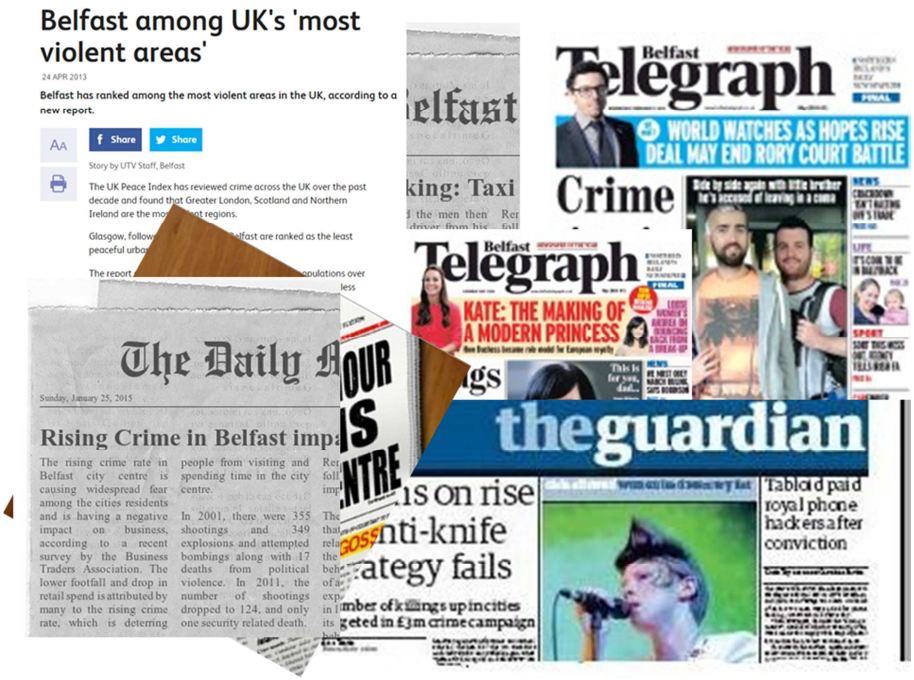

Figure 1: Media reports for Belfast

3.3. Understanding the Problem

In order to understand the problems and provide the necessary information required to inform decisions, Maria, in partnership with her team and other key stakeholders agreed that they needed to structure the information they provide in a manner that is effective and efficient and meets the purpose of the end user. They decided that the most optimum way of doing this was to prioritize the information that they needed to know and establish a series of questions that essentially they needed to answer based on a 'what, where, when and who (WWWW)' approach. They did so by looking at the brief that they received from the police commander and identified the following questions as being the most pertinent to answer:

- Where are there high levels of burglary in Belfast over the course of the past 12 months and do we have a holistic picture of all crime recorded by different agencies?
- They have been instructed that the majority of victims are in the age range of 60 years old and over. Therefore she needs to answer the question of 'where are there high densities of this age cohort in the City?
- She needs to match this against high rates of burglary

- Maria also needs to understand where burglary problems may be a problem in the future and have a mechanism to monitor burglary in the City and understand when it is potentially becoming a problem
- Maria then needs to decide on where she is going to suggest that crime prevention initiatives should be directed
- Maria then needs to draw areas which can be provided to the community policing teams for enhancing police visibility
- Maria needs to be able to review this on a monthly basis to ensure that they are directing resources in to the right locations
- She needs to provide a well-structured argument on why there is a need for certain interventions and what could be adopted (what has or has not worked elsewhere)

3.4. The Approach: Using the UDP to build the evidence base

In order to answer the questions that Maria has identified, she navigates to the UDP of the BESECURE Platform[1]. Upon reaching the UDP, she is presented with the UDP main window which consists of 3 options (Figure 2). These options are 'My Projects'; 'Dashboard'; 'Early Warning System'. The setup of the UDP interface is one that is progressive and where the user should start with the 'My Projects' wizard, then 'Dashboard' and then 'Early Warning System'. This is essentially to create more structured information and to give an easy flow to the analysis.

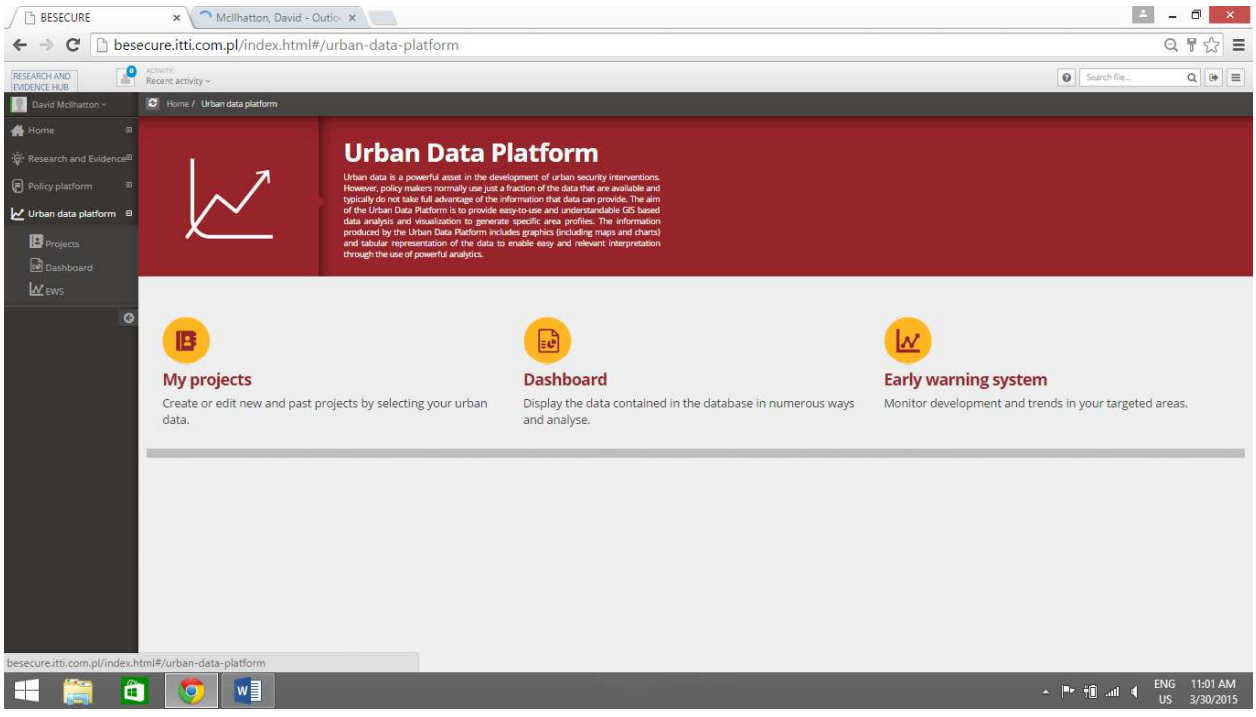

Figure 2: Main Menu of UDP

As a consequence of the process structured, Maria selects the 'My Projects' tab and is presented with the following screen. This screen allows her to complete useful information

[1] Currently located at: http://besecure.itti.com.pl

about the analysis that she is about to undertake and which is saved in the database and can be reverted back to in the future (Figure 3)

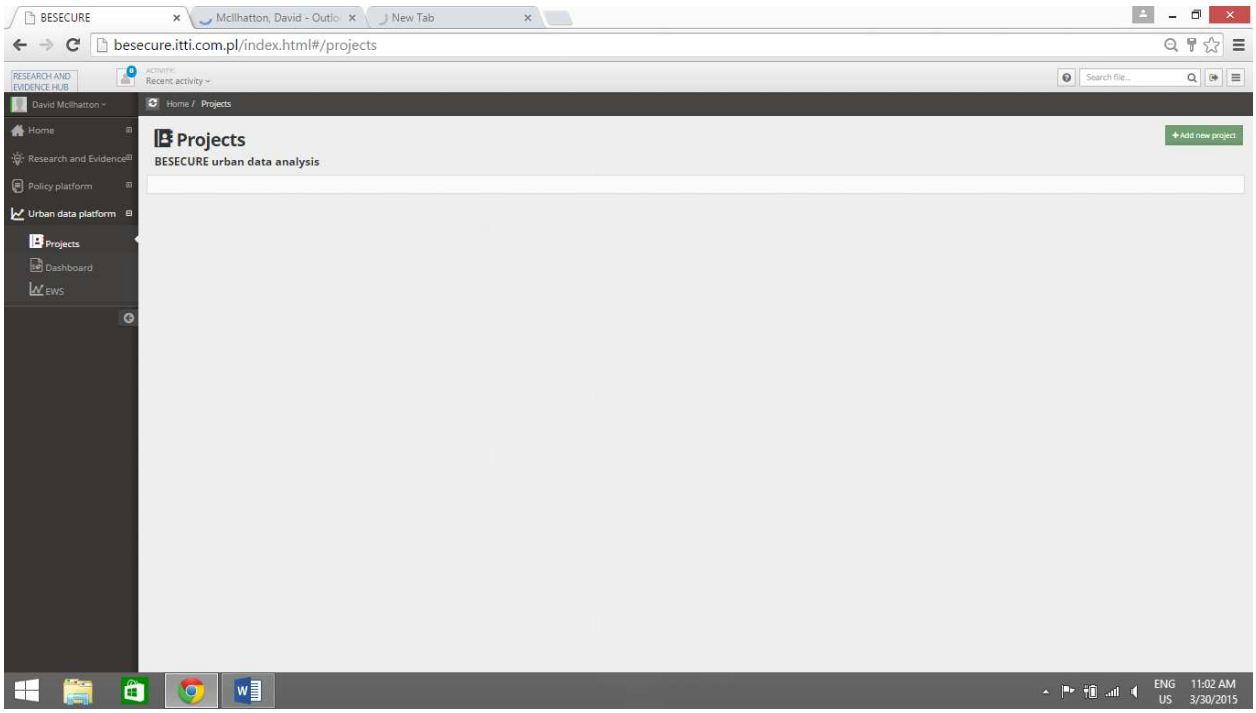

Figure 3: My Projects interface

Maria selects the 'Add Project' option on the top right of the screen and is presented with the 'Add project' sub-window (Figure 4). This window allows Maria to edit the information about the project (where it relates to and description of the project).

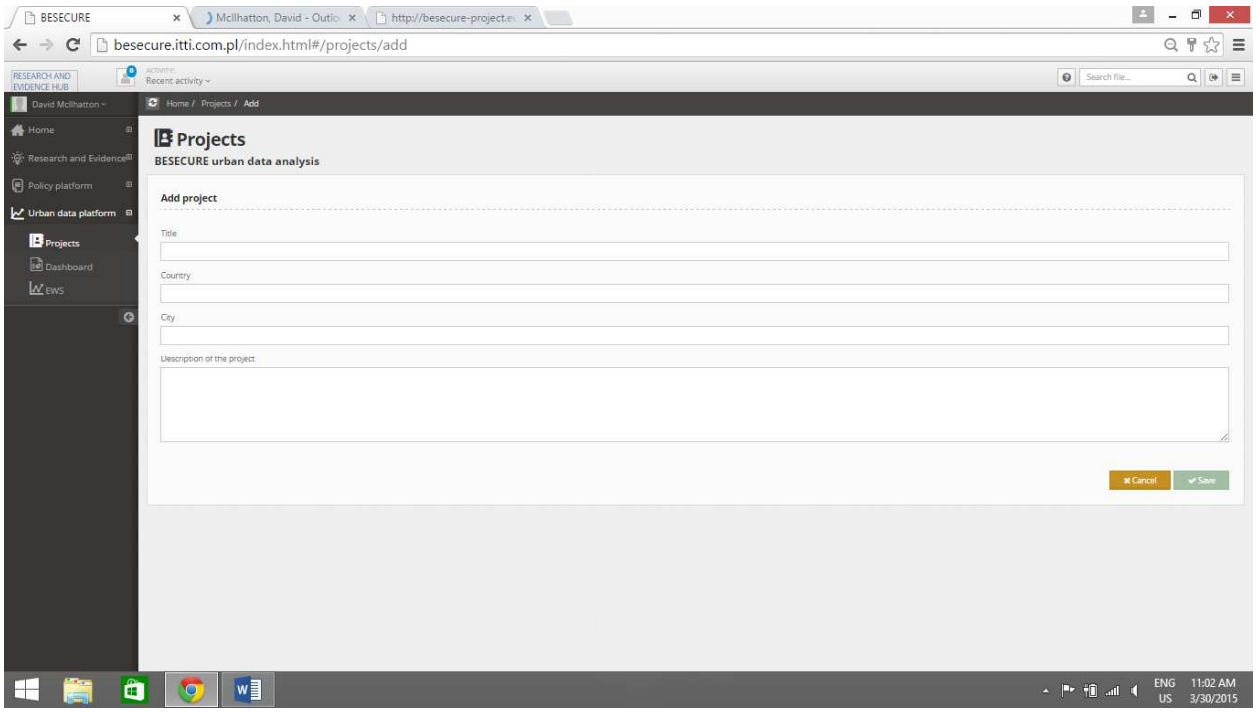

Figure 4: Sub-Menu of My Projects (Add Project)

Once she has completed the meta-data about the project in which she is about to conduct, she can then save the project. This is then stored and Maria can then revert back if needed (Figure 5). Maria, in this case has named her project 'Local Representative Request 2/3/2015' as a local representative of Council made the initial request to the Police.

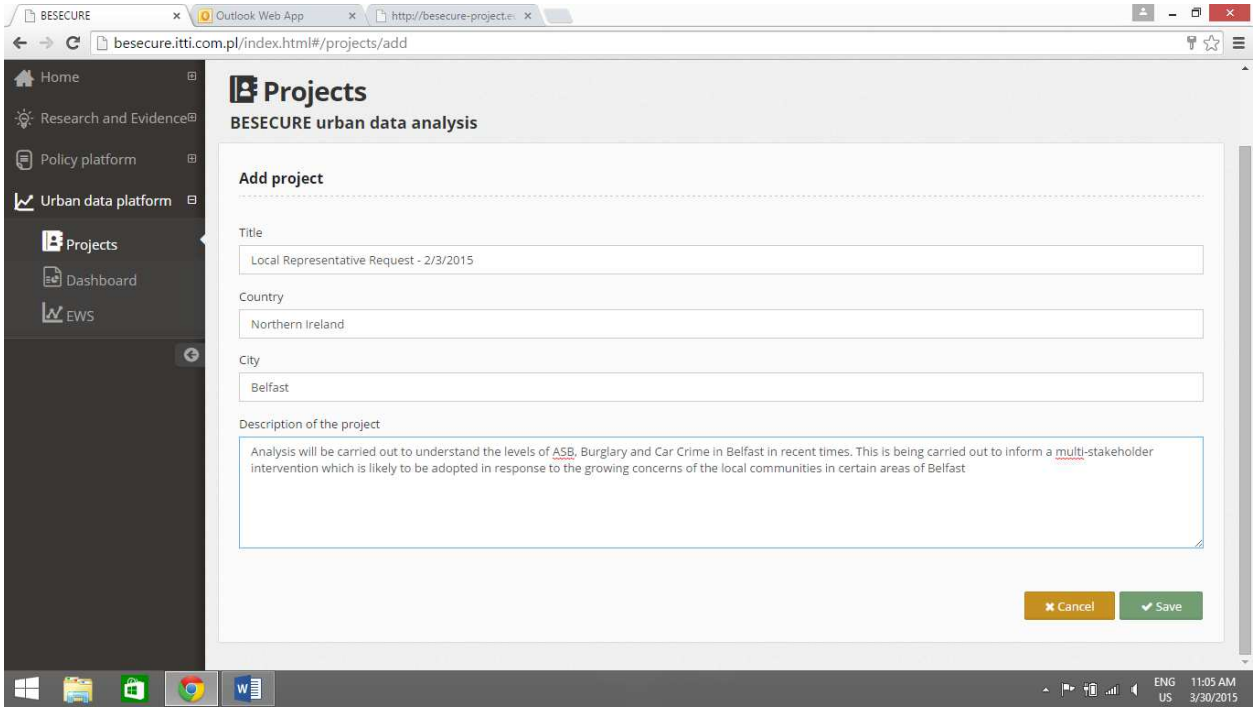

Figure 5: Completed Project Meta Data

An advanced feature of the 'Add Project' form is the ability to add attachments to the project. These can be pictures (e.g. jpeg, tiff, png, gif) and documents (e.g. pdf, doc). Maria can upload pictures of the analysis that she has run here for future use (Figure 6)

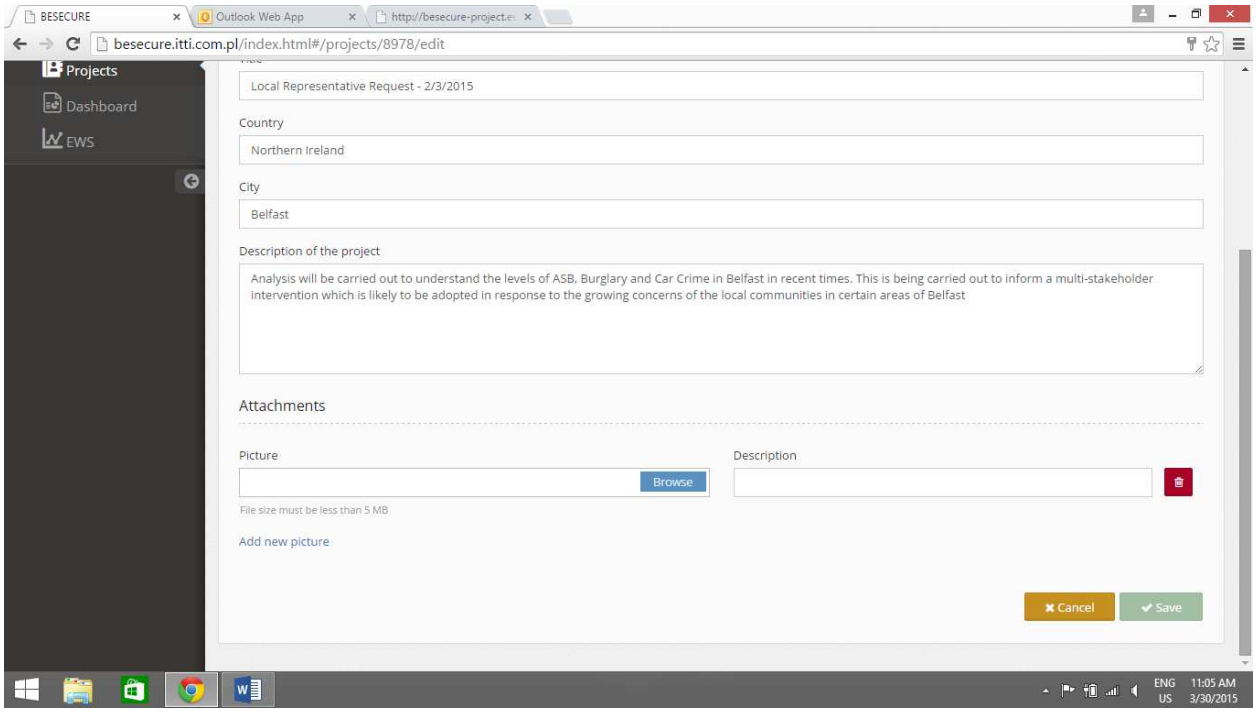

Figure 6: Option to add attachments to project

Once Maria has done this, the project is now stored and available to return to if needed. Indeed, she has the ability to go back and delete/edit if needed (Figure 7)

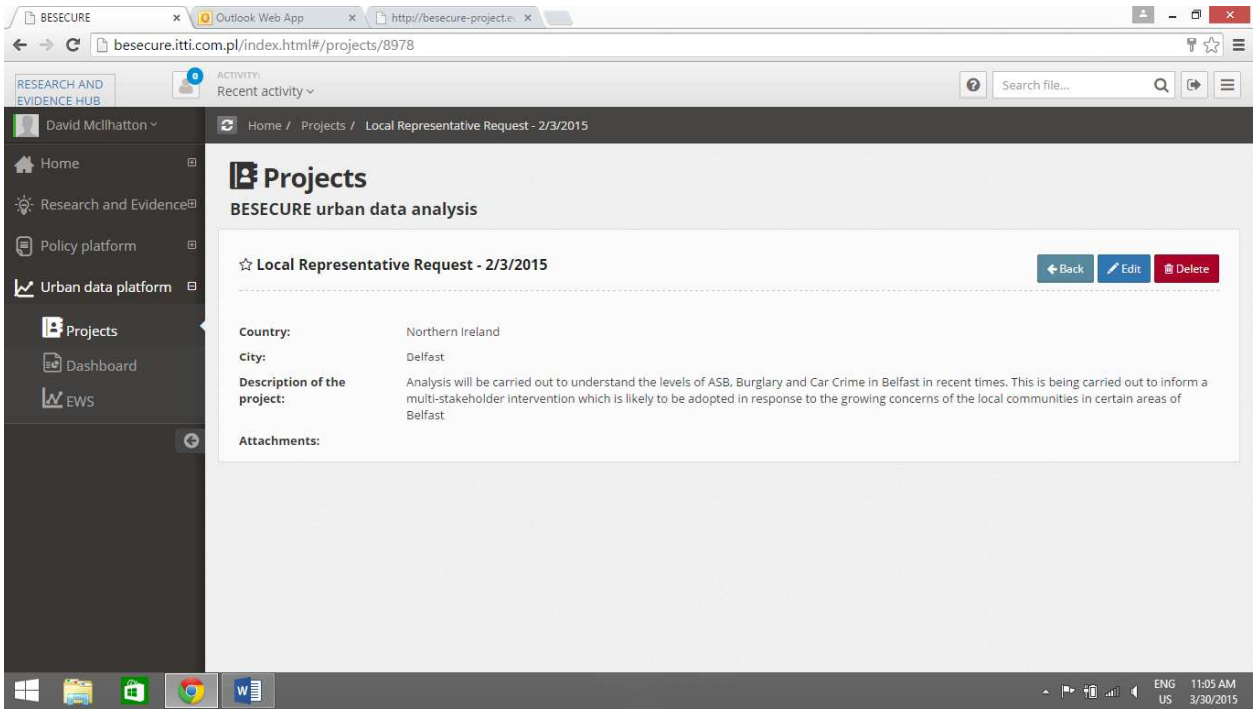

Figure 7: Completed Project screen

When the project has been completed, Maria then clicks on the 'Dashboard' and she is presented with a map of her area (in this case Northern Ireland, but centred on Belfast as pre-set). She then has the ability to select the data that she wants to display for Belfast. As she wants to understand crime trends in Belfast, she selects the Police data for the city. She first must set her base geography layer to LGD (local government district) and then click anywhere on her screen. This then selects the LGD for Belfast and the user is returned with the crime values for Belfast in 2014.

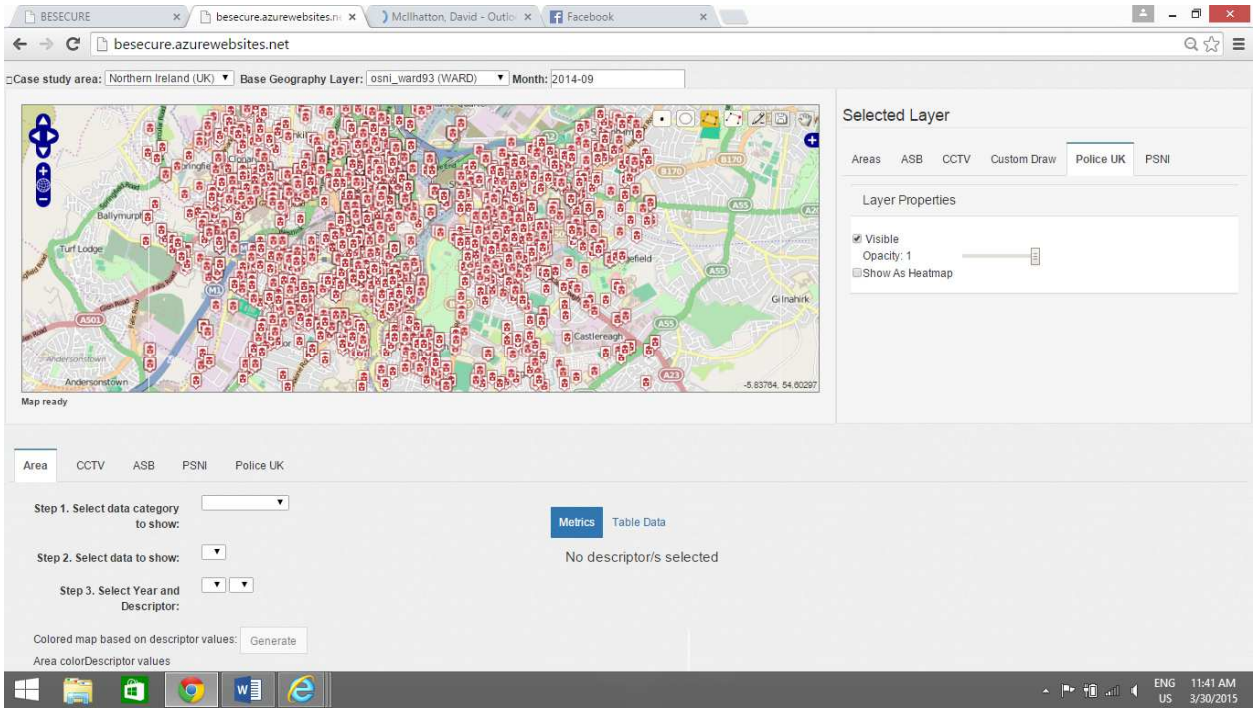

Figure 8: Main Mapping Screen of Dashboard

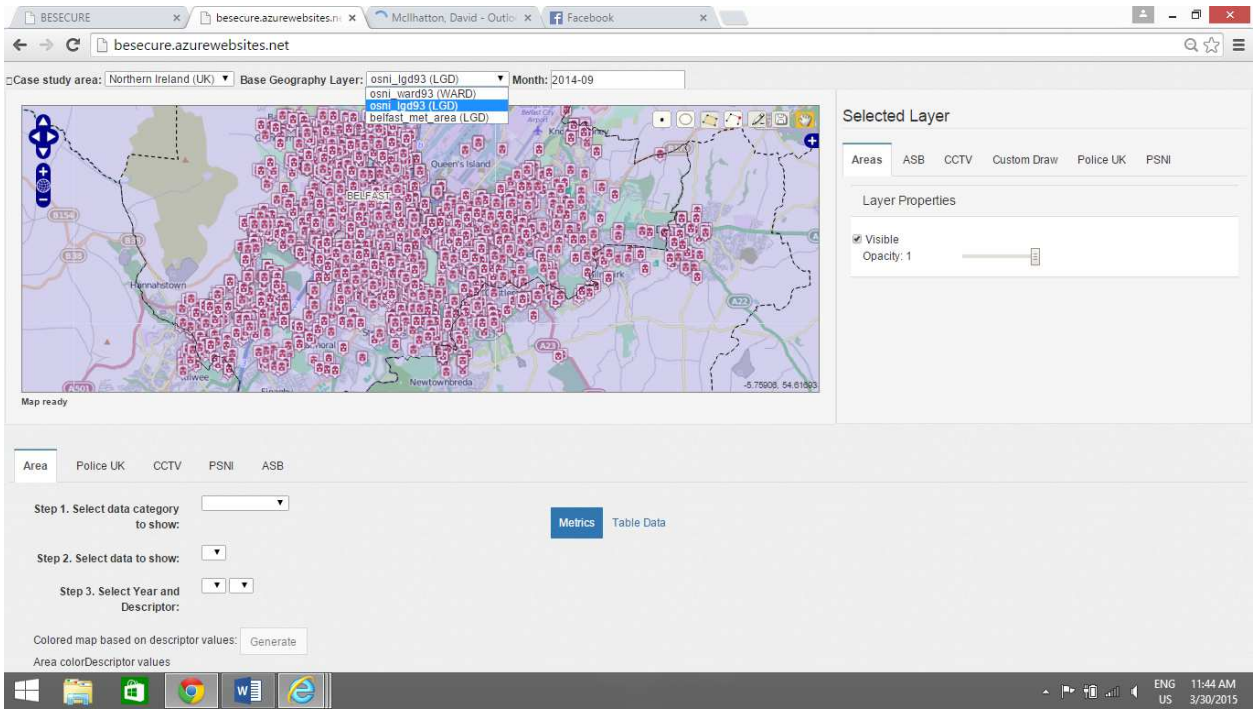

Figure 9: Base Geography Layer Changed to LGD

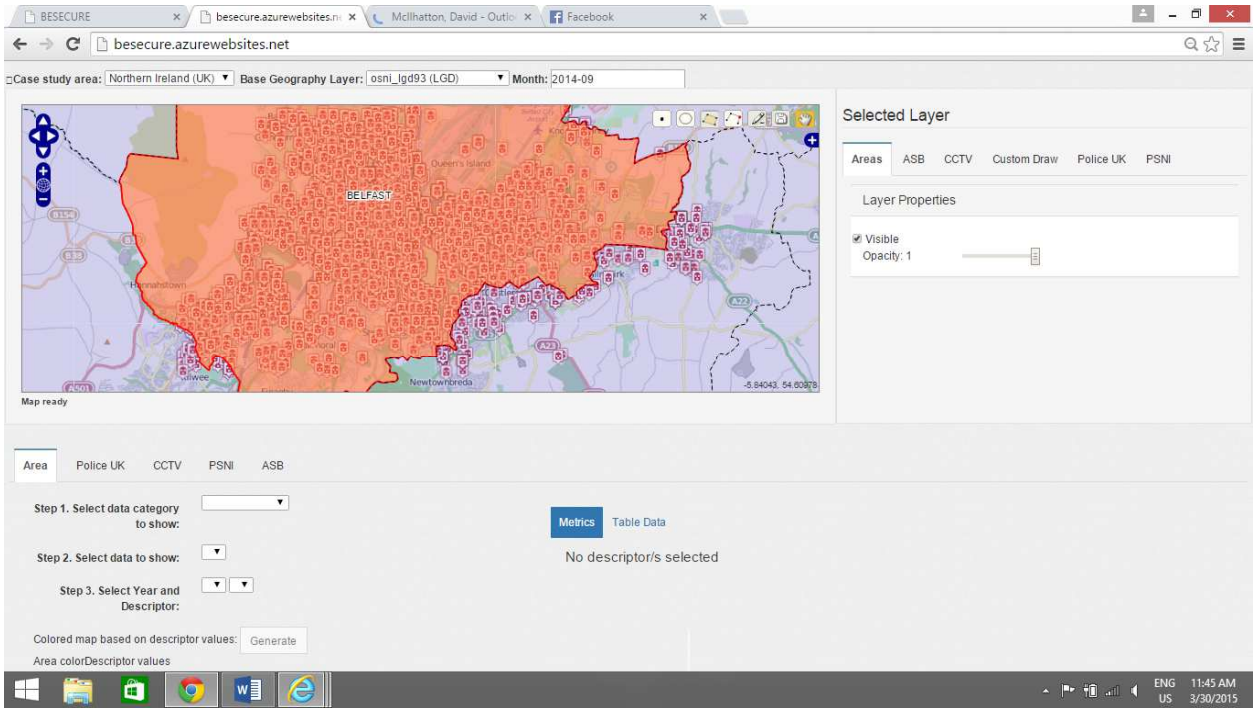

Figure 10: Belfast LGD selected for Analysis

All of the analysis is done in the backend of the system, so therefore Maria does not need to know how to undertake the GIS analysis, which in turn means that she does not have to be an expert in GIS. Maria then selects to display the data as a table and is then given the total number of crimes within Belfast during her study period (the system returns a count of 4481 crimes during study time period) (Figure 11).

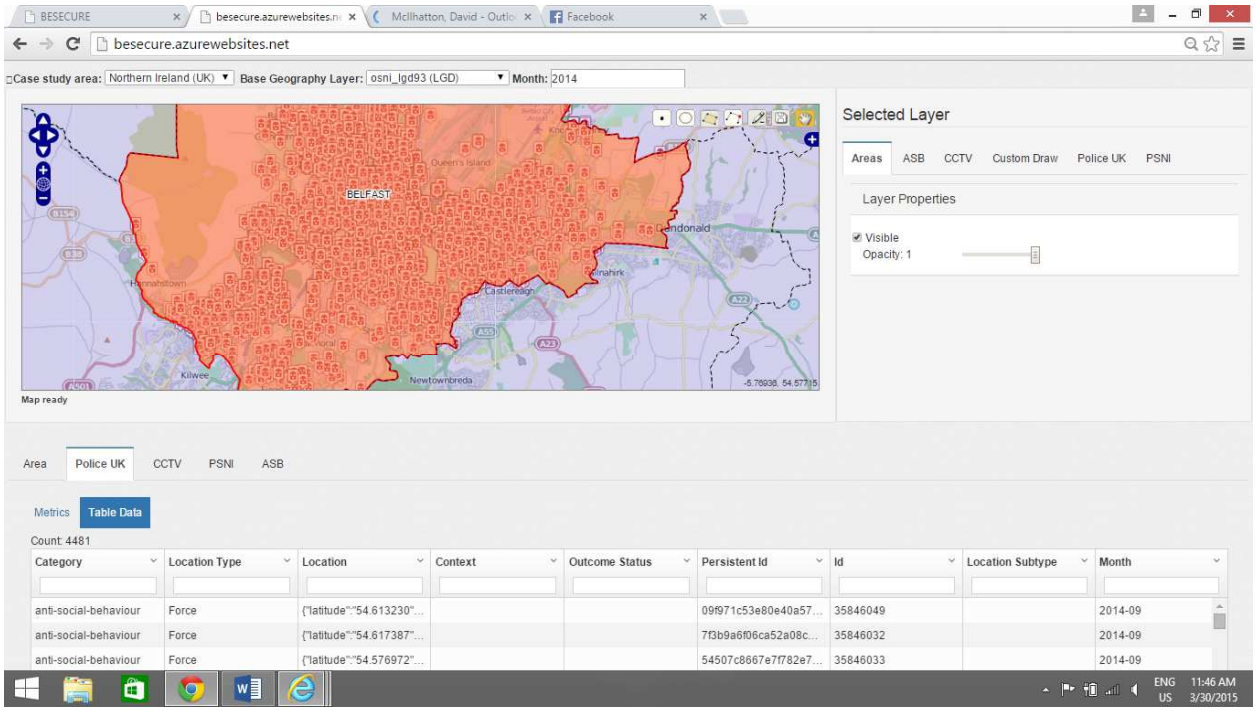

Figure 11: Total Crimes displayed as table data (Crime rate of 4481)

Once Maria has done this, she has the potential to view the output in tabular format (Figure 11), but also in a graphical manner (Figure 12). This provides Maria with images that she can then use in her policy support. The graphics and tabular data are dynamic and as a consequence, when Maria zooms in to specific areas, the table updates with just the information within that area. The graphic does exhibits this behaviour.

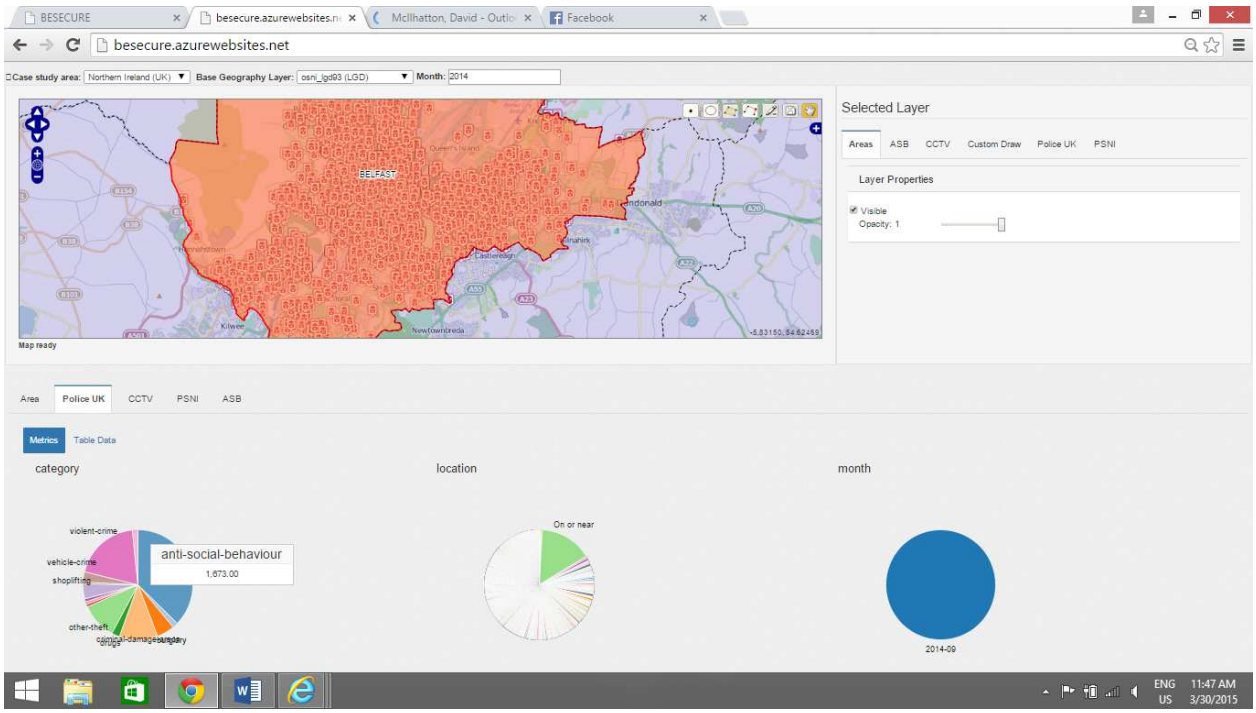

Figure 12: Total Crimes displayed as graphical data (Crime rate of 4481)

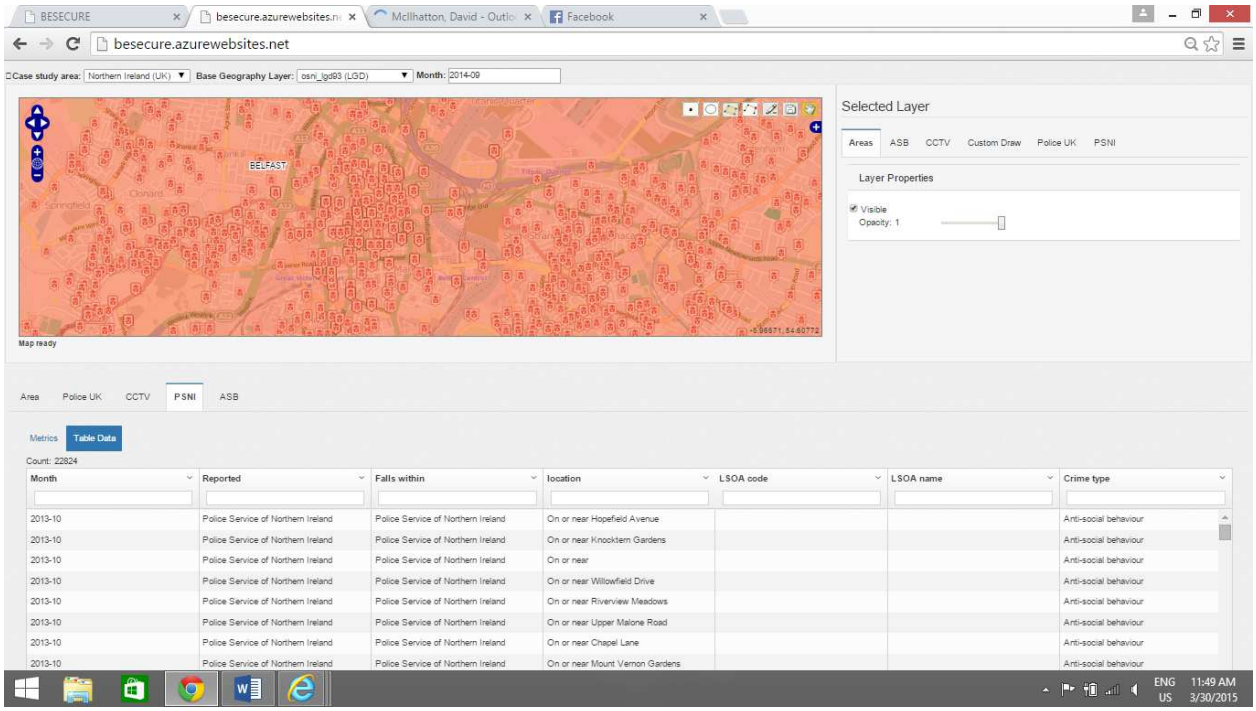

Figure 13: Table update when the map is zoomed in

When Maria zooms in, she also has the ability to change the data that is being shown in order to build up as holistic a picture as possible. In the case below, she is able to look at the incidents that have happened in her area of interest over the past 6 months and by crime type. She is also able to look at the localised clustering of the crime data by streets (Figure 14)

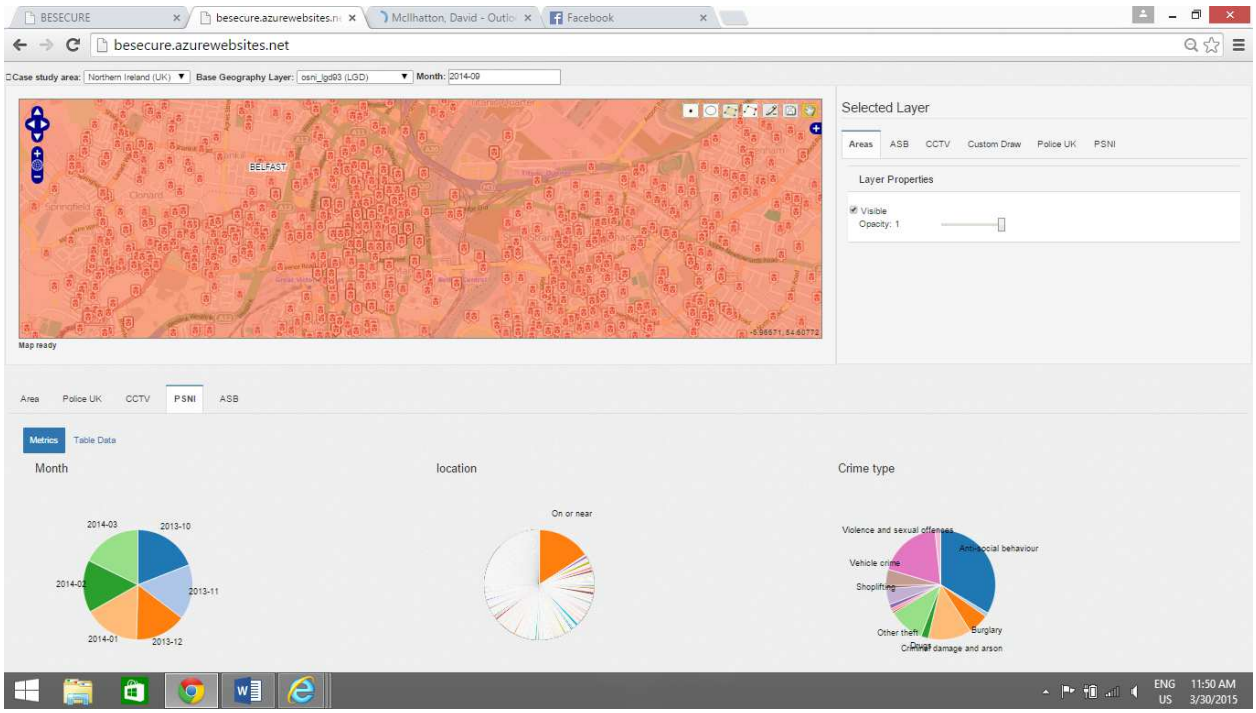

Figure 14: Change of data and analysis graphics

One of Maria's tasks was to understand the hotspots of crime in her study area. The urban data platform permits her do this in a simple and interactive manner. She simply clicks on the police crime data (which makes it active) and then selects 'Show as Heatmap'. This then creates a kernel density map highlighting the hotspots of different crime types across the city. She has the ability to alter the opacity of this heatmap if needed, as well as the intensity and cluster bandwidth (Figure 15). This image can then be saved as a screenshot which can then be uploaded in to the 'My Project' area

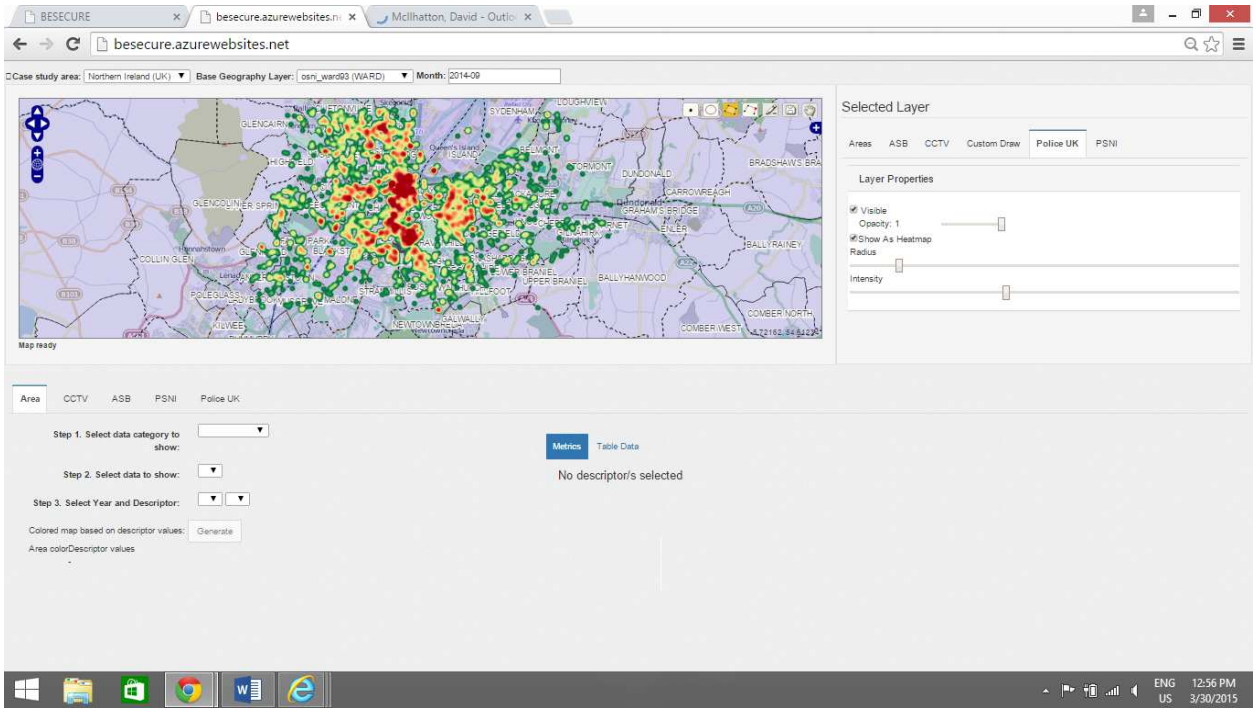

Figure 15: Development of the heatmap

Maria can then use the 'draw polygon' tool to draw polygons around the clusters. This effectively allows her to identify the core hotspot areas and target her interventions. She is able to then zoom in to the hotspot areas (Figure 16). This allows her to then get more focused analysis of the hotspot area which she can use to better understand the real problem areas.

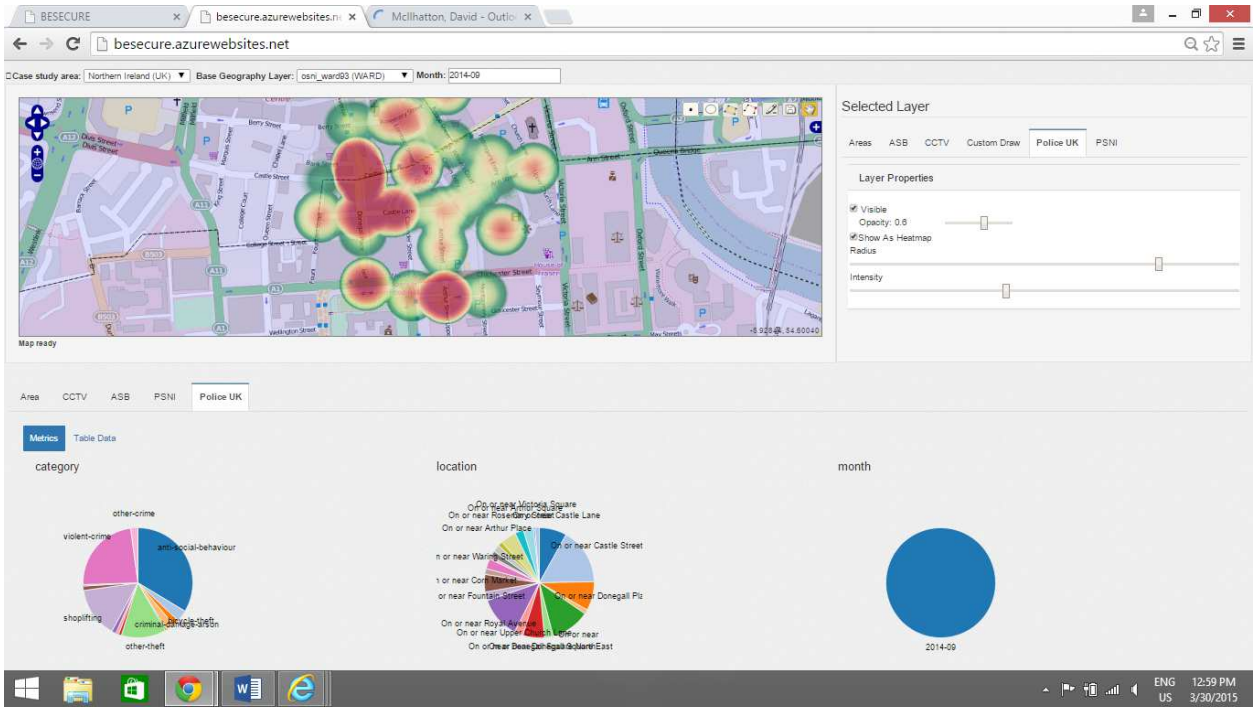

Figure 16: Localised hotspot analysis

Indeed, this ability to focus more specifically, allows her to identify the real problematic streets and crime types by streets more efficiently and effectively. She can hover her mouse over the graphics within the analysis and it will illustrate to her the crime instances in those problematic areas (Figure 17).

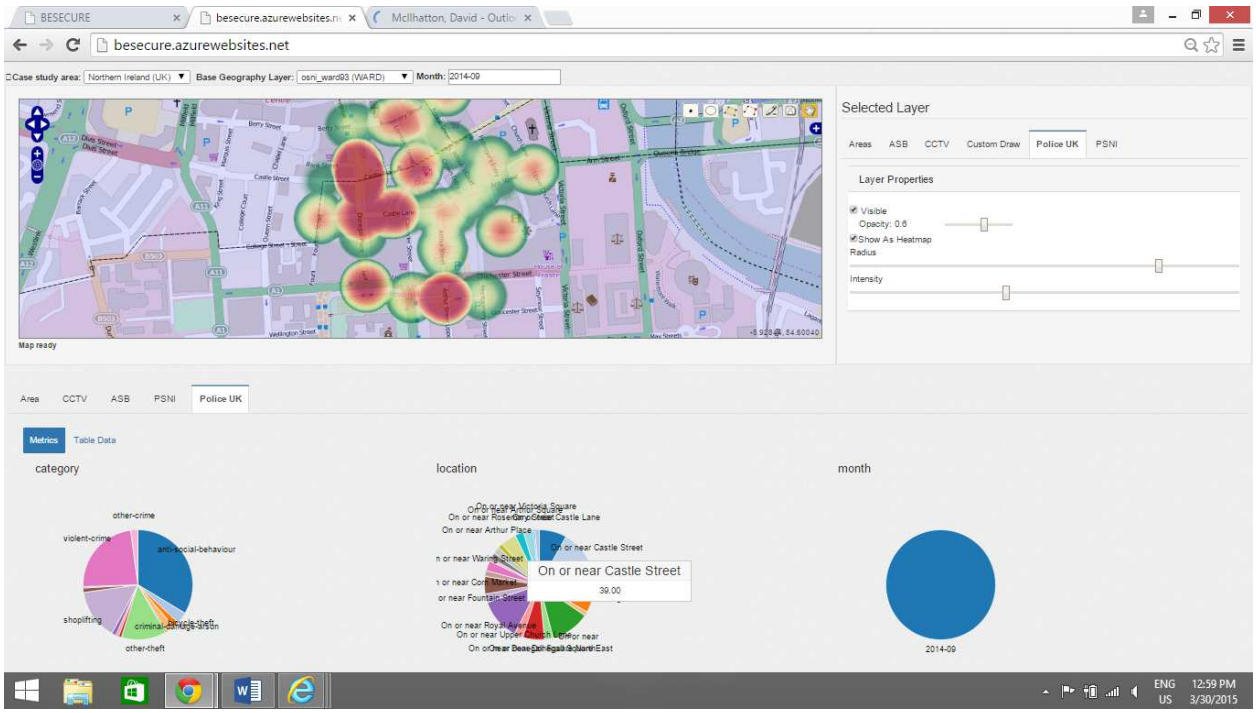

Figure 17: Localised street analysis

Indeed, Maria can analyse more than just the crime in the urban data platform. In the example below, Maria has selected the ward area that one of the main crime hotspots in Belfast intersects. By her clicking the ward (which is done with the mouse and requires nothing more than left button click), she can see all of the socio-economic data associated with that ward. She can then build up area profiles of the hotspot wards (Figure 18).

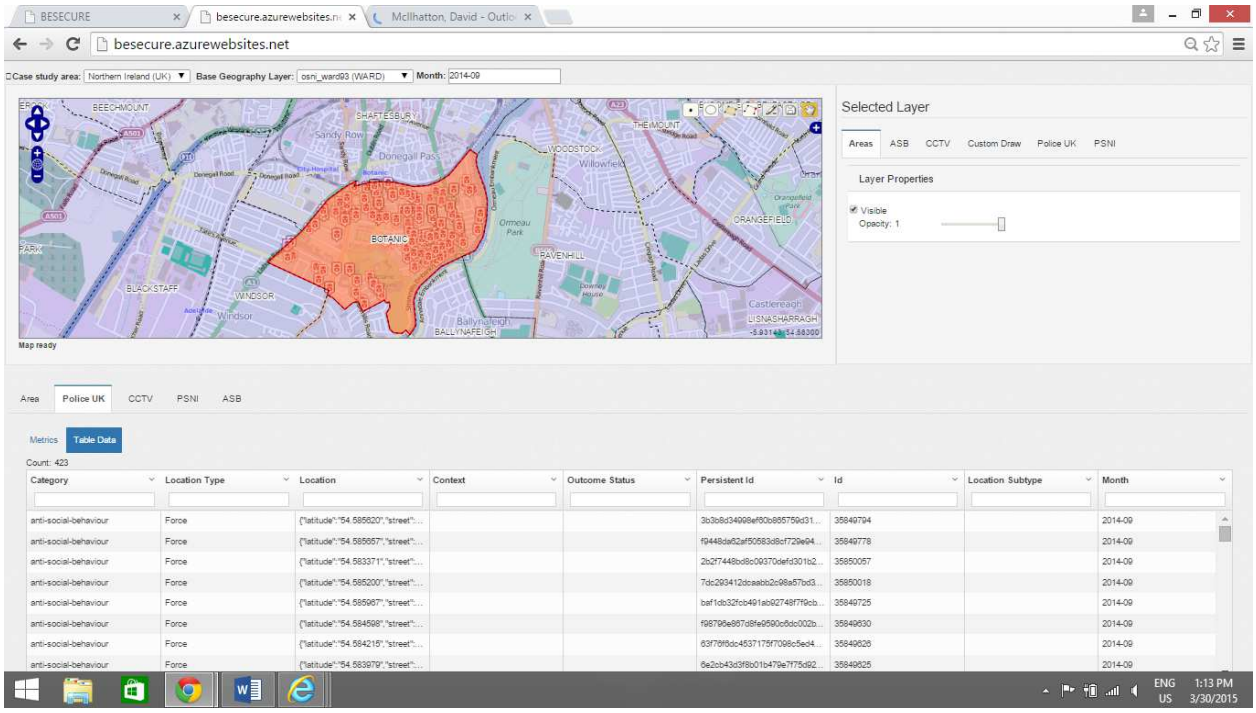

Figure 18: Selecting Ward and viewing socio-economic data

Now that Maria has identified the hotspot areas, she must now understand where there are high numbers of people aged 65+ years. To do this, she selects the 'Area' tab and once she does this, she is presented with the wizard below (Figure 19). In this wizard, she selects the data category in Step 1 and then selects 'Demography' (Figure 20). In step 2 she selects 'Population by Age (Wards) (Figure 21), followed by year selection in Step 3 (Figure 22). Once she has done this, she clicks generate and a choropleth map of the study area is then presented. This wizard allows the user to interact with the urban data platform, whilst not requiring the user to be an expert in GIS. Indeed, Maria, if she was analysing other variables, can do so using this wizard for other socio-economic variable analysis. This is already pre-built in the database and therefore is the same process as selecting the demographic data.

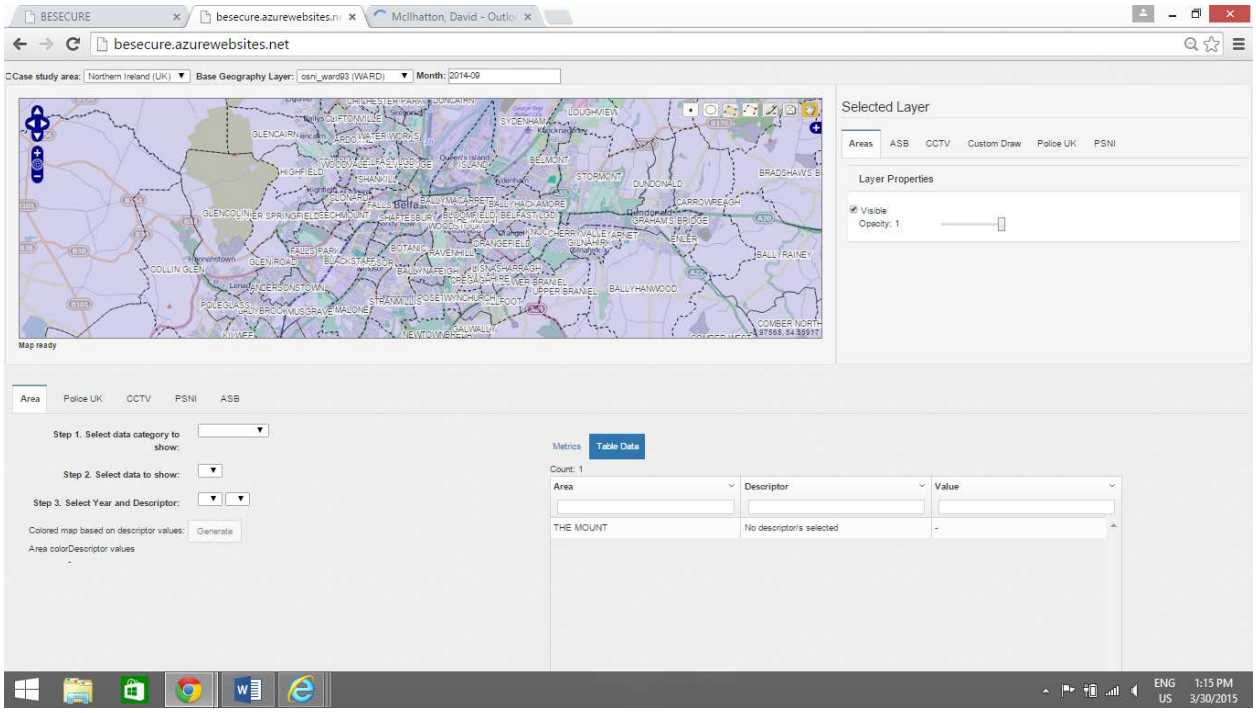

Figure 19: Area data wizard

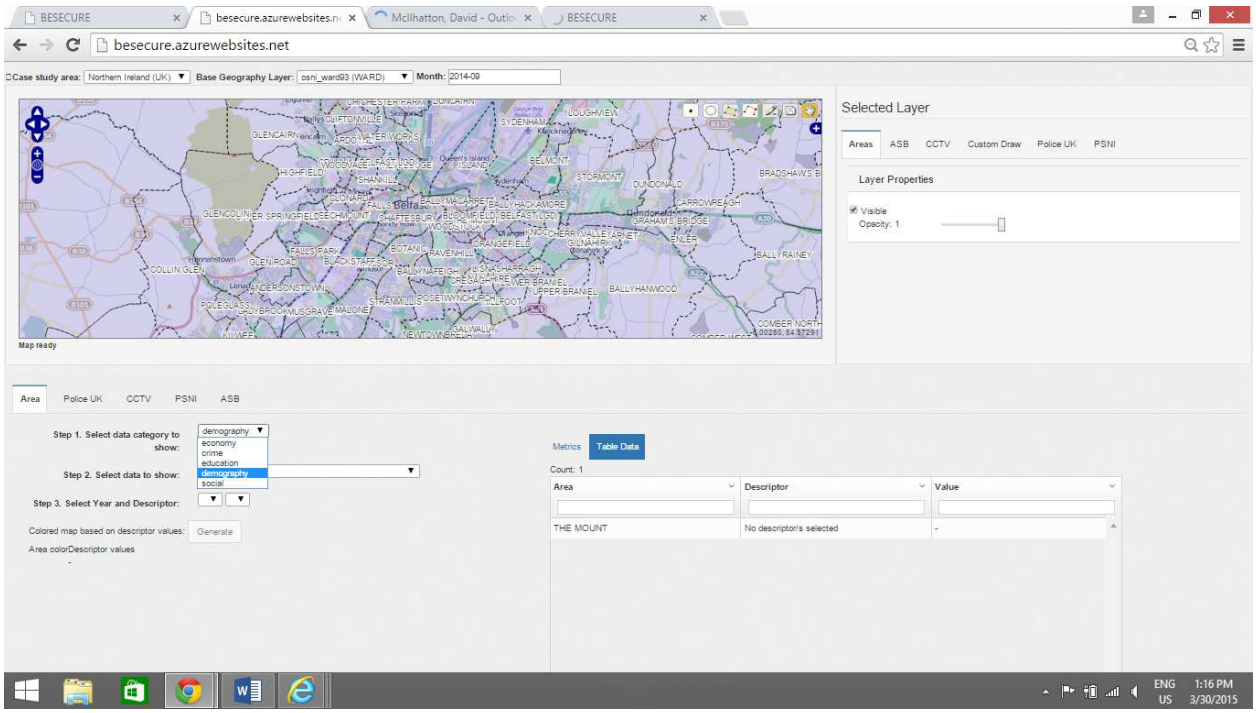

Figure 20: Step 1- Selecting demography

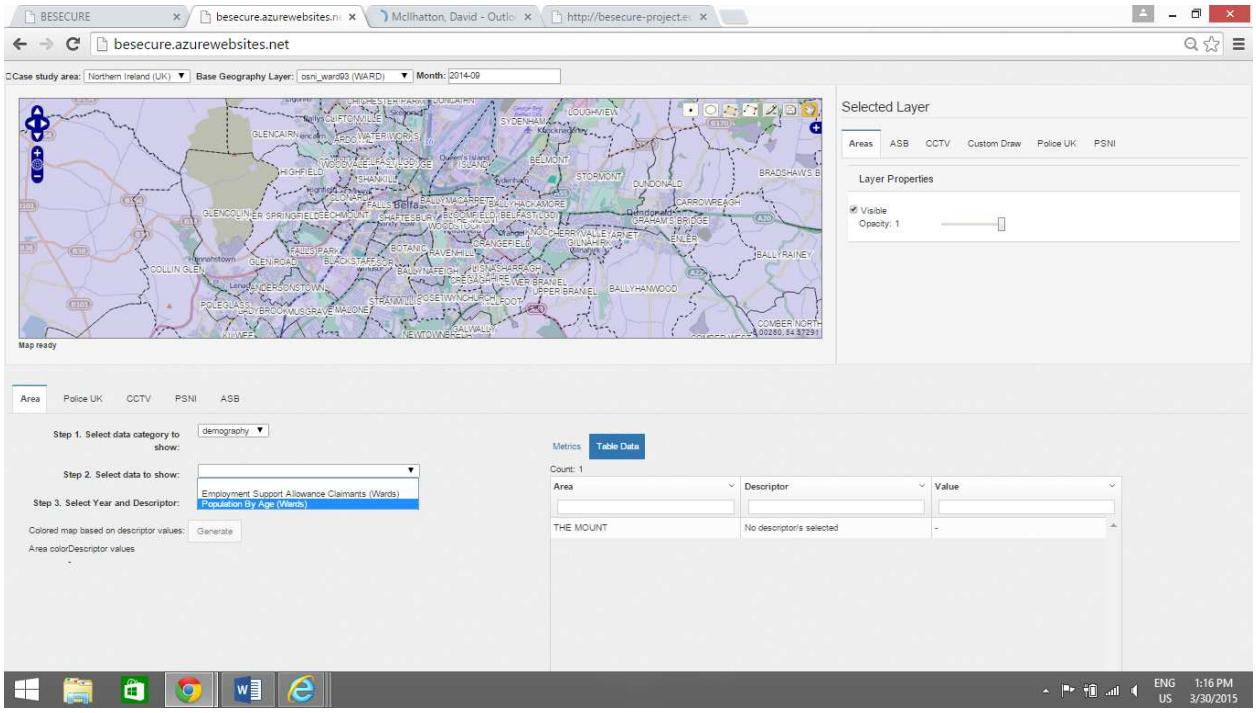

Figure 21: Step 2- Selecting population

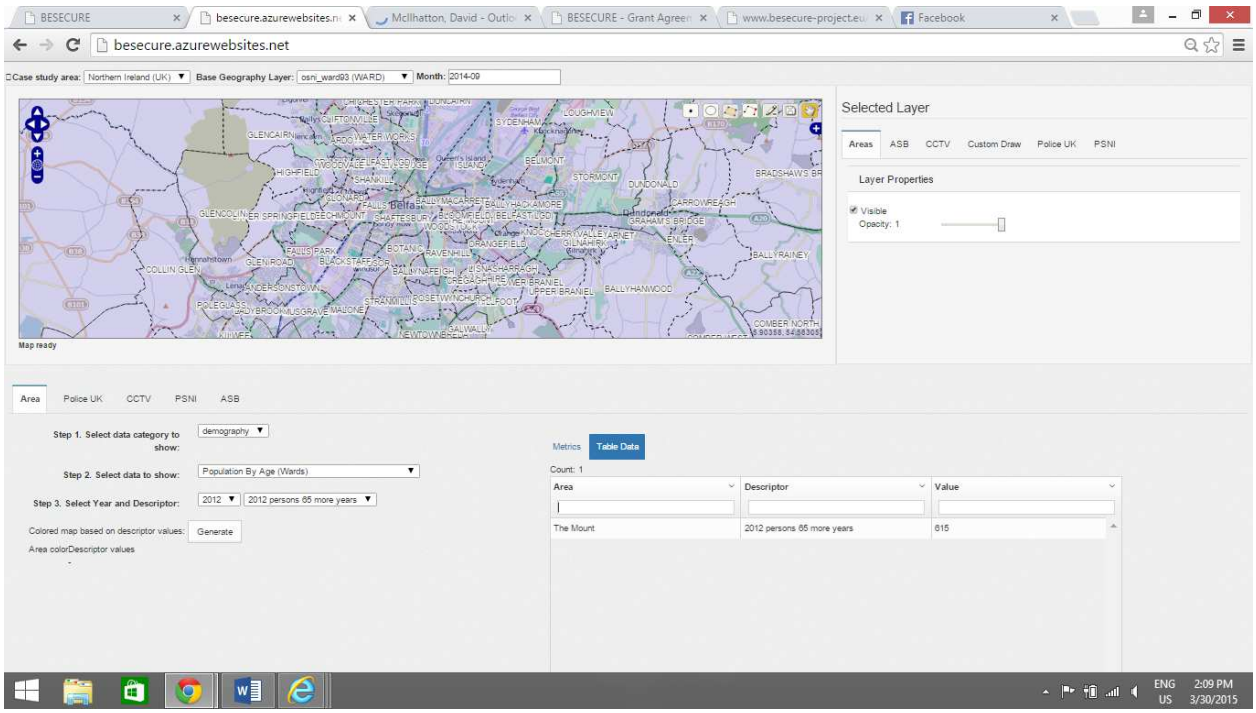

Figure 22: Step 3 – Selecting year and time

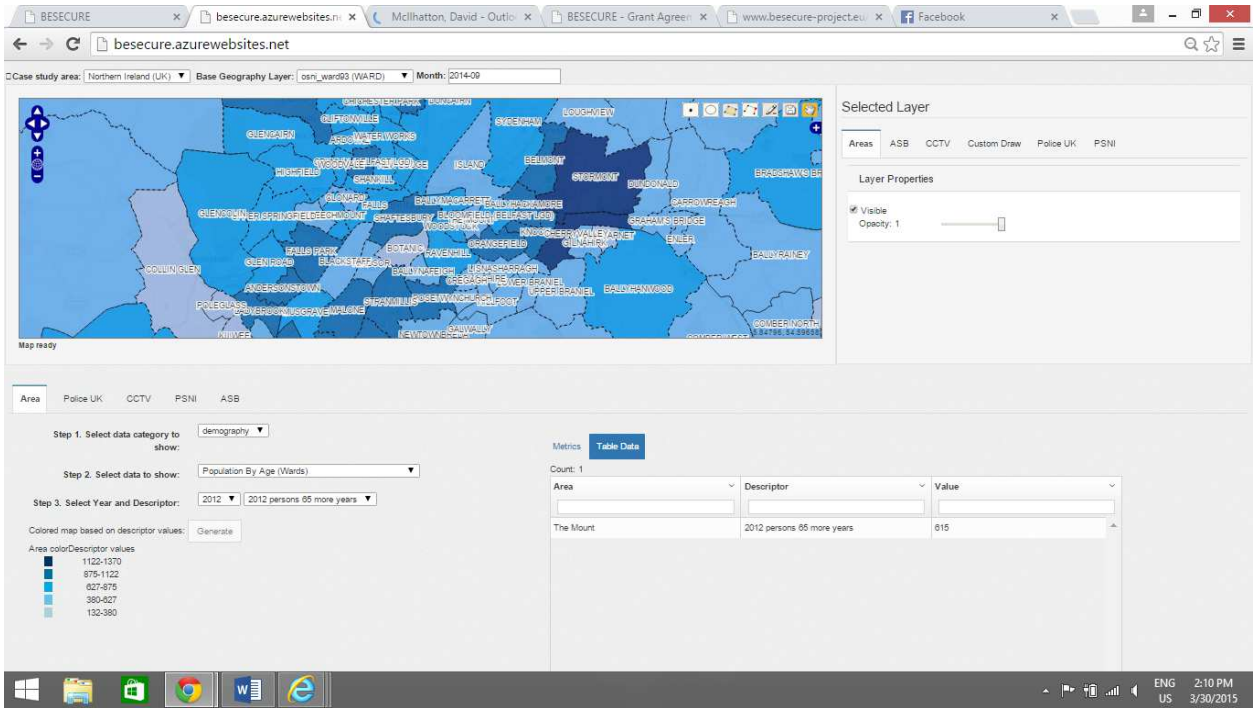

Figure 23: Choropleth map generated

Maria can then overlay the heatmap on top of the choropleth map and be able to understand which areas have hotspots of crime and also high levels of people aged 65+ (Figure 24).

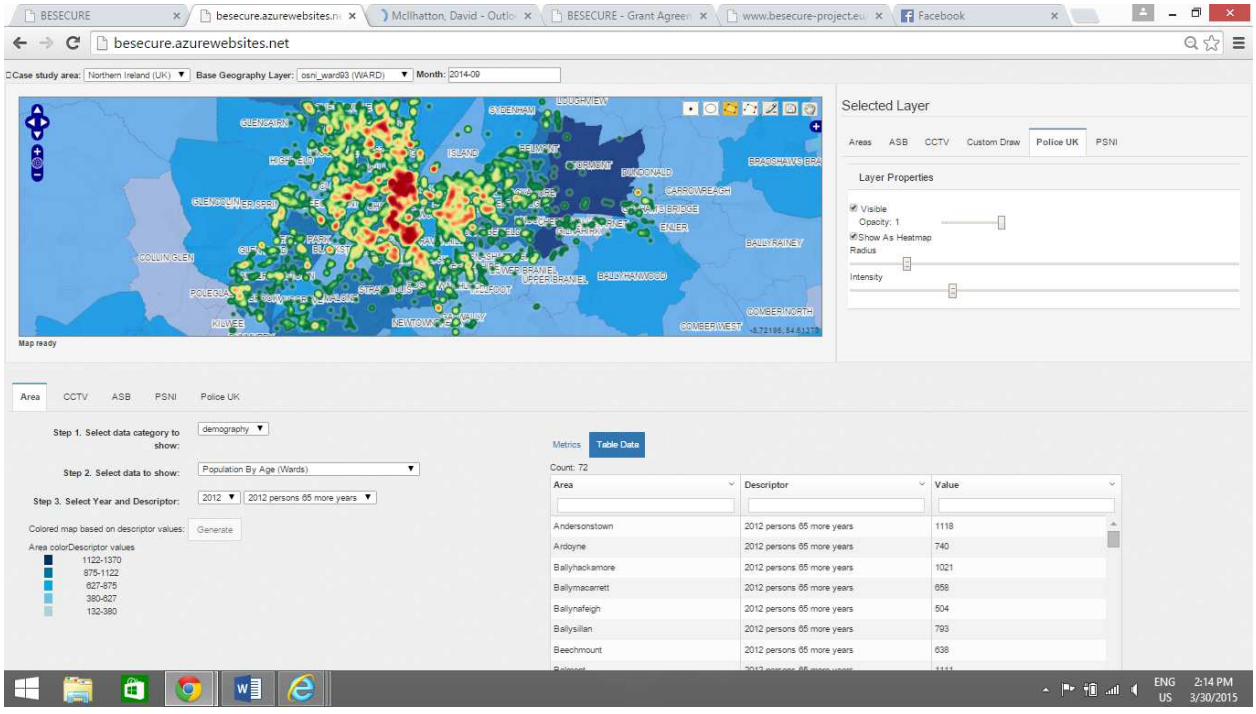

Figure 24: Correlation between crime hotspots and people aged 65+

Proposing Interventions: Alley-gating as possible intervention to prevent ASB and Burglary in Hotspot Areas

Maria then wishes to understand where potential interventions need to go in the city. Therefore, she uses the knowledge and understanding that she has gained from the analysis carried out previously to inform where she selects to examine where potential interventions (in the case of burglary and ASB- these relate to alley-gating) could be located for maximise effect. Therefore she selects areas where there are crime hotspots and high levels of people aged 65+ (Figure 25). She then uses her draw polygon tool to digitise around a hotspot area with high levels of elderly people and creates another heat map within that local area. This is designed to see where the real hotspots are locally (Figure 26) and to test where interventions would be most effective.

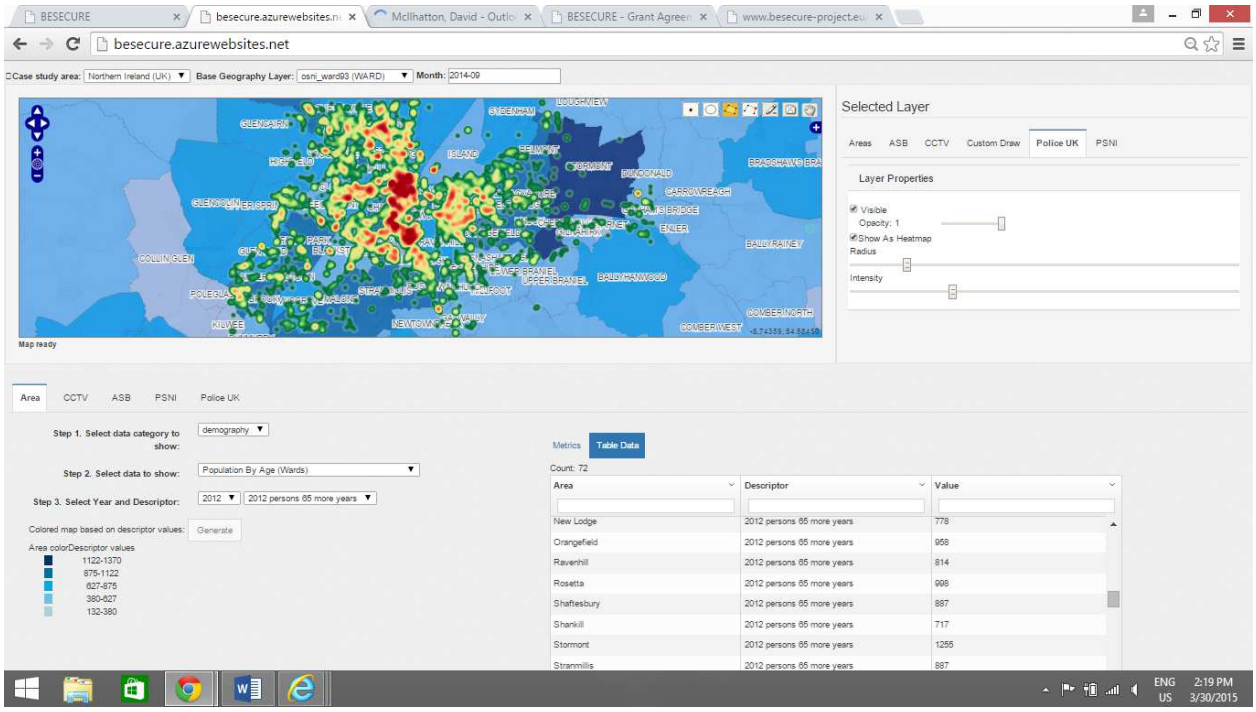

Figure 25: Selecting hotspot areas

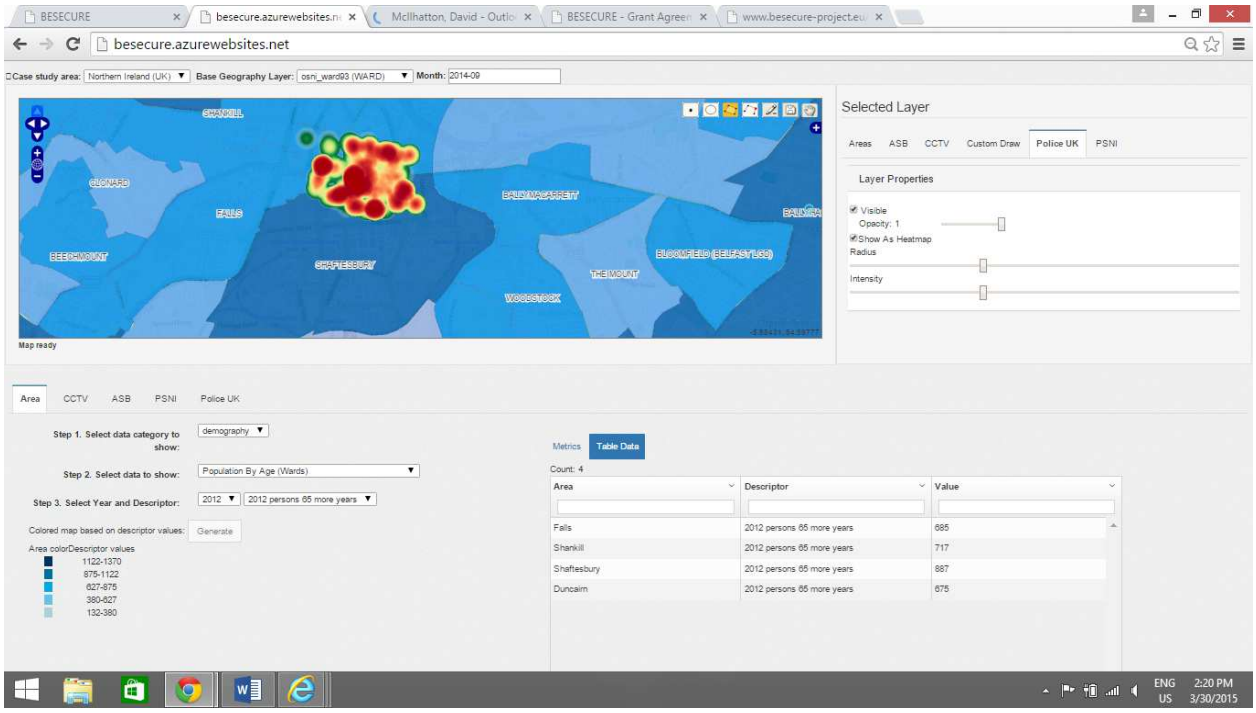

Figure 26: Selection of localised hotspots

Maria can then zoom in and see where the hotspots are at the street level and then have the graphical and tabular analytics which are associated with those hotspots. She now has an understanding of the key streets that are problematic and the types of issues that those streets face (Figure 27)

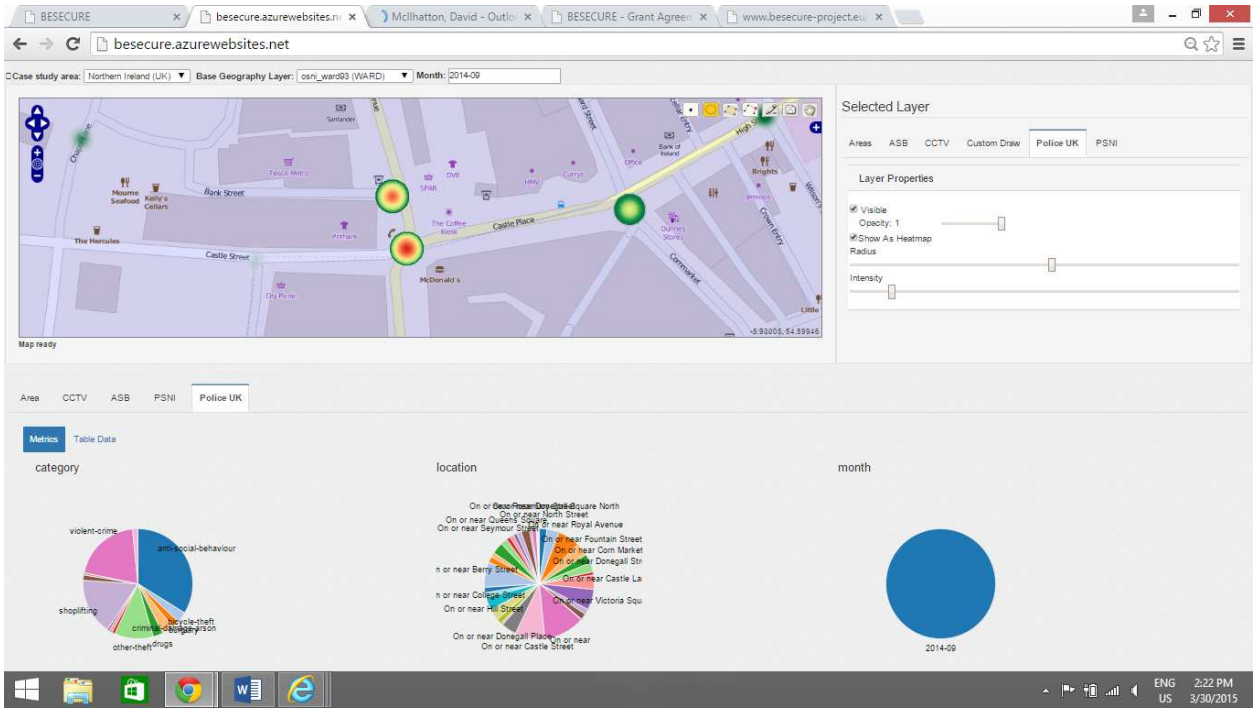

Figure 27: Street level hotspots where high levels of elderly live

Maria wants to present a picture of where alley-gates would be most effective in relation to tackling the highest levels of crime. To do this, she uses a site selection tool which enables

her to fictitiously put an alley-gate on the map and draw a buffer at any distance. In the case below, Maria has created a buffer of 100m. This then returns all the crime within 100m of that proposed site and analysis is provided in relation to crime statistics. This can then be used to inform the priority areas for alley-gating (Figure 28)

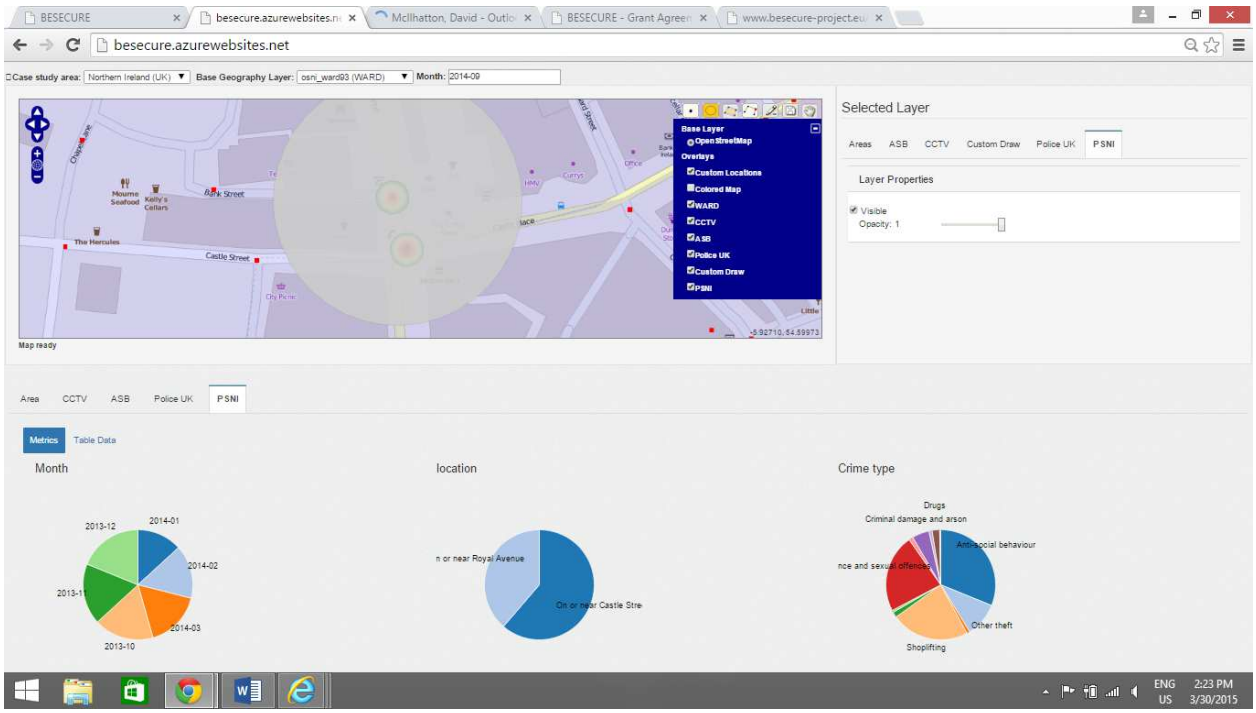

Figure 28: A 100m buffer around proposed alley-gate site

Maria can then do foresight analysis in the platform by selecting the 'Early Warning System' function. In this environment, Maria can understand the areas where there are likely to be high levels of unemployment (or any variable) in the future using a forecasting tool (Figure 29). This essentially allows Maria to present evidence on where problems are likely to occur in the future and therefore propose interventions in a strategic manner.

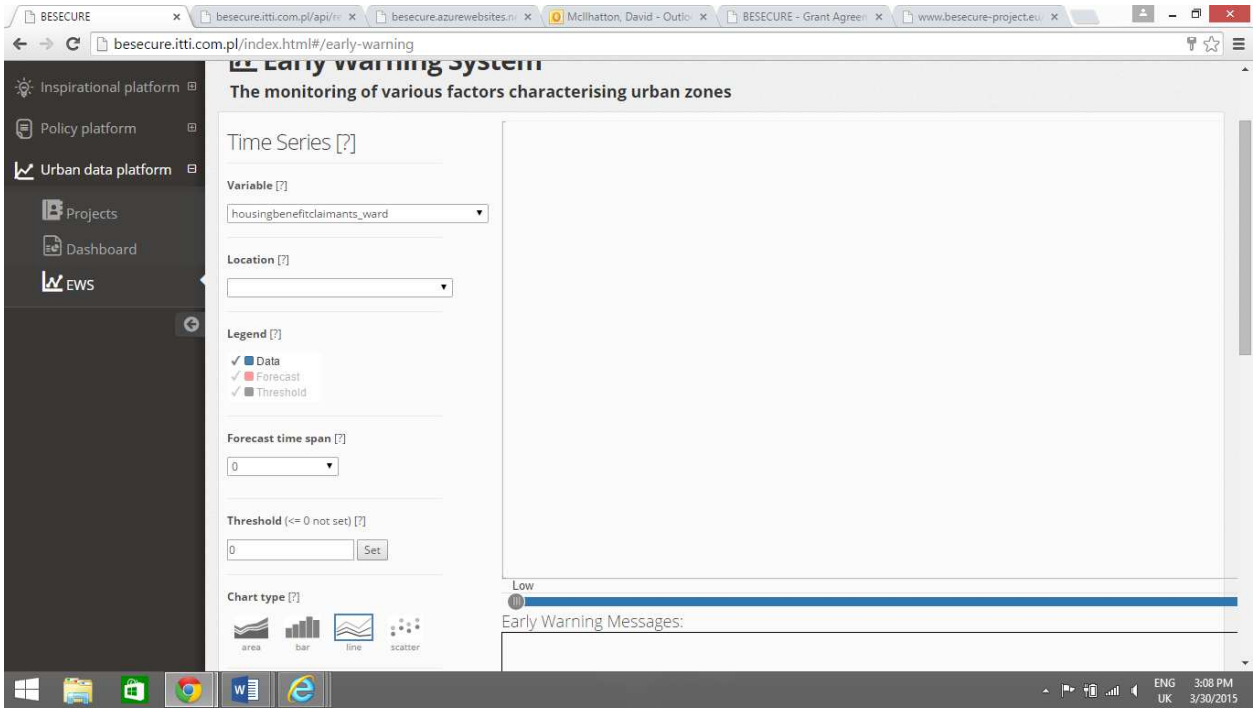

Figure 29: Early Warning System (EWS) menu

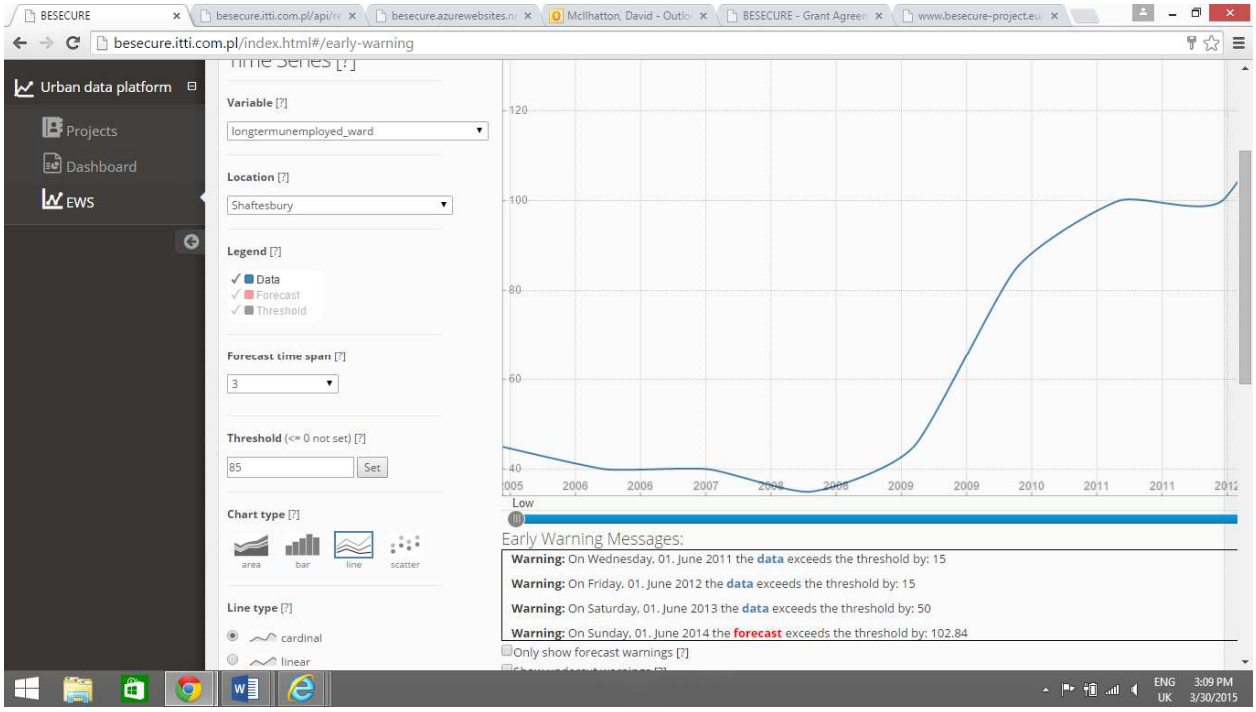

Figure 30: Forecast analysis in the Early Warning System

3.5. The Approach: Understanding Issues and Lessons Learned

Once Maria has conducted all of the analysis required to underpin the evidence in which she will use, she can then use the Inspirational Platform (Figure 31) to understand what has and has not worked elsewhere, identify pertinent literature that could support her recommendations as well compare practices that have happened in other urban areas. She

can navigate to the Inspirational Platform using the main home page of the BESECURE platform (Figure 32).

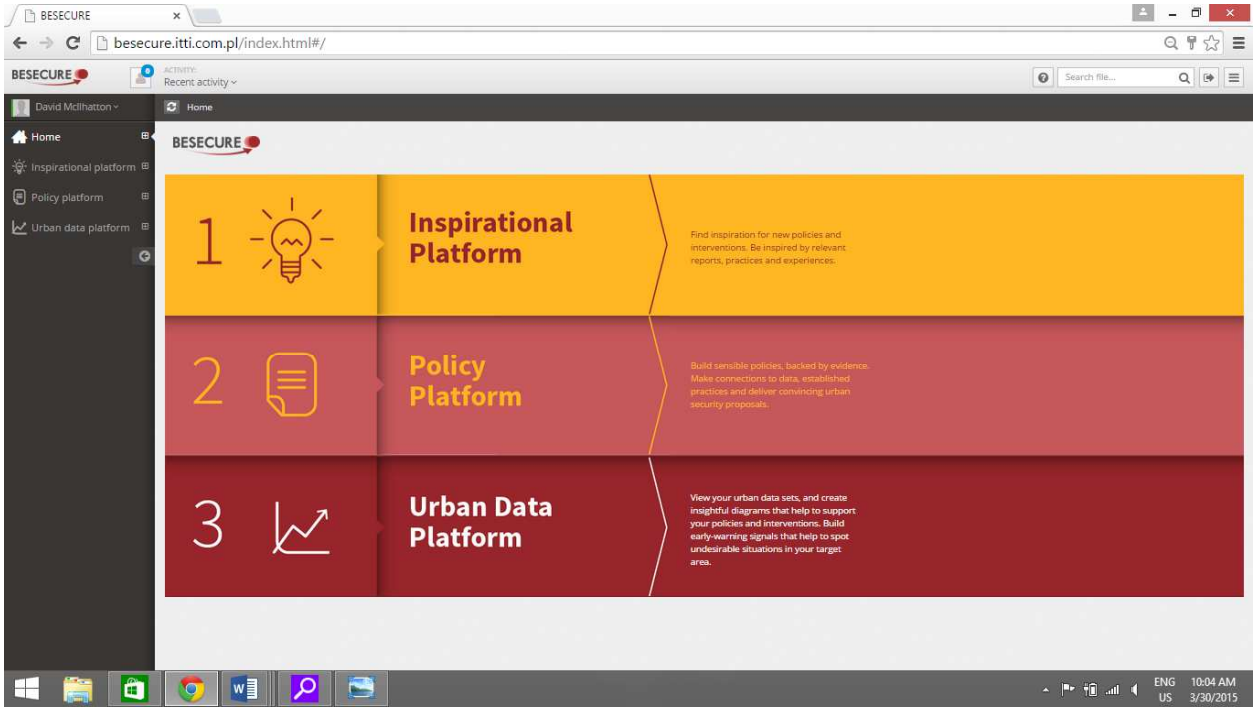

Figure 31: Main home page of the BESECURE platform

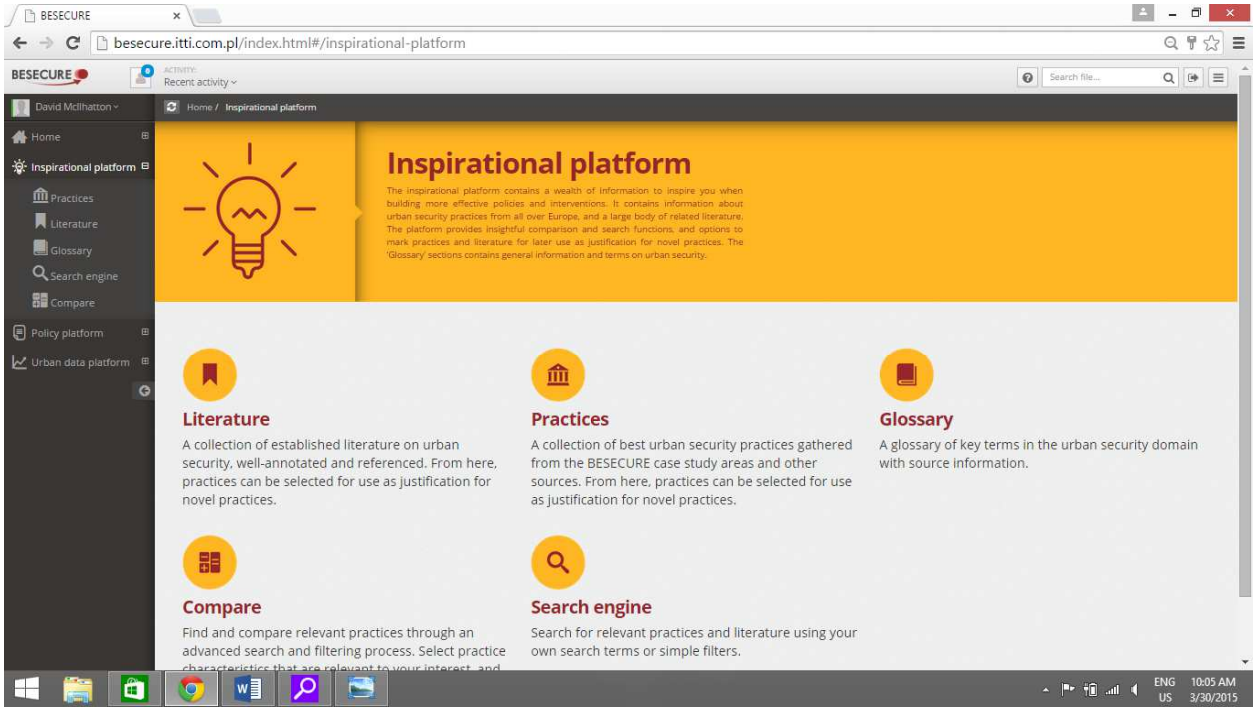

Figure 32: Main Inspirational Platform (IP) landing page

In the Inspiration Platform, Maria has the option to explore numerous key literature documents related to practices, a glossary of terms for standardisation of definitions and a search engine (approaches adopted in other urban areas on urban security) (Figure 33, Figure 34, Figure 35 and Figure 36)

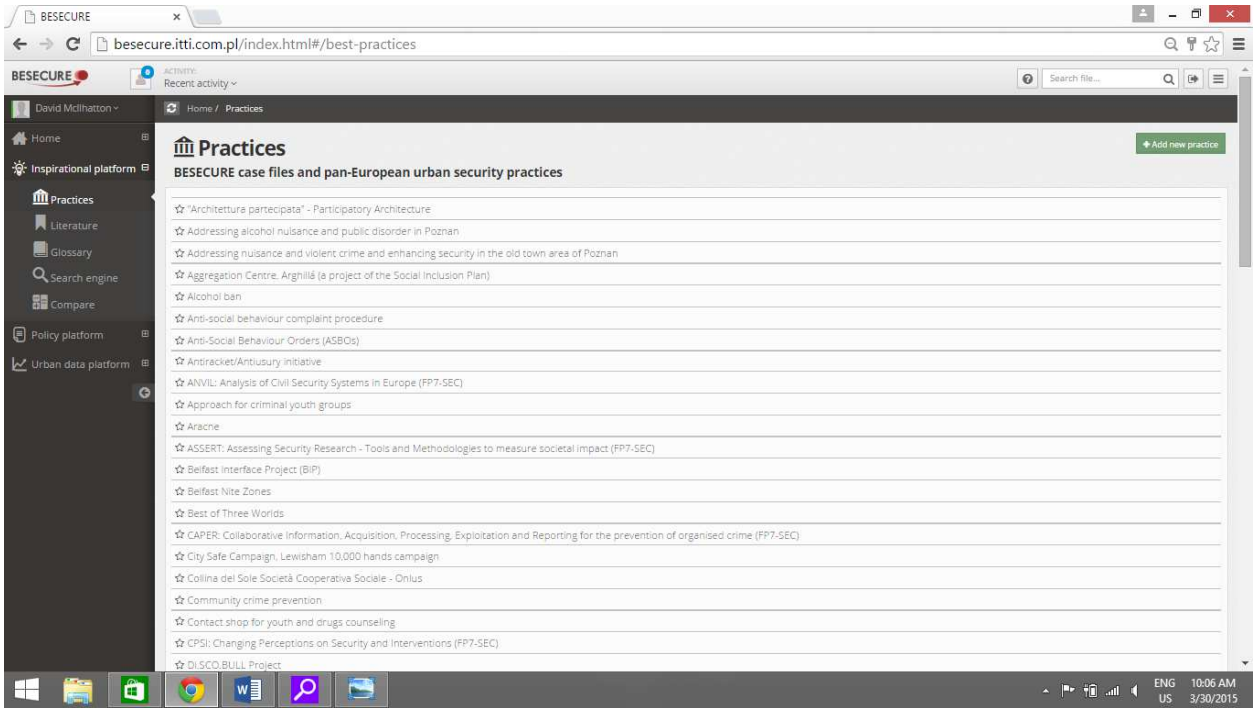

Figure 33: Main Practices landing page

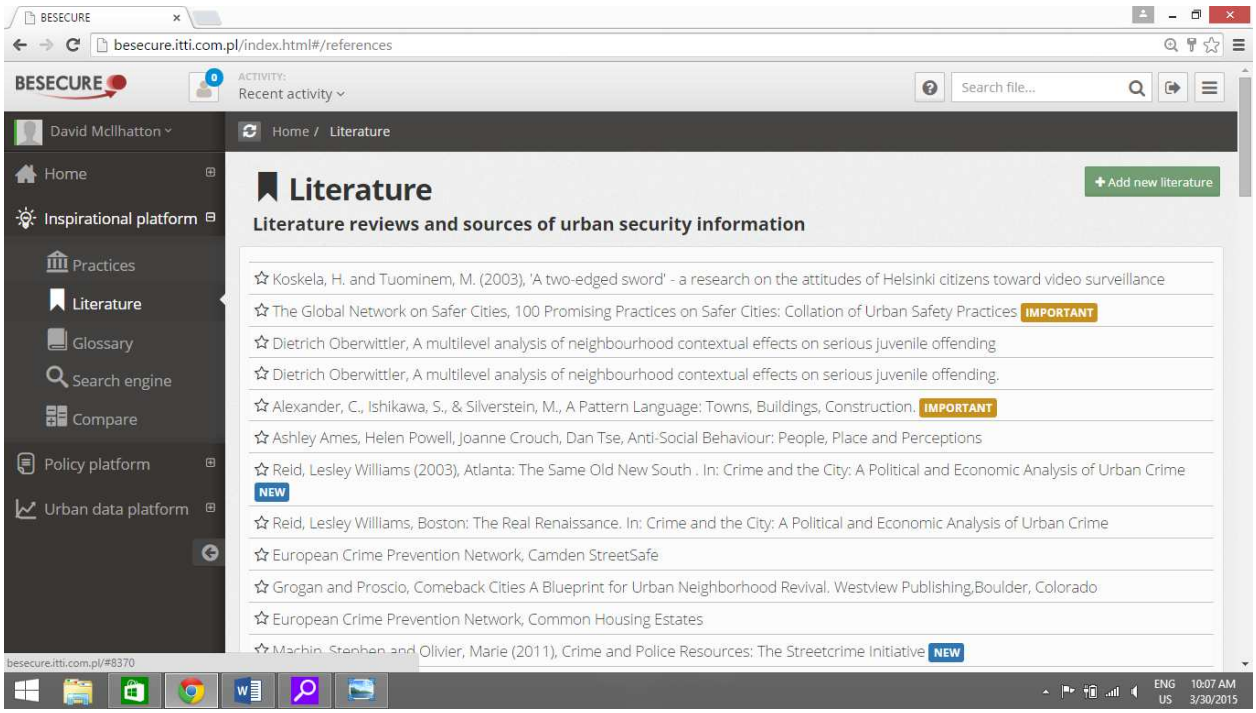

Figure 34: Main Literature landing page

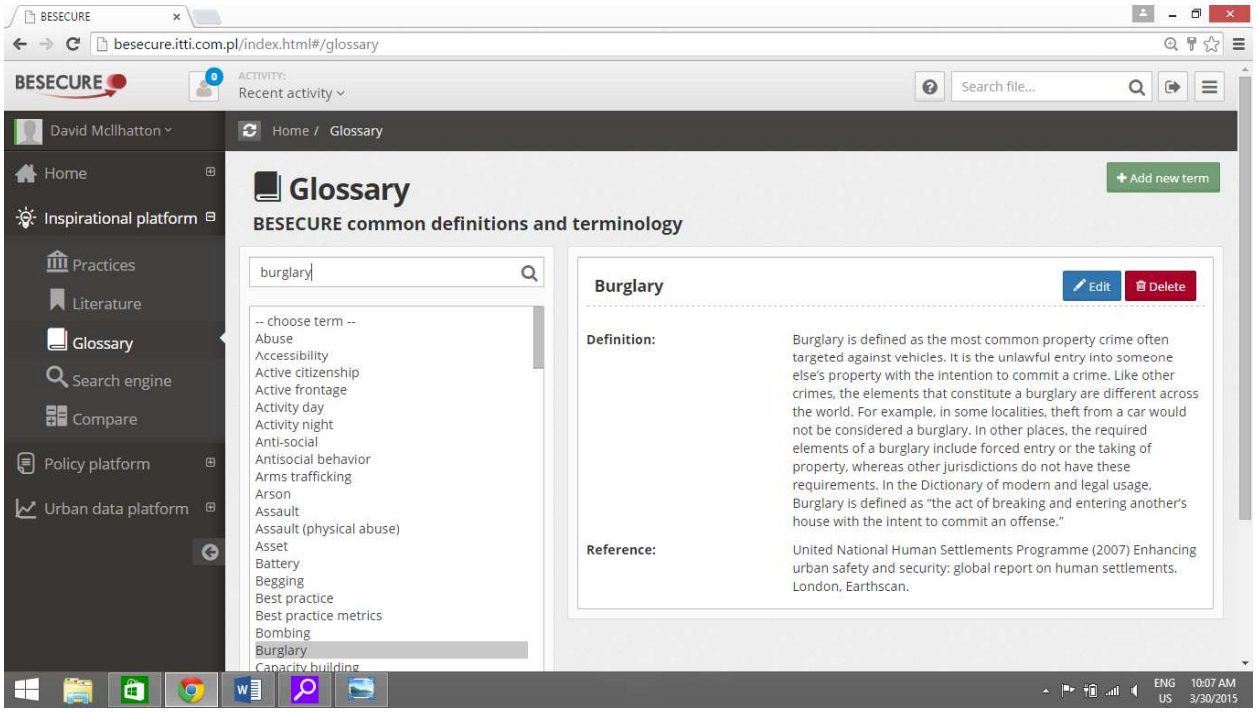

Figure 35: Glossary of Terms

As Maria wants to learn about ASB and Burglary, she can use the glossary to understand the agreed definitions coming out of the literature and which ones best fit the purpose of the work that she is undertaking. Maria searches for Anti-social behaviour in the search bar and definitions are then returned in a module to the right of the search component. If Maria has a corporately agreed definition for a term, she also has the ability to add a new term which is then automatically stored in the database (Figure 36).

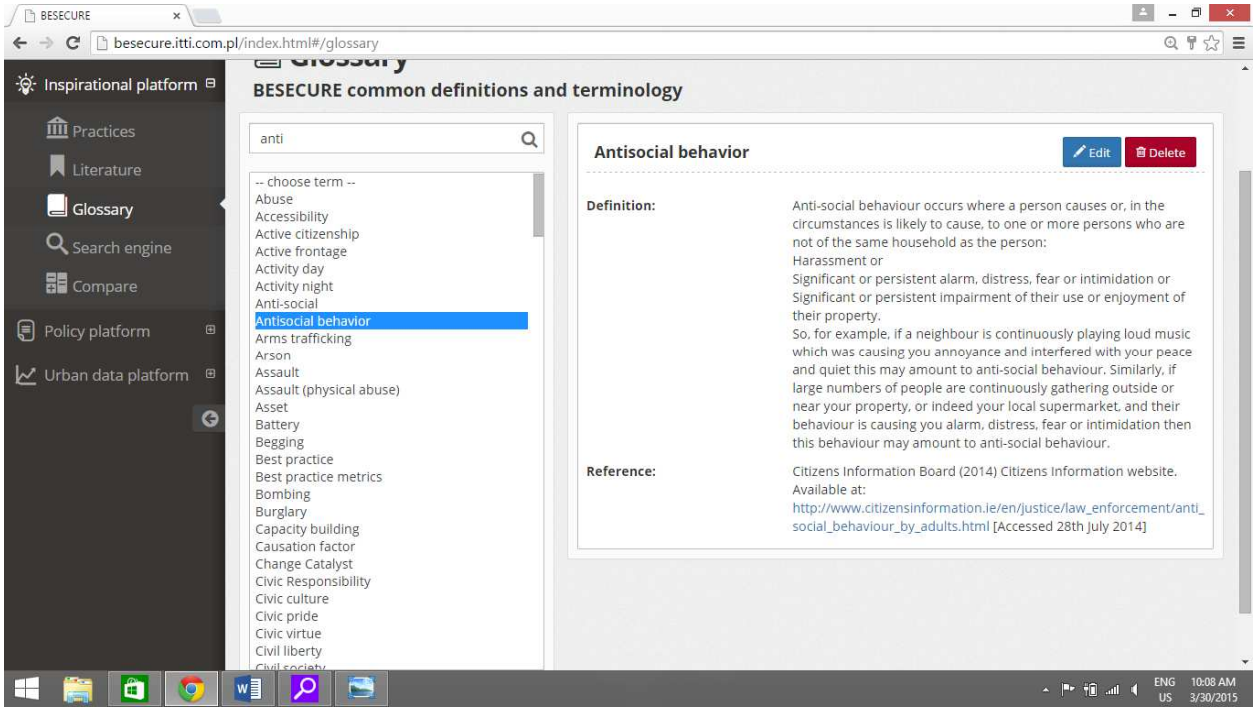

Figure 36: Search for Anti-Social Behaviour terminology

The inspirational platform also has a search engine based on the tags that have been assigned to the literature papers (keywords/descriptions of the purpose/outcome and methodology), the practices that have been adopted elsewhere and the glossary of terms. Maria is interested in learning what approaches were adopted in urban areas relating to ASB. Therefore, she types anti-social behaviour in to the search engine, uses the 'Filter Criteria' to select 'City' and the system only returns to her the practices that relate to ASB in cities and also the literature that relates to city areas (Figure 37)

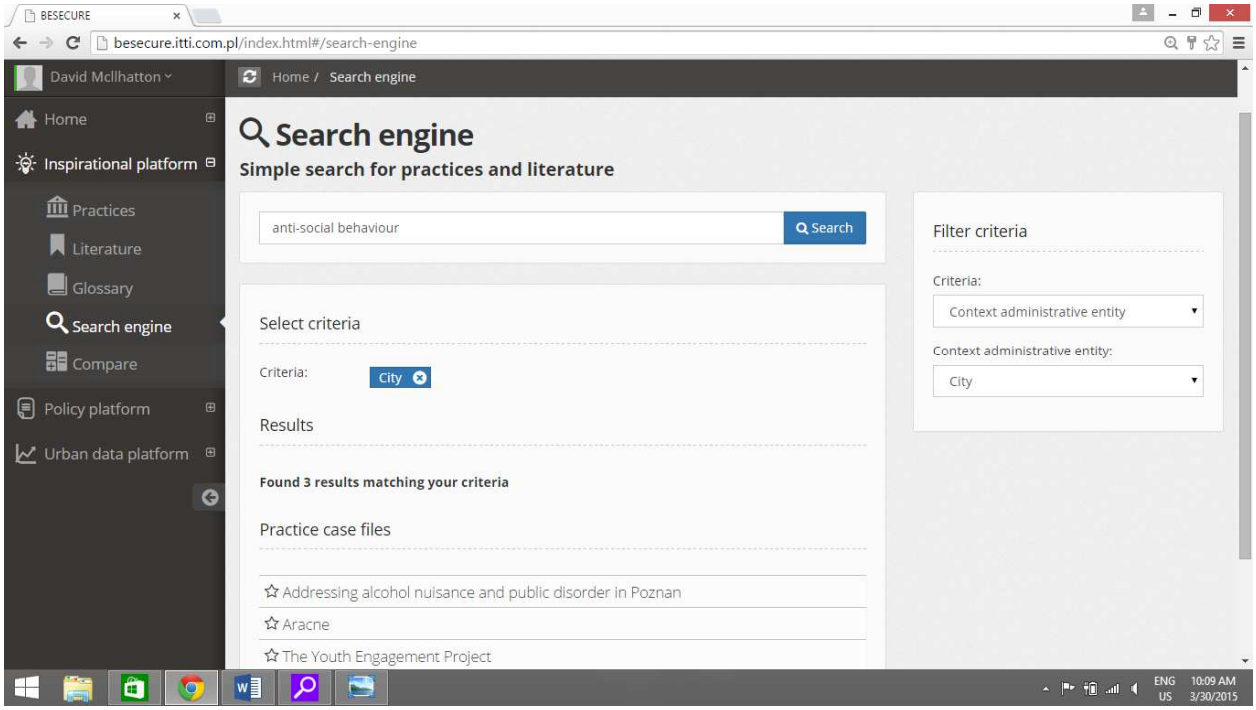

Figure 37: Maria setting the search filters in the inspirational platform

Maria is then returned the different practices that relate to her search and she is able to add these to her favourites to use in the policy support component. Maria is able to understand from click on the returned practices and literature meta-information about then in order to give her a flavour of what the practice was based on and its outcomes. This saves from having to trawl through extensive volumes of literature. If Maria wishes to go in to more detail, she has the option to 'Read More' (Figure 38 and Figure 39).

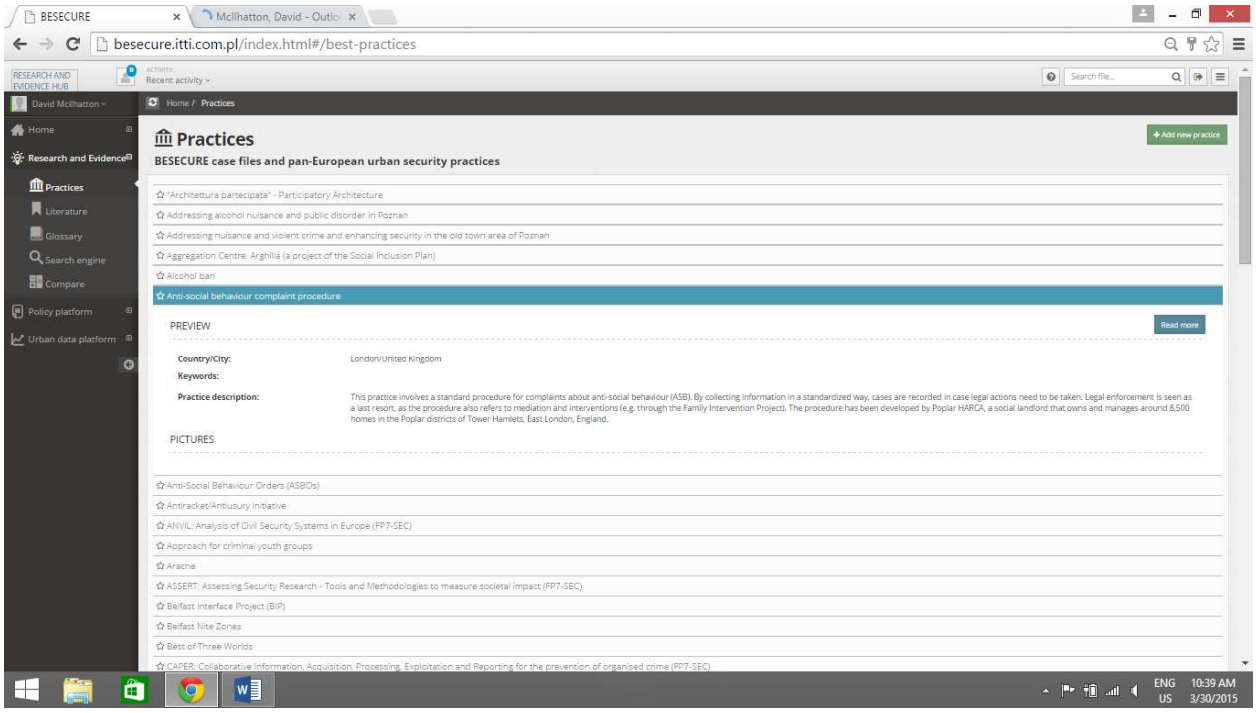

Figure 38: Practice Overview and option to read more

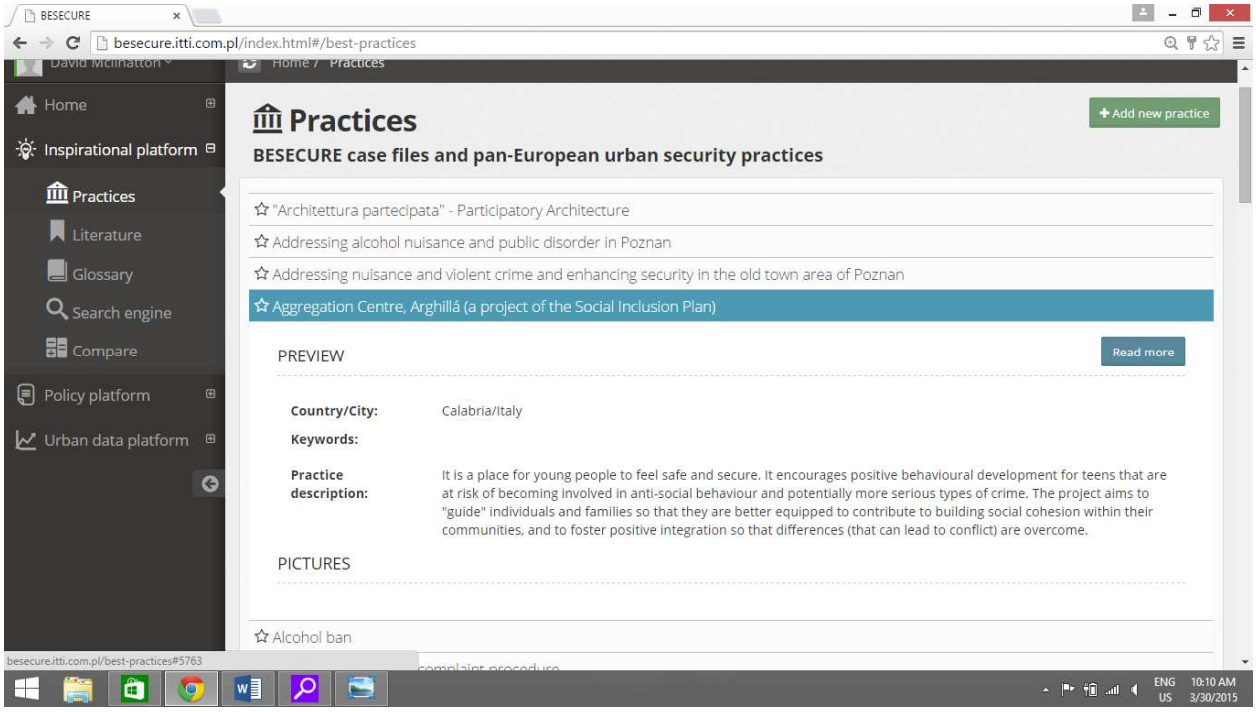

Figure 39: Zoomed in view of the practices

When Maria 'Reads More' she is presented with the ability to understand the tags that have been associated with the practice, its description, the practice specification and intent, the target of the practice and other related information (Figure 40 and Figure 41).

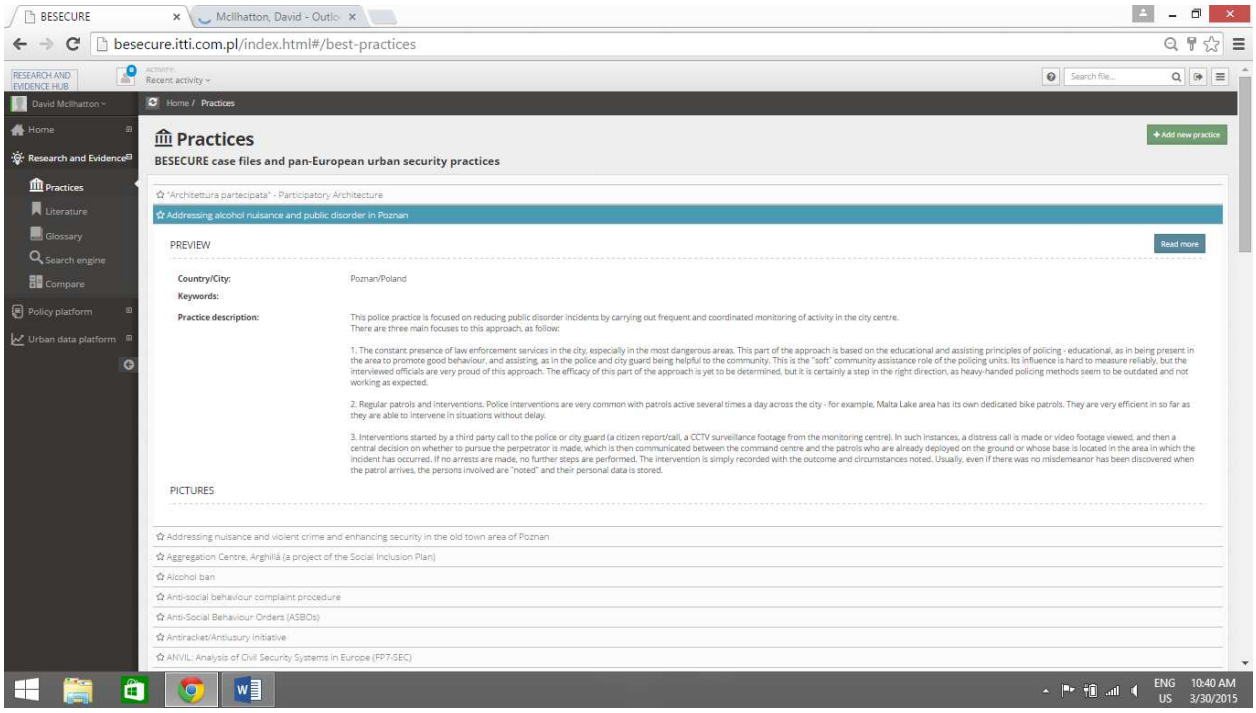

Figure 40: Metadata of Practice

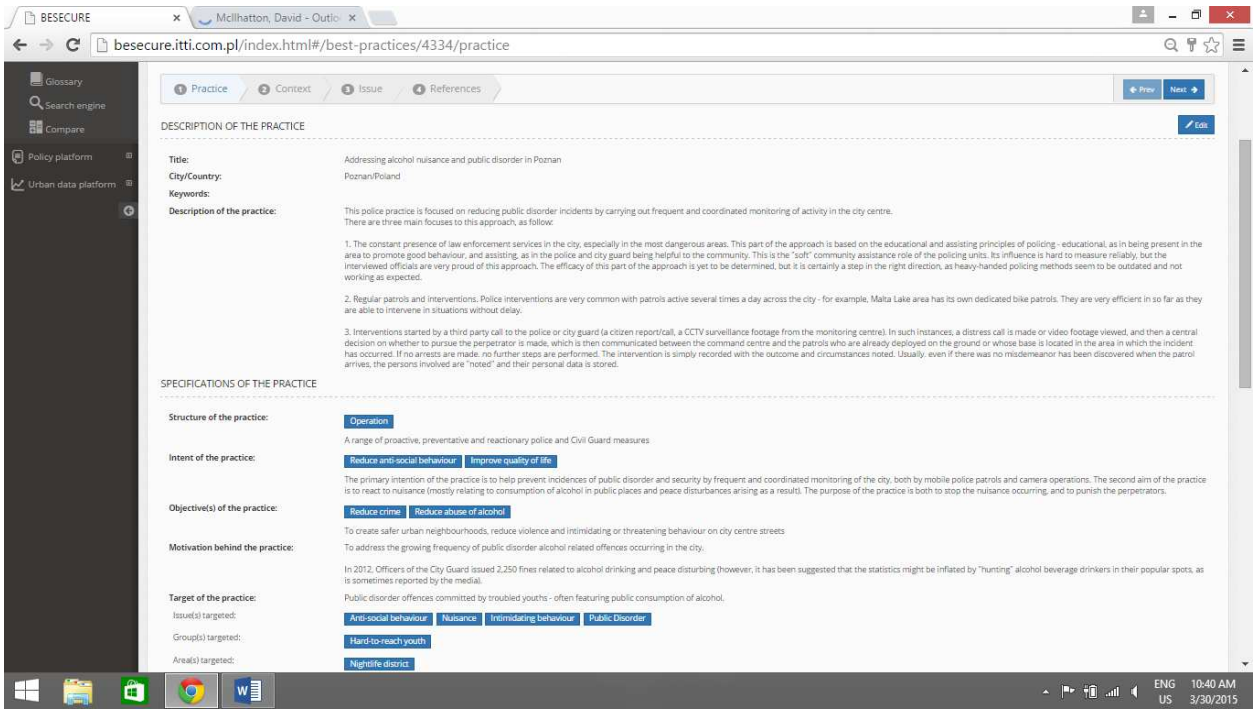

Figure 41: Description of Practice

Maria can then move forward after understanding the description of the practice, to gain knowledge of where the practice was adopted. There is done through the provision of a map of the area when the intervention was made and a short description of the area, including socio-economic information and general spatial trends (Figure 42).

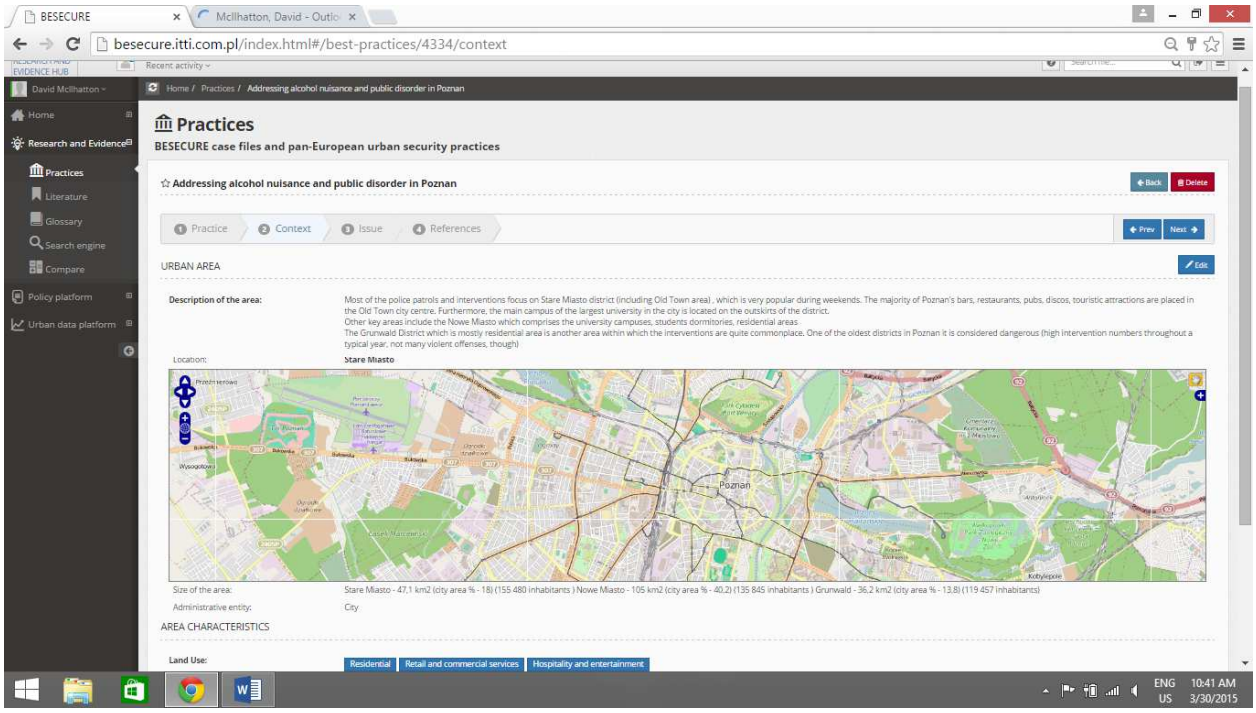

Figure 42: Map showing location of Practice

Maria is then able to view the issue that the practice is trying to address, including details of issue type, causation, area that issue has taken place in (description of area which is then tagged), what effects the issue had, when the issue was primarily occurring and who were involved (age category, gender, and so on) (Figure 43).

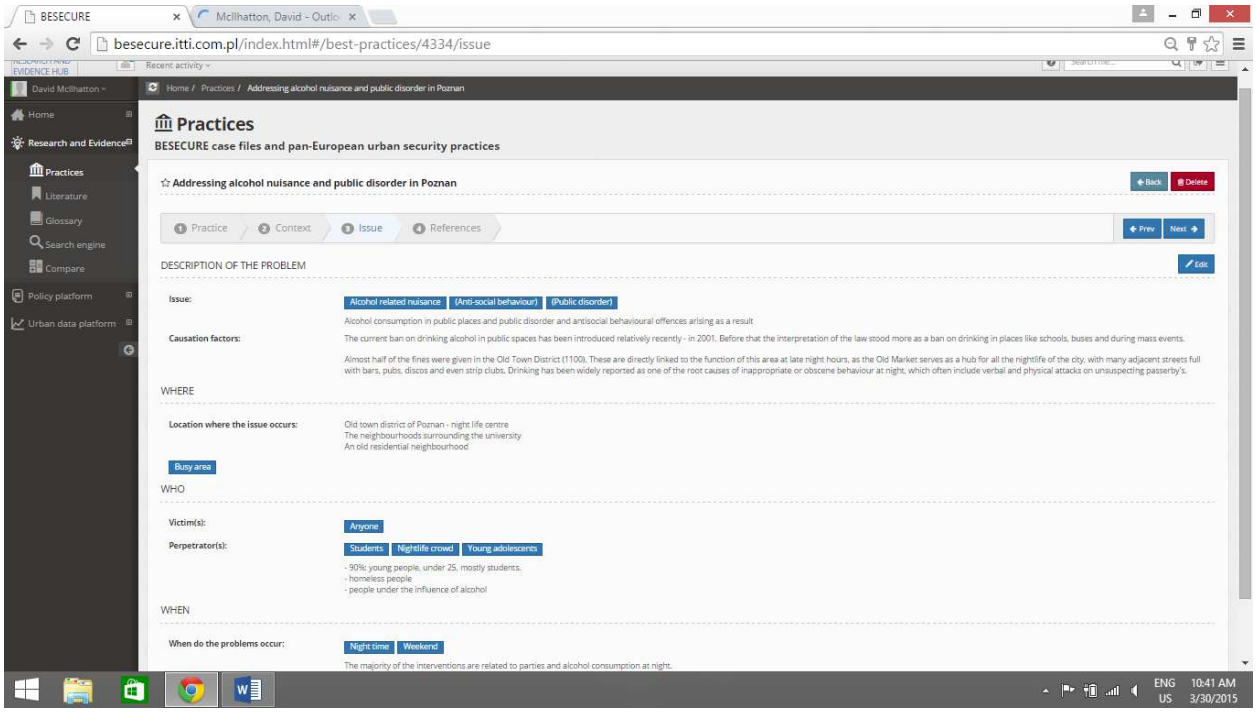

Figure 43: Issue Description

Maria is then able to see any associated literature with the intervention/ issue. This could be web links to documents, images or other documents which can then be opened and viewed (Figure 44)

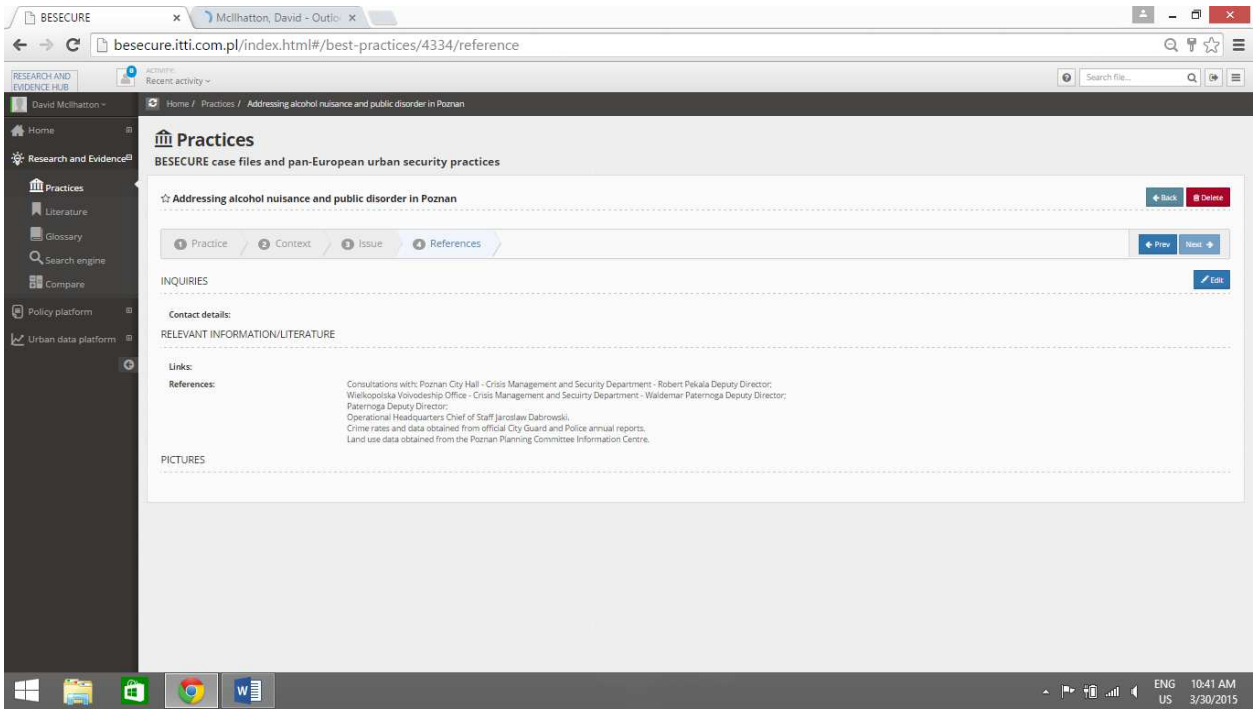

Figure 44: References for Issue

Maria is able to gain insight on any of the practices in the inspirational platform for different approaches adopted and for different issues giving her a holistic picture. Indeed, she is also able to compare practices and see which ones provide the best correlation with her requirements if there are extensive amounts of literature in the database (Figure 45). This is an advanced search/ filter component that allows for different issue types and area types to be interrogated and search for in the database. Maria is then returned with results based on how relevant they are to her criteria (based on a percentage, i.e. 100% is total match; 0% is no match).

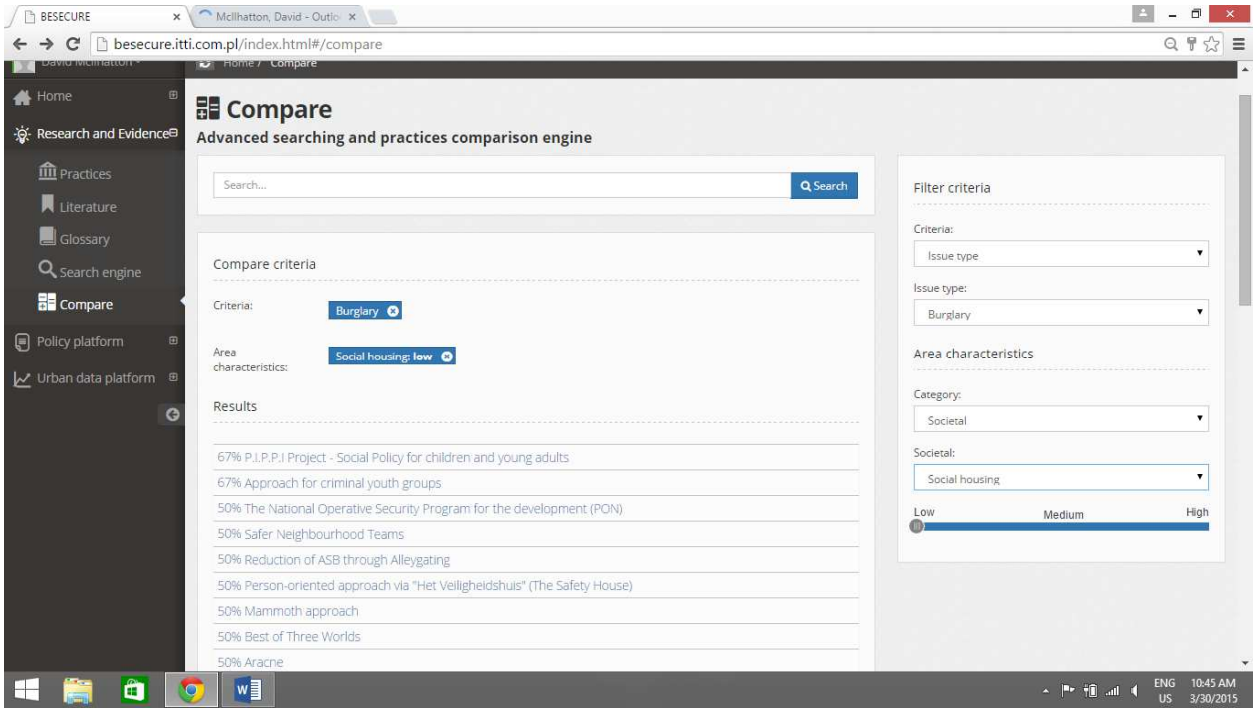

Figure 45: Compare Practices function

3.6. The Approach: Developing Support for Policy

When Maria has gained the knowledge and understanding of what the issues in her area are using the UDP and understood what has happened elsewhere, she is able to inform the decision making process in her organisation. She is able to do this in the Policy platform. In this platform, she is able to create a one page policy support fact sheet that can be provided to her senior management on potential approaches (Figure 46).

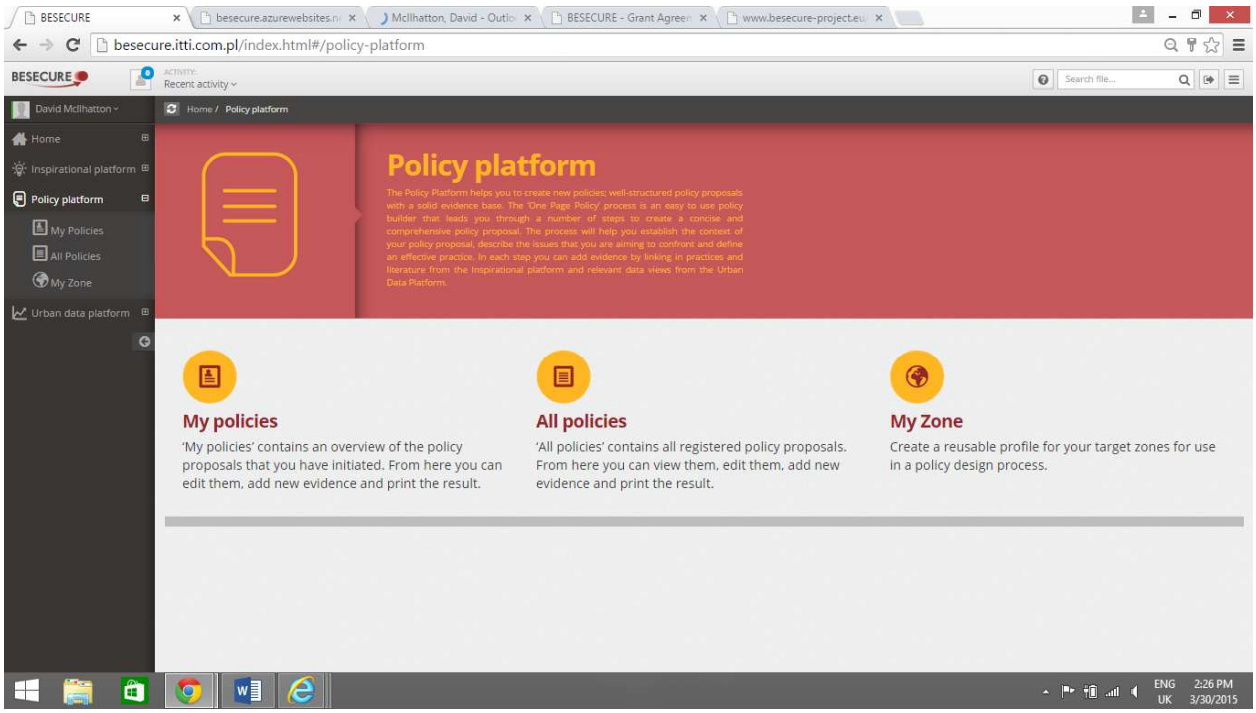

Figure 46: Main Landing Page of Policy Platform

In this case, she needs to create a new policy support document based on all the information that she has learned from using the UDP and IP components. She does this by going to the 'My Policies' tab and clicking on 'Add New Policy'.

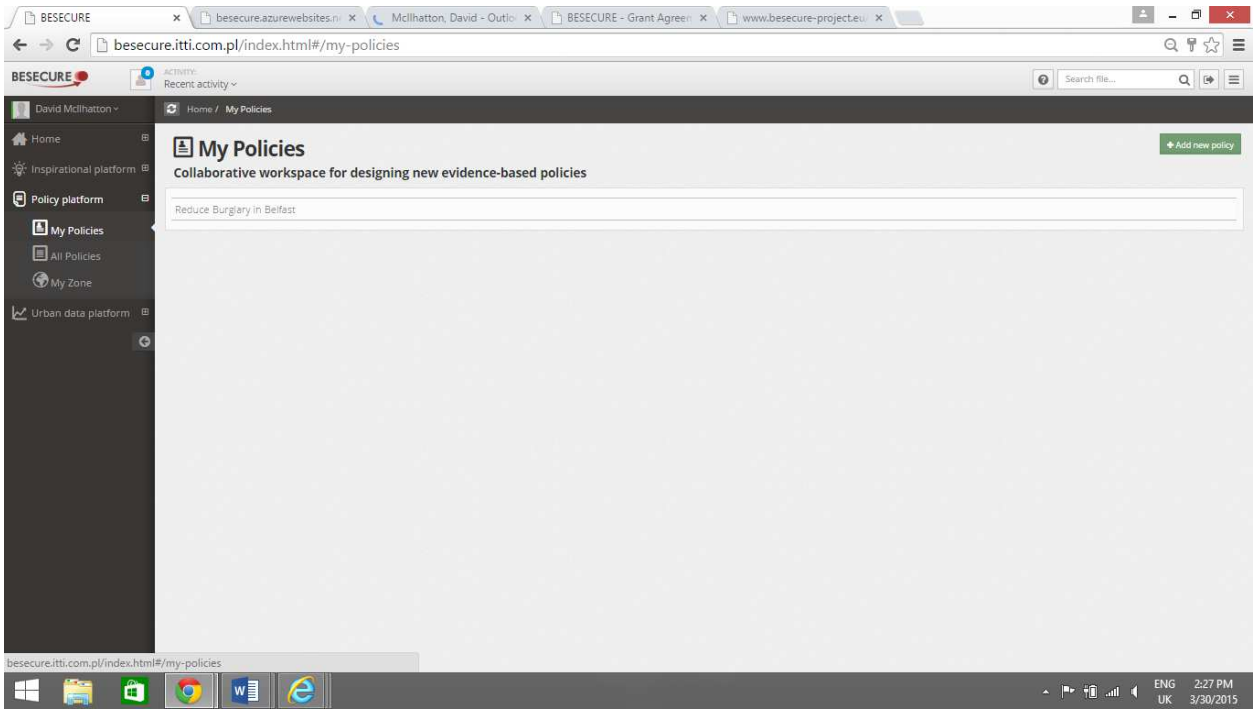

Figure 47: My Policies Landing Page

Maria is then able to give the Policy Support document a name and description relating to what the policy is trying to tackle (Figure 48 and Figure 49). She is then able to advance on this and provide context to the policy support, including information relating to the area in which the policy support is based on (area characteristics and trends) and add attachments such as photos and documents to support. These could be images from the UDP or other related material (Figure 51)

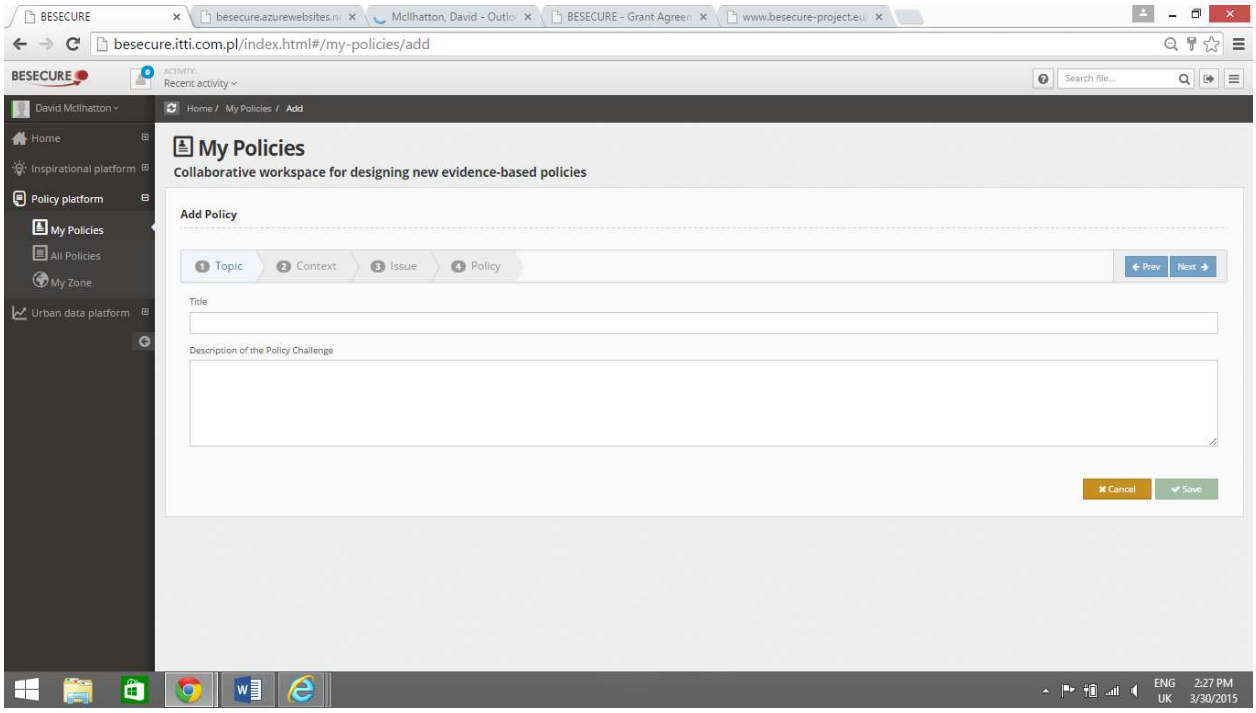

Figure 48: Add Policy Page

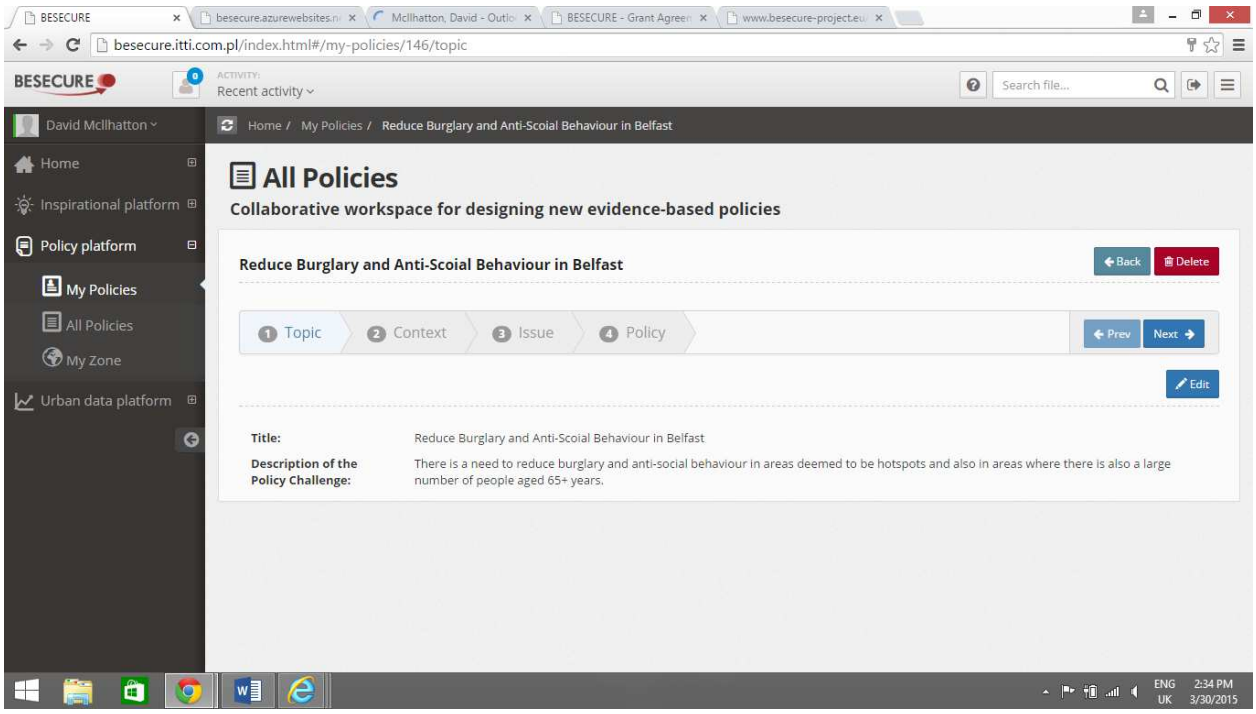

Figure 49: Completed Topic Page

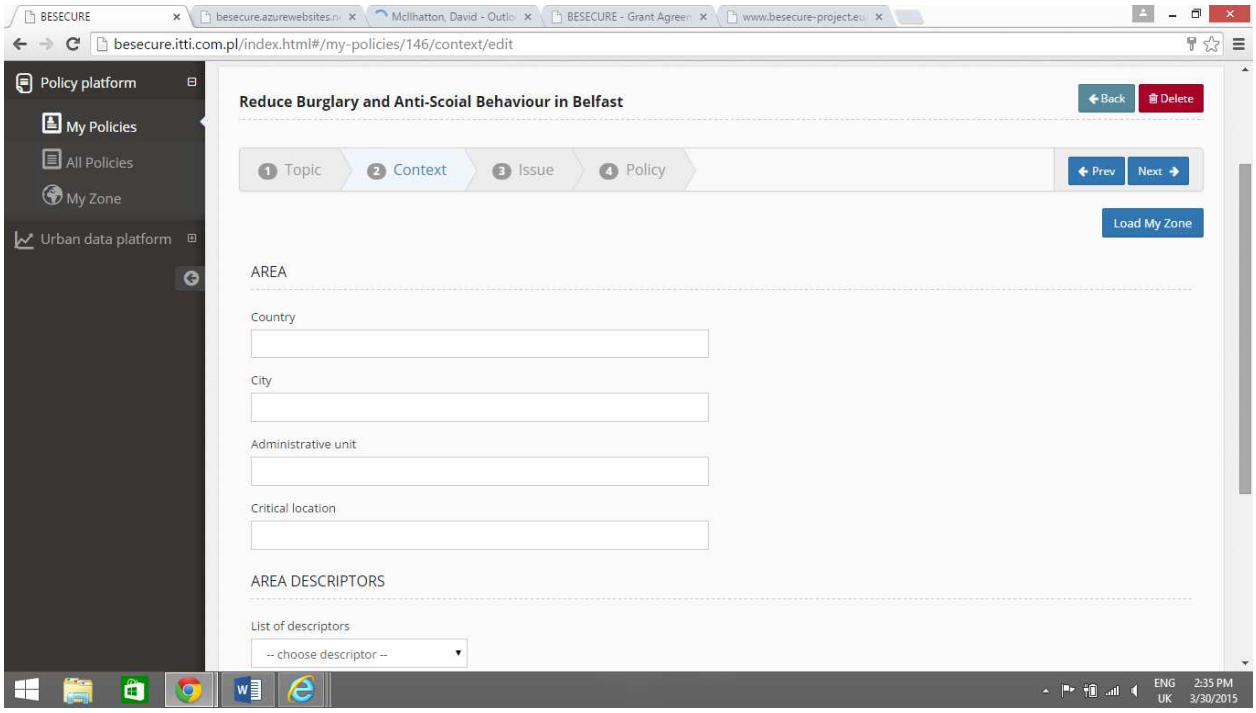

Figure 50: Setting the Area Context

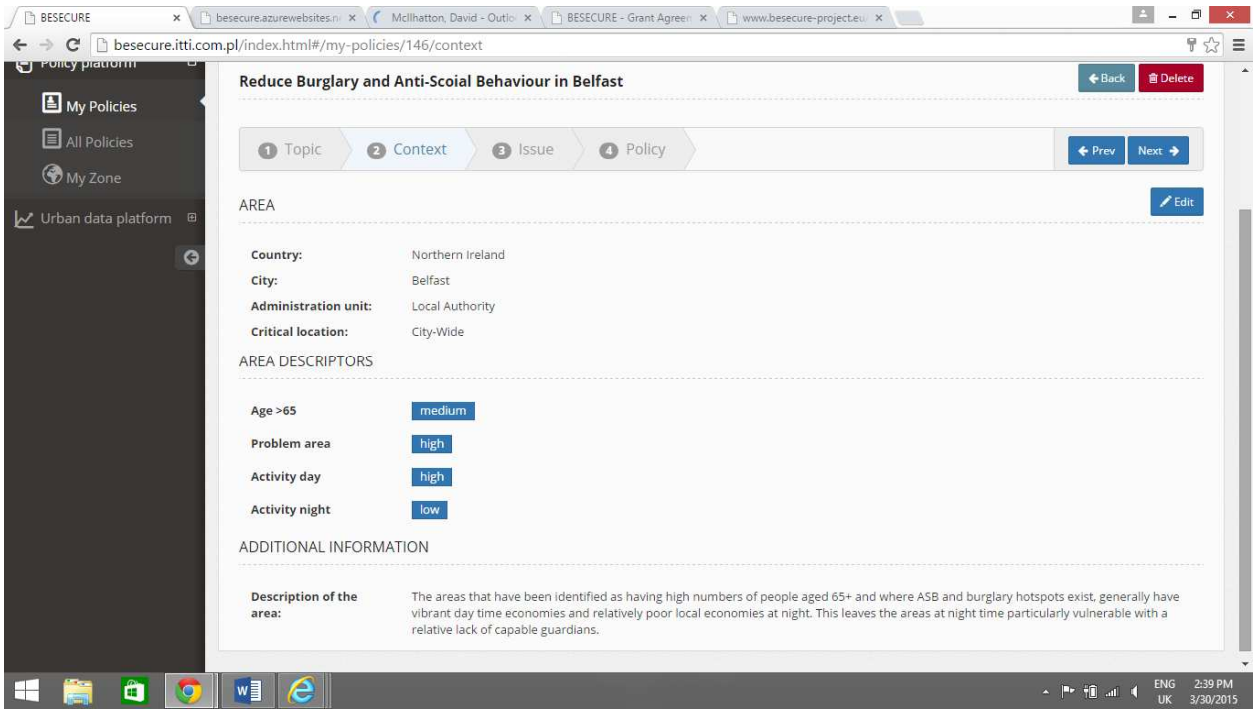

Figure 51: Populated area context page

Maria is then able to select the issue that the areas in which the policy are challenged with. This includes information relating to the issue type and category, its description, who the victims are, as well as when the issues are most pertinent (Figure 52)

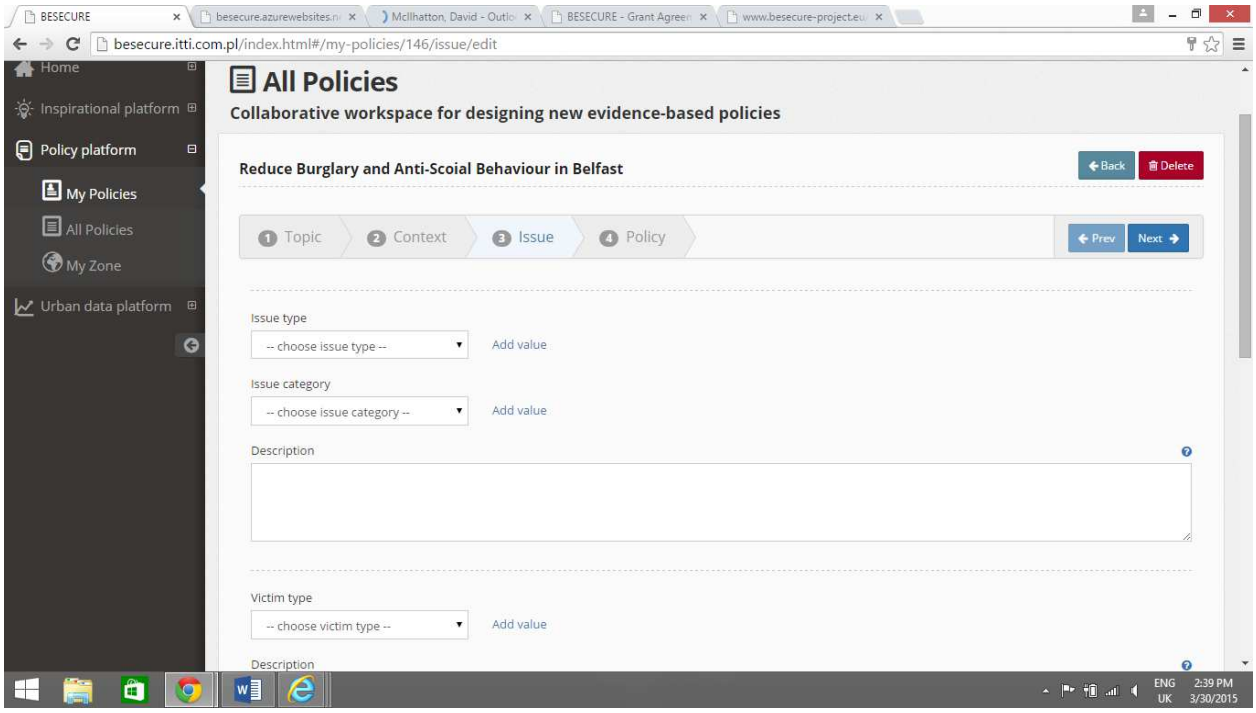

Figure 52: Issue Page in 'Add New Policy'

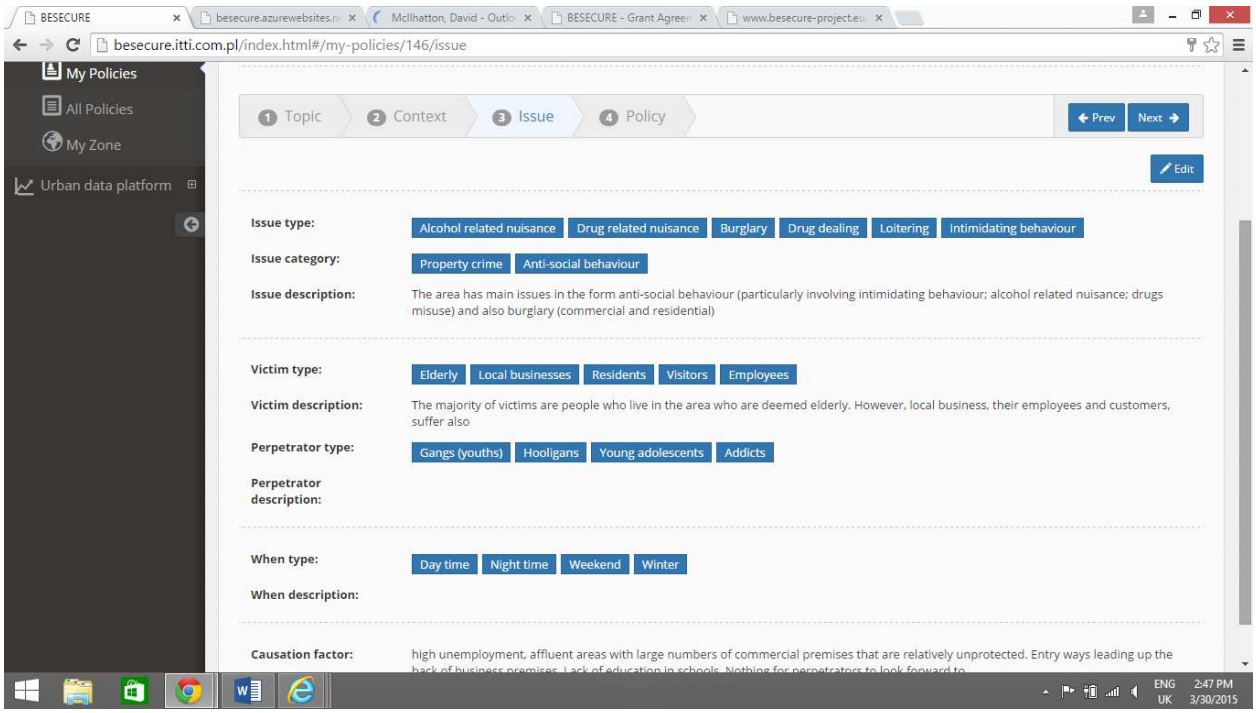

Figure 53: Populated Issue description

Maria then populates the policy tab with all the information that she has just entered by adding evidence to each tab (Figure 53). Once this is done, Maria is then able to generate a report, which is essentially the one page policy support document. This provides in a structured yet efficient manner, the context to the problem and area, the type of problems that the areas are facing, the intent of the policy, the potential interventions that could be adopted, associated information on what has been done elsewhere, the resource implications of the proposed interventions and its timeline, as well as the stakeholders that

need to be involved (Figure 54 and Figure 55). Her result is a structured report that is easily understood and interpreted by lay people and more importantly, those who need to make decisions (Figure 56).

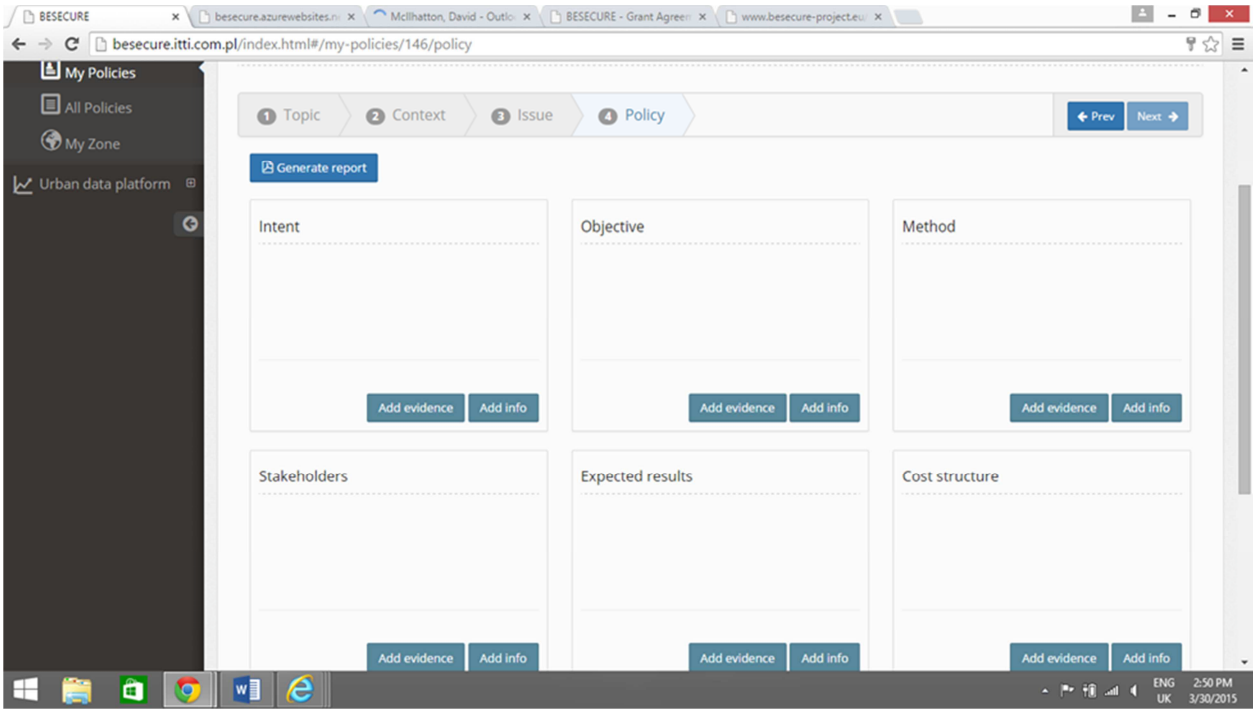

Figure 54: Policy Support Tabs

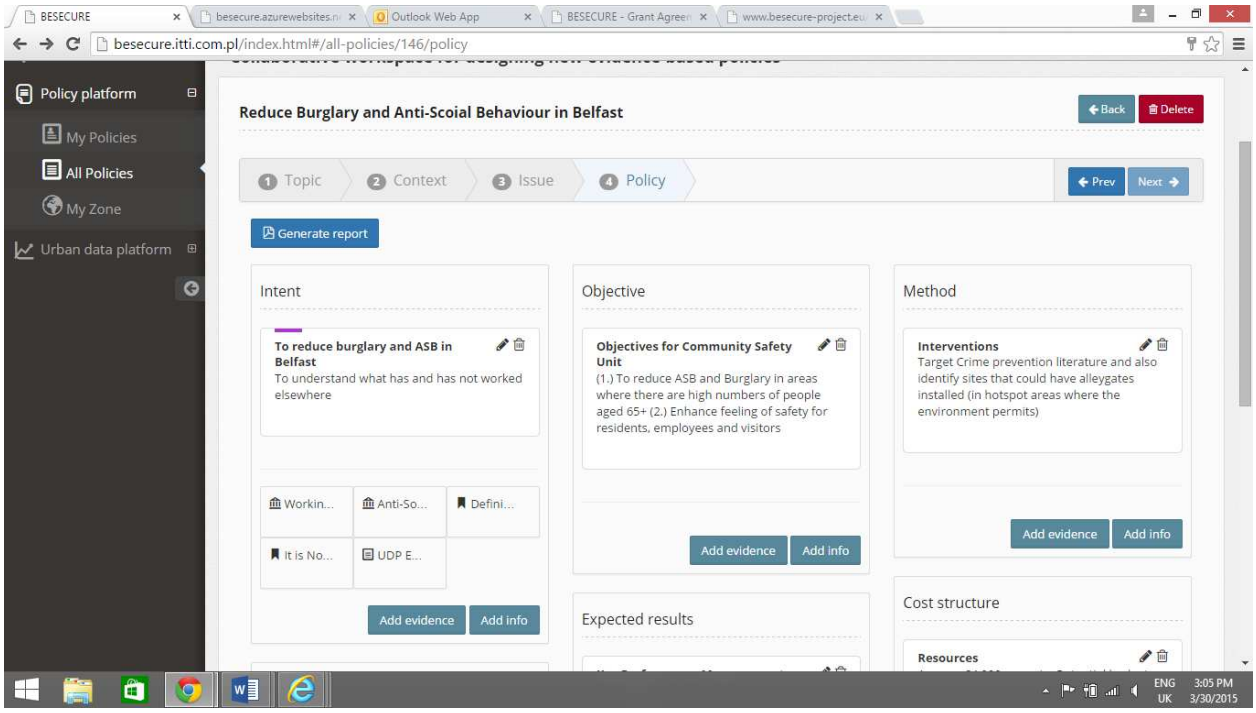

Figure 55: Populated Policy Support

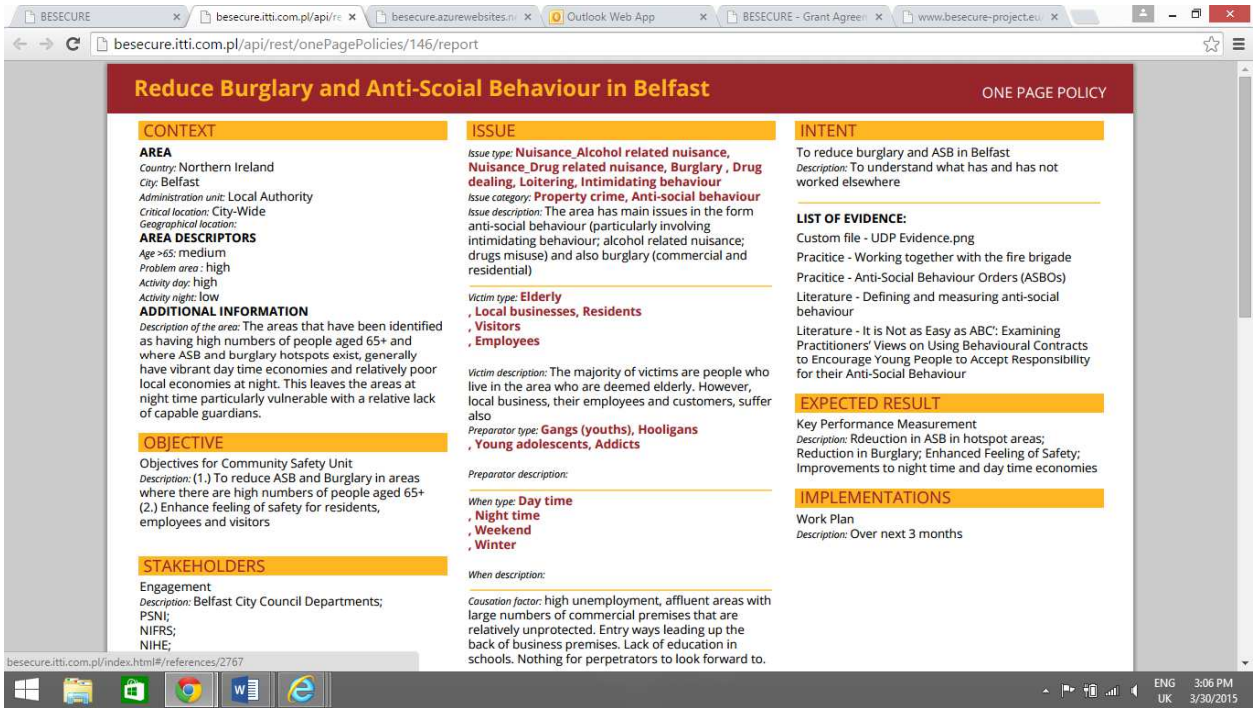

Figure 56: Resulting One Page Policy Support Document