



DESURBS Deliverable 1.3: Urban space incident database

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Authors: Rob Rowlands, Jon Coaffee and Jonathan Clarke (Warwick) with Ksenia Chmutina and Lee Boshier (Loughborough), Lee Middleton and Panos Melas (IT Innovation)

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Table of Contents

- 1 Introduction..... 3
 - 1.1 Background..... 3
 - 1.2 The DESURBS Project..... 3
 - 1.3 Work Package 1 (WP1) 4
- 2 Role of WP1.3 5
- 3 Database Population 6
 - 3.1 Database Specification 6
 - 3.2 Links to Integrated Security and Resilience (ISR) Framework (WP2) and Decision Support System Portal (DSSP) (WP5) 6
 - 3.3 Population and Amended Specification of Database..... 7
- 4 Conclusions..... 11
- Appendix 1 – Protocol for Case Additions to WP1.1 Incident List 12

1 Introduction

This report constitutes Deliverable 1.3 of the FP7 Security Program research project ‘Designing Safer Urban Spaces’ (DESURBS, Grant Agreement no. 261652). The purpose of this report is to give an overview of the urban space incident database developed in the project.

1.1 Background

As security-related risk in cities has intensified our concern with anticipating, preventing, preparing, responding and recovering from the disruptive challenges brought about by such enhanced risk has become a key concern of urban managers and built environment stakeholders such as urban planners, urban designers, civil engineers and architects. Security risks to urban areas are widespread. From crime and public order to terrorism, “securitising” cities has been a focus of policy responses. This has occurred alongside ongoing natural threats such as earthquakes and flooding, which include in many cases increasingly human induced risk – and the ever present risk of accidents in evermore crowded urban areas. Through it all enhancing resilience - the capacity to adjust to threats and mitigate or avoid harm and has physical, economic and social components – has become is the aim for urban stakeholders. Shaping new and existing urban spaces through planning, design and management is central to this.

Resilient design is therefore a holistic activity involving a range of activities which shape and manage the built fabric so as to reduce its vulnerability to a range of hazards and threats. It is concerned with both the spatial form and redesign of the built environment as well as the processes that help shape it. Yet designing and redesigning urban spaces to make them more secure is often constrained by the limited local knowledge and experience of dealing with these different types of hazard and security threat. By sharing, analysing and understanding past experiences of how these risks have impacted on urban spaces improvements in the practice of resilient urban planning, design and management can be made.

1.2 The DESURBS Project

DESURBS is a research-based project which aims to develop tools which assist built environment professionals and urban managers to create and maintain safer urban spaces. Through a series of integrated work packages and based on knowledge from past incidents, DESURBS is developing an online, interactive decision support tool to help users identify strength and weaknesses in urban spaces and take the most appropriate steps to identify, mitigate against or eliminate the risks to them through enhancing resilience.

The main objective of this project is to create a decision support portal to tackle this problem. The portal will consist of a continuously evolving urban space security event database, an Integrated Security and Resilience (ISR) task plan formulation framework for engaging and assisting local stakeholders in the decision support process; and comprehensive supporting models and tools to improve the design of new and renewed urban areas. Improved design will contribute to the creation and maintenance of safer places, protect surrounding natural environments and making the urban space itself less vulnerable to damage.

The overall strategy of the DESURBS work plan is straightforward and aimed at achieving the best possible workflow. The work is divided into seven work packages of which WP1 is the first.

1.3 Work Package 1 (WP1)

WP1 involves establishing the urban security and resilience database that looks at a range of past urban security incidents and 'near misses' and that is sufficiently comprehensive to inform the identification of weak points in a variety of urban spaces in cities old and new, and to inform the design of more robust and resilient spaces in the field of urban planning/design/engineering. The security incidents analysis is to act as the basis for the creation of a relational database that can be a useful resilient redesign tool for urban planners, designers and engineers. This report provides details of this analysis. WP1 lays the foundations for the project. It contains four tasks:

- To identify a range of past urban security incidents and 'near misses' in differing urban environments that is sufficiently comprehensive to:
- To inform the identification of weak points in urban spaces;
- To inform the design of more robust and resilient spaces in the field of urban planning/design engineering
- Illuminate the need for and usefulness of the comprehensive supporting tools to be developed in the project in WP4.

This is broken down into 4 sub-work packages:

- WP1.1 established a list of security incidents and was reported on in DESURBS Deliverable 1.1, *Security incidents analysis*.
- WP 1.2 specifies the form and content of the relational database and is the subject of this report;
- **WP1.3 establishes the initial, fully functional database (including the rating scale from WP1.4) that can be used as a resilient (re)design tool by our targeted end users (urban planners, designers, engineers).**
- WP1.4 develops an objective rating scale for quantifying safety of different urban space designs and use it to show that DESURBS solutions result in urban spaces less prone for and less affected by security threats.

The subsequent and concurrent Work Packages in the project build around WP1. In WP2 we elaborate an Integrated Security and Resilience (ISR) design assessment framework which details a multi-disciplinary methodology that engages local stakeholders and focus groups to help recognize and understand the risks and vulnerabilities present, in the context of the competing functionalities (social, economic, aesthetic, managerial) and limitations in a given urban area. In WP3, we develop mapping and visualization tools to facilitate efficient use of the project's outputs. In WP4 we develop and adapt supporting models, tools and technologies that advance the state-of-the-art for quantifying different vulnerability aspects of urban spaces to identified threats and risks, to be used to help carry out the ISR design methodology within the framework developed in WP2. The activities of WP2, WP3 and WP4 are informed and developed with reference to case studies in Jerusalem and Nottingham, where the project has established ties with local governmental and municipal planning authorities. In WP5 we combine all of the above into an internet-based, user friendly Decision Support System Portal. WP6 and WP7 are for dissemination and management, respectively.

2 Role of WP1.3

This report covers work carried out in work package 1.3 (WP1.2), which is to establish an initial database. This task uses as its foundations the work previously completed in WP1.1 (D1.1) based on the identified weaknesses and possibilities for strengthening in the range of incidents analysed in and is now concerned with populating the database structures. Report D1.2 outlined the form, content specifications and technical specifications of the databases.

It is an essential requirement that the database is incorporated seamlessly into the DSSP in WP5 and to effectively tie in the tools to be developed in WP2, WP3 and WP4. Therefore WP1.3 requires the continued co-operation of all partners in the co-production of the database.

This report establishes the progress to date in populating the datasets which constitute the database with relevant and appropriate data. The datasets themselves are too complex to be presented here in their entirety and therefore an overview is provided together with relevant examples of some of the data used to illustrate progress and the connection of this task with other DESURBS Work Packages, notably WP2 (Integrated Security and Resilience Framework(ISR)) and WP5 (Decision Support System Portal (DSSP)).

3 Database Population

3.1 Database Specification

As outlined in D1.2, the Urban Space Incident Database is constituted of a series of 4 relational datasets:

- WP1.1 Incident List - a list of security incidents and near misses categorised by hazard type and illustrating the design weaknesses which contributed to them.
- ISR Case Examples – A set of hazard specific examples which highlight the importance of addressing each stage of the ISR.
- Document Repository - a collection of standards, regulations and other documentary material which provide supportive information which will aid decision making
- Tool database – examples of tools developed outside of the project might be of use in assisting end users in their decision making and draws on the work reported in D2.3.

3.2 Links to Integrated Security and Resilience (ISR) Framework (WP2) and Decision Support System Portal (DSSP) (WP5)

The combined database is designed to facilitate the Decision Support System Portal (DSSP) being developed in WP5 and within this play a fundamental role in providing evidence and further support within the Integrated Security and Resilience Framework (ISR) developed in WP2. The incorporation of the datasets is illustrated in Fig 3.1 below.

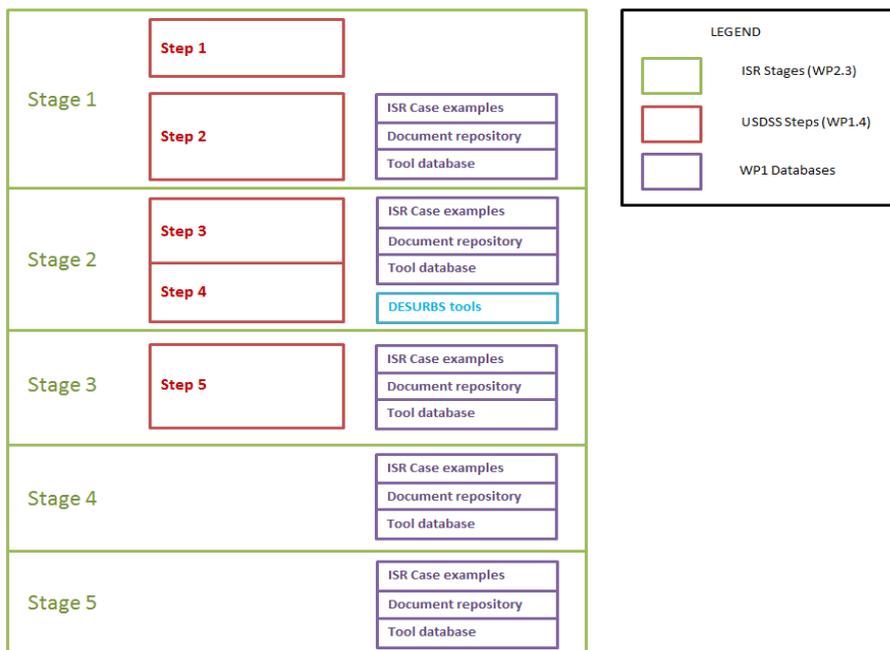


Fig 3.1 Role of the WP1 Databases within the ISR, USDSS & DSSP

The precise roles are explained in report D1.2 and are referred to in more detail below.

3.3 Population and Amended Specification of Database

WP1.1 Incident List

The WP1.1 Incident list was created in WP1.1 to assemble the facts and figures about a range of security incidents and near misses. Importantly this work provided the basis for capturing the relevant information about the ‘weak points’ in urban spaces, the role of key stakeholders and how the supporting tools might have played a mitigating role. This information is presented in report D1.1 of the project.

Going forward into WP1.3, the WP1.1 Incident List performs an important role in providing a range of examples of why design weaknesses need to be addressed in urban design, planning and management. To ensure that this dataset is a strong resource it has been cleaned with 96 of the original cases being retained with all cases now containing complete information¹.

This dataset continues to be up-dated with relevant incidents. A protocol has been established for the addition of new cases. Fig 3.2 illustrates the steps users will follow to ensure only appropriate cases are added to the database. A complete outline of the protocol is outlined in Appendix 1.

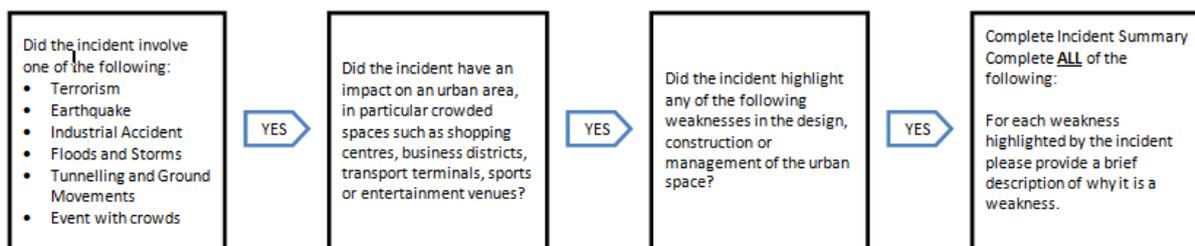


Fig 3.2 Protocol for Adding Cases to WP1.1 Incident List

This dataset will be used in two ways in the DSSP (WP5):

1. In the open element of the DSSP to provide an overview of the types of incident and their impacts which the DSSP can provide decision support to mitigate against. This is available to all users.
2. At Stage 2 of the ISR (see report D2.3) to illustrate in detail the impact of not addressing specific design weaknesses within the overall design of urban spaces. This is available to registered users as part of the ISR.

ISR Case Examples

The purpose of the case examples is to illustrate to end-users why taking appropriate action at each stage of the ISR (WP2.3) will be beneficial and enhance urban safety. Although some of the cases collated within the WP1.1 incident list have been included for this purpose, it has been necessary to collate and analyse further incidents in order to address specific learning points in respect of each ISR stage.

¹ For all cases, partners were asked to ensure complete information was provided for all cases. Those cases where information was lacking were removed from the list. In addition, only cases which illustrate the 6 hazard/threat types used in the development of the DSSP were retained.

The specification of this dataset has been revised since report D1.2 to reflect developments in the ISR and the DSSP. Two datasets have been established within this. The first covers stages 1 to 3 of the ISR and includes incidents of good practice and those where weaknesses or deficiencies in the application of that stage contributed to the incident. A simplified structure (Table 3.1) is now being used to ensure that the correct data is collated in the database and that this can be presented to end users in a useable and informative format (Table 3.2). Case examples will appear in the ISR as vignettes of good and bad practice at each stage.

Field Shortname	<i>Description</i>
HazardType	<i>Code for Hazard relating to named hazards in Hazard_Name</i>
Hazard_Name	<i>Identifying Field selected from one of the 6 hazard types (Industrial Accidents; Earthquakes; Events; Floods and Storms; Terrorist Incidents; Tunnel Collapse and Ground Movements)</i>
ISR_Stage	<i>Code for ISR Stage</i>
ISR_Name	<i>Name of ISR Stage</i>
Good/Bad	<i>Does the case illustrate best practice or mistakes at this ISR stage?</i>
Incident_Name	<i>Give a brief, commonly used name to the incident</i>
City	<i>The name of the city in which the incident took place.</i>
Country	<i>Use the UN Standard 3-letter (not numeric) code for the country available from http://unstats.un.org/unsd/methods/m49/m49alpha.htm</i>
Geocode	<i>To geocode use http://www.gpsvisualizer.com/geocode and enter the address of the incident. The Geocode should be in a format 53.4833,-2.2435 or entered into Google maps and returned as a URL e.g. http://maps.google.co.uk/maps?q=53.4807125,+2.2343765</i>
Date	<i>Insert as dd/mm/yyyy format</i>
Place_Type	<i>Description of the place in which the incident occurred from:</i> <ul style="list-style-type: none"> ○ Transport Terminal ○ Shopping Centre ○ Business District ○ Sports Venue ○ Entertainment Venue ○ Wider urban area
Incident_Description	<i>A brief description of what happened and why this ISR stage played a role in the incident.</i>
Lessons	<i>Identification of the lessons end-users can take from this example and why the relevant ISR stage is important.</i>

Table 3.1: Revised Structure of Case Examples Dataset.

ISR Case Examples: What should cases show at each stage.

Stage	Task	Purpose	Incident Description (for each a brief description of any incident if applicable)		What lessons need to drawn out for end users?	
			Best Practice	Mistakes	Good practice	Mistakes
1	Identify, characterize, and assess hazards/threats	The importance of identifying potential risks. Understanding the impact of such a threat on a particular space. How to identify and assess a hazard.	Brief overview if an incident. What was the risk? How was it identified? How the impact of the hazard was identified.	Brief overview of the incident How the risk failed to be identified and/or how the impact was underestimated/overlooked/ignored.	That the threat had been identified How that threat had been identified (what process and techniques, how was information/research used) How the potential impact was understood. The benefit of identifying the threat (incidents avoided or prevented etc)	Illustration of how the threat had not been identified and/or underestimated. Any failings in the risk identification methods (if used). How the incident was a result of these failings.
2	Assess the vulnerability of urban spaces to specific hazards/threats	Understand what vulnerabilities the site may exhibit Understand what vulnerabilities the design may exhibit <i>Understand how to address these vulnerabilities</i>	What vulnerabilities and weaknesses were identified? How were they identified? What implications did this have for the design/management of the space?	What vulnerabilities were not identified/overlooked? Why did these contribute to the incident?	How the vulnerabilities of the site were identified How the vulnerabilities of the design were identified. What steps were taken to address these vulnerabilities. The benefit of identifying and addressing vulnerabilities.	How vulnerabilities were overlooked The impact of these vulnerabilities/weaknesses and contribution to the incident.
3	Determine the risk (i.e. the expected consequences of specific hazards/threats on specific assets)	Understanding how risk to a site is composed Developing a coherent approach to risk assessment	How was the overall risk assessed? What methods were used? How was this risk assessment used in the design/management of the space?	Was the overall risk assessed? If not, why not? If yes, was the method used flawed/inappropriate/inadequate?	Risk assessment undertaken The benefits of this risk assessment What was addressed as a result of any risk assessment and its impact.	Was a risk assessment not undertaken If undertaken, why was it flawed. What was the impact of the failure of the risk assessment.
4	Identify ways to reduce those risks	Understand what mitigation measures are available for particular hazards in particular sites.	What risk reduction measures were identified? How were they identified?	Were risk reduction options overlooked?	How were risk reduction measures identified What has been their impact in reducing/restricting/preventing incidents.	Why were risk reduction measures identified?
5	Prioritise risk reduction measures	Understand the implications of prioritising different risk reduction measures.	What measures were prioritised How was this decision made? What have been the consequences of this prioritisation? On balance, what has been the benefit?	Were risk reduction measured prioritised? If not, why not? If they were, why was this inappropriate?	What risk reduction measures were prioritised and used What has been the impact of this choice What has been the benefit – what has been identified as “acceptable” risk?	Were risk reduction measures used? What was the failure of the choice of measures, why is this more than an “acceptable” risk.

Table 3.2 Role and purpose of case examples by ISR Stage.

DESURBS Deliverable 1.3: Urban space incident database

The second set of cases is collated for use in Stages 4 and 5 of the ISR. These stages assist end-users in identifying appropriate mitigation measures. Cases collated here illustrate each option in use and the benefit it has derived.

Hazard Type	Mitigation Option	Examples of possible actions	Example	Description	Supporting Documents, Tools and Resources	What they offer
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Document Repository

The Document Repository has been created to catalogue and then link to a range of standards, regulations and other documentary material which can be attached to the end-users self generated report to provide supportive information which will aid decision making. The documents will be selected to provide coverage for all six hazard types covered by the DESURBS project and for stages 1, 3, 4 and 5 of the ISR (stage 2 is covered by incidents in the WP1.1 Incident List which provide examples of specific design weaknesses and vulnerabilities).

Appendix 4 illustrates the documents included to date in an abridged form. Further work will be undertaken to complete this dataset ensuring all hazard/threat types and ISR stages have appropriate documents. This work will be undertaken with consortium partners and in conjunction with end-users as part of the ISR and DSSP testing.

Tool Database

The tool database is designed to highlight tools which are relevant and may be useful to end-users in undertaking their risk assessments and assessing the appropriateness of mitigation measures. This includes the bespoke DESURBS tools as well as a wide range of non-DESURBS tools which provide complimentary support.

4 Conclusions

This report has outlined the ongoing work to populate the relational database. It has further developed and refined the database specification outlined in D1.2 to ensure that the most appropriate data is collated and stored in the most effective way.

Progress in populating the four datasets has been positive with the following key achievements:

- WP1.1 Incident List is now cleaned and ready to use in the ISR and DSSP. A protocol has been established and tested to enable this list to be continually updated.
- ISR Case examples for Flood and Storm, Earthquake, Events with Crowds and Terrorism hazards and threats have been collated and added to the dataset.
- A set of appropriate and relevant documents and tools have been added to the Document Repository and Tools Database to facilitate informed decision making through the use of the enable the ISR.

The database has been incorporated as a core component in the ISR (D2.3) and is now embedded within the DSSP (D5.2).

Appendix 1 – Protocol for Case Additions to WP1.1 Incident List

