

## CHAPTER 11

# A GIS Based Character Appraisal Toolkit

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### **Introduction**

#### ***A Background to The Evolution of Character Appraisals***

The evolution of character appraisals is closely connected to the development of British planning legislation. Section 69 of the Planning (Listed Building and Conservation Areas) Act 1990 defines conservation areas as ‘areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance’ (1). British local planning authorities have the statutory obligation to identify and designate such areas (2). These areas may vary in character, form and size and may contain listed buildings. On the other hand these may also exist as cultural landscapes with a sense of place “created by different components such as unlisted traditional buildings, historic street patterns, open spaces, trees, boundary walls, views or even sites of human activity such as market places, which combine to provide special character (3)”. British Local Planning Authorities (LPA) are bound through sections 70 and 71 to survey areas and designate conservation areas. In prescribing these areas it has become essential to compile conservation area character appraisals (4).

In a drive to create effective character appraisals English Heritage compiled successive guidelines. A series of ‘best practice’ guidelines were first compiled in 2005 with a ‘Guidance on conservation area appraisals’ (English Heritage 2005) and ‘Guidance on the management of conservation areas’ (English Heritage 2005). These consultation documents were further supported by a series of publications namely; ‘Understanding Place: an Introduction’ (English Heritage 2010), ‘Understanding Place: Historic Area Assessments in a Planning and Development Context’ (English Heritage 2010), and ‘Understanding Place: Characterisation and Spatial Planning’ (English Heritage 2011). The last in the series is ‘Valuing Places: Good Practice in Conservation Areas’ (English Heritage 2011) which proposes approaches and techniques adopting the principle of constructive and sustainable conservation.

The document ‘Valuing Places: Good Practice in Conservation Areas’ essentially highlights the importance of character appraisals and its benefits in delineating urban conservation areas (UCAs) and managing development control systems within UCAs;

An appraisal will help local authorities to develop a management plan for the conservation area because it analyses what is positive and negative, and identifies opportunities for beneficial change or the need for additional protection and restraint (5).

The principles set out in the document are connected to the exogenous effects or impacts of character appraisals. Character appraisals may have positive effects on real estate and on the property market. These have the possibility to valorise the historical fabric and channel new developments and enhance character through design. Character appraisals are also important in the sphere of education and academia because they integrate the multi-layers of history through landscape. Character appraisals give a full historical overview of the urban context and map the evolution and transformation of the area under study (6).

The second section of this valuable document sets out the process of character appraisals which follows a stepped approach with; an audit of heritage assets, an assessment of condition and definition of boundary. The document is forward looking with section 3 proposing effective management and launching of management plans through community engagement and applying a 'development team' approach (7). Effective management based on character appraisals leads to the elaboration of planning strategies which may include; "Local Plan policies, guidance, regeneration strategy, enhancement schemes, street and traffic management, trees, open space and green infrastructure strategy, enforcement and remediation strategy" (8). The necessity of fine tuning the application of character appraisals and to develop guidance to compile these assessments was significant. This demand resulted in the creation of toolkits directed at 'best practice' in the methodology of applying diverse criteria for these assessments.

### **Toolkits for Character Appraisals**

In the past 20 years Local Councils spurred the creation of toolkits for character appraisals in the United Kingdom. One of the most significant contributions to the development of character appraisal toolkits comes through Oxford City Council in 2008 (9). In partnership with the Oxford Preservation Trust and English Heritage, Oxford City Council directed its capacity building project with a mission.

The Toolkit was developed in response to a need to improve the robustness of assessments of character that inform planning decisions. It will be used to enhance the assessments made by a number of participants in the planning process including developers, council officers and members of the public (10).

The development of the toolkit went through a full consultation process and was supported by an online questionnaire. The working group which included Oxford University and the Civic Society had an ambitious brief.

...A pilot study to develop a robust checklist of indicators (or 'metrics') that will enable planning and other professional staff and lay people (including councillors) to identify key elements that contribute to forming character and to measure the significance/value of a Conservation Area that will be based on a robust methodology. The study will be written up and disseminated as best practice to other local planning authorities and interest groups partnerships (11).

Table 1: Structure or stepped approach to carry out the character assessment survey (13).

#### Detailed Character Assessment

1.	It works best on a street by street basis. If you wish to assess a larger area it will be worth surveying each street individually and putting together an overall picture after all the surveys are finished.
2.	Take an initial walk around your survey area. Use this opportunity to note your initial thoughts/perceptions of the area and assign a score to the broad character features.
3.	Taking photographs is strongly recommended as they can illustrate and visually explain any comments you make on the questionnaire. They are also useful to look back over after you have completed the survey.
4.	Annotating a street plan/map is also a useful way to explain certain features e.g. direction of views, location of key buildings, spaces, etc.
5.	Make comments using the explanation of terms to prompt your thoughts.
6.	Give a score to each feature based on your opinion of its negative or positive contribution to the space.
7.	It is also worth noting how the building/space/area being assessed relates to its wider context e.g. how a building sits within a street or a street within an area. The setting and interrelationships between the single element, such as a building, and the wider context, such as the street, are just as important as the quality of the buildings themselves.

The pilot study followed a staged approach with an initial phase addressing the target beneficiaries and fine tuning language and criteria in the third phase. Questionnaires were revised to increase accessibility and involve a wider audience in the consultation. The final product has generated; (A) an explanation tool on the character assessment toolkit, (B) a surveying tool for a detailed character appraisal, (C) a surveying tool for a rapid character appraisal and (D) guidance on resources, survey tools, management and assessment.

The Oxford Character Assessment Toolkit is formulated on a survey with 'a series of

themed questionnaires' (12). These are designed to prompt the assessment of those assets and features that might contribute to the character of the area, building or space. These themes give the option of a numerical score which rate or give a value and significance to the character of the asset. The scores may be subjective but the intention is to analyse comparatively trends by different individuals compiling the survey. The toolkit also suggests a 3-stepped approach in compiling the survey; (A) initial assessment or reaction, (B) the survey and (C) a final reaction. There is no prescribed methodology for the application of the survey. However the document recommends a structure to maximise the potential of the survey.

### **Applying Character Appraisals: The Maltese Planning System**

The application of character appraisals in the Maltese planning context did not arise through the legal obligations connected to the Development Planning Act (1992). Although similarly to the British Town and Planning Act 1990 the Maltese planning regime places an obligation on the Planning Authority (now the Malta Environment and Planning Authority) to schedule, list and protect heritage assets the formulation of character appraisals is not part of the legal or policy framework. Section 46 of the Development Planning Act (1992) refers to the listing and scheduling of assets.

The Authority shall prepare, and from time to time review, a list of areas, buildings, structures and remains of geological, palaeontological, cultural, archaeological, architectural, historical, antiquarian, artistic or landscape importance, as well as areas of natural beauty, ecological or scientific value (hereinafter referred to as "scheduled property") which are to be scheduled for conservation and may in respect of all or any one or more of the scheduled property make conservation orders to regulate their conservation...

However the obligation of assigning Urban Conservation Areas (UCAs) falls within the parameters of the 'Structure Plan of the Maltese Islands', specifically through policy UCO2 (14).

POLICY UCO 2: Provisional boundaries of Urban Conservation Areas will be defined for designation purposes, and precise boundaries will be specified in the relevant Local Plans. The village core boundaries contained in the Temporary Planning Schemes shall be used as provisional boundaries. The Planning will amend the boundaries of designated Urban Conservation Areas and designate additional Areas as appropriate for the fulfilment of its conservation objectives (15).

Through the development related pressure on the Local Plans and through the policy recommendations the Malta Planning Authority induced the compilation of Character Appraisals in 1999 with a joint pilot project focusing on the old city of Mdina. The joint project was developed by the Heritage Team of the Environment Management Unit and

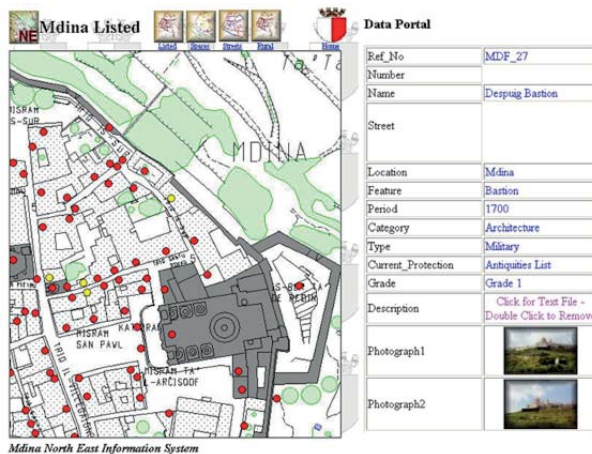
a study group from the Town and Regional Planning Department of Dundee University in Scotland (16). The compilation of the character assessment for the Mdina Urban Conservation Area was supported by a re-assessment of the National Protective Inventory (NPI) and the development of a GIS based NPI. The whole exercise was directed at the better management of conservation and sustainable development in the area. The development of the digital NPI was based on the Council of Europe criteria for inventories for cultural heritage assets. The focus on Mdina was twofold; (1) it was vital in directing sustainable development and attenuate negative development impact and (2) Mdina had been proposed as a UNESCO World Heritage Site in the tentative list and therefore necessitated a management plan. In planning terms the digital planning tool for Mdina was crucial because in a digitally oriented development control system the NPI could assist in determining planning applications. The NPI was also further extended to include streets and spaces following the grading regime or system adopted for buildings.

### The Initial GIS Structures

An initial project employing image-mapping and a webGIS option was initiated in the mid-2000s, which system created an early prototype system. This was based on the creation of spatial entities and attribute designations that were integrated with the digitised card material (Borg & Formosa, 2008).

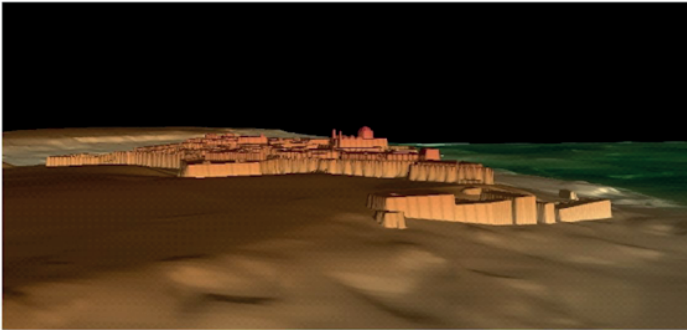
The systems were based on graphic interfaces, where scheduled property was activated by simply clicking on an image which activated the data portal relevant to that property as well as text boxes and property imagery (Figure 1).

Figure 1: Interactive Image-Mapping system and Data Portal.



The subsequent technologies employed for the Mdina Heritage Management System (HMS) were based on web-server technology, followed by plans for full Web-GIS systems. In sequence, this was followed by an initiation of a 3D modelling information system, which aimed to create a model of the city of Mdina in 3D allowing the GIS specialist to analyse the planning developments in real-time 3D, create a digital mirror of the town and analyse the impact of development. The use of early 3D modelling systems, GIS-add on applications such as raster generators (the systems were all vector-based at the time), helped create the first outputs (Figure 2).

Figure 2.: 3D Mapping System – Urban Structures and Topographic Integration



The concept was conceived for development around a VRML model. This would allow users to access the city model and other linked spatial information, which would have extracted data from the HMS. Figure 3 depicts the process entailed in converting the vector data to raster and to the eventual 3D model (Borg & Formosa, 2008).

The conceptual model, as envisaged, was still based on the vector structure employed in the national planning agency, but early on the authors stated that the process should be an augmented one, technologies that were still 6 years away from being developed. Borg and Formosa (2008) proposed that the solution was through the generation of an immersive building and topographic model. The technologies available at the time were used as surrogates towards this advanced system with data integration proposed through accessibility made possible by Image-Maps and map-server options. The resultant information system was envisaged to deliver a layered approach where users could access data that is available in an immersive clickable scenario through direct links to 3D models of buildings within historic cities. In addition, the system would incorporate links to multimedia, imagery, walkthroughs, HMS data, and access to a dynamic array of live information systems. Interestingly, the linkages between the different technologies has become a reality through the internet over the period to date. The internet made such

multimedia approaches a matter of fact, pushing the boundaries of the dissemination process. This was further enhanced through the transposition of diverse legislative tools that at the time had not yet been integrated into the Maltese system (OJ, 2003a; OJ, 2003b; OJ, 2007; Government of Malta, 2012; EC, 2014).

### Figure 3a-d: 3D Mapping System – Urban Structures and Topographic Integration

Figure 3a: The MapInfo stage  
– building heights



Figure 3b: Conversion to a grid file  
through Vertical Mapper



Figure 3c: The pseudo 3D interface  
for polygon analysis

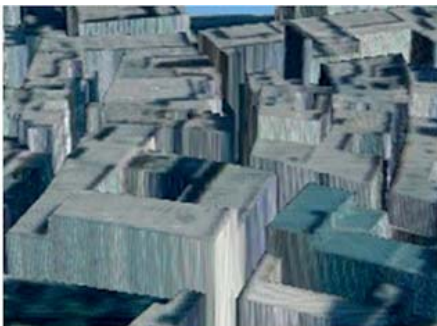


Figure 3d: Integrating orthophotos  
with the 3D interface



### The Next Steps

This innovation was followed by other character appraisals directed at facilitating the assessment and planning control in UCAs. The second project which followed similar assessment criteria and using the same tools were Pieta' and Kirkop (1999-2002). The



three pilots were later used to assess the effects on Urban Conservation Areas and in the compilation of the section on Conservation for the Structure Plan Review (2005) (17). Following these developments in 2008 the Ministry for Urban Development and Roads developed a character appraisal to direct the 'Marsascala Action Plan - A Transit Village for a Sustainable Community' and assist the compilation of project design briefs. Heritage Enterprise produced two main character appraisals between 2009 and 2011.

To develop the Valletta Action Plan through the co-funded Urbact project HERO and following 'best practice' a pilot area over the Marsamxett quarters was drawn-up. The HERO project which was based on the application of the Cultural Heritage Integrated Management Plan (CHIMP) was an opportunity to develop an Action Plan for the said area using Council of Europe and UNESCO parameters. This was further supplemented by a full character appraisal commissioned by the Valletta Local Council. The REPAIR Urbact project for Paola which had as its deliverable an Action Plan also used as a platform a character appraisal after the drafting of a baseline study. The character appraisal was deployed for planning and design and was crucial in the development of the heritage trail and interconnecting World Heritage Sites.

### **Toolkits: The Maltese Experience Through Other Applications**

The application of character appraisals has been a precursor in fine tuning toolkits geared specifically for strategic and action planning. In 2000 Heritage@Risk assessment criteria published by ICOMOS were for the first time used as a tool in the Maltese context. Heritage@Risk remains a significant tool to determine character and value of an asset. The project considered twelve sites from different categories but of critical value (18).

Heritage@Risk assessment is based on a survey determined by five set criteria (please refer to table 2). As in the case of character appraisal methods mentioned the structure also involves a scoring sheet with varying levels of risk within each set criterion. 'All the sites were therefore gauged in a holistic and standard format to provide an as objective as possible picture of the situation.' The critical assets were prioritised with a forecast of setting rapidly rehabilitation, restoration, maintenance and monitoring programmes. Some of these sites were not only of national significance, but were of universal value, and therefore were specifically targeted for management under an international conventions and charters regime (19).

In developing a more objective toolkit the Research and Information Team and the Heritage Management Team at the Planning Authority formulated a digital matrix with these elaborated criteria to record surveys and the extrapolate results (20). This matrix is important because it is supplementary and complimentary to the National Protective Inventory (now connected to the Scheduled Property Register) and in a proactive way supports 'sustainable conservation' policy implementation through sensible and sensitive



interventions. Heritage@Risk also assists as a tool in gauging value even for the purposes of economics of culture or heritage economics as it indicates the value of an asset through loss or damage and assists in calculating interventions. In most situations in valorising character through appraisals Heritage@Risk was a significant tool to further assess the value of a system or a group or complex of systems.

Table 2: Heritage@Risk criteria following ICOMOS conventions (21).

1.	Maintenance Deficiency
2.	Risks from Social and Collective Behaviour
3.	Insufficient Conservation Standards
4.	Development-Related Risks
5.	Compromised Values.

The demand to develop toolkits for assessment in the realm of heritage and culture is on the rise especially because experts and professionals in the field seek to substantiate value not only through qualitative data but also quantitatively through the analysis of indicators and statistical data. The application of a GIS based toolkit for cultural assessment was considered again in 2013. The need for digitising a toolkit for assessing fortified cities in Malta was contemplated through the surveys spearheaded by the Task Group working on the 'Circles of Sustainability Assessments' propelled by UN Global Compact Cities Programme through the Global Cities Institute (22). The Task Group composed of; political and administrative representatives from the cities, urban and environmental planning experts and citizens through the last quarter of 2013 applied the assessment on the fortified cities of the Inner Harbour of Malta with the support of European Walled Towns. The cities included; Valletta, Floriana, Paola, Vittoriosa, Cospicua and Senglea (23).

Table 3: The perspectives for the 'Circles of Sustainability Assessments' (24)

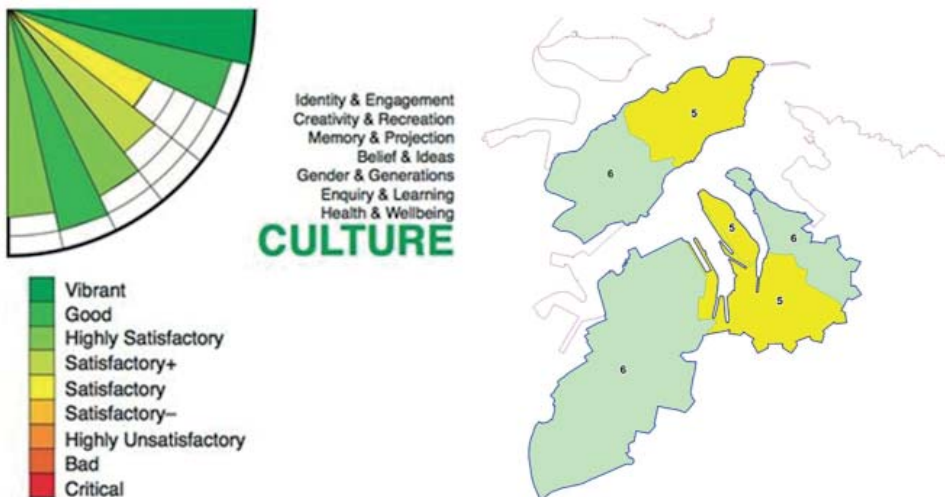
1.	Identity and Engagement
2.	Creativity and Recreation
3.	Memory and Projection
4.	Beliefs and Ideas
5.	Gender and Generations
6.	Enquiry and Learning
7.	Health and Wellbeing

The ‘Circles of Sustainability Assessment’ concentrated on the fourth domain culture. The results were presented in the Paola International Integrated Heritage Management Conference (December 2013). The results were presented supported by a paper following the criteria set by the questionnaire and therefore substantiated through ‘a major essay on the urban area using the questions to guide the writing’ and ‘assigning metrics-based indicators to each point on the scale’ (25). The Task Group went a step further as it was interested in grafting the results spatially and in the process it investigated the possibility of dovetailing these indicators to other area based environmental indicators. The questionnaire based tool makes use of a number of domains, sub-domains also referred to as perspectives and aspects. The questionnaire gives a further possibility of gauging the aspects through a scoring system (26).

### New GIS Technologies and Extending Character Appraisal Tools

New methodologies entail the uptake of new technologies. Having been instrumental in the conceptualisation of methods of dissemination in the mid-2000s, as described in the HMS exercise described earlier, the GIS-based toolkit employed a decade later, again took up new methodologies to investigate the study areas through the application of the ‘Circles of Sustainability Assessments’. From base-mapping exercises to fully immersive technologies, the new exercise elicited vital analytical outputs. Figure 4 depicts the vector-based output that integrated the model statistics in a 2D mode.

Figure 4: 2D models for perspectives for the ‘Circles of Sustainability Assessments’ applications. These will ultimately also sustain the compilation of Character Assessments



Preparing for the potential creation of an interactive 3D model of the islands, inclusive of the NPI, would require the uptake of various technologies and legislative tools, inclusive of diverse European Union directives (Formosa, 2012). Such was required due to the changes emanating from international and national initiatives and projects (GEO, 2014; OJ, 2003a; OJ, 2003b; OJ, 2007; Government of Malta, 2012; EC, 2014; MEPA 2009; MEPA, 2014).

The new process also entailed a series of steps that employed raster mapping as its core functions. The results allowed for the depiction of a series of spatial information structures, which, using the relative visualisation tools, would in turn result in the generation of real immersive information systems.

Figure 5 depicts the base layers created from a series of LIDAR data sheets pertaining to the Mdina area. This was made possible through the implementation of an ERDF project entitled Developing National Environmental Monitoring Infrastructure and Capacity [8], which involves monitoring of air, water, soil, radiation and noise and 3D terrestrial and bathymetric surveys. This project co-financed by the European Regional Development Fund, which provided 85% of the funding and the Government of Malta, which finances the rest under Operational Programme 1 - Cohesion Policy 2007-2013 - Investing in Competitiveness for a Better Quality of Life. The results from this project included terrestrial and bathymetric data covering the entire nation as well as 1 nautical mile from the baseline coast, at points of (0.25m – terrestrial) and 1m (bathymetric) resolution.

Figure 5: Initial Conversion steps (a) Mdina sheets integration in LasTools and (b) Mdina side perspective.

(a)



(b)



Taking the process one step further entailed the sourcing of dissemination technologies. This has been initiated and is under investigation for its potential to provide the tool for the realisation of the earlier exercise. Various tools were investigated and whilst dedicated

applications are available for the purpose of this exercise, an interactive tool was readily available, one with a low learning curve. The application under review, Minecraft, is based on a simple block concept which provides an environment with the main elements required for this exercise (27). Whilst technically a game engine, the application is instrumental in providing for the management of the spatial component and also providing access to the alteration of the virtual spaces. The immersive component empowers users with potential for the alteration of the surroundings, develop buildings, create scenarios and collaborate with other persons.

Figure 6: (a) 1m block conversion output – top perspective and the (b) Main square walkabout view.

(a)



(b)



Figure 6 depicts the result of the Figure 5 2D to 3D conversion. Various potential information systems can be integrated in such serious game environments allowing for the study of social interactivities that also depict the findings from the Heritage@Risk outputs.

### **Towards a Comprehensive Toolkit for Character Appraisals**

Building on the experience gained through the fine tuning of toolkits for character appraisals and other applications which are based on urban conservation management or related assessments a comprehensive toolkit should facilitate planning processes. A comprehensive toolkit will facilitate the data gathering processes and provide a GIS based tool which is accessible to all. In a world where urban planning is moving towards ‘decentralization and democratization where the actors may realise the set goals on a regional and local level rather than through a top-down approach’ a comprehensive toolkit for character appraisals will enhance good governance through a digital driven dynamic public consultation instrument (28).

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### Notes

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2) Op.cit.

3) MacCullagh, R., Conservation Areas, [online], <http://www.buildingconservation.com/articles/conservareas09/conservareas09.htm>

4) Op.cit.

5) English Heritage (2011). *Understanding Place: Conservation Area Designation, Appraisal and Management*, Helm, 5.

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7) Op.cit.

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9) There were other toolkits for character assessments and appraisals namely; the Stafford County Council, Edinburgh World Heritage, The Civic Trust of Wales and other tools listed on the Placemaking Workshop [online], <http://www.bathnes.gov.uk/sites/default/files/sitedocuments/Planning-and-Building-Control/Planning-Policy/Placemaking-Plan/toolkits.pdf>

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16) The team was coordinated by; Dr Malcolm Borg, Mr Bill Richardson (Planning Authority, Malta) and Mr Neil Grieve (University of Dundee, Scotland)

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19) Op.cit.

20) The project team was led and coordinated by Dr Saviour Formosa and Dr Malcolm Borg.

21) Op.cit.

22) Urban Profile Process Tool, [online], <http://citiesprogramme.com/aboutus/our-approach/circles-of-sustainability>

23) The task group was led by Dr Malcolm Borg in collaboration with Dr Saviour Formosa responsible for statistical analysis and Mr Victor Sladden advisor to European Walled Towns. Professor Paul James Director of the Global Cities Institute supervised the exercise.

24) Op.cit.

25) Urban Profile Process Tool, [online], <http://citiesprogramme.com/aboutus/our-approach/circles-of-sustainability>



26) Op.cit.

27) Minecraft is a game about breaking and placing blocks. At first, people built structures to protect against nocturnal monsters, but as the game grew players worked together to create wonderful, imaginative things. [online], <https://minecraft.net/>.

28) Borg, M., 'Corradino Lines Recreational Park, Management Plan (2013), quoting Geospatialworld [online],<http://www.geospatialworld.net/paper/business/ArticleView.aspxaid=30413#sthash.vYzAkclq.dpuf>.