## Northamptonshire County Council

Dear Ms. Stewart-David,

### RE: Mass Shelter Capability Project (ECHO/SUB/2014/693661)

Please find enclosed two copies of the final report for the Mass Shelter Capability (MaSC) Project.

These reports summarise the conduct and findings of the project although represent only a small proportion of the work undertaken as well as the benefits of the project both in the ideas produced and the softer networks that have developed.

We'd like to thank you for your support in this project and the opportunities it afforded. All involved found it to be a productive and worthwhile endeavour which I trust is reflected in the report.

If you have any queries, please do not hesitate to contact me.

Yours sincerely,

**Roy Boulton**
**Assistant Director for Environment, Planning and Transportation**

Northamptonshire
County Council

# MaSC Project
# ECHO/SUB/2014/693661
# Final EU Commission Report

MaSC

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## Project Overview

The Mass Shelter Capability (MaSC) Project is an EU Civil Protection Mechanism funded project to investigate Mass Shelter Capability options being led by Northamptonshire County Council (NCC) working alongside Technisches Hilfswerk (THW) in Germany and The National Directorate for Fire and Emergency Management (NDFEM) in Ireland.

Many risk scenarios have the potential to displace large numbers of people away from their homes to a place of safety. Within the UK the key risk driver relates to tidal flooding, however, across Europe there are a number of other potential risks, including Earthquakes, Tsunamis and Nuclear Accidents that may trigger a similar impact.

The aim of the project is to scope and provide planning guidelines on the development of a phased and modular capability which can be operationally deployed within five days. The design guidelines for this capability assumes provision for 10,000 people for a period of at least up six months, which represents an upwards revision from the six week timescale in the original project bid documentation.

To develop these guidelines the project organised and facilitated three sequential workshops, which will build on existing knowledge and experience relating to mass shelter in order to develop detailed criteria and planning guidelines for modular mass shelter capabilities. This will form the foundation for the future development of flexible, scalable and interoperable mass shelter EU civil protection modules and other capacities, as part of a broader EU capability.

### Anticipated Benefits

- Enhance understanding of shelter challenges across, suggesting solutions to improve the current systems through collective consideration of common shelter challenges
- Enhance understanding of risk profile across the EU that may result in the need for a mass shelter response.
- Support development of participating states own emergency response capabilities
- Support precursor activity for the development of future modules for EU civil protection mechanism

Outcomes will enhance capability, improving preparations to support citizens in times of crisis and cultivate a series of shelter delivery options supported by evidence of "what works".

### Products of the Project

- Mass Shelter literature review and case study analysis and EU mass shelter risk profile
- Validated mass shelter schedule of requirements
- Planning guidelines for development and implementation of a mass shelter capability
- Outcome reports for three workshops and project evaluation report

# Summary of Project Implementation Process

The MaSC Project was divided into distinct phases and worked to deliver tasks against the amended project timeline plan agreed at Project Meeting 1. The initial bid documentation timelines and revised timelines are shown in Table 1 below. The largest change was to move the workshop dates back to allow greater time to plan the workshops and ensure that the project could engage with the most appropriate delegates.

**Table 1:** Initial bid documentation timelines and revised timelines.

| Task | Original Bid Timeline | | Amended Project Timeline | |
|------|------------|-------------|------------|-------------|
| | Start Date | Finish Date | Start Date | Finish Date |
| Task A:<br>Task Management &<br>Reporting to the<br>Commission | 01/01/2015 | 31/12/2016 | 01/01/2015 | 31/12/2016 |
| Task B:<br>EU Mass Shelter Risk<br>Profile | 01/01/2015 | 30/04/2015 | 01/01/2015 | 25/09/2015 |
| Task C:<br>Mass Shelter Literature<br>and Case Study Review | 01/01/2015 | 30/06/2015 | 01/01/2015 | 25/09/2015 |
| Task D:<br>Workshop 1: Context,<br>Analysis and Options | 01/02/2015 | 31/08/2015 | 01/02/2015 | 01/12/2015 |
| Task E:<br>Workshop 2: Module<br>Specification | 01/05/2015 | 30/11/2015 | 01/05/2015 | 07/02/2016 |
| Task F:<br>Workshop 3: Logistics<br>and Operationalisation | 01/08/2015 | 28/02/2016 | 01/08/2015 | 28/04/2016 |
| Task G:<br>Modelling and Validation | 01/02/2015 | 30/06/2016 | 01/02/2015 | 30/06/2016 |
| Task H:<br>Mass Shelter Capability<br>Planning Guidance | 01/07/2015 | 30/11/2016 | 01/07/2015 | 30/11/2016 |
| Task I:<br>Task Publicity | 02/01/2015 | 30/11/2016 | 02/01/2015 | 30/11/2016 |
| Task J:<br>Project Evaluation | 01/03/2015 | 30/11/2016 | 01/03/2015 | 30/11/2016 |

The Core Project team is comprised of seven team members, four from NCC- Matthew Hoy, Project Manager; Natalie Laugher, Project Co-ordinator; Julia Partridge, Project Support and Becky McClelland, Project Administrator, two from THW- Maren Jaschke, Technical Officer and Stephan Mack, Senior Office and one from NDFEM- David Hickey, Technical Officer. The project team is being further supported by representation from UK government departments, specifically the Cabinet Office and Department for Communities and Local Government.

The project was managed using PRINCE2 project management principles and methodologies with the project team is making use of a UK based secure extranet to assist information sharing. As well as the seven formal project meetings the project team held two planning days prior to Workshops 2 and 3.

# Evaluation of Project Implementation Process

The application of PRINCE2 methodologies is a proven system for managing projects of a similar nature to the MaSC project and served the project well particularly in the workshop delivery phase. Each of the workshops entailed a complex array of activities in order to coordinate and deliver an effective programme for both delegates and the project objectives.

## Activities

### Task A: Task Management & Reporting to the Commission

*Objectives*

- Coordinate activities and task to ensure effective delivery of the project and achievement of project objectives
- Coordinate all project documentation
- Provide 2 x interim reports to EU Commission
- Provide final report to EU Commission (see Task J)
- Recording the project as a case study in itself

The coordination of activities and tasks within the MaSC project was initially designed to be organised using the application of PRINCE2 methodologies which is a commonly used and well recognised standard for project management. In applying this methodology the project was divided into a number of identifiable stages with identified deliverables for each stage (Figure 1).
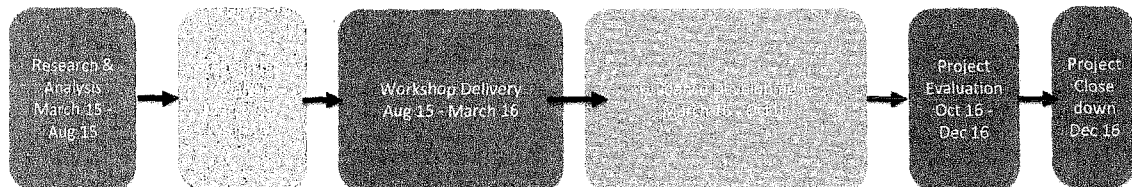


**Figure 1**: Phases of the MaSC Project. More detail of these phases and how project activities were aligned can be seen in the overview project plan.

Whilst overall project management remained within the PRINCE2 framework, a more AGILE project management approach was adopted for the workshop delivery phase. This was to reflect the complex and iterative series of activities required to design and successful deliver the workshops, ensuring that each workshop built upon the outcomes of the previous given the approximately eight week separation between workshops. The AGILE approach treated the workshop delivery phase as a series of 'sprints' with clear tasks to be deliver in preparation for the next.

Core project documentation was shared between partners using a secure document sharing platform provided by the UK Cabinet Office, known as Resilience Direct. This allowed for all partners to access project documentation at any time and provided a central repository which allowed for greater coordination of development.

Interim reports were provided on time to the European Commission however the final report was delayed due to a significant business continuity disruption affecting the project.

Throughout the project there was a variety of travel requirements, particularly in relation to the workshops and therefore the approach was taken that travel, accommodation and subsistence would be coordinated centrally. This process was beneficially supported by the competitive procurement of a travel management company,

Horncastle Executive Travel, who worked as the principle provider to manage all travel requirements for the workshops and project meetings held in the UK and Ireland. They also managed requirements for other related events attended by members of the project team in support of the MaSC Project.

The project team retained an oversight throughout the contract, acting as a liaison with the contractor and attendees. This assisted the project team to manage the event by maintaining a full awareness of the travel schedule being managed by the contractor.

The resource commitment from the project team was considerably reduced by the appointment of the contractor. Beneficial results of the appointment of a specialist organisation were demonstrated by the quantity, and in many cases complex requirements, of the transport solutions required for each event. It enabled individual attendees to request a travel schedule which met their individual requirements, and so retained the exceptional service level aspired throughout the project.

A cost effective service was provided due to the nature of specialism held by the contractor. Their access to industry specific travel and accommodation booking systems, not available on the open market, enabled the most economical available solutions to be sourced.

An evaluation of workshop travel arrangements was favourable. The majority of attendees praised the smooth running travel arrangements and the excellent organisation and communication. A few minor issues were identified during each workshop and captured during the post-event evaluation process. Lessons learned were applied to future events to avoid future incidents.

**Task B: EU Mass Shelter Risk Profile**

*Objectives*

- Identify and describe risk scenarios which may lead to this level of mass shelter requirement.
- Complete geographical analysis to identify and prioritise EU mass shelter risk locations
- Prepare EU mass Shelter risk profile report and presentation

The completed Mass Shelter Risk Profile can be found at http://www.mascproject.eu/masc-live/Documents/MASc%20Risk%20Assesment%20Final%20Report%20Final%20Version.pdf

Task B was a specific task designed to ensure that the project itself was grounded in a sufficient understanding of the mass shelter risks across Europe by undertaking a desktop risk profiling exercise. In short, the purpose of Task B was to confirm whether the planning assumption being used by the project was realistic and which countries within Europe would be considered to have a mass shelter risk.

To ensure both rigour and impartiality in this assessment, academics from Coventry University were commissioned to develop a profile of EU Mass Shelter Risks and present their findings during the first workshop in Northampton.

The review itself was a desktop analysis of the available geospatially referenced data and was therefore limited by the availability, resolution and quality of this data; data availability being the key controlling factor in the analysis undertaken.

In response to the limited availability of data for large magnitude hazard events, the Coventry University team used analysis of historical events and application of estimates from models to define a "hazard zone" estimation method on a hazard by hazard basis. In so doing, a simplification of hazard processes and controls had to be done in many cases.

The output data produced does not define the risk posed by the hazards, in as much as it does not take into account any vulnerability parameter such as age, income or disability, rather it identifies the populations that are within the "hazard zone" as defined by the Coventry University team.

Whilst this profiling gives an indication of the scale of mass shelter hazards and suggests geographical areas where risk analysis should be conducted, it does not replace or replicate more detailed assessments which the areas in question may wish to consider.

For the purposes of the risk profile, mass shelter hazards were deemed to be those high impact/low probability events which were likely to result in a population in excess of 100,000 being displaced or made otherwise homeless, leading to a requirement for shelter to be provided for more than 10,000 people.

Ten hazards were considered for their potential to result in a requirement for mass shelter. Each required a slightly adapted assessment methodology to reflect limitations on the availability of data which is detailed in the full report. A summary of the findings for each hazard can be found by here:

- Earthquake
- Volcanic Eruption
- Tsunami
- Forest and Wildfire
- Landslides and Slope Mass Failure
- Coastal Flooding
- Inland Flooding
- Dam failure
- Nuclear Incident
- Chlorine and Petrochemical

The two biggest challenges encountered in the development of the mass shelter risk profile were:

1. The availability of publicly accessible high quality hazard and risk data at sufficient resolution
2. Accounting for the wide range of variability sufficiently to allow for desktop analysis on a pan European level

In addressing both these issues it was necessary to develop pragmatic workarounds which would allow for objective analysis of the available data so that broad conclusions could be drawn.

Coventry University, who undertook the research and authored the final report were very keen to emphasise that the findings are ultimately an indication of exposure to potential displacement events and that they are not a substitute for detailed country level risk analysis.

Despite the limitations described above, the risk profiling work identified that over 300 million people within Europe live in areas considered to be exposed to hazards which may cause displacement or homelessness. Two thirds of these are accounted for by exposure to earthquakes and/or flood risk.

Although the total number exposed was very high, this is an aggregation of a lot of smaller scale risks. For each of the ten hazard scenarios the authors attempted to describe what they considered to be the reasonable worst case scenario and give an indication of what the mass shelter requirement would be in this circumstance.

In terms of a single event hazard, the authors concluded that the reasonable worst case scenario in terms of numbers of people exposed, would be for a 6 m surge in the North Sea Basin which has the potential to displace more than 10 million people in a single event and could lead to a mass shelter requirement of more than 400,000 people.

**Task C: Mass Shelter Literature and Case Study Review**

*Objectives*

- Within defined parameters collect and review existing academic work relating to mass shelter to synthesis common themes and considerations
- Within define parameters collect and review case study work relating to mass shelter to synthesis common themes and considerations
- Prepare report summary for presentation at Workshop One

The final report was received by the project team in September 2015 prior to the first workshop and is available at http://www.mascproject.eu/workshops/Documents/Workshop-1-Northampton/MaSC%20Project%20Literature%20Review%20Report%20September%202015.pdf

A Literature Review is a common starting point for any research project and is intended to establish clearly a baseline of the existing knowledge as well as identify themes, trends and lessons that can be derived from this. For the MaSC Project, a Literature Review was felt to be an important early step which would inform all subsequent work and so was included in the project plan as a task in its own right (Task C).

The core of this action was a comparative review between available written material to find common themes and lessons which could be used to inform discussions at the workshops including identifying those areas where there was a divergence between theory and reported experience.

To ensure both rigour and impartiality, academics from Northumbria University and the United Nations University were commissioned (via the UK Cabinet Office, Emergency Planning College) to undertake the Literature Review and present their findings at Workshop 1 in Northampton.

The Literature Review applied both a systematic and non-systematic approach to identify relevant documents. The authors considered peer reviewed academic literature as well as relevant research and reports produced outside of the traditional publishing channels and included documents identified on the basis of recommendations of experts and practitioners. A review of available academic research identified 291 papers that had content that may have been relevant to the project. A detailed review identified that of these 73 were relevant to the project.

Case studies evaluated for this Literature Review included:
- 2002 European floods (Czech Republic and Germany),
- 2005 Hurricane Katrina and Hurricane Rita (USA),
- 2007 Typhoon Krosa (China),
- 2007 California Wildfires (USA),
- 2008 Sichuan Earthquake (China),
- 2008 Hurricane Gustav (USA and Cuba),
- 2009 L'Aquila earthquake (Italy),
- 2010 Haiti earthquake (Haiti),
- 2011 Fukushima (Japan),
- 2014~*onward* Syrian Refugee Crisis.

The review targeted literature concerned with shelter operations rather than post-disaster reconstruction, although this also included references and information about shelter operations, and the constraints that emerge from their long-term existence. A point of convergence between the documents reviewed was their focus on capabilities and the gaps as well as challenges in the implementation of existing guidelines and standards on mass shelter.

As well as conducting a review of the available literature, the authors were asked to report on their findings and make recommendations on key lessons as well as on areas which the MaSC Project should consider exploring in more detail.

The final Literature Review report details the methodology used in full as well as some of the limitations and difficulties encountered by the authors.

A limitation of specific note is that there were several difficulties in identifying and reviewing the outputs from previous EU projects that may have looked at emergency shelter provision. Improving access to learning between past and current EU projects is an area that it may be valuable for the commission to explore.

The review of existing guidelines, best practice reports and case study experiences in mass shelter has underlined the importance of exploring the prospects and challenges of mass-scale shelter planning. Existing guidance documents rarely acknowledge the need for planned camps as a shelter option, and thus routinely fail to provide effective contingencies for such shelter arrangements. Yet, as natural hazards are increasing in intensity and frequency in the context of climate change, planning for catastrophic events emerges as an urgent necessity in EU civil protection planning.

There is an abundance of best-practice guidelines and planning tools for effective shelter planning and establishment from various national and international stakeholders. These guidelines provide an extensive overview about "what good looks like", but are often not considered in disaster situations, where complex and rapid emergencies often trigger spontaneous and largely disorganised response measures. Moreover, they often refer to a context of humanitarian relief in developing countries, and thus it is necessary to consider ways in which existing guidance can be transferred, and where necessary, adapted to a European civil protection context.

At the heart of many of the struggles and challenges encountered in the case studies reviewed was a discovered tension between efficiency and effectiveness of shelter planning. This trade-off closely relates to questions of participation. Participatory shelter planning strategies that identified and acknowledged the needs of the displaced population seemed to be less efficient (provision of shelters in time and on budget), but more effective (the long-term impact of programmes and their success in facilitating transition and development). Sometimes, what is best for authorities as shelter providers constrained by time and capacity might not be what is best for the displaced population for facilitating a speedy recovery and reconstruction.

Given the lessons identified in the case studies examined for this review, the development of capabilities to underpin the "last resort option" of planned camps should be considered as an essential contingency in terms of delivering an all-hazards encompassing European civil protection practice. What is important, however, is that such planning should be considered positively, in the sense that it also has the potential to yield important capacities, insights and lessons that inform the development of capabilities for dealing efficiently and effectively with the full spectrum of shelter options.

**Task D: Workshop 1: Context, Analysis and Options**

*Objectives*

At the end of the workshop participants will:

- Received contextual information on the challenges for effective mass shelter planning and execution based on literature and case study review
- Appreciate the extent of identified risks across member states that may result in such a mass shelter consequence and received a visualisation representation of those hazards that can be geographically plotted
- Considered options available to deliver an effective response to mass shelter based on project planning assumption of 10,000 for six weeks

Sedgebrook Hall in Northampton was the venue for this workshop which was held on the 24th and 25th September 2015 in Northampton. This workshop focused on the challenges of Mass Shelter, the background of the project and what the project is looking to achieve. The workshop was well received by the delegates and following on from the debrief, the project team were able to refine and make adjustments to Workshop 2. Information relating to the workshop including videos of the presentations delivered can be found at http://www.mascproject.eu/workshops/pages/workshop-1-northampton.aspx

The following outputs were produced from the workshop Revised Planning Assumption, The Composite Schedule of needs, Settlement Typologies, Guiding Principles for Intermediate Mass Shelter and further developments to the MaSC Project Data model.

Whilst all the outputs of this workshop were very beneficial and formed the basis for the remaining workshops it is of particular note that it was as a result that the core planning assumption was amended to extend the sustainability time frame from six weeks to 'at least six months'

Discussion of questions raised by the literature review directly led to the development of the settlement typologies which also identified that planned intermediate settlements were a necessary, albeit last resort, option for which countries exposed to mass shelter hazards should consider developing capabilities to deliver.

A key challenge for this first workshop was in identifying and securing participation from a range of different organisations with views and expertise that could effectively contribute to the project. In part this stemmed from the MaSC project being an unknown within an established field of work. Whilst this challenge was adequately addressed it was an issue of note for future similar workshop based projects.

The workshop itself consisted of six 90 minute sessions spread over two days with each session focusing on a different topic or theme. The sessions were a combination of presentations and related task(s) designed to elicit ideas from the delegates in order to progress different areas of thinking in relation to mass shelter requirements and solutions. For example the second session consisted of a presentations from Coventry University regarding the risk profile (Task B) together with tasks designed to review and improve the core planning assumption for the MaSC project.

At the conclusion of the workshop a structured debrief was held by the planning team in order to identify any issues or particular successes from the workshop that should be addressed or incorporated for subsequent workshops. This was compared to feedback from the participants and used to identify recommendations for continuous improvement and a debrief report prepared. Many of the issues identified were practical in nature but by adequately addressing them it improved the experience for delegates at Workshops 2 and 3.

**Task E: Workshop 2: Module Specification**

*Objectives*

At the end of the workshop participants will have reflected on options explored in Workshop 1 and through information sharing, debate and discursive activities:

-   Segmented options into common response modules
-   Developed the range of considerations to be applied to each module and
-   Explore what capabilities would ideally be needed for effective execution of each module

This workshop took place on the 7th and 8th December in Dublin at The Davenport Hotel, this was the longest workshop as a decision was made to extend it to two full days in order to achieve the greatest benefit from the delegates. Information relating to the workshop including videos of the presentations delivered can be found at http://www.mascproject.eu/workshops/pages/workshop-2-dublin.aspx

Workshop two developed the Concept of Deployment, a Triage and Registration Process and the basis of a five day schedule of works for site construction.

At the outset of the project design it was intended that this second workshop would focus on the specification of a 'module' for addressing the capability gaps that exist in relation to Mass Shelter. However in progressing the outcomes of the first workshop the focus of this second, extended workshop (eight 90 minute sessions) shifted to concentrate more on the concepts that would be required to underpin the early activity in the implementation of any mass shelter solution.

Of particular value was the incorporation of an extended planning task for delegates where they were presented with scenarios and asked to work in small groups to design potential solutions and identify the key issues and challenges that arose from their proposals. Each group was asked to present their ideas in the early afternoon with delegates then offering constructive feedback. An amalgamation of the ideas presented formed the basis upon which the concepts of deployment were developed.

As with the first workshop, a structured debrief was conducted at its conclusion in order to assist the design and delivery of the final workshop.

A key learning point was the need to continually emphasise the core concepts behind the project and the planning assumption to which the project was working. It was found that several delegates viewed the objective as set out in the planning assumption as 'impossible' which at times impacted on their ability to engage with the tasks that were set in a meaningful and constructive way; however regularly relating back to both planning assumption and the risk profile upon which this was based helped to overcome this.

**Task F: Workshop 3: Logistics and Operationalisation**

*Objectives*

At the end of the workshop participants will have:

- Received presentation of the validation work at Task G
- Considered *capabilities* identified in Workshop 2 within context of validation work at Task G and draw conclusions on what priority capabilities are needed for effective execution of each module to respond and recover from common consequences of major civil emergencies
- Used validation work at Task G to understand how much capability by module might be needed to deal with an incident requiring mass shelter and set out where that can be sourced within both an individual member state and cross European context

This workshop was held at the Courtyard Marriott in Berlin on the 22nd and 23rd February 2016. Workshop 3 focused on the operational needs of MaSC, the work from the delegates at this workshop will be incorporated into the guidance document as part of Task H. Information relating to the workshop including videos of the presentations delivered can be found at http://www.mascproject.eu/workshops/Pages/workshop-3-berlin.aspx

The format of the third workshop was similar to the previous workshops in that it consisted of six 90 minute sessions which focused on what would be required in terms of knowledge, expertise and resources in order to effectively deliver a mass shelter solution.

An important part of this workshop was also to review and update the outputs from previous workshops and seek feedback on the developments. For example, a draft version of the concepts of deployment animation was presented and comments sought from the delegates, many of whom had been present at the previous workshops.

The workshop looked in detail at the ideas of Mass Shelter from the perspective of a deployable capability and therefore key outputs from this third workshop included an updated five day schedule and significantly more detail in relation to the roles and management structures likely to be required. Whilst good progress was made in these areas it was identified that significant extra detailed work is required and therefore their further development were incorporated into the successful MaSC II grant application.

The final session of this workshop concentrated on what delegates would want from any guidance produced as a key aspect from the project team's perspective was that any guidance produced would be both useful and likely to be used. There were a wide variety of views collected from participants, many of which conflicted with other views expressed however the consensus seemed to be for the guidance to be easily navigable with a series of easily accessible tools.

Although this represented the final workshop in the MaSC project a debrief was also conducted in order to identify opportunities for future learning and a debrief report prepared.

**Task G: Modelling and Validation**

*Objectives*

- Taking outcomes from Task D and E for each module draw up a capability requirements list required to affect and initiate an effective mass shelter response
- Develop desktop validation models to assess the schedule of requirements and identify significant constraints capability and capacity data
- Presentation of key findings to inform Workshop 3 (Task F)

The project team had a key ambition to develop practical tools that can be utilised by responders to support their response efforts. One primary tool, identified, that has currency across planners and responding agencies is the development of desktop site assessment and resource modelling tools for potential mass shelter locations and scenarios.

The project team identified that this aspect of the project deliverable required a professional specialist contractor to act as a Data Modelling and Validation Partner for the MaSC Project to deliver on the concept and arrive at a working modelling tool. Scoping work was undertaken by the project team in the early part of 2015 and a request for quotation (RFQ) was published on the Source Northamptonshire website for a period of four weeks, in addition project partners distributed to potential providers.

Follow a competitive tendering process, DIEM consulting was appointed as the successful contractor appointed in March 2015 and worked as a principle contractor attending all workshops, utilising delegate's expertise to help shape the development of the model.

The intention of such a tool was to provide responders with a modelling device to enable them to establish parameters based on their unique set of circumstances, i.e. the numbers that needed to be accommodated and the limiting factors they needed to work within and the tool would calculate quantities and numbers of resources that will be required to execute an effective shelter response over the period of time that the shelter solution needed to be active. The tool consists of simple spreadsheet type format where practitioners can insert figures on the scenario they are facing or the resources available and then see the additional requirements or capacity that therefore exists and so make a judgement as to the viability and sustainability of the situation.

The aim was to provide a tool that has real practical application for responders to affect a proportionate, emergency shelter response.

In developing the tool there are two primary features which add value to the utility of the product.

- The development of a mathematical model construct setting in place calculations/equations that will work out what is required for site planning. It also goes into detail around peak demand and average demand and will cover things like how much of the water that is used will be converted into waste. This will also provide the scalability calculations needed and has a series of defaults and adjustors so that selections can be adjusted according to demand and need.

- An overlay of regulatory standards to be considered in the building of the emergency shelter solution. The contractor carried out research and a comparative analysis of regulatory standards in participating states of the Mechanism to identify pertinent standards and has incorporated these into the model allowing for flexibility with utility across a wide range of member states. As well as to EU regulations, the internationally agreed minimum standards (SPHERE / UNHCR / WHO) would be the regulatory basis for civil protection operations.

The modelling tool was utilised throughout the workshops developing it through an iterative process alongside the wider consultative and discursive elements of the workshops. Within each workshop delegates explored and drew up capability requirements list across all aspects of a shelter response need including utilities, human resources, land space, building materials, on site services and other schedule of requirements to affect and initiate an effective mass shelter response. The contractors incorporated into the modelling tool known regulatory parameters taken from EU and national regulatory foundations, where available, adding value to the modelling tool by setting it within a regulatory framework.

Beneficial results of this tool were demonstrated within the workshops events even as it was in development stage. It allowed delegates to have greater clarification on planning parameters. Using the tool within the workshop exercises to establish common understanding of numbers and quantities required, enabling the delegates to discuss both limitations and solutions with a commensurate degree of certainty resulting in far more solution focussed conversations.

By utilising the model during the workshop sessions delegates drew out a number of additional considerations, such as the importance of focussing on complexity of supply chains for delivery cycle forecasting and planning and the vital importance of staffing resource profiling to smooth out potential bottle necks through the processes and mitigate potential cascade consequences to the supply of services.

Taking the modelling tool and discursive outcomes and conclusions from all the workshops the project develop an analysis toolkit which allows responders to assess any identified site for suitability as a mass shelter site for the full range or a sub set of modules as defined though out the workshops to accommodate the planning assumption of numbers and timescale for shelter. The analysis tool kit is a physical check list which can be completed to support responder's conclusions and decision making process.

Within the timescale of the project we have been able to field test the utility of the tool within an exercise scenario, using local responders in the county of Kent in the United Kingdom. This provided final validation process for the tool, taking place in Autumn 2016. Future lessons learned by application of the tool to be incorporated into further developments of the tool kit, this work has been identified as potential on-going work beyond end date for the project.

**Task H: Mass Shelter Capability Planning Guidance**

*Objectives*

Produce planning guidance for responders that will support individual capability programmes to respond to and recover from the common consequences of major civil emergencies, with resulting mass shelter consequence, as defined by the project planning assumption to deliver an effective response to mass shelter based on project planning assumption of 10,000 for six weeks. Guidance will include:

- Defined contextual information on the challenges for effective mass shelter planning and execution based on literature and case study review (Task C)
- Identify shelter options and common response module segments
- Describe the range of considerations to be applied to each module
- Summarise validation work at Task G to demonstrate how much capability by module might be needed
- Set out suggestions where that can be sourced within both an individual member state and cross European context

Task H related to the drafting, design and production of guidance material to summarise the outputs of the information collected and developed over the course of the project. In effect, Task H represents the primary output and main legacy of the MaSC project in that it is intended to make the ideas and tools useable to others.

The purpose of this task was to produce planning guidance for responders that will support individual capability programmes to respond to and recover from the common consequences of major civil emergencies, with resulting mass shelter consequence, as defined by the project planning assumption to deliver an effective response to mass shelter scenarios.

The development of the guidance has been considered throughout the project process. The overall objective for this guidance has been to develop something that in both design and content is useful to planners and responders and also likely to be used. With this objective in mind it was felt that creating the guidance in a format that was optimised for online usage would have the greatest potential and allow the incorporation of a variety of media formats.

The workshop phase of the project presented an opportunity to consult with the target end users for the guidance in order to assess and prioritise their requirements and preferences. The guidance was referenced at various stages throughout the workshops and planning process however the bulk of discussion took place during two sessions where it was focused upon.

In both cases the delegates were presented with an introduction to the guidance and then asked to review a copy of the product description. Accompanying this were then a series of questions designed to elicit discussion and to collect ideas and views.

The first look at the guidance document took place towards the end of the first day of Workshop 1 in Northampton, UK. During this first day the concentration of the workshops had been on establishing the context and requirements for mass shelter as well as describing what standards and guidance already existed. This allowed for a discussion towards the end of the day which could shift the conversation toward the areas were the MaSC project could create the most value.

Delegates were specifically asked:
- What information would be most useful at the time of an incident?
- How would you want this information presented?
- Are there any lessons from current guidance that the MaSC project should particularly seek to address?

This identified a number of areas for the project to consider but also highlighted themes around providing a range of tools that could be used by various actors and ensuring that they are all joined up. For some delegates there seemed to be a desire for the guidance to walk them through the preparedness activity that may help them and provide quick reference reminders for immediate actions should the capability be required. This feedback has directly led to the development and inclusion of the Emergency Actions section of the guidance.

The product description was refined and updated over the workshop phase before being presented back to delegates in the final session on the final day of Workshop 3 in Berlin. It was presented at this stage to act as a focal point for how to bring together all of the issues, ideas and concepts that had been developed throughout the workshop phase. This then was used to give the MaSC project team a clear steer on how best to progress the guidance development phase of the project in order to make the product useful to stakeholders.

In the third workshop, delegates were asked:
- Who do you see as the audience for the guidance?
- How would you envisage the guidance is used?
- What do you think should be the major areas of content for the guidance?
- What format/style/ structure do you think would make the guidance most likely to be used and do you think a hard copy version is essential?
- What do you would be the best way to share the completed guidance and associated products?
- How do we maximise the value of the work of the project?
- Any other comments?

There was a long list of information collected in response to these including a list of more than twenty distinct groups of actors who were seen as the audience for the guidance.

One of the main conclusions that we drew from this feedback was the need to make the guidance as accessible and flexible as possible in order to allow users to access and apply the tools and different aspects within their own political, cultural and organisational contexts. The driver seemed to be to make the guidance relevant and applicable so that it did not stand alone but formed a hub from which other information could be accessed and in doing so helped support shelter responses more generally of any scale.

The format of the final guidance was a source of much discussion within the project team and by the delegates. There were a wide range of views expressed and often this reflected individual attitudes towards technology and the different operating environments they would expect to make use of the guidance. What was clear was that the hope was for the guidance to be concise, useful and applicable in a range of circumstances.

In determining a format for the guidance four broad options were considered:
1) Printed, bound hardcopy guidance document
2) Designed single guidance document published online
3) Online format guidance with print capability
4) Online/App form only

Consideration and debate of the various merits of each of the above options became one of the major topics of discussion for the formal project team meeting held in April of 2016 in Cork, Ireland. This meeting provided an opportunity to conduct a gateway review of the workshop delivery phase and by taking on the comments of delegates, plan out the development of the guidance.

In reviewing the options it was considered that a single published hardcopy format would be the most limiting in terms of production and distribution. The project team also reflected on various other guidance where a hard copy had been produce and considered that this was not always the most accessible means of communication.

Publishing online was felt to be the most effective means for communicating the guidance for both distribution purposes and because a search functionality would enable users to quickly identify the particular aspects they

were looking for. It also presented the opportunity to integrate a more diverse range of material and media content into the guidance.

As part of this discussion it was agreed that we should aim for more encyclopaedic content which would be easily navigated as well as allowing greater scope for alteration, addition and further development. It was also agreed that we should retain the ability for users to print the documents to enable offline access to the material.

In effect the project team decided that the Option 3 was the best way forward, with the emphasis on online functionality.

Having made a decision to focus on an online encyclopaedic style for the guidance the work to develop this formed two parallel tracks of work. The first of these was to create the platform itself with the second to be to generate the content in the form of articles.

In order to publish articles and make them available to end users we first needed to create the system and front end interface that would house the guidance, and so work began with our technical and media contractor, RJDM, to develop the platform for this using the Umbraco content management system as a basis. In order to meet the requirements of the project it was then necessary to work with software developers to add both features and design to the basic system. This represented an area of additional spend not originally anticipated however affordable due to the savings delivered on travel and subsistence.

In visual design terms the intention was to create a relatively straightforward look that was consistent with the branding that had been used throughout the project and most notably in the use of colour as a navigation tool. In terms of the design, part of the goal was to give the site being developed an intuitive feel that would, as far as possible, be familiar to users by using common iconography.

There was also a requirement to develop a number of features to allow for the integration of additional media and to give the users more flexibility in curating the content. For the most part these consisted of a range of smaller items such as search facilities, user administration, an integrated glossary and general navigation controls.

The major additional feature was the development of a system for curating articles into folders or books which would order the articles in a more traditional format. As well as helping to order articles on particular themes it also allows for them to be printed thereby meeting one key requirements raised by the project team and the workshop delegates.

In creating this tool it had the added advantage of allowing end users to customise their own books, to add or remove articles as fits their specific context as well as making notes which support their understanding and application. Underpinning all of this was a concept that the articles themselves would be live and so any update would be immediately replicated in all the books and folders which reference this article.

In combination with the book functionality of this has allowed the creation of an evolving guidance resource which can easily be expanded or adapted, and which will be developed further through the MaSC II project.

**Task I: Task Publicity**

*Objectives*

- Throughout the project, develop and maintain profile amongst partner member states and across other European member states and promote European support for the project, through specific identification of EU support, in line with project publicity regulations, on all inputs, outputs and deliverables
- Maintain EU publicity requirements on activity that continues beyond project end date, for example continued promotion of guidance material for at least twelve months after project end date

A dedicated project micro site has been set up at mascproject.eu and was used to great effect during the workshops as the presentations were uploaded during each session. During the workshops the presentations were filmed by the projects multimedia partner RJDM and these are now available on the website.

The project website provided an easy to publicise focal point for information relating to the project which simplified messaging throughout the project. As the project evolved the website was updated to become a repository of the outputs of the workshops and the project more general, with the products section of the website hosting various iterations of the ideas and concepts developed and enabled interested stakeholders to locate and comment on the latest versions.

Given its established position the website is also the gateway to the online guidance which can also be directly accessed via http://guidance.mascproject.eu

Throughout the course of the project, members of the project team have sought opportunities to promote the work of the MaSC project and to seek input from experts in a variety of fields. Presentations were given at a number of different forums in order to further promote the project including the UK Shelter Forum, EU information days, and an international shelter conference hosted by Shelter Centre. Many smaller presentations and briefings were also delivered throughout the project timeframe although there was limited contemporaneous capture of these in order to fully document and evaluate these in this final report.

On the whole the MaSC project has been well publicised and anecdotally seems to be recognised as making a positive contribution, particularly in the UK where it has national recognition among emergency response practitioners who now actively seek information from the project team and continue to request input at upcoming training and exercises.

Publicity of the MaSC project will continue throughout 2017 with further publicity arising from the MaSC II project which commenced in January 2017.

**Task J: Project Evaluation**

*Objectives*

- Collection of data and feedback to assess the merits of the overall program and provide data on whether a program works and why, which parts of it are effective and which need improvement, to support learning from the project and enable communication of best use of responders resources in planning for a mass shelter capability
- Provide reliable information to improve mass shelter program and services across partner organizations and share that learning across all European member states
- provides on-going framework for improving the project providing measures to make our goals and objectives more meaningful

An outline project evaluation plan was created and regularly reviewed throughout the project with a lessons learned log maintained by Northamptonshire County Council as the coordinating partner.

As the core of the project the workshops were individually evaluated and debriefed to ensure that learning could be incorporated into subsequent workshops to improve the content being presented, the logistics of the event and experience of the delegates. The evaluation of the workshops also informed detailed planning of subsequent workshops to redesign tasks and activities in reflection of the previous workshop. For each workshop a report was produced and published at www.mascproject.eu

The evaluative process for workshops was based on a combination of elements:
- Written feedback collected as part of the tasks
- Observations during the workshops
- Completed delegate feedback forms
- Facilitated structured debrief
- Ad hoc feedback from stakeholders

Evaluation of the project products has been primarily undertaken through and iterative design approach which has allowed for consultation feedback to be provided at each stage both from within the project team and from wider stakeholders. In particular iterations of several of the main project products were presented at the MaSC workshops alongside tasks designed to review specific aspects of them.

The final guidance to accompany the products has, due to time constraints, had a lesser degree of consultation however the guidance platform was designed with the intention of allowing for continuing refinement of these products with an in built mechanism for feedback and evaluation. The ongoing commitment to publicising the outputs of the project, including a specific UK workshop being held later in 2017 will support the garnering of this feedback.

# Presentation of Technical Results and Deliverables

The technical results and deliverables of the project were often developed through various iterations that crossed several tasks, particularly those that were progressively developed through the three workshops.

## Mass Shelter Guidance Platform

### Introduction

The guidance platform was developed as Task H in the MaSC workshops.

Task H related to the drafting, design and production of guidance material to summarise the outputs of the information collected and developed over the course of the project. In effect Task H represents the primary output and main legacy of the MaSC project in that it is intended to make the ideas and tools useable to others.

### Objectives of Task H as defined by the Original Bid

Produce planning guidance for responders that will support individual capability programmes to respond to and recover from the common consequences of major civil emergencies, with resulting mass shelter consequence, as defined by the project planning assumption to deliver an effective response to mass shelter based on project planning assumption of 10,000 people for six weeks. Guidance will include:

- Defined contextual information on the challenges for effective mass shelter planning and execution based on literature and case study review (Task C)
- Identify shelter options and common response module segments
- Describe the range of considerations to be applied to each module
- Summarise validation work at Task G to demonstrate how much capability by module might be needed
- Set out suggestions where that can be sourced within both an individual member state and cross European context

### Actions identified for the Task

The T3a form that formed part of the original bid submitted identified the following actions required to complete the task:

Action H.1 - Planning Guidance scoping and design
Action H.2 - Guidance by section. Compiling, drafting and formatting of guidance document
Action H.3 - Proofing and Quality Assurance
Action H.4 - Formal Guidance Consultation
Action H.5 - Guidance Publication (English Language)

### How was this Task Approached?

The development of the guidance has been considered throughout the project process. The overall objective for this guidance has been to develop something that in both design and content is useful to planners and responders and also likely to be used. With this objective in mind it was felt that creating the guidance in a format that was optimised for online usage would have the greatest potential and allow the incorporation of a variety of media formats.

The workshop phase of the project presented an opportunity to consult with the target end users for the guidance in order to assess and prioritise their requirements and preferences. The guidance was referenced at various stages throughout the workshops and planning process however the bulk of discussion took place during two sessions where it was focused upon.

In both cases the delegates were presented with an introduction to the guidance and then asked to review a copy of the product description. Accompanying this were then a series of questions designed to elicit discussion and to collect ideas and views.

The first look at the guidance document took place towards the end of the first day of Workshop 1 in Northampton, UK. During this first day the concentration of the workshops had been on establishing the context and requirements for mass shelter as well as describing what standards and guidance already existed. This allowed for a discussion towards the end of the day which could shift the conversation toward the areas were the MaSC project could create the most value.

Delegates were specifically asked:
- What information would be most useful at the time of an incident?
- How would you want this information presented?
- Are there any lessons from current guidance that the MaSC project should particularly seek to address?

This identified a number of areas for the project to consider but also highlighted themes around providing a range of tools that could be used by various actors and ensuring that they are all joined up. For some delegates there seemed to be a desire for the guidance to walk them through the preparedness activity that may help them and provide quick reference reminders for immediate actions should the capability be required. This feedback has directly led to the development and inclusion of the Emergency Actions section of the guidance.

The product description was refined and updated over the workshop phase before being presented back to delegates in the final session on the final day of Workshop 3 in Berlin. It was presented at this stage to act as a focal point for how to bring together all of the issues, ideas and concepts that had been developed throughout the workshop phase. This then was used to give the MaSC project team a clear steer on how best to progress the guidance development phase of the project in order to make the product useful to stakeholders.

In the third workshop, delegates were asked:
- Who do you see as the audience for the guidance?
- How would you envisage the guidance is used?
- What do you think should be the major areas of content for the guidance?
- What format/style/ structure do you think would make the guidance most likely to be used and do you think a hard copy version is essential?
- What do you would be the best way to share the completed guidance and associated products?
- How do we maximise the value of the work of the project?
- Any other comments?

There was a long list of information collected in response to these questions, including a list of more than twenty distinct groups of actors who were seen as the audience for the guidance.

One of the main conclusions that we drew from this feedback was the need to make the guidance as accessible and flexible as possible in order to allow users to access and apply the tools and different aspects within their own political, cultural and organisational contexts. The driver seemed to be to make the guidance relevant and applicable so that it did not stand alone but formed a hub from which other information could be accessed and in doing so helped support shelter responses more generally of any scale.

**Determining the Guidance Format**

The format of the final guidance was a source of much discussion within the project team and by the delegates. There were a wide range of views expressed and often this reflected individual attitudes towards technology and the different operating environments they would expect to make use of the guidance. What was clear was that the hope was for the guidance to be concise, useful and applicable in a range of circumstances.

In determining a format for the guidance four broad options were considered:

5) Printed, bound hardcopy guidance document
6) Designed single guidance document published online
7) Online format guidance with print capability
8) Online/App form only

Consideration and debate of the various merits of each of the above options became one of the major topics of discussion for the formal project team meeting held in April of 2016 in Cork, Ireland. This meeting provided an opportunity to conduct a gateway review of the workshop delivery phase and by taking on the comments of delegates, plan out the development of the guidance.

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Publishing online was felt to be the most effective means for communicating the guidance for both distribution purposes and because a search functionality would enable users to quickly identify the particular aspects they were looking for. It also presented the opportunity to integrate a more diverse range of material and media content into the guidance.

As part of this discussion it was agreed that we should aim for more encyclopaedic content which would be easily navigated as well as allowing greater scope for alteration, addition and further development. It was also agreed that we should retain the ability for users to print the documents to enable offline access to the material.

In effect the project team decided that the Option 3 was the best way forward, with the emphasis on online functionality.

Having made a decision to focus on an online encyclopaedic style for the guidance the work to develop this formed two parallel tracks of work. The first of these was to create the platform itself with the second to be to generate the content in the form of articles.

## Developing an Online Platform

In order to publish articles and make them available to end users we first needed to create the system and front end interface that would house the guidance, and so work began with our technical and media contractor, RJDM, to develop the platform for this using the Umbraco content management system as a basis. In order to meet the requirements of the project it was then necessary to work with software developers to add both features and design to the basic system.

In visual design terms the intention was to create a relatively straightforward look that was consistent with the branding that had been used throughout the project and most notably in the use of colour as a navigation tool. In terms of the design, part of the goal was to give the site being developed an intuitive feel that would, as far as possible, be familiar to users by using common iconography.

There was also a requirement to develop a number of features to allow for the integration of additional media and to give the users more flexibility in curating the content. For the most part these consisted of a range of smaller items such as search facilities, user administration, an integrated glossary and general navigation controls.

The major additional feature was the development of a system for curating articles into folders or books which would order the articles in a more traditional format. As well as helping to order articles on particular themes it also allows for them to be printed thereby meeting one key requirements raised by the project team and the workshop delegates.

In creating this tool it had the added advantage of allowing end users to customise their own books, to add or remove articles as fits their specific context as well as making notes which support their understanding and

application. Underpinning all of this was a concept that the articles themselves would be live and so any update would be immediately replicated in all the books and folders which reference this article.
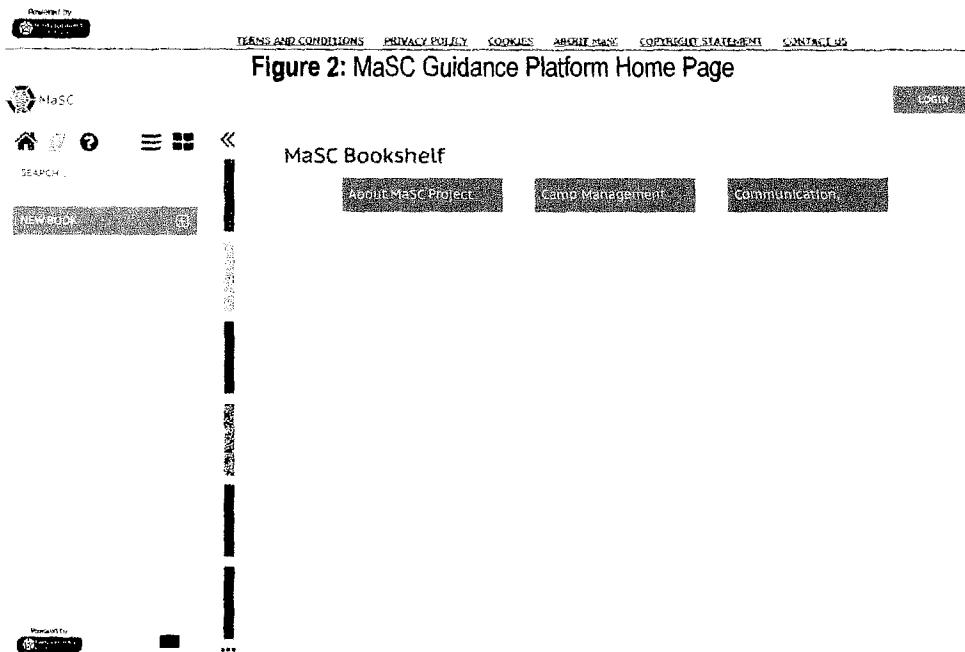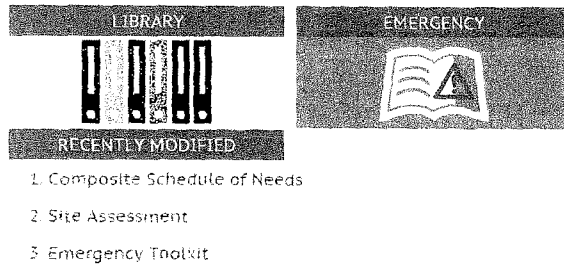


**Figure 2:** MaSC Guidance Platform Home Page



**Figure 3:** MaSC Guidance Platform Library

## Developing the Guidance Content

Part of the decision to make a more encyclopaedic style of guidance was that the guidance content itself would take the form of a number of standalone but interrelated articles which covered specific aspects of the project work. The idea being that these articles could be concise and focused but provide links to further information such as related topics or the development process that sat behind the content, allowing users to get the information they need to depth they feel is necessary.

As requirements for specific articles were identified, they were captured and categorised in terms of whether they related to an output of the project, such as the site assessment tool, or the process and working of the project, such as those that describe the workshops. They were then further categorised by their relative priority in order to help manage workloads of the project team. The priority categories were as follows

| | |
|---|---|
| High | Articles which directly communicate the products of the MaSC project or are a requirement of the reporting process |
| Medium | Articles which explain how to make best use of the tools and products developed |
| Low | Articles which explain the development process which led to the creation of the products and tools |
| Nice to have | Background or other contextual information which help to explain or support the ideas presented by the MaSC project |

In the initial identification process more than 150 articles were identified as potentially being required with 138 of those considered to fall into the High or Medium category.

The added advantage of adopting the article format is that this approach allows for a number of different authors to contribute difference articles whilst allowing for easy integration of the content. This also simplifies the process of update and amendment as change only affect the article in question without compromising or necessitating a larger review.

In combination with the book functionality of this has allowed the creation of an evolving guidance resource which can easily be expanded or adapted, and which will be developed further through the MaSC II project.

For more information on the MaSC Guidance visit http://www.mascproject.eu/masc-live/Pages/masc-guidance.aspx .

To view the Guidance visit: http://guidance.mascproject.eu/

## Mass Shelter Modelling Tool

### Foundations

The thing that all consulting firms seek is 'client impact'; having the advice we give used by clients to make a tangible difference to clients and their stakeholders. This applies to high profile strategy firms like the McKinsey and Deloittes of this world, as much as to boutique firms such as DIEM. In the case of DIEM, which has worked a lot in the early stages of defence programmes and corporate technology investment initiatives, turning the models or frameworks we develop as part of a consulting project into a 'decision-making tool' for our clients to use once we have gone has been a reliable way of ensuring ingoing client impact. The MaSC project was unusual in that, from the outset, the purpose was to create a tool to aid decision-making. It was also unusual in that it provided the opportunity for us to take experience gained in developing tools for the military and apply it to the benefit of civil issues, whereas in recent decades it is the military that has benefited from experiences in the civil sector.

From 2012 to 2014 DIEM led a number of studies into the provision of utilities (water, energy, waste management) to troops during expeditionary operations. For ten years the British Army had been involved in 'enduring' operations in central Asia and during that time many issues had been uncovered relating to the utilities and facilities at smaller bases out in the operational areas from which troops operated. DIEM applied its standard approach of:

- Developing causal map of the 'problem space' i.e. a picture of the drivers, constraints and outcomes of the provision of utilities to small bases;

- Conducting small-group interviews with units that had recently returned to verify the picture and gather evidence from their experiences of when things went well or badly;

- Turning the causal map into a dynamic simulation of the utilities on the base, and how they impacted operational capability in different scenarios; and

- Using the simulation to test different options and create plans for investment in new equipment and technology to provide better support to troops.

Having develop the simulation to explore the impact of new equipment and technology, it was pointed out by officers responsible for planning and building bases, that the simulation could actually be used as a planning tool as well; inputting the situation that would be faced and then testing whether the planned base, in terms of number of generators, water provisioning, waste plans, were up to the job.

The development of the tool, and the lessons learnt about how it could be used, were published in the October 2014 edition of the Institute of Engineering and Technology journal which dealt with 'Infrastructure Risk and Resilience: Managing Complexity and Uncertainty in Developing Cities' (Jaya-Ratnam et al., 2014).

### The MaSC Project Requirement

The Mass Shelter Capability (MaSC) programme was an EU Civil Protection Mechanism funded programme run by organisations from the UK (NCC, supported by the UK Cabinet Office), Ireland (NDFEM) and Germany (THW). In June of 2015 NCC published a requirement for a 'Data Modelling and Validation Partner' for the MaSC project, one of several projects under the overall banner of 'MaSC'. The original requirement had called for a simple 'data model', effectively a database of quantities, that could be used to inform those responsible for setting up mass-shelters for those displaced by any major climate or man-made event. It was to set the requirement for a subsequent phase where an 'app' would be developed as a user-friendly 'front end'.

The proposal DIEM put forward in response to the requirement offered a more dynamic tool which would form the 'back-end' of the 'app', based on our experience of developing tools for planners of small bases for the military. DIEM's proposal was chosen and commissioned. Figure shows the proposed stages of the project.
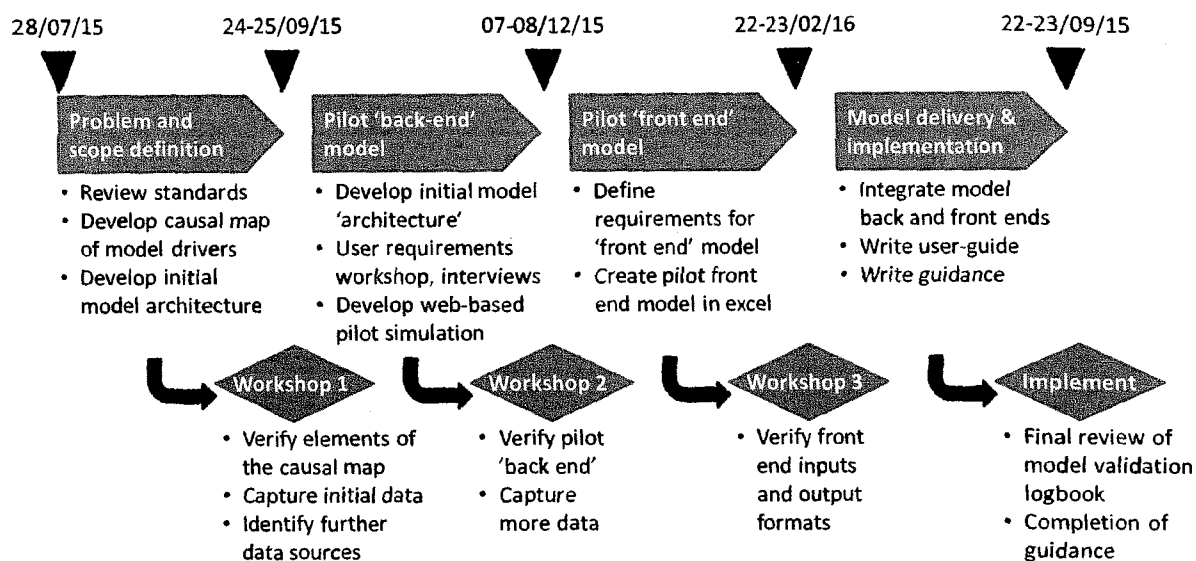


**Figure 4**: High-level project plan

## Problem and Scope Definition

The starting point of the project was to understand the legal requirements and standards laid-down by organisations such as the UNHCR, WHO, and national governments. Key insights covered:

- The challenges posed by different types of situations that lead to mass displacement of populations, in particular the diversity of the displaced population and hence variety of needs, the difficultly in access land and providing support and services, and the seasonal and climatic impact on the needs of the displaced;

- The different aspects of the response including engagement with the displaced and many other stakeholders e.g. government, politicians, the media, planning, and the actual process of acting on and monitoring progress against the plans; and

- The potential 'architecture' of the model of mass-shelters that would form the basis of the tool, as shown in Figure below.

The challenges and potential domains of the model were presented at the first of the MaSC workshops. This workshop, held in Northamptonshire, was attended by a wide range of stakeholders, practitioners and academics. The challenges and potential domains were presented to them and inputs sought via two exercises:

- Exercise 1 asked the attendees to propose the different 'dimensions' or parameters that should be used to represent each of the 'nodes' in the potential model, sources for those dimensions, and people or organisations with an understanding of how these dimensions relate to each other e.g. how does the age of the displaced person relate to their need for water etc.;

- Exercise 2 asked the attendees to suggest the standards that should be applied to each parameter. These could be existing standards such as 'SPHERE', or they might be absolute figures based on the attendees' experience of providing mass shelter.
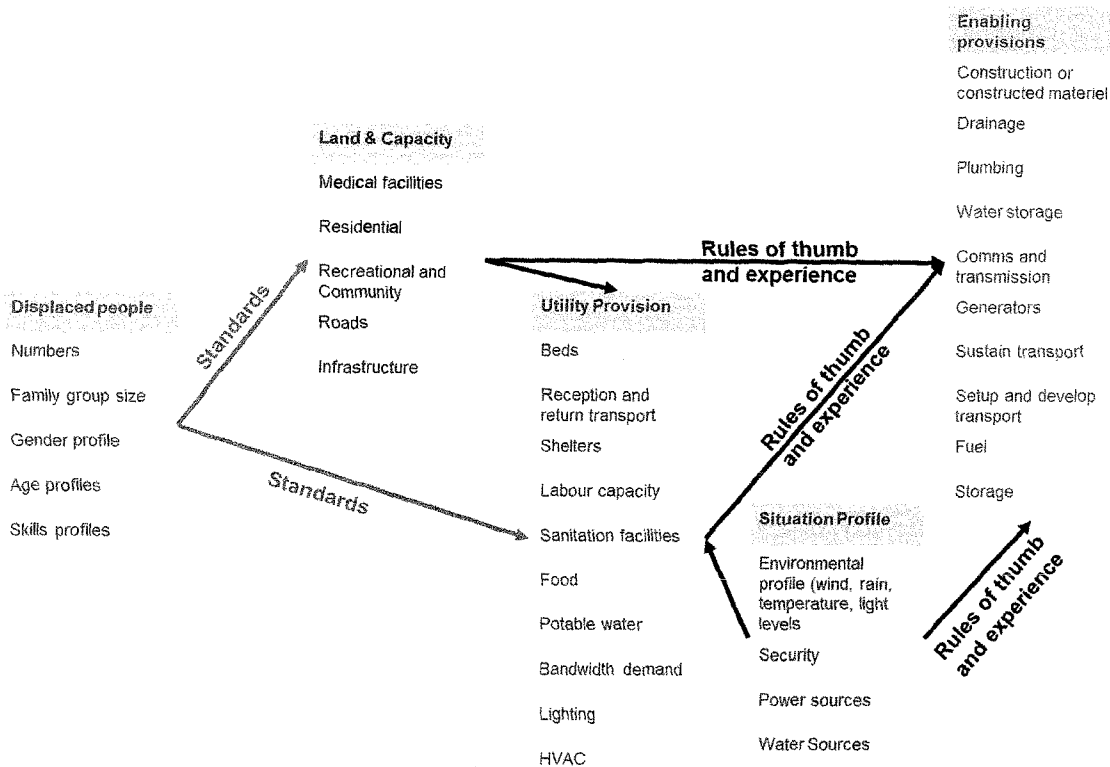
**Figure 5**: Potential domains of the MaSC 'tool'

A key output from the workshop was the buy-in from a range of stakeholders and experts both those responsible for planning for and providing shelter, and those who provide shelter set-up and management services and advice. Following the workshop DIEM conducted a number of interviews to gather the views of these stakeholders and experts, and incorporate them into the next stage of the project.

### Pilot 'Back and Front' Ends of the Model

Armed with the outputs and insights from the first workshop, DIEM developed a dynamic simulation of a mass-shelter. Using the 'system-dynamics' modelling approach, which captures stocks and flows of people, supplies, resources and capacities e.g. living space, power, waste-management capacity etc. It also allows scenario parameters and planning decisions or rules-of-thumb to be tested. The initial version was demonstrated to the UK, Irish and German members of the project team. Following feedback from this demonstration a web-based version was developed and uploaded, and attendees at the second workshop were provided links which would allow them to 'play' with the tool.

At the second workshop, held in Dublin, the simulation was demonstrated to attendees on a one to one basis, and their inputs in terms of usability, source data and potential applications were collated.
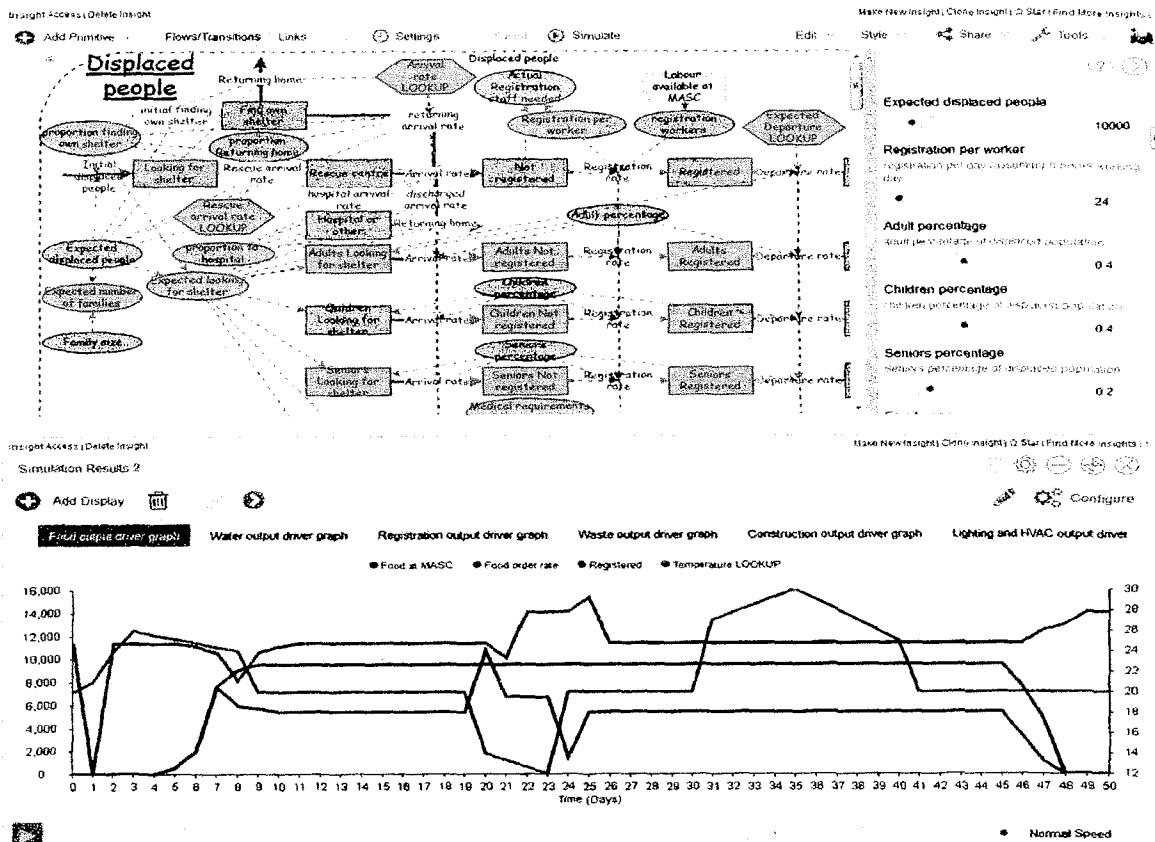
**Figure 6**: Extracts from web-based MaSC simulation - structure and inputs (top), and time-based outputs (bottom)

There were three themes in the feedback received:

- Stakeholders could see three applications for the tool i.e. in planning, in training, and in policy making;

- The ability to test the 'what if' of different decisions and see the resulting impact over time should be linked with a some form of project planning tool or format; and

- The actual tool and the way it is presented was too complex and perhaps intimidating for the potential users.

The third and final workshop, held in Berlin, allowed the requirements for the tool to be developed further. At this workshop the attendees, who had been split into team, were asked to go through the stages of planning the construction and management of a mass shelter in the context of a realistic scenario. This allow DIEM to observe the process and to validate how the tool could contribute to different stages of planning and management.

## Model Delivery and Implementation

Figure shows extracts from the final version of the model, produced in Excel for easy download and widespread use. It fulfils three main functions:

- It allows those responsible for providing mass shelter i.e. practitioners or policy makers to test the impact of different scenarios on what resources would be required;

- It provides a planning function to allow those in the midst of a major event to quickly generate a plan and then monitor and report progress against it; and

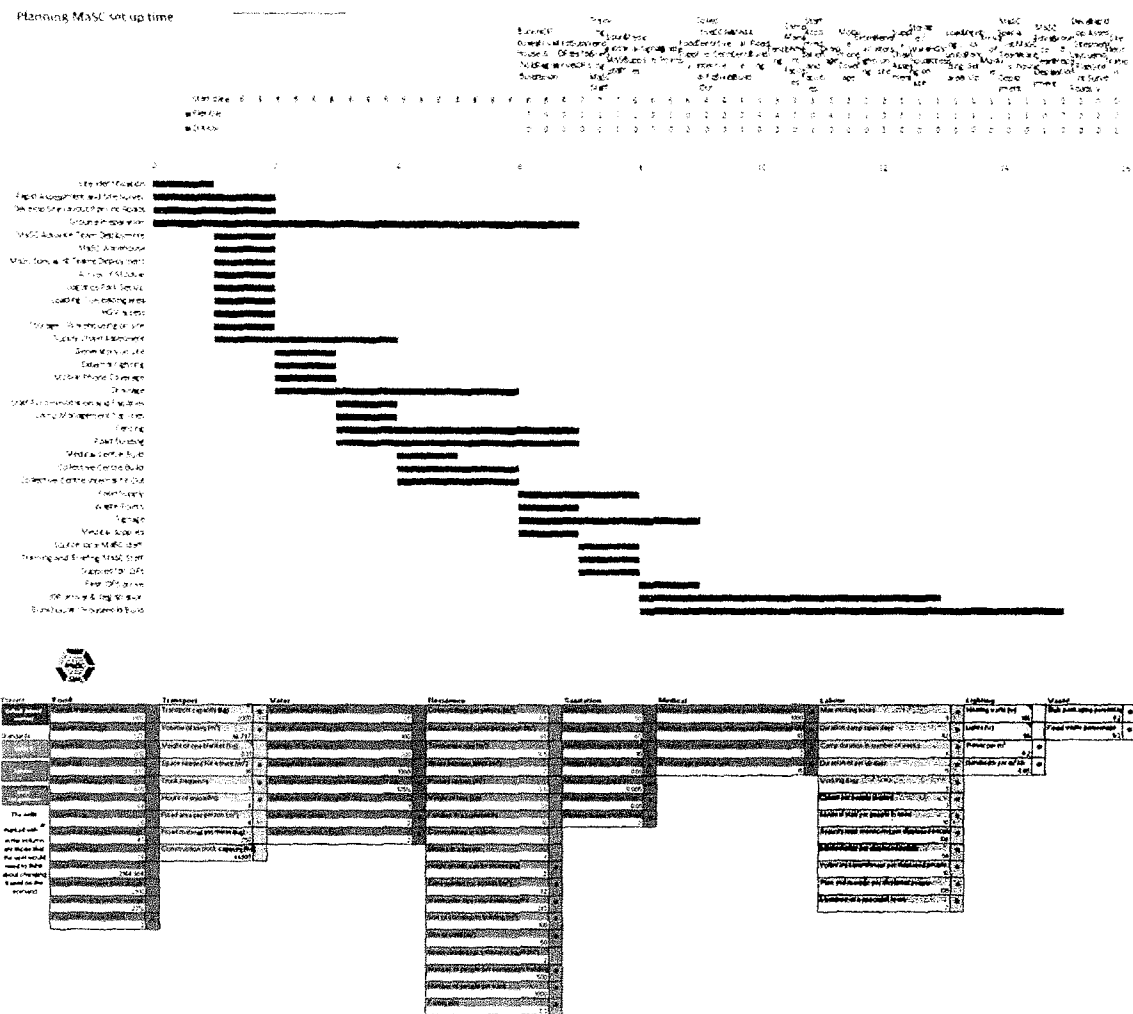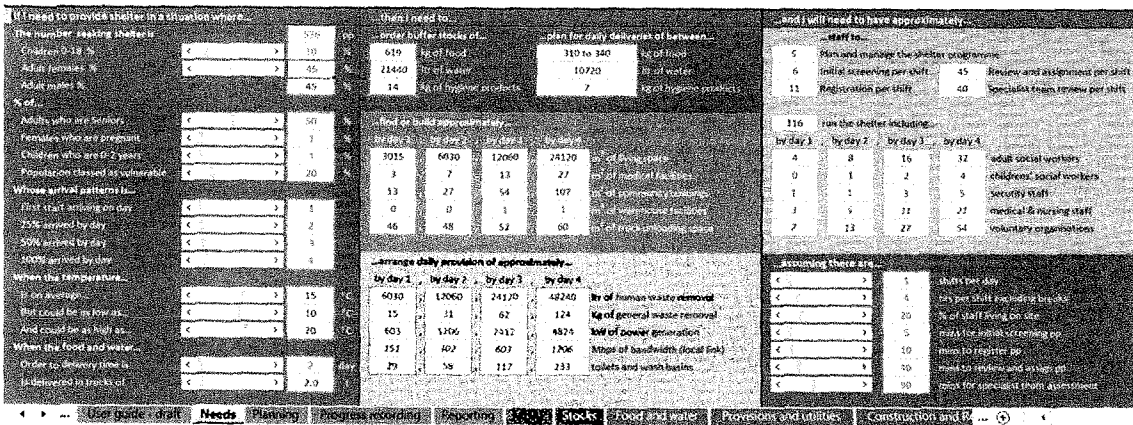- It allows the impact of different standards to be assessed.

**Figure 7**: Extract from the final MaSC planning tool – main needs (top), implementation plan (middle), data sets (bottom).

Included within the tool itself is a user guide and access to all the underlying calculations should users wish to interrogate the model in detail.

In September 2016 Kent County Council, some of whose officers had contributed to the development of the tool, held a major exercise and DIEM were invited to test the tool as part of the 'evacuation cell'. This provided

invaluable experience of the overall process of managing the initial evacuation across multiple agencies e.g. police, health service, local government. It also highlighted the manner in which other tools and systems in use could provide data for, and make use of, the MaSC planning tool.

Following this experience a 'Concept of Use' document was produced to sit alongside the tool and user guide, which lays out how the MaSC planning tool can be used as part of the suite of tools available, as summarised in Figure 88.
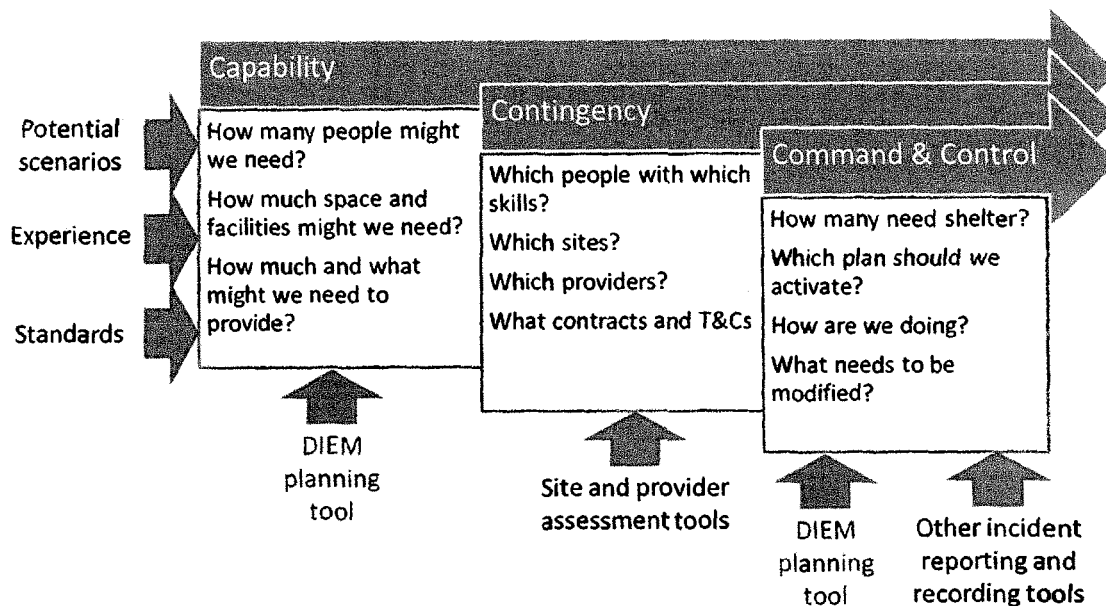
**Figure 8**: Summary 'Concept of Use' of the planning tool in relation to other tools

## Lessons and Next Steps

As with any project involving 'IT', the future, multiple stakeholders, and a tight budget, there were unforeseen difficulties and general challenges that had to be overcome. In this particular project's case, the diversity of the different stakeholders and hence their different views and requirements (all valid and based on experience) created a challenge in balancing the level of detail with the level of complexity of the model. Nevertheless, a combination of culture and approach meant that they never threatened the successful delivery of the project. Key lessons that should be taken away from this are:

- **The importance of a clear and 'bought-in-to' vision**: It may well be viewed as a statement of the obvious that a team needs a clear goal. But in this case the subtle point was the clarity of the joint vision i.e. what the overall MaSC project team wished to achieve rather than being overly wedded to exactly what was delivered. The key vision was the utility that the tool would have to potential users, which all the core team were bought in to. There was no constraint on how that would be achieved;

- **The collaborative approach**: From the beginning of DIEM's work on this project they, the NCC project team, and the wider MaSC team worked in an open and collaborative fashion. There was a fairly detailed initial requirement but DIEM were free to propose alternative approaches and were given a fair hearing on the pros and cons of these alternatives. As the project developed NCC exposed a greater part of the overall project to DIEM in order to ensure that the various projects were able to make the most of the other parts;

- **Flexibility**: Finally, NCC and the MaSC team showed suitable flexibility in the project, the requirements for the tool, and how it might be used. With any type of decision aid or system, it is very difficult to be

prescriptive before a prototype is available. A starting point is clearly necessary but, once stakeholder have been engaged and the pros and cons of different approaches have been explored it usually becomes necessary to change certain aspects, if not most of them. NCC were not rigid when it came to the details of the specification and the format of the tools and were guided purely by their overarching vision of maximising the utility of the tool.

Having delivered the tool to the MaSC team, it has been made available for stakeholders to download via the MaSC website, along with other resources developed under the MaSC programme. In the course of the project and particular during the implementation and delivery stage, a number of potential next steps were identified:

- **Integration with other tools:** The UK police use systems such as STORM and CLIO during major incidents such as evacuations. The MaSC tool could be integrated with these, as much of the data need by all these tools is common. In addition the MaSC planning tool developed by DIEM could be integrated with the 'Site Assessment' tool also developed under the MaSC programme;

- **Generating reports and contingency plans:** The tool could be updated to generate contingency plans and reports so that, in the event of an incident that block internet connectivity, the benefits of the tool could still be realised. In addition, functionality related to local road network, community facilities, and costs could be added; and

- **Running roadshows to enhance its use:** Whilst there was excellent engagement from the current stakeholders, many of the individuals are likely to move on to other positions over the years. A regular 'roadshow' for the various MaSC tools would maintain awareness and ensure that sufficient numbers of stakeholders are at least aware, and ideally experienced in using, the tools.

For more information please visit http://www.mascproject.eu/masc-live/Pages/masc-modelling-tool.aspx

### References

D.J.J. Jaya-Ratnam, F.J. Anscomb, W.S. Ghani, S. Green and B.C. Horton. - 'Systems architectural and dynamics analysis to ensure resilience of utilities in Tactical Bases in an operational environment' (October 2014) http://www.theiet.org/sectors/built-environment/managing-complexity.cfm

## Mass Shelter Site Assessment Tool

### Introduction

The process of selecting a site or sites for use as a mass shelter solution can often involve evaluating the site against a given set of criteria in order to develop a prioritised order of preference.

The following is a suggested list of site selection principles that could be applied to assist with the prioritisation. They are in order of perceived importance.

### Principles for Prioritising Sites

1) Sites should be safe for those displaced

2) Sites should not risk irreparable environmental damage

3) Sites should only be used where a legal agreement which covers the maximum potential duration of use can be reached

4) Sites closer to the evacuation area should be prioritised

5) Sites should be located near to existing local infrastructure and services (e.g. near to an existing town or city)

6) Sites (singularly or collectively) should not be of a size which exceeds 12% of the local population

7) Site topography and geology should be more suitable for rapid and sustainable habitation (e.g. gently sloping, clear of obstructions, good drainage)

8) Sites should have good access to transport networks

9) Sites with large areas of hard standing should be prioritised

10) Sites with existing infrastructure should be prioritised

11) Sites with large (and suitable) existing structures which can be adapted for use should be prioritised

### Explanation of the Principles for Prioritising Sites

*1) Sites should be safe for those displaced*

The purpose of evacuation is to move people to a place of relative safety and therefore it would be counterproductive to locate a Mass Shelter solution in a location which presents an unacceptably high risk to the people living there. All sites will come with risks and hazards; this first principle is about ensuring they are either acceptably low or can be adequately mitigated against.

*2) Sites should not risk irreparable environmental damage*

The establishment of a mass shelter settlement will undoubtedly have knock on consequences for the environment in which it is sited and efforts should always be made to minimise the negative impacts. In some locations however, there may be a substantial risk that the damage would be irreparable, for example where an aquifer may become contaminated, the deforestation of ancient woodland or where there would be extensive damage to a site of cultural or historical significance. Where this is the case, alternative sites should be prioritised.

*3) Sites should only be used where a legal agreement which covers the maximum potential duration for use of the site, can be reached*

Throughout Europe there are various legal systems governing the ownership and use of land, and it is important that the establishment of a MaSC settlement respects these systems. The detail of this will be specific to each country and each site being considered, however the broad principle is that a site should only be used where an arrangement can be reached where the use of the site would be legal for the whole duration of its use.

4)    *Sites closer to the evacuation area should be prioritised*

The wellbeing of those displaced is an important consideration throughout the provision of mass shelter and as such requires consideration of aspects beyond the provision of accommodation. Part of this includes enabling access to their normal livelihoods and assisting in the recovery of their normal place of residence. To that end, sites that are located nearer to or are better connected to the evacuated area should be prioritised.

5)    *Sites should be located near to existing local infrastructure and services (e.g. near to an existing town or city)*

Those evacuated will require support from a range of existing infrastructure, ranging from basic utilities through to schools and leisure facilities. Whilst it is possible to create and provide these on the given site, it is often more effective and more efficient to utilise existing arrangements. Not only does this require less effort to establish, but it has added benefits for the wellbeing of those displaced.

6)    *Sites (singularly or collectively) should not be of a size which exceeds 12% of the local population*

Whilst it is appropriate to utilise infrastructure and services from nearby settlements, it is essential that they are not overburdened in a way that may cause them to fail. This represents good practice, both in terms of the provision of those services and in maintaining good relations with the host community. Based on anecdotal feedback, a guideline maximum increase of 12% is advised.

7)    *Site topography and geology should be more suitable for rapid and sustainable habitation (e.g. gently sloping, clear of obstructions, good drainage)*

The provision of mass shelter will require a large and concentrated amount of construction in a short period of time, therefore the land upon which it is built can make a significant difference to the relative ease of this task. Sites which are relatively clear of obstacles, relatively level (preferably with a slight gradient to assist drainage) and of a geological makeup suitable for construction should be prioritised over those with greater complicating factors.

8)    *Sites should have good access to transport networks*

The provision of mass shelter will depend on the large scale movement and delivery of resources and supplies. This will include construction equipment, raw materials and ongoing consumables. In addition, those displaced will wish to access transport networks in order to go about their lives and organise their longer term recovery and good access will make this easier.

9)    *Sites with large areas of hard standing should be prioritised*

In the early stages of the construction, a large amount of vehicles and resources will arrive and areas of hard standing will make this easier to manage while the construction of foundations, roads and pathways take place. If the area of hard standing is sufficiently large then this may provide a stable footing for several of the facilities that are likely to be constructed.

10)    *Sites with existing infrastructure should be prioritised*

The provision of mains supplies such as electricity, water and telephony is an essential part of the mass shelter response. Although the facilities on site are unlikely to be sufficient to service the full requirements, it may be that an upgrade is a more straight forward task. Even where this is not the case, the existing infrastructure may be

adequate to support early stage operations whilst more substantial and sustainable arrangements are put in place.

*11) Sites with large (and suitable) existing structures which can be adapted for use should be prioritised*

Part of the concept of deployment highlights that in the earliest stages, larger facilities will be constructed to act as a focal point for receiving, registering and supporting those who have been displaced. In some circumstances these will act as a collective centre to provide accommodation whilst smaller units are constructed. Where these structures already exist and can be adapted, the early task burden will be reduced and that may mean that resources can be allocated elsewhere.

For more information visit: http://www.mascproject.eu/masc-live/Pages/masc-site-selection.aspx

## MaSC Arrivals Process

### Introduction

At its most basic level, the provision of emergency shelter is simply a task of opening a safe space that affords protection to those that need it. However, as recognised by the composite schedule of needs, this provision is only suitable in the very first instance, after which the specific needs of those seeking shelter must be taken into account.

Some of these needs, such as the provision of drinking water, will be universal and applicable to nearly all present, whereas others will be specific to an individual or family in question.

To adequately understand these needs and begin to address them, they must first be identified. The Arrivals Process is designed to register those requiring shelter and assess their needs both in the immediate to short term and in the longer term to ensure that they are receiving the service and support they need (Figure 9).

### Objectives for the Arrivals Process

To triage means to sort or to choose and in this context is about ensuring those displaced get the right support, in the right place at the right time. Triage is therefore a key part of the arrivals process, which has the following objectives:

- To record the numbers and group make up of those requiring assistance

- To identify those who require medical and/or other specialist assessment and assistance

- To capture sufficient information to enable allocation of appropriate accommodation

- To capture essential personal data to support the delivery of services

- To gather information necessary to support decision making both at the site and in relation to the wider incident response

- To minimise staff resource demands whilst maintaining an effective and appropriate service

# MaSC    Arrivals Process V3-7

Initial Screening — Registration — Assignment and Orientation

**Arrives at Registration Centre**

Does any member require immediate medical attention? — YES  NO

**Triage waiting area**
Refreshments, snacks and charging points

Family group called forward for assessment

Is there an obvious need for specialist assessment? — NO
YES

Do they speak the local language? — NO → Await available onsite translator
YES

Record basic group makeup

Can the group navigate the site independently? — YES → Provide copy(s) of the registration form
NO

Are there any immediate issues? — YES  NO

Are their issues medical? — YES  NO

Do they require specialist assessment? — NO
YES

**Medical waiting area**

Medical provide assessment/treatment

Is it appropriate for the group to remain on site? — YES  NO

**Specialist assessment waiting area**

Complete registration form(s) → Specialist team conduct assessment

**Registration assistance**
Refreshments, meals, snacks, charging points and basic supplies

Fill out registration form

Return form — Main waiting area — Await housing allocation

Initial review of registration form

Has the form been filled out completely? — NO  YES → Ensure means of call back

Are there any specialist needs? — YES  NO

Identify and allocate appropriate housing

Receives welcome pack and supplies

Are there any specialist needs? — YES → Specialist team conduct assessment — NO → Transfer off site

Provide Care/Management Plan

Is it appropriate for the group to remain on site? — NO → Transfer off site / YES

Complete Registration

**Directed to assigned accommodation**
Receives orientation and briefing
Arrives at information point

Group called to information point

Back office review and processing
Forms sent for more detailed review and background checks

Group allocated specialist equipment and supplies

Key: Action Performed by IDP   MaSC Staff Action   Question asked of IDP   Specialist Team Action   Waiting area   Process end   Thicker line indicates default path   — PROCESS  — NO  — YES

Figure 9: The Arrivals Process

## How does this work?

The arrivals process is intended to guide responders through the process of triaging and registering arrivals at the shelter location. Throughout the process family groups are kept together as far as possible and developing an understanding of the make-up of these groups is an intrinsic part of the overall process. It should be noted that a family group may be a single individual depending on their circumstances.

The first phase is an initial screening conducted on arrival to identify obvious potential issues such as a requirement for immediate medical treatment or a clear need for specialist assessment. This screening will also involve some very simple questioning of the group to ascertain whether they are aware of any issues that would require this alternative assessment.

Assuming that there are no immediate issues the family/group would be given sufficient copies of any registration forms and directed to the main waiting area where they would be asked to complete this in their own time.

Once registration forms are completed they would be handed in for staff to complete the registration process and, once means of contact are assured, the family/group would be free to make use of the facilities and services available whilst the paperwork is reviewed and appropriate accommodation allocated.

## Registration Forms

Accompanying this process should be registration forms to capture the relevant information needed to review the needs of those present and provide the management information as needed.

These forms may be paper or electronic and will be very specific to the needs of the area providing the response in terms of their information needs, the services they may provide and the equipment and resources available at the time.

The United Nations High Commission for Refugees (UNHCR) has produced through its international humanitarian guidance some UNHCR registration forms which may serve as starting point.

As part of the design and testing for the arrivals process, the MaSC Project, also developed some example UK triage and registration forms which are more closely aligned to the arrivals process but are specifically reflective of the UK arrangements, thus not all sections may be relevant elsewhere.

For more information visit: http://www.mascproject.eu/masc-live/Pages/triage-and-registration.aspx

## Settlement Typologies

### Introduction

The Literature Review undertaken by the MaSC Project identified the six displaced population settlement classifications commonly described by the international humanitarian aid community. These options are summarised in Figure 10. Although these classifications are well established, the MaSC Project revisited these definitions to consider whether these definitions were applicable to the provision of shelter to a displaced population in a European disaster.
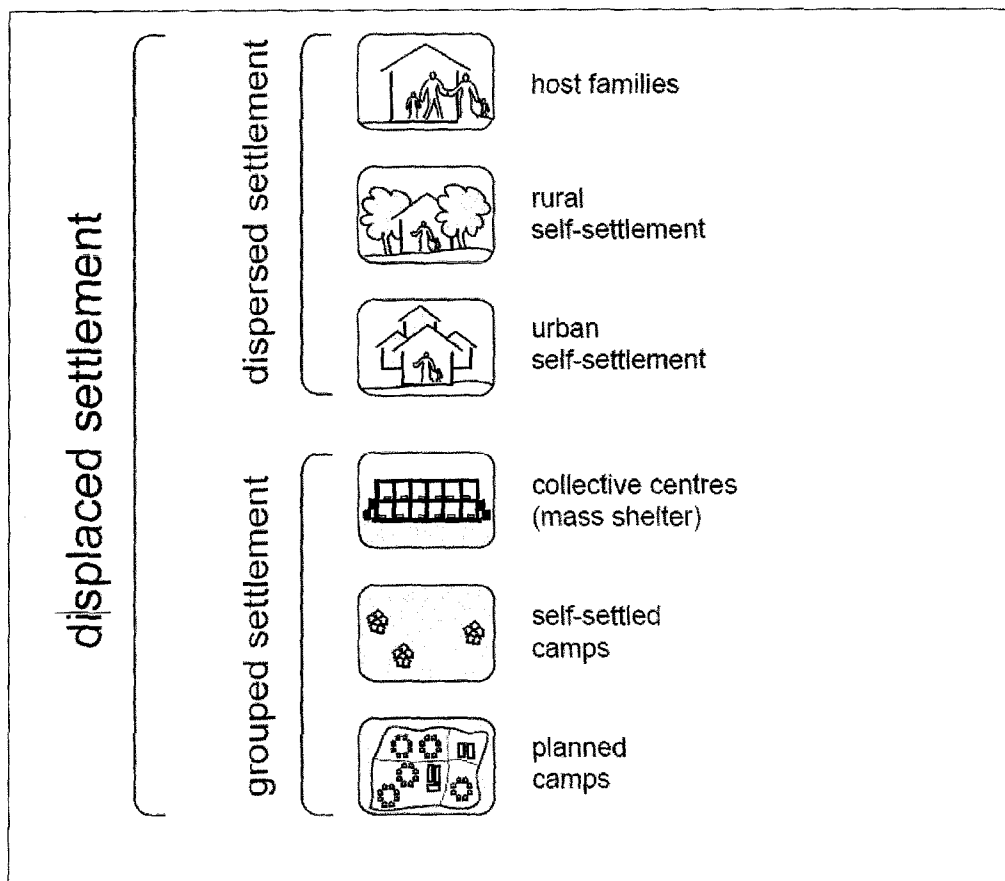


**Figure 10:** Six Options for Transitional Settlement (The Shelter Centre). Source: Corsellis and Vitale (2005)

### Types of Settlement Options

The MaSC Project has redefined settlement options for displaced populations in Europe which can be categorised into eight settlement options as outlined below and summarised in Figure 11.

Own Home
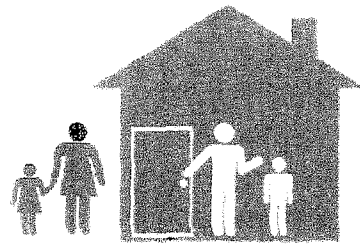
Host Families
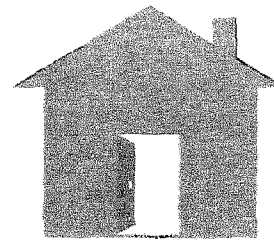
Vacant Housing
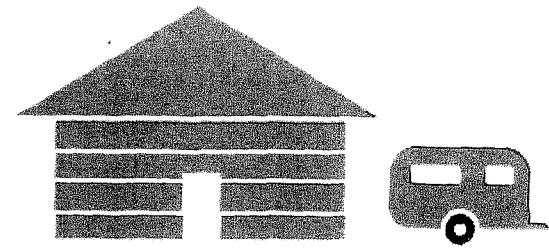
Leisure Accommodation
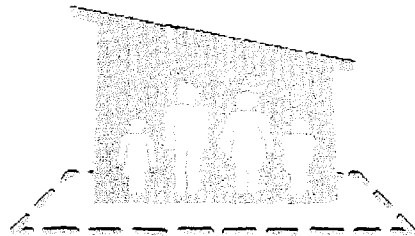
Self Settlement
on private ground
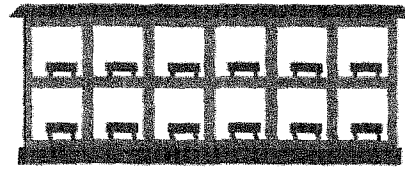
Collective Centres
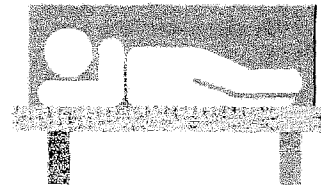
Rough Sleeping
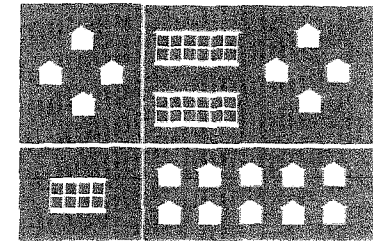
Planned intermediate
settlement

MaSC

Figure 11: MaSC Settlement Typologies

## Repair / Re-build Homes

Firstly, it is important to acknowledge that when people are made homeless as a result of a disaster, the ultimate goal is to return people to their homes and communities by repairing and rebuilding homes and infrastructure and cleaning-up and restoring the environment to its pre-disaster condition. This is the preferred option for sheltering a displaced population although this may not always be possible or feasible in the short to medium term.

## Vacant Housing and Leisure Accommodation

Within Europe, it is likely that the displaced population will use their own means to source whatever accommodation they can in the first instance. Options such as renting vacant housing or sourcing accommodation in hotels and guesthouses would certainly be utilised by individual families where this is available and when people can afford this. Government, state agencies or municipal/local authorities can often assist displaced persons in sourcing this accommodation or by providing financial support in certain circumstances
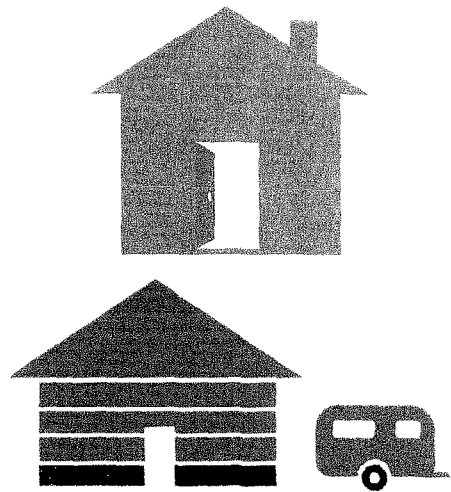
## Host Families

Where alternative accommodation is not immediately available or affordable, family and friends or sometime volunteers can often provide shelter for displaced persons in their own homes. This is usually a short term arrangement.
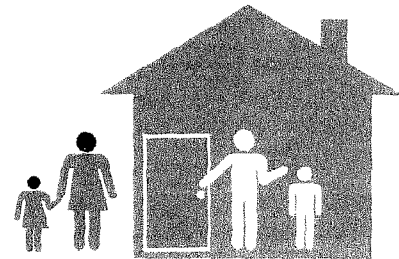
## Collective Centres

Where displaced people are unable to source alternative accommodation through vacant housing, leisure accommodation or through host families, municipal or local authorities will usually provide emergency accommodation in collective centres such as public buildings, schools, leisure facilities etc. The provision of emergency shelter in collective centres is well practiced as a means of shelter within Europe and is well detailed in national evacuation and shelter guidance throughout many of the member states of the EU.
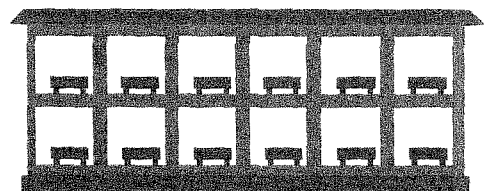
*Self-settlement on private ground*

When national or local authorities are unable to meet the immediate shelter needs of the population displaced by a disaster and where no other options are available, it is likely that communities will self-settle on private land using whatever materials are available to provide shelter e.g. tents, tarpaulins, etc. While there is merit in supporting communities to help themselves (by supporting community resilience), this is unlikely to be an acceptable settlement option within Europe due to the responsibilities of Government and local authorities to provide suitable housing /shelter for their citizens and legal issues in relation to property rights and land-use planning obligations.

*Planned Intermediate settlement*

This is the provision of shelter to a displaced population on a planned intermediate settlement on a 'green field' site by national / municipal / local authorities. It is in this area that the MaSC Project focuses specifically.
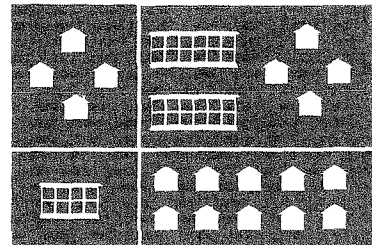
*Sleeping rough*

In the immediate aftermath of a disaster, if civil protection services are over whelmed or when homes are damaged in isolated areas and people are cut-off from immediate help or where there is risk of further building collapses such as powerful aftershocks following an earthquake, people may have no option but to sleep rough initially. This is the least desirable option and clearly is not an acceptable option for shelter in a European context.
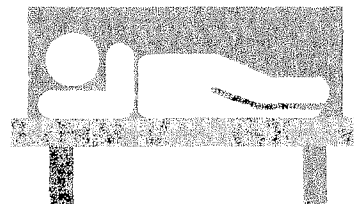
## Key Changes in Settlement Typologies Identified in MaSC

The key differences between the settlement typologies defined under MaSC and those defined in existing guidance in the international humanitarian aid community are as follows:

- Inclusion in MaSC of repair/rebuild of homes as the preferred shelter option while acknowledging that this might not be possible or feasible depending on the disaster

- Inclusion in MaSC of the use of vacant accommodation and/or the use of leisure accommodation as viable short to medium term shelter options

- Omission in MaSC of urban and rural self-settlement as viable settlement options in the European context

- Inclusion in MaSC of 'rough sleeping' as a consequence of national/local authorities to provide shelter due to the size and scale of the disaster

The commonality between the settlement typologies defined under MaSC and those already defined in the international humanitarian aid community are to maintain Host Families, Collective Centres, Self-Settlement on private land and Planned Intermediate settlement as viable settlement typologies in a European context.

## Conclusion

It is acknowledged that planned intermediate settlements are considered to be the option of last resort by many international organisations. However, in a disaster of a certain scale and impact, as illustrated by the shelter requirements envisaged under the project planning assumption, the provision of shelter within Europe in planned intermediate settlements may be an inevitable last resort. The necessity for focus in this area has also been reinforced by the risk profile work undertaken in the MaSC Project which identified the key hazards that could potentially result in a mass displacement of people within Europe.

While recognising that many or all of the identified settlement typologies will be used in the provision of shelter following a disaster which results in a mass displacement of people, the MaSC Project concentrates on providing guidance for the provision of a planned and managed intermediate settlement on a suitable site. This marks a significant step change in European civil protection thinking, planning and practice.

For more information visit: http://www.mascproject.eu/masc-live/Pages/composite-schedule-of-needs.aspx

## Composite Schedule of Needs

### Introduction

The main objective of the MaSC Project was to scope and provide planning guidelines for participating states on the establishment and deployment of a phased, scalable, interoperable modular mass shelter capability, that could potentially accommodate 10,000 people on one or more green field sites for at least six weeks and up to six months; with the ability to be operational (ready to receive people) within five days of activation.

The Composite Schedule of Needs is a validated, time-phased, hierarchical framework intended to set out what civil authorities would need to provide for people displaced by crises - and when it should be provided, in order to establish and maintain a medium to long-term mass shelter module.

### Developing the Composite Schedule Of Needs

Considering Maslow's Hierarchy of Needs is a useful framework that aids consideration of what people who have been displaced by a disaster might need whilst they are resident in emergency mass shelter. Maslow's categorisations: physiological, safety, love and/or belonging, esteem and self-actualization encompass both functional and perceptive aspects, addressing needs that enable survival, such as water and a requirement to stay warm and dry in the winter; and things that civil authorities cannot control but can facilitate their fulfilment, respectively. With this in mind, the expert delegates generated a list of the diverse range of requirements that displaced people might have. These requirements were categorised into **universal** needs: the common things that everyone is likely to need, such as food, water, shelter, clothing, privacy, hygiene and so on; and **specialist** needs: things unique to the person and their circumstances. Every single person will have one or more specialist needs. Some examples include medicine, mobility, culture, furniture, diet, infant and social care, mental health requirements and pet care.

### The Schedule

The resulting Schedule of Needs sets out these needs and the timeframe within which they should be established (the timeframe illustrates their hierarchy) - expressed using three time periods: on arrival; within ten days; and within six weeks. This approach recognises that, in the context of intermediate emergency mass shelter, civil protection practitioners cannot meet all needs immediately on arrival.

Meeting diverse needs should be the responsibility of teams organised into six specialist functions: Household, Wellbeing, Stewardship, Community, Place and Utilities. The Household function denotes all issues and activity to do with the living conditions and accommodation units for each family unit (a single person, without a partner or children is also considered as a 'family unit') within the mass shelter. The Wellbeing function focuses on the customer experience of displaced people and their animal companions. The Stewardship function encompasses the civil authority framework aspects of the mass shelter, with which residents will interact and eventually contribute to in a democratic sense. The Community function facilitates the interaction of residents with each other. The Place function establishes and maintains the societal and infrastructure aspects of the mass shelter, on a more overarching, overall, level compared to the Household function. The Utilities function focuses on the essential facilities that the whole mass shelter complex will need to use.
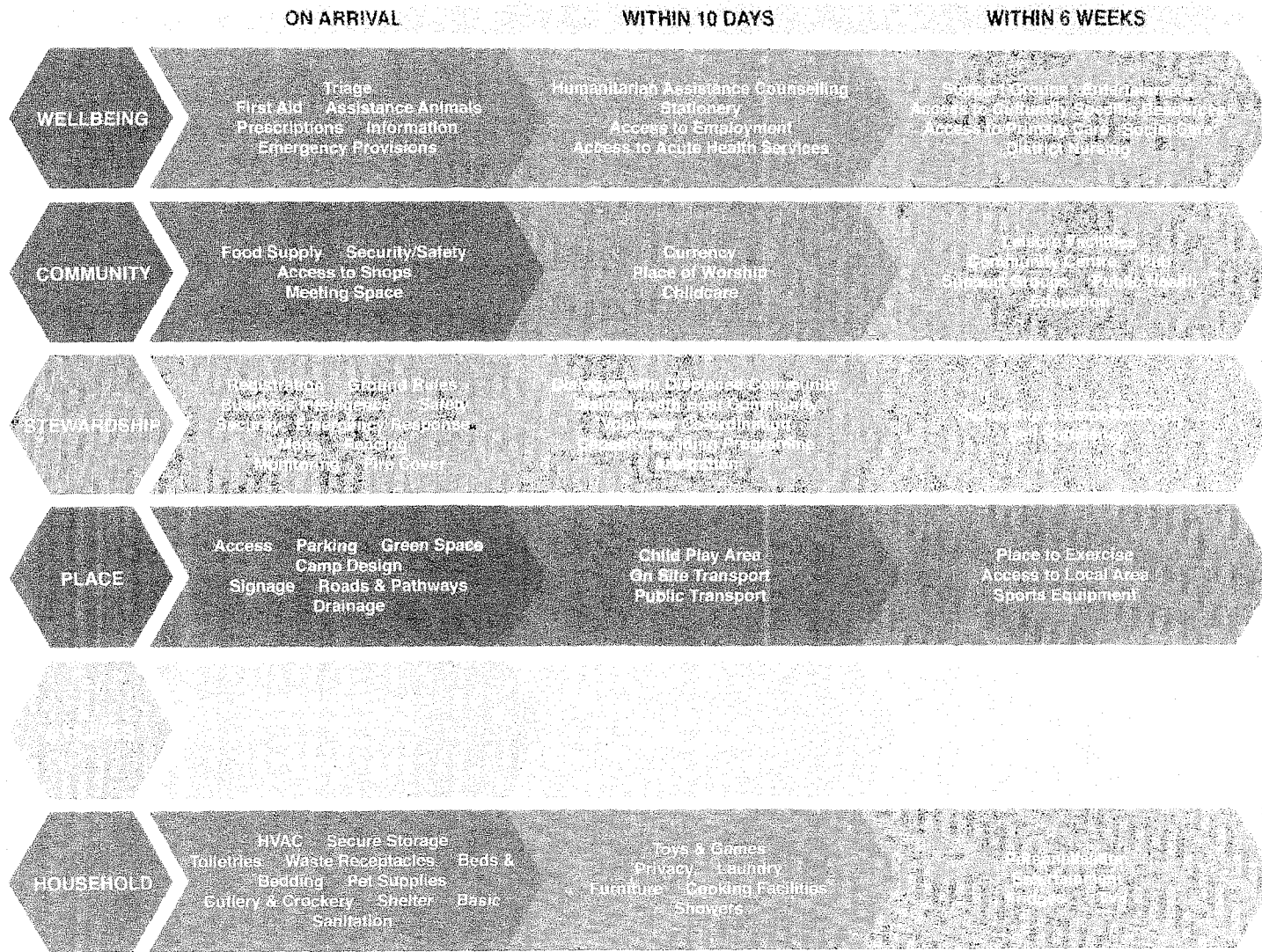
The full schedule is presented in Figure 12.

**Figure 12:** Composite Schedule of Needs

## Evaluation

Quality testing is an integral and ongoing part of the Mass Shelter Capability Project. Each of the products of MaSC have been tested or exercised for practical implementation. A preliminary test of the Composite Schedule of Needs looked at the potential specialist needs of four fictitious families displaced by an emergency.

*Family One:*

Matt is a single parent (father) aged 34, with two small children aged two and four years old. The father works full time and relies on paid childcare. Usually economically self-sufficient but depending on the type of emergency and what has happened, this family might not have anywhere to go.

Results: Some of the specialist needs might include:

HOUSEHOLD: toys, bottles, nappies and wipes

PLACE: play facilities

COMMUNITY: childcare and school

*Family Two:*

Syed, aged 53, married to Yasmin, aged 49, have three daughters – aged 12, 15 &17. Yasmin's elderly parents (79 & 77) and Syed's brother, Ali, lives with them. The family moved to the UK 2 years ago and haven't yet established a broad network and Syed is a small business owner. Ali's visa has expired, so he isn't necessarily going to want to make himself known to authorities. The family are devout Muslims and their culture does not allow women to be unaccompanied by a male family member.

Results: Some of the specialist needs of this family might include:

WELLBEING: medicines, social care

COMMUNITY: mosque

STEWARDSHIP: immigration

PLACE: family space

Further family cards were developed to continue this assessment process and apply this thinking in the development of the arrivals process to ensure that it was able to adequately cope with the broadest array of challenges. The full set can be located at http://www.mascproject.eu/masc-live/Documents/MaSC%20Family%20Groups%20-%20Jun%202016.pdf

## Management Structures

### Introduction

A variety of tasks and functions were identified as being required for a Mass Shelter Capability from the MaSC Schedule of Needs. The efficient and seamless deployment and operation of a Mass Shelter Capability requires a clear division of labour and cooperation and coordination between various groups and agencies throughout the different phases of deployment, planning, construction, operations and maintenance. The MaSC Management Structures therefore includes both the MaSC Team, deployed as a UCPM Mass Shelter Capacity, and representatives from the local authorities.

The MaSC Management Structures have also been adapted to the specific tasks that need to be completed in different phases and to the specific needs that need to be addressed in the first few days, weeks and months of deployment. In summary, the MaSC Management Structures expand over time, especially as the Mass Shelter/Camp Management take over responsibility for additional fields of action based on the needs identified by the MaSC Composite Schedule of Needs.

### Phase I (Day 1-5): Assessment, Planning Construction and First Arrivals

In the first few days after the activation of an UCPM Mass Shelter Capacity, the main focus lies on assessment, planning and construction. In this first phase, most activities are implemented by a MaSC Team consisting of a team leader and camp planners, as well as infrastructure managers either focusing on civil engineering and construction or logistics and procurement. During this first phase, local authorities need to launch their Mass Shelter/Camp Management operations in order to establish functioning human resources and administration procedures as well as coordination and liaison mechanisms and to host first arrivals. At this point, Coordination, Media & Liaison Management would focus on coordinating operations with the land owner(s) as well as local police and fire departments and health services (i.e. hospitals/doctors). In order to provide an efficient environment for Logistics & Procurement Managers of the MaSC Team, a Coordination, Media & Liaison Manager also acts as a link between the MaSC Team and local businesses. One of the key priorities of Civil Engineering and Construction Managers is to set up the first community level shelters as soon as possible in order to provide shelter for first arrivals. The MaSC Team will be completely self-sufficient as it will include Technical Assistance and Support components for office and administration, ICT and technical support (including tools and equipment for site assessment, surveying and site planning), logistics and subsistence support and transport support on site depending on the needs of the specific location and site. Phase I is displayed in Figure 13.
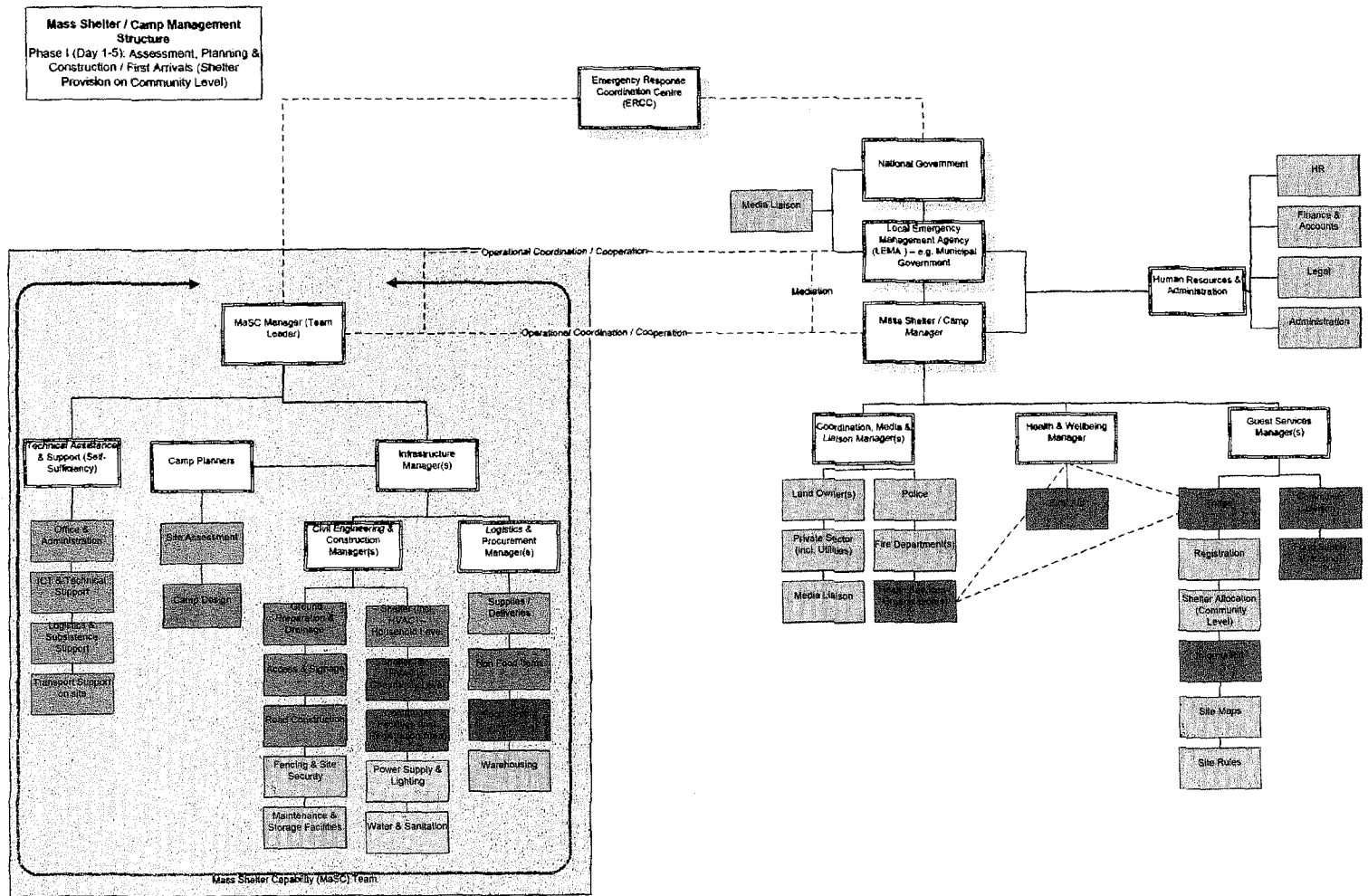
**Figure 13:** Mass Shelter/Camp Management Structure Phase I (Day 1-5): Assessment, Planning & Construction/First Arrivals (Shelter Provision on Community Level).

**Phase II (Day 6-19): Construction on Household Level, Shelter Allocation on Household Level, Joint Implementation and Division of Labour**

In the first two weeks of operations, the Mass Shelter/Camp Management takes over several additional responsibilities in the areas of facility management, logistics and procurement, health and wellbeing and guest services. During this time it is crucial to define linkages between the MaSC Team and Mass Shelter /Camp Management personnel as clearly as possible and to establish a commonly understood way of collaborating and of operational handover. There is a fine line between infrastructure construction still being conducted by the MaSC Team and infrastructure facility management and maintenance which lies in the responsibility of the more permanent Mass Shelter/Camp Management personnel. Especially with regard to any infrastructure, both teams need to work hand in hand – both sides need to agree on a detailed and structured hand-over process for any infrastructure. As a result of this process, there are several areas of work that will need to be implemented jointly or will require a clear division of labour. Phase II is displayed in Figure 14.
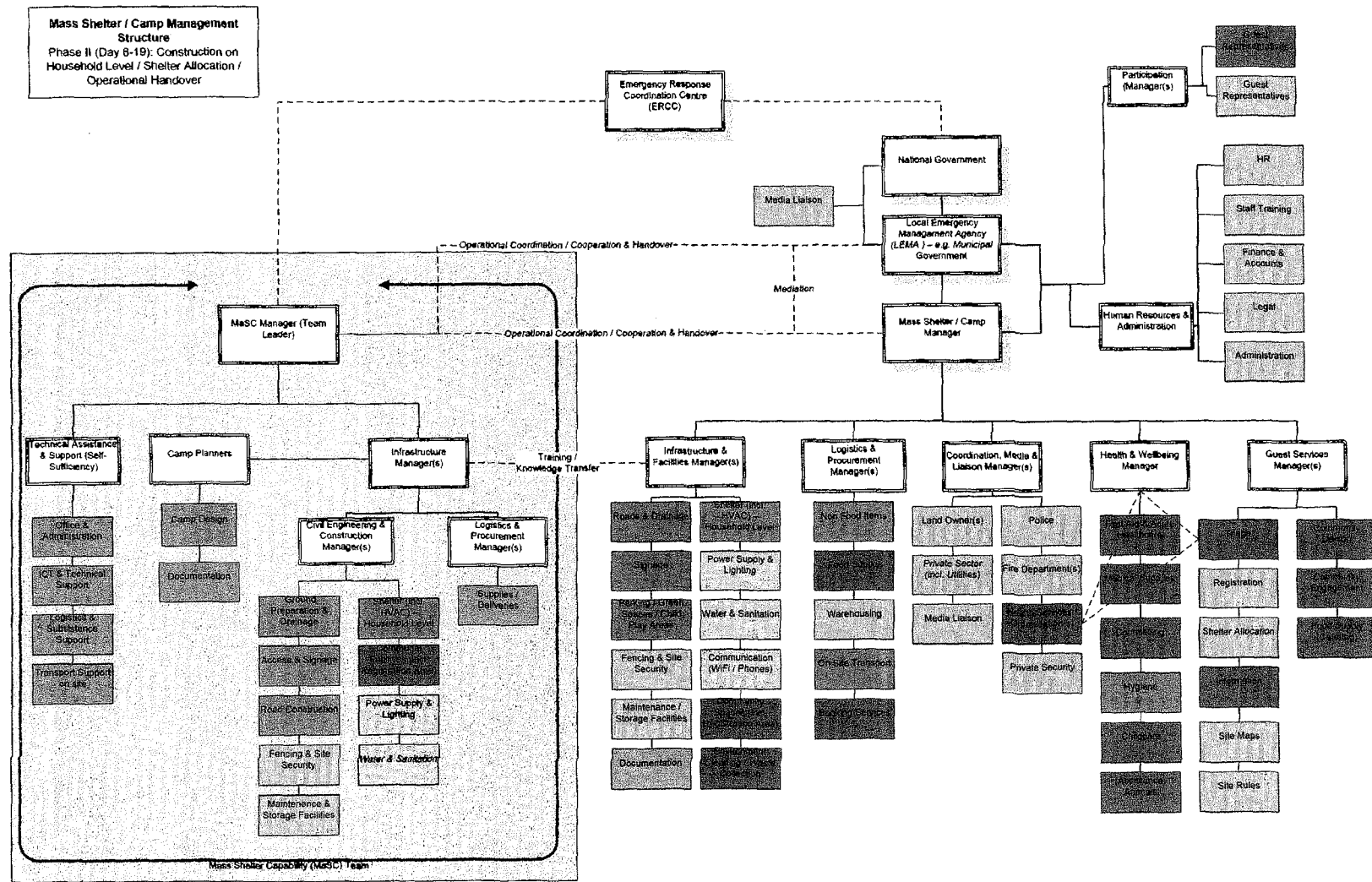
**Figure 14**: Mass Shelter/Camp Management Structure Phase II (Day 6-19): Construction on Household Level/Shelter Allocation/Operational Handover.

**Phase III (Day 20-42): Mass Shelter Camp Hand-over**

During Phase III, the Management Structure reflects all functions needed to build up and develop solutions to the needs (on the community and household level) defined by the MaSC Composite Schedule of Needs within the first six weeks of operations. Additional functions and personnel, for example for Education & Leisure, will need to be in place in order to assume responsibility for those new areas of work. In addition, the MaSC Team will finish construction work and hand-over all facilities to the local Mass Shelter/Camp Management, including necessary instruction for maintenance and decommissioning. Even after operational hand-over is completed, national governments can still request UCPM experts as advisors or specialised experts to support local Mass Shelter/Camp Management structures and personnel. However, if local Mass Shelter/Camp Management takes over responsibility for operations as soon as possible, it strengthens continuity and local ownership as most MaSC Teams will need to start rotating staff after two weeks of deployment. Phase III is displayed in Figure 15.
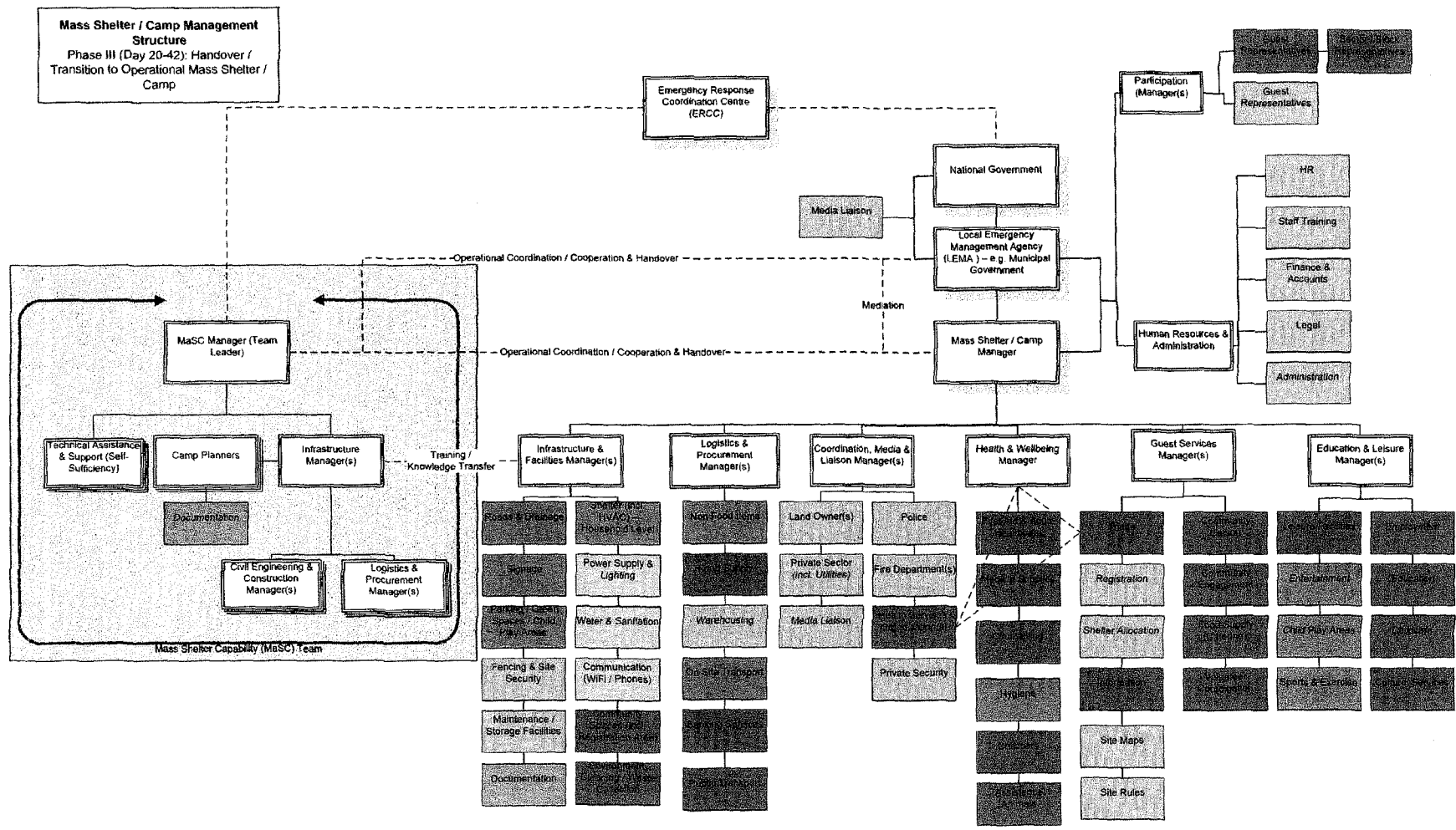
**Figure 15**: Mass Shelter/Camp Management Structure Phase III (Day 20-42): Handover/Transition to Operational Mass Shelter/Camp.

**Phase IV (Day 42+): Mass Shelter Camp Operations and Maintenance**

The Management Structure for Phase IV details all functions and tasks needed to meet all needs according to the MaSC Composite Schedule of Needs on the community and household level. Additional areas of responsibility like Education & Leisure have to be operational. Furthermore, a more structured way of representing residents of the Mass Shelter Capability and the Host Community is expected to be functional at this point. Local Mass Shelter/Camp Management should be functioning independently and not relying on UCPM capacities any longer. Nonetheless, national governments can still request UCPM experts as advisors or specialised experts to support local Mass Shelter/Camp Management structures. Phase II is displayed in Figure 16.

The here proposed phases, while logical and feasible, are of course guidelines and aspired objectives that might need to be adapted to the specific situation as well as the availability of resources during each specific deployment.
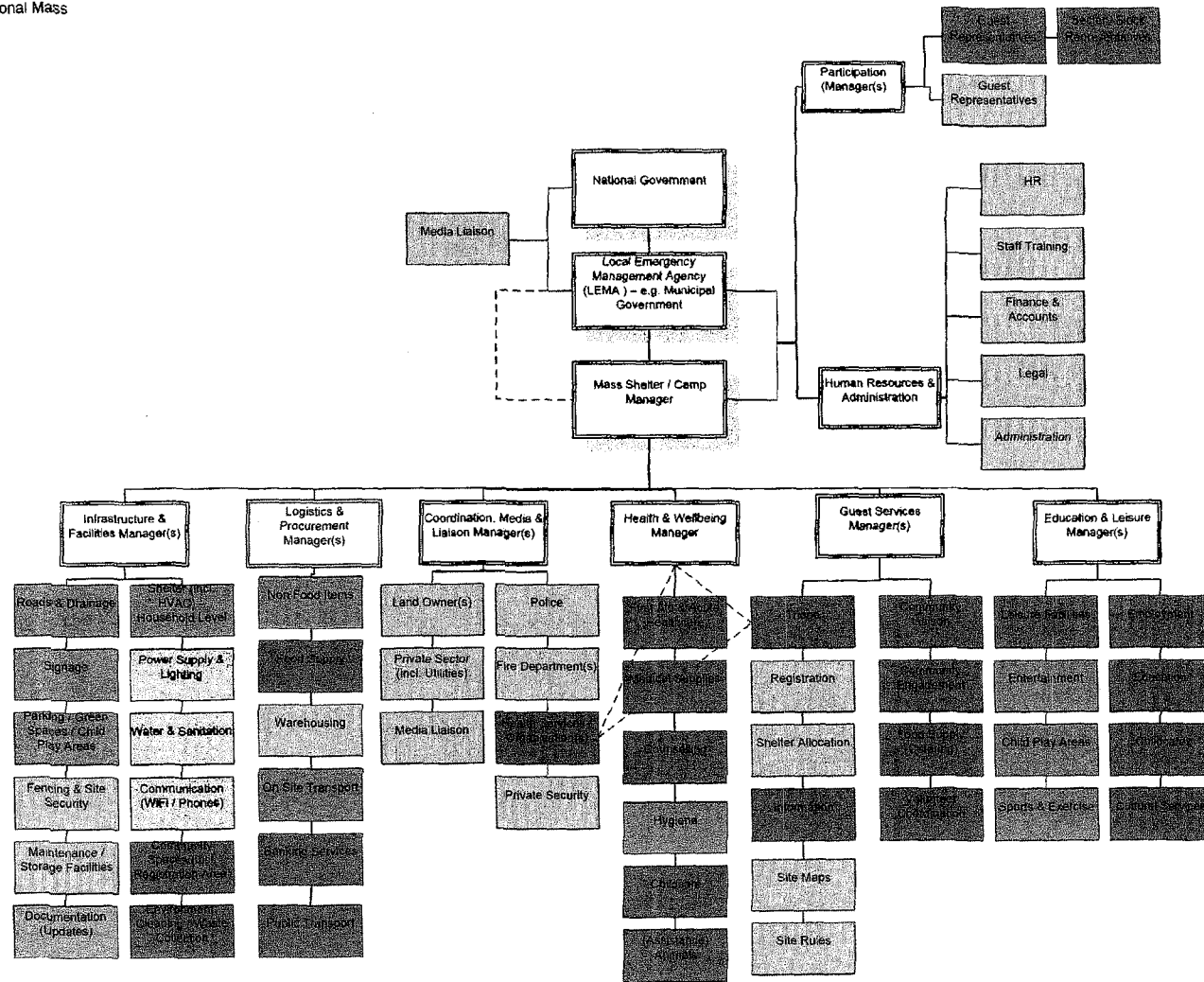
Figure 16: Mass Shelter/Camp management Structure Phase IV (Day 42+): Operational Mass Shelter/Camp

# Evaluation and Lessons Learnt

Throughout the MaSC project, a number of lessons were identified regarding project delivery. Some of these lessons relate specifically to the development of Mass Shelter capabilities and as far as possible have either been incorporated into the guidance or formed part of the proposals for future projects.

Other learning points are more general in terms of resilience projects, particularly those with a substantial workshop component. Whilst many would be considered to be comparatively minor a few represent useful lessons and are therefore summarised below:

1) The project was fortunate to garner involvement from a number of sagacious, pragmatic and accomplished individuals whose contribution greatly aided the development of the ideas and concepts which underpin the project's outputs. Identifying these individuals and obtaining their commitment through the workshops was key to the effectiveness of the project and would not have been as successful had workshop places not been fully funded.

> **Recommendation:** *Targeted and fully funded residential delegate packages for workshops is a good approach*

2) To support the delivery of the delegate packages a transport management company was procured to manage the bookings and provide a support service to delegates should they experience any difficulty or should their flights and transfers be disrupted. By drawing on this specialism it was felt that the project not only provided a better experience for delegates but also was able to make substantial savings on travel and subsistence

> **Recommendation:** *Centrally coordinating travel and subsistence with support from a specialist travel management company provides benefits to those travelling as well as cost savings for the project as a whole*

3) The model of sequential workshops was very effective in delivering substantial improvements in thinking. Around 60% of delegates were consistent between workshops and this both saved time and allowed for ideas to be discussed in much greater depth as there was already an understanding of what had gone before in previous iterations. The balance with new delegates opened up ideas to challenge, reduce opportunities for 'group think' and ensured there was a robust understanding of topics being discussed.

> **Recommendation:** *Sequential workshops are very effective particularly where a significant proportion of delegates are consistent*

4) The sequential workshops were however, an extensive commitment in order to ensure that there was reasonable progress between the workshops. For the MaSC project there was around an 8 week gap between each of the workshops which allowed sufficient time to consider outputs and prepare material for the next workshop, whilst also being soon enough that discussions were relatively fresh in delegate's minds. However the turnaround time for much of this work put the project team under considerable pressure to deliver.

> **Recommendation:** *Ensure resource planning has due regard for the level of commitment required between workshops*

5) The AGILE project management methodology worked well for the workshop delivery phase of the project. The phase was divided into a series of 'sprints' which enabled the design of each workshop to be adapted from the initial planned structure and allowed them to more fully take account of the learning from the previous workshops. However, it was quickly recognised that these sprints needed to be subdivided and incorporate additional face-to-face planning days with the rest of the project team at approximately the midpoint between workshops.

Although these could have been delivered using remote technologies such as telephone conferencing, the face-to-face nature of them allowed for a depth of focus and discussion that is not easily replicated by virtual meetings and contributed to greater collaboration of design.

> **Recommendation:** Incorporate frequent project planning days at key points reflective of the project structure and timetable

6) Although consistency of delegates had a number of advantages it did not remove the need for a level of repetition of key ideas and fundamental aspects of the project. In particular this was applicable where delegates were being asked to consider ideas outside their normal range of expectation. A notable example of this was anxiety expressed over the planning assumption and whether it was realistic (the risk profile showed, if anything, it understated the potential scale). In some case there were individuals who felt the objective was 'impossible' and therefore found it difficult to engage in some of the tasks.

> **Recommendation:** Identify, communicate in a variety of forms and consistently repeat the core assumptions and aims of the project so that all involved understand the overall task

7) Throughout the project, and particularly in the early stages, the project team had a desire to identify and consult with previous EU projects that addressed similar or related topics so that the MaSC project could benefit from their learning and build upon work already undertaken. This proved to be challenging as it was difficult to identify such projects and where they were identified there was little or no response to enquiries nor was it always possible to access their materials and reports.

> **Recommendation:** The EU commission should consider means to enhance the legacy of civil protection projects through the development of a searchable repository of project information including the key outcomes and reports

8) At the outset of the project it was not always easy to gain engagement from stakeholders who had not heard of the project. Often when contacting organisations regarding the project enquiries would become stuck in a call centre as it was seen as sales and marketing. It was often possible to overcome but required persistence and clear messaging. The result of this was that attendance was more limited at the first workshop than hoped and the process was more time consuming than originally forecast.

> **Recommendation:** Ensure communications to promote workshop attendance are clear in the offer and give potential delegates sufficient warning (greater than 3 months)

9) Whilst effective, the intensity of the workshop delivery phase put pressure on the project team and led to a loss of momentum in the immediate period afterward as individuals recuperated from this work and had to balance other non-MaSC work priorities that had been delayed whilst the workshop phase was ongoing. The loss of momentum put a delay into the system which had knock on consequences on the timeline for the production of the guidance platform and material.

It was also during this period that the only dedicated member of the project team left to take up a new opportunity. It was decided not to directly replace this team member as a cost saving measure and in

view of the issues it would create to recruit and bring up to speed a replacement. When taken together with the delays to the final project report it highlighted the value and importance of having more than one individual dedicated to the project as this would provide greater continuity, momentum and resilience.

> **Recommendation:** Ensure the project is supported by dedicated staff resources and for this to be more than one individual.

10) The guidance platform that has been developed for MaSC has many potential benefits and allows for ease of access as well as the ongoing refinement of many of the MaSC outputs. However the process of developing the platform proved more complex and involved than initially forecast creating issues in trying to both develop and populate the platform concurrently. It would have been advantageous to have substantially produced either the platform or the content before seeking to undertake the other element. Given the circumstances of the project in summer 2016 this was unfortunately not an option, but does provide valuable insight and learning for future projects.

In hindsight detailed development of the guidance platform should have commenced earlier in the project however due to the focus on the workshops and competing work priorities, this did not occur.

> **Recommendation:** Detailed project planning should include a more detailed profiling of projected resource demands to ensure the project team are not overburdened during particular periods and that periods of lower demand are used appropriately

# Finance Narrative

In total the project eligible costs totalled €645,467.26, which represents a €44,296.74 saving on the €689,764 amount forecast in the original bid documentation. With in-kind contributions estimated at €164,090 the total project is estimated to have cost €809,557.26

There were several financial challenges during the course of the MaSC project however the end result is that the project was delivered under budget with some variation between budget categories, in particular large savings on the travel and subsistence spend offset by *significant extra expenditure in relation to personnel costs*.

Within categories variation occurred due to a reprioritisation of expenditure areas. For example around €15,000 was redirected from development of the Mass Shelter Requirements Model to further improve the website and enhance the development of the guidance platform. This was felt to be appropriate as a simpler Microsoft Excel version of the model was felt to be adequate whereas the guidance platform development has broader advantages in ensuring all of the products of the MaSC project are accessible.

## Exchange Rate Fluctuations

Coordination of the project was UK based and therefore much of the finance of the project, including a substantial proportion of the personnel costs, was conduct in GB Pounds Stirling whilst the project bid, grant agreement, and reporting requirements are in Euros meaning that much of the project was therefore affected by fluctuations in the exchange rate between the two currencies.

Unforeseen in the project bid process were the changes in the macroeconomic circumstances. These included the continuing sovereign debt crisis and the referendum and subsequent decision of the UK to exit the EU which lead to significant volatility in the exchange rate. Figure 17 below shows the exchange rate between the GBP:EUR since 1st January 2000 where the only comparable periods of volatility were in the early years following the Euro's introduction and during the 2008 global financial crisis.
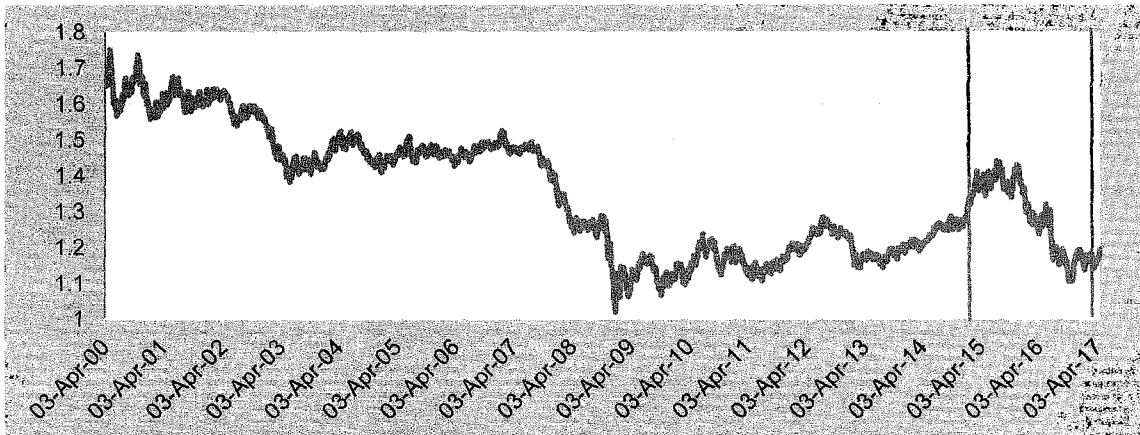


**Figure 17:** The exchange rate between the GBP:EUR since 1st January 2000. The purple markers show the Formal Project Period.

These fluctuations in currency value had significant impacts on budgetary control as it created significant uncertainty in forecasts. It could not be known how much the grant value would be in GBP nor what many of the costs incurred would equate to when the currency conversion was applied.

Added to this is a complication in the way the grant monies are handled by NCC in that the grant is delivered in two parts and on each occasion the grant monies in EUR are converted to GBP on the day of receipt at a retail exchange rate.

Figure 18 below shows in more detail the changes in exchange rate between the time of the bid submission, for which an exchange rate of 1.2276 was used, and the end of the 2016/17 financial year (31st March 2017).
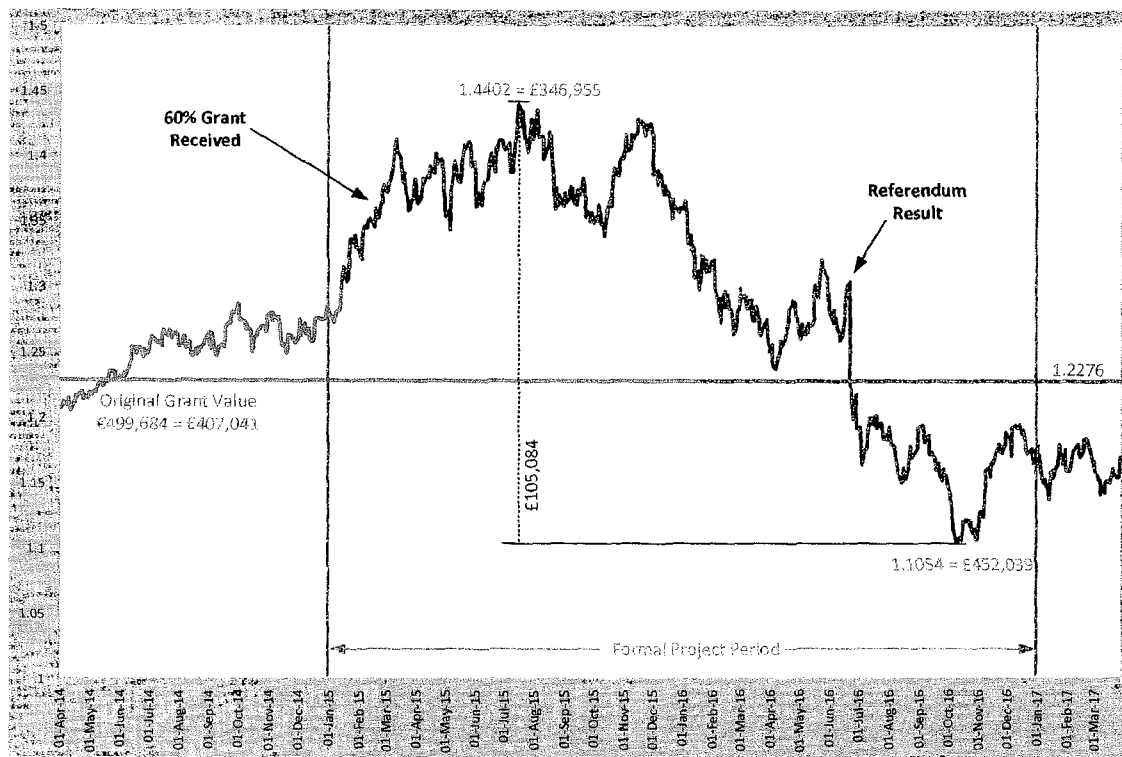


**Figure 18:** The exchange rate between the GBP:EUR between 1st April 2014 and 31st March 2017.

The maximum grant awarded by the EU for the MaSC project was €499,684, which the bid documents equated to £407,401. The currency changes meant that as the GBP strengthened relative to the EUR the equivalent value of the grant varied. At the Pound's strongest the grant would have be valued at £346,955 as opposed to £452,039 when it was at its weakest.

In order to effectively manage this uncertainty the project explored various options to 'fix' the exchange rate as well as ensuring that there were clear spending priorities, regularly agreed with partners. In some areas we elected to shift some parts of the project delivery onto existing project team members which whilst it increased personnel costs would have more chance of being recouped through additional in-kind contributions.

The sharp decline in the value of the pound following the result of the UK referendum on exiting the EU had the beneficial effect of going someway to counteracting the previous period of a strong pound relative to the initial bid and therefore helped bring the overall budget broadly in line with the initial forecasts.

**Savings on Travel and Subsistence**

In the original bid documents, expenditure on travel and subsistence was estimated to total €202,904 however the final net cost was €107,452.79 and therefore represented a saving of €95,451. There are a number of reasons for this saving however these can be summarised as:

- The employment of a travel management company to coordinate the travel arrangements allowed access to cheaper travel options as well as more flexibility for delegates travelling. Although an additional booking fee was incurred this was more than offset by the total saving in fares, simplified administration and additional services to delegates when difficulties were encountered.
- At the time of bid submission the oil price averaged around $100 per barrel however a sharp decline at the end of 2014 meant that for most of the duration of the project the oil price was around $50 per barrel. This reduction benefited the project as, on the whole, air fares were cheaper than were original forecast.
- Competitive procurement approaches and robust negotiations delivered substantial savings on venue costs for the workshops, particularly those in Northampton and Dublin. In particular inclusive residential delegate packages which incorporated venue costs with bed, board and refreshments offered good value when compared to procuring these aspects separately.
- The total number of trips taken was around one third less than initially forecast due to workshop attendance being slightly lower than originally forecast in the bid documents.


**Additional Personnel Expenditure**

In the original bid documents, expenditure on personnel was estimated to total €284,171 however the final net cost was €354,182.09 and therefore represented an additional expenditure of saving of €70,011.09. There are a number of reasons for this however these can be summarised as:

- Much of the additional personnel expenditure was a result of an underestimation in the original bid documents of both the volume of material produced and the time it would take to distil and write up into meaningful articles for the MaSC guidance platform
- Additional work was undertaken by the project team in order to manage and negotiate other contractual elements which allowed for savings or additional value for money to be made with regard to other spend categories, including contributing to the savings on subsistence.
- One of the peak periods of activity coincided with the peak strength of the GBP vs EUR. With the core of the project team incurring personnel costs in GBP this had a distorting effect on the project personnel costs.
- As a risk mitigation measure against ongoing currency fluctuations it was felt appropriate for the core project team to undertake additional work rather than sub-contracting thereby creating greater flexibility and reducing the overall risk.