

# Evacuation Responsiveness by Government Organisations (ERGO): Evacuation Preparedness Assessment Workbook

Duncan Shaw, Pavel Albores, Susan Anson, Paul Kailiponi, Magesh Nagarajan and Patrick Tissington



- ⚙️ Prepare your public
- ⚙️ Visualise your at-risk zone
- ⚙️ Make an evacuation decision
- ⚙️ Disseminate the warning
- ⚙️ Transport evacuees
- ⚙️ Allocate shelters

Preparing Nations, Cities, Organisations and their People



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# ERGO

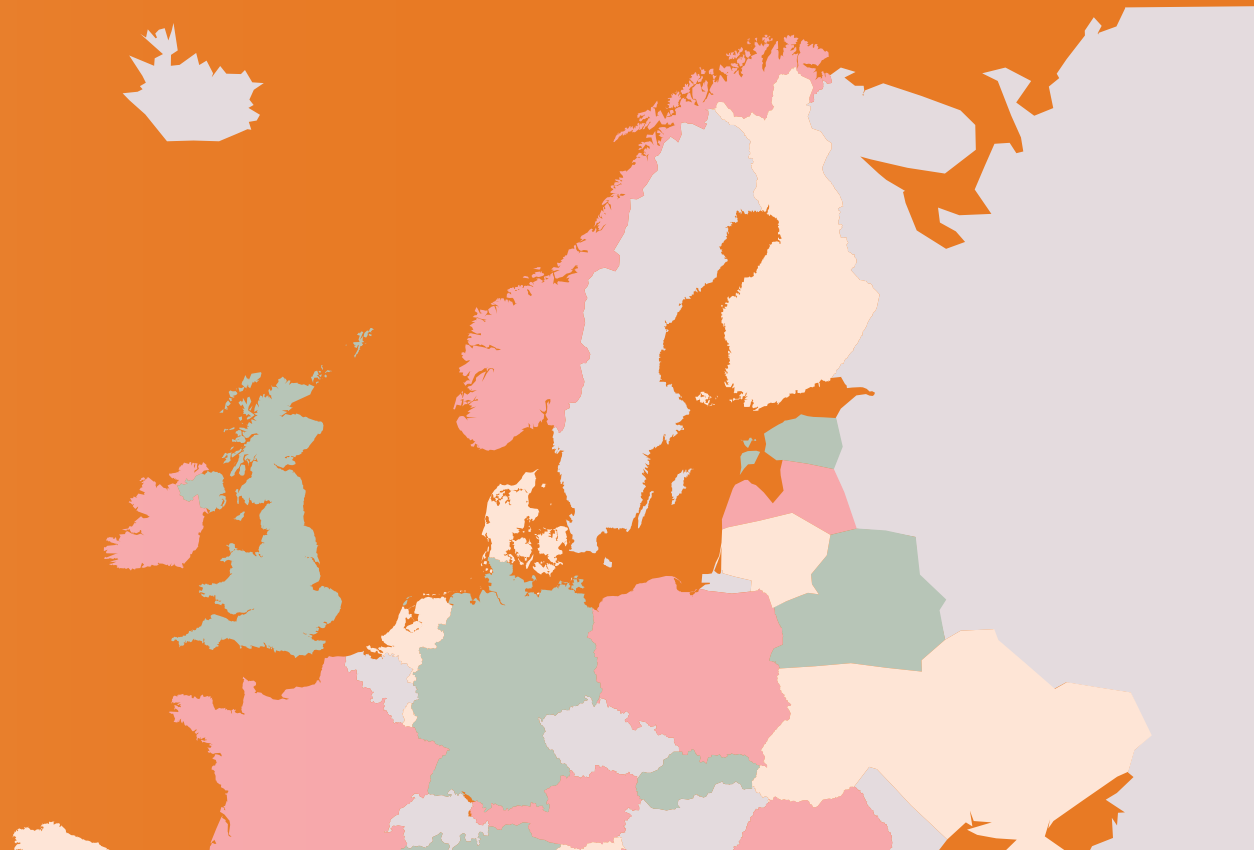
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# Introduction to the Evacuation Preparedness Assessment Workbook





# Introduction to the Evacuation Preparedness Assessment Workbook

## Introduction

This Evacuation Preparedness Assessment Workbook (EPAW) is a tool to assess the level of preparedness of Government Organisations (GOs) for the mass evacuation of their public. It has its origins in the results of a three-year, EU-funded research project called Evacuation Preparedness by Government Organisations (ERGO) which sought to research and strengthen the preparedness activities for the evacuation of cities, regions or even countries.

This EPAW presents a list of tasks to be carried out at the different phases of evacuation preparedness. It also provides an assessment facility to evaluate how much progress GOs have made against each task, as well as indications of standard and best practices for each task. A brief background to the need for evacuation, the ERGO project and the development of the workbook is given next. After this, the application process of the workbook is explained and illustrated with an example.

## Background

Mass evacuations have been required in many different areas during 2010-2011, from the earthquake, tsunami and nuclear emergency in Japan, to forest fires in the UK, Greece and Australia, flooding in Australia and Sri Lanka and landslides in Brazil, to name a few. An element that these incidents have in common is the need to quickly move masses of people away from a zone that is at-risk i.e. evacuate. With the requirement placed on governments to keep its citizens safe, preparations are needed for these eventualities – no matter how apparently remote the chances of the plans ever being needed. GOs with responsibility for emergency preparation have a complex balance to make between the costs of preparing for evacuation against the, perhaps remote, probability of the plans they make ever being needed.

## The ERGO Project

The ERGO project was designed to identify and transfer good practice on the planning, coordination and execution of mass evacuations. It has examined the methods used by government organisations to prepare both themselves and their public for mass evacuation. The project took place over three years (January 2008-December 2010), with the involvement of evacuation experts from 10 countries - Belgium, Bulgaria, Denmark, Germany, Iceland, Poland, Spain, Sweden, the United Kingdom and Japan.

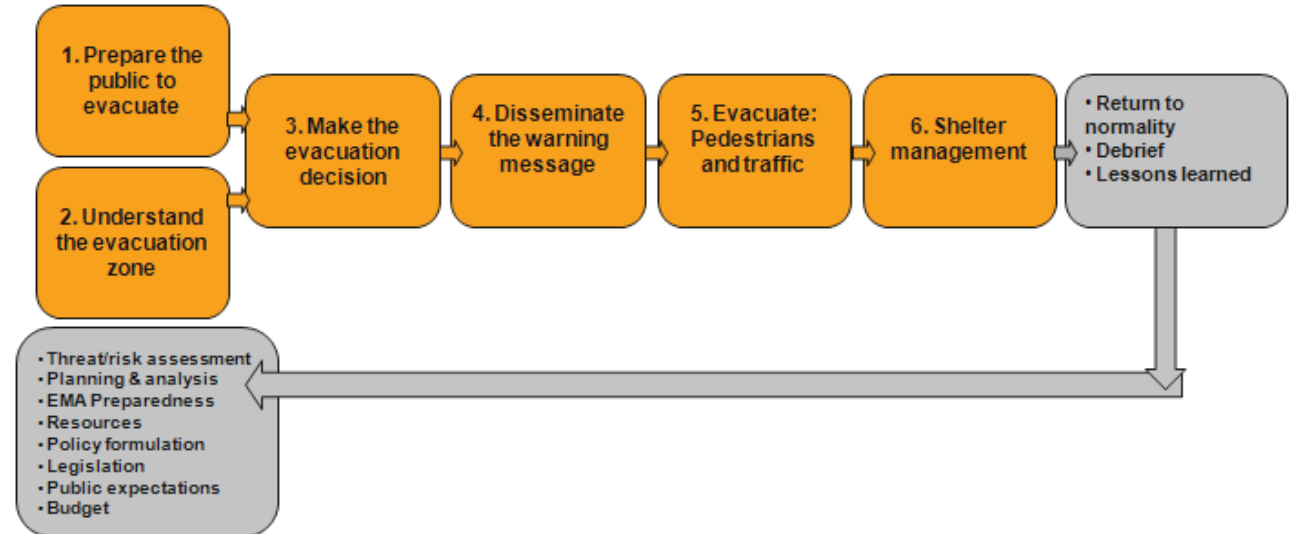


Figure 1.1 The ERGO Framework for Evacuation

# ERGO

## The challenges of mass evacuation

The approach taken by the project was to divide mass evacuation planning into six parts (see Figure 1). These six parts form the ERGO Framework for Evacuation - a conceptual model that was designed to help government organisations to think about the challenges of mass evacuation. These six parts are where the project makes original contributions to the practice and theory of evacuation planning. Underpinning this framework is a body of ERGO research findings that aim to contribute to creating, testing and evaluating of evidence-based policy making.

The ten countries that were recruited to participate were selected on the basis of providing as wide a range of hazards, risks and environments as possible. All countries were visited by the research team and interviews conducted with experts in the range of professions aligned to that country's preparation for evacuations. In doing so, the researchers interviewed over 142 evacuation experts resulting in approximately 114 hours of interview recordings which were rigorously analysed using a variety of good-practice research methodology from an academic tradition. Areas for the creation of new material were identified and samples created for the preparation of the public, computer modelling and evacuation decision-making. Simultaneously, materials were collected from the participating GOs and further research carried out to assemble an online repository.

The project set out to answer the following research questions:

- What analytical models are used to plan for mass evacuation?
- What policies and programmes are used to prepare the public to evacuate?
- How these models, policies and programmes are implemented in practice?
- How might these models and policies and programmes be better aligned?

Alongside the aims of the collection, analysis, creation and dissemination of knowledge, ERGO also set out to help GOs answer the question of "How do we measure our preparedness?". This workbook aims to distil the results of the project and the answers to this questions into an easy to use, practical tool that emergency planners, government officials, NGOs and anyone involved in the planning of mass evacuations can use to evaluate where they are already achieving good practice and the areas where they may wish to place more resource. The nature of preparing for disasters is such that the plans created are rarely tested which means that planners may not be confident that they have taken sufficient steps to prepare for evacuation.

More information on the ERGO Project and on the answers to the above questions, can be found on the project's final report (Shaw et al, 2011) or on the website of the Aston CRISIS centre (<http://www.astoncrisis.com>).

## Evaluating preparedness

Evaluation is important for the continuous improvement of evacuation plans. Without evaluation, there cannot be an evidence-based assessment of good practice and what areas need additional work. One theme that emerged from the analysis of the interviews, focus groups and the feedback from countries was the lack of a tool to measure how well prepared are GOs on mass evacuation. This lack of measurement was due to a number of factors:

1. Lack of knowledge on how to measure preparedness for mass evacuation.
2. Lack of a process for measuring preparedness.
3. Lack of focus on the effort in the initial phases of the preparedness cycle.
4. Lack of a tool with which to measure and compare the preparedness stages.

The literature review showed that there are very few examples of tools that can be used to evaluate the preparedness of GOs – and we did not find any examples in ERGO countries. Most examples in the literature have a USA focus and (normally) deal with only one aspect of evacuation preparedness, such as evacuating a hospital ward or other specialised evacuation procedures. A comprehensive framework for evaluation of preparedness was therefore needed. A structured evaluation tool should allow emergency managers to: compare their preparedness models; learn from other GOs; use it to benchmark preparedness practices and to share best practice. These are all aspects incorporated within the EPAW.

## EPAW key points

Based on the above points, the key points which underpin the EPAW are:

- The importance of a clear process for evaluating the preparedness of GOs for mass evacuation.
- Measuring tasks that are relevant to preparedness - a checklist of desirable activities.
- An evidence-based evaluation tool resulting from empirical research.
- Evaluating capacity as well as capability.
- Creating an audit trail of results.
- Not comparing assessments without context.
- Continuous improvement is fundamental to strengthening preparedness.

## Workbook development

The process of developing the EPAW was structured around the ERGO Framework for Evacuation. For each part in the Framework, a thorough analysis was carried out of the literature and of the interviews with evacuation experts from the ten ERGO countries. The coding of the interviews was used to identify emerging themes in each area. For these themes, a series of tasks were compiled, in order to allow GOs to gauge the level of progress against these themes. Additional tasks for the workbook were developed from the methodological approaches followed for each part of the ERGO Framework for Evacuation. For example, for warning dissemination, the information required in order to develop a dissemination plan (e.g. population density, geographical distribution, listening and viewing patterns for radio and TV, mobile phone ownership) is included in the workbook as a prompt to either obtain this data or agree that it is already satisfactory obtained.

Since the workbook is based on the ERGO Framework for Evacuation, the sections that the workbook includes are:

0. Fundamental issues common to all parts
  1. Preparing the public
  2. Understanding the evacuation zone
  3. Making the evacuation decision
  4. Disseminating the warning message
  5. Evacuating pedestrians and traffic
  6. Shelter management

For each section, the main themes were identified and worded in statements of preparedness (i.e. tasks that a GO could carry out and assess). These tasks were then refined and presented to the ERGO International Advisory Board (IAB) which is a group of senior emergency managers from the ten participant countries,

whose role was to steer the project, provide feedback and help develop the research outcomes (including the EPAW). In the IAB the EPAW tasks were discussed, validated and detailed feedback was obtained. The feedback was then incorporated in the workbook and the final draft piloted with the IAB Chairman. For each task, best practices are identified in the workbook from the analysis of the data collected, or scientific/practitioner reports.

Since the EPAW is intended to be a stand-alone document, each section presents a brief introduction to:

- . The planning area on which GOs might want to prepare.
- . The importance of the theme for preparedness.
- . Potential best practices.

Next to this initial description, the grid of tasks is presented, allowing the user of the workbook to rate their degree of progress in fulfilling that particular task. The degree of progress is rated on a 5 point scale where an assessment for each task can be one of:

1. We have made no meaningful progress
2. We are approaching a satisfactory standard
3. We deliver to a satisfactory standard
4. We have exceeded a satisfactory standard
5. We are an example of best practice

Also, the EPAW collects the justification for the assessment, to act as an audit trail for when it is reviewed.

The tasks are designed to be broad based and challenging. Thus, it is unlikely that a city or region will be an example of best practice for all the tasks and it is also very unlikely that a city or region would have made no progress in any of the tasks. What is more likely is that a profile will be developed for the particular region at a specific point in time. From this profile, priorities can

be identified in order to improve the preparedness of the region. Once the actions resulting from these priorities have been implemented, the EPAW can be applied again to the region and see what progress has been made, leading to new priorities and repeating the cycle as many times as considered necessary.

## Using the Evacuation Preparedness Assessment Workbook

In order to use the workbook, the process outlined in Figure 2 can be followed. As can be seen in Figure 2, this is an iterative process, one leading to continuous improvement of the preparedness of GOs. It is recommended that the workbook is used for an analysis of progress. For example, an initial assessment can be carried out, filling the workbook and six to twelve months later, another assessment can be carried, filling in a new workbook. The two workbooks can then be compared to:

- Gauge the level of progress.
- Audit the agreed actions.
- Review priorities for further improvement.

Alternatively, the workbook can be used individually for a senior manager to reflect on performance and consider attention approaches for their departments.

These reflects can be combined with those from managers of others departments to give a broader view and then used as the basis of discussion on ways forward.

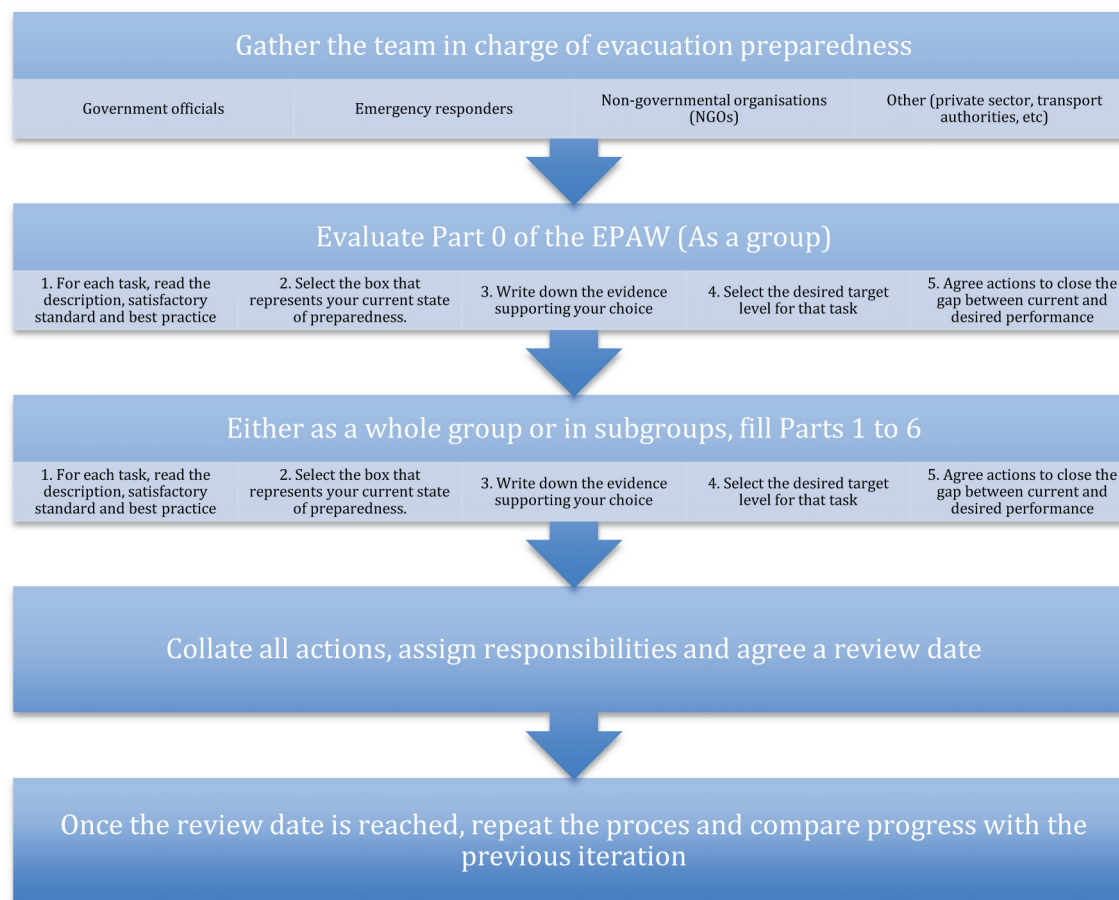


Figure 2 Workbook application process

Figure 3 presents an example of how to fill the EPAW. It is highly recommended that the column “Justification for Assessment” be used to document the evidence behind the ranking given to a particular task. As can be seen in Figure 3, it can also be used to document the actions needed to be taken in order to achieve the desired performance target.

It is important to highlight that GOs do not need to aim to achieve best practice status in all the items. Instead, they can use the EPAW to indicate what level of progress they want to achieve and identify actions to move from the current position to the desired status.

The workbook can be used as a whole (to evaluate the plan of a city or region in a holistic view) or by individual departments or sections, in order to inform the development or evaluation of plans in a specific area. The EPAW is intended to be used as an evaluation tool for GOs to indicate which areas a particular city/region/country is strong in and which areas need to be addressed.

### A short health warning

The EPAW is intended to be used as an evaluation tool for organisations that have an evacuation plan and as a guide for those organisations that do not have a plan or that have one that is incomplete. Talking about a comparable model, Simpson (2008, p. 658) proposed that: “There are a number of ways in which a more fully explicated preparedness model might assist in the general disaster preparedness efforts in local communities. Five are listed here, and include the use of such a methodology as:

1. a research instrument;
2. a community preparedness and recovery audit or assessment;
3. a risk pricing instrument for the insurance industry;

4. an instrument for the allocation of [federal] funding, both for mitigation and recovery activities; and
5. a political instrument.”

The EPAW is designed to be used to cover points 1 and 2 in Simpson’s list and to a lesser extent, point 4. It is not intended to be used as indicated in point 3 (a pricing instrument for risk) or point 5 (a political instrument). It is important to reiterate the recursive nature of the use of the EPAW, using it to identify areas for improvement, creating actions for that improvement, executing the actions and the re-evaluating to see if the gap has been filled and to find new areas for improvement. As such, it is a tool that is designed to be used and reused many times in order to improve an organisation’s preparedness for evacuation.

The EPAW aims to provide organisations with a structure for self-assessment of their own stage of development. It will not show in some league table form how a particular department or country is prepared. Nor will it provide a ‘grade’ for their plans. It does provide the means whereby GOs can regularly evaluate their own and the public’s preparedness for mass evacuation.

## Example EPAW tasks and worksheet

### Task 1.1: Identify how the public can best prepare for mass evacuation

To prepare for mass evacuation, you may want the public to adopt specific behaviours (what the public should do), knowledge (what the public should know) and/or beliefs (what the public should believe or feel) (Kotler and Lee, 2008). Setting the desired behaviours and knowledge as measurable objectives will enable you to evaluate your strategy. Measurable objectives include information on the desired preparedness behaviour or knowledge (e.g. creating an emergency kit), the desired change (e.g. increase by 15%) and the time period by when the increase should occur (e.g. 2015). Desired preparedness beliefs may be identified but not as measurable objectives due to the difficulties in measuring beliefs. To make them more realistic, the measurable objectives should be reviewed after conducting research (Task 1.5) and after identifying who you want to prepare (Task 1.6).

**Satisfactory standard:** Collaborating with a wide range of Emergency Management Agencies (EMAs) we have assessed, identified and formally documented the behaviours, knowledge and beliefs that the public should adopt to best prepare for mass evacuation. We use this information to drive our preparedness strategy.

**Best practice:** We have used our knowledge and understanding of the Emergency Management field to set realistic measurable objectives for the behaviours and knowledge the public should adopt to best prepare for evacuation. As we gather further information on our target audience, we recognise the need to review the objectives set. Our progress in achieving objectives will be formally monitored regularly and the strategy reviewed accordingly.

### Task 1.2: A documented preparedness strategy

A marketing plan may be used to document your preparedness strategy and provide information on Tasks 1.1-1.11. Detailing the different areas of your preparedness strategy will help to ensure that the different areas of a strategic approach are considered, act as a reference point for staff and include information necessary for evaluation. Potential sections of the marketing plan may include:

- The desired public preparedness behaviours, knowledge and beliefs.
- Research (both existing research and the findings of research you have conducted).
- The target audience.
- The preparedness marketing strategy.
- The evaluation of the preparedness strategy.

**Satisfactory standard:** Based on our research of developing preparedness strategies, we have identified each component of our preparedness strategy and have written a first full draft strategy which is being put out for wider review.

**Best practice:** Our organisation has documented and recorded our preparedness strategy and any decisions taken. This information is stored as a guide for staff and as evidence for evaluation purposes. The strategy is periodically reviewed, exercised and rigorously evaluated. All changes to the strategy are documented.

### Task 1.3: Systems in place for developing the preparedness strategy

The following systems can be put in place to develop and implement the preparedness strategy:

- An individual who has overall responsibility for the preparedness strategy.
- A process to continually develop the preparedness strategy, for example using coordination meetings held with different EMAs to produce communications.
- A team responsible for the public preparedness strategy.

**Satisfactory standard:** We have determined which members of the organisation are responsible for the preparedness strategy and the process used to develop the strategy. We have confirmed that each individual knows their responsibilities.

**Best practice:** In our organisation each individual's and the team's role in developing the preparedness strategy is clearly defined and all stakeholders know what these are. Set processes have been established to develop the strategy and we have regular meetings to formally monitor their effectiveness.



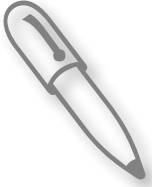
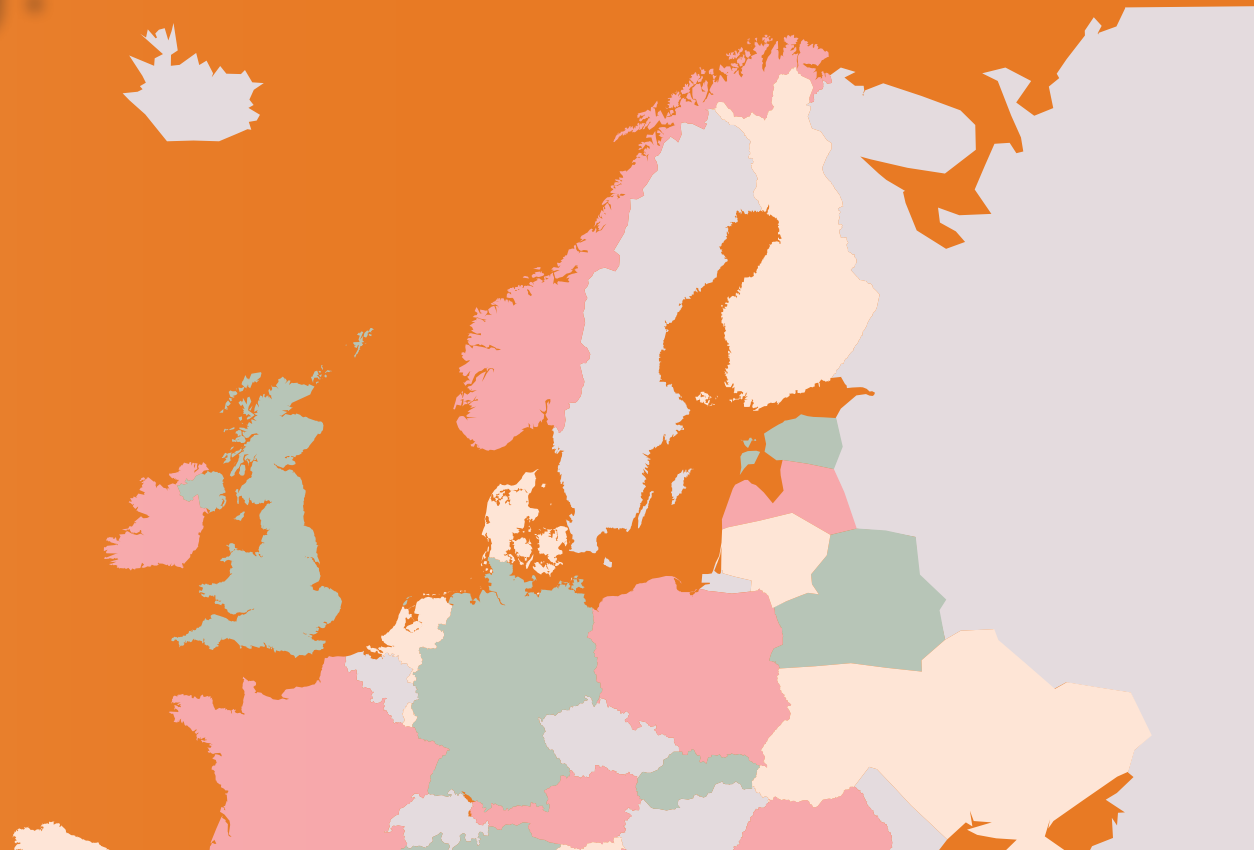
	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
1.1. We have identified how the public can best prepare for mass evacuation	✓ ★					
1.2. Our preparedness strategy is documented		✓		★		
1.3. We have systems in place for developing the preparedness strategy, including:						
a. An individual responsible for the preparedness strategy		✓	★			
b. A process in place for developing, reviewing and monitoring the public preparedness strategy			✓ ★			
c. A team responsible for preparing the public		✓	★			

Figure 3 Example of how to fill an EPAW worksheet

Key ✓ Current Performance ★ Target Performance



0. What fundamentals need to be in place for effective planning and decision making?



# 0. What fundamentals need to be in place for effective planning and decision making?

When GOs start to think about preparing for an evacuation, there are fundamental tasks that need to be considered for all agencies/workstreams. For example, it is necessary to 'understand local evacuation plans and procedures' irrespective of whether you are: preparing the public, understanding the evacuation zone, making the evacuation decision, issuing a warning message, evacuating, or managing shelters. Instead of including a task of 'understand local evacuation plans and procedures' for each Part of the EPAW, this first section presents all the fundamental tasks that are common across all Parts 1-6.

Understanding laws, identifying multi-agency partners, institutionalising processes, training staff, building an evidence-base and evaluating preparations are all further examples of tasks which need to be performed in each of Parts 1-6 of the ERGO Framework for Evacuation.

Of course, there are some specific tasks which related only to Part 1 or Part 2 (etc) and these are detailed individually in those sections. For example, the task 'identify your target audience' is only pertinent to Part 1: Preparing the public, and so is detailed under Part 1.

This generic section contains seven fundamental tasks that are common to all Parts 1-6 of the EPAW. This section includes:

- **Task 0.1:** Understand the laws and guidance for evacuations
- **Task 0.2:** Understand local evacuation plans and procedures
- **Task 0.3:** Identify who is important in the multi-agency collaboration
- **Task 0.4:** Ensure appropriate systems and processes are in place
- **Task 0.5:** Train staff and exercise the plans
- **Task 0.6:** Take an evidence-based approach to decision making underpinned by research
- **Task 0.7:** Evaluate your evacuation preparations

When using the EPAW to think about preparedness for mass evacuation, each of these seven tasks can be applied to Parts 1-6 that follow i.e. Task 0.1 of understanding laws/guidance is applied to each of:

- Part 1: Preparing the public
- Part 2: Understanding the evacuation zone
- Part 3: Making the evacuation decision
- Part 4: Disseminating the warning message
- Part 5: Evacuating pedestrians and traffic
- Part 6: Shelter management

This way, the specific laws/guidance that underpin each Part can all be separately considered by the experts who are assessing their preparedness for a mass evacuation. Applying each of the generic Tasks 0.1-0.7 to Parts 1-6 complements the specific

tasks in each Part and strengthens how GOs can assess their preparedness using the EPAW.

### Task 0.1: Understand the laws and guidance for evacuations

Your plans, activities, decisions and analytical models should be informed by (and comply with) the laws and guidance/standards operating at the international, national, regional and local levels. Failing to comply with the relevant laws is not a sustainable strategy. Laws may also be more informal e.g. the terms of reference for your organisation with regards to its responsibility in evacuation planning and response.

**Satisfactory standard:** We have identified and documented the different levels of laws, guidance and standards that inform our emergency plan. As a multi-agency response, we assess our plans to ensure we are complying with the current laws.

**Best practice:** We develop emergency plans and strategies based on emergency laws, guidance and standards operating at the international, national, regional and local levels. We actively monitor and assess how changes in legislation affect our plan and strategy. We are successful in meeting voluntary international standards. We feed our experiences back to law/standard makers to ensure higher levels of compliance are possible.

### Task 0.2: Understand local evacuation plans and procedures

All ERGO countries have evacuation plans. An understanding of these plans, however, implies much more than simply having a set of plans and processes regarding evacuation operations on a bookshelf. Multiple organisations that have evacuation plans should understand how their plans will interact with one another during an incident.

**Satisfactory standard:** The lead agency has evacuation plans for all support organisations and high-risk facilities. These plans are regularly updated and are reviewed by the primary agency to avoid planning conflicts. Support agencies have access to the evacuation plans of other organisations.

**Best practice:** Periodic reviews of underlying organisations' evacuation plans are made by the primary agency. Periodic guidance is given by the primary agency to support evacuation plans for public and private groups. Primary evacuation plans are in alignment with higher-level government organisations.

### Task 0.3: Identify who is important in the multi-agency collaboration

Multi-agency coordination can improve the breadth of actions taken by GOs to prepare the public as well as plan, exercise, and make decisions in conducting a mass evacuation. Effective multi-agency working requires coordination, agreeing terms of reference and the building of professional relationships.

**Satisfactory standard:** Organisations that can support evacuation planning and response planning meet regularly to discuss evacuation planning and exercise together. Input and requests from collaborating organisations are coordinated by the primary agency. There are widespread professional relationships across the multi-agency partners.

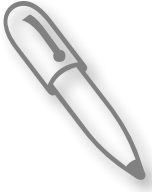
**Best practice:** There is active participation of multi-agency partners in the various stages of evacuation preparedness and collaboration extends to all stages of the ERGO Framework for Evacuation. A review of multi-agency collaboration is conducted routinely to identify gaps, and feedback on the effectiveness of the partnership is provided across partners to heighten productivity. Officials search for new organisations that can further support evacuation processes, in particular to address identified gaps.

### Task 0.4: Ensure appropriate systems and processes are in place

Emergency management plans encompass a wide range of activities to prepare for evacuations. The plans (and activities) will require processes to be in place to ensure that effort is systematised within the organisation (i.e. it is continually addressed rather than forgotten). These systems/processes will include preparations for both the public and emergency organisations. Public preparation includes the responsibility of GOs to inform and prepare populations living in at-risk areas. Command and control structures must also be in place to make important evacuation decisions and allocate appropriate resources to move people out of at-risk areas. The systems can also inform operational models to simulate/predict possible conditions under which an evacuation may occur. Across all steps of the ERGO Framework for Evacuation, these systems and processes can be analysed to improve preparations.

**Satisfactory standard:** We have processes in place to ensure that continual attention is put on key aspects of evacuation preparedness e.g. formal agreements between multi-agency partners, warning information is available, databases of key information are validated, learning from debriefs is institutionalised, and exercises are regularly conducted to test our plans. Our processes have been verified to be adequate to successfully evacuate the public from an at-risk zone within operational timeframes.

**Best practice:** Formal agreements and documentation of all processes are periodically reviewed and updated. This documentation is established throughout all stages of the ERGO framework and all changes are verified and practiced. You compare processes with other multi-agency partnerships, locally, nationally and internationally. You share your processes as examples of best practice.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
0.1. We have a breadth of knowledge in various levels of evacuation laws and guidance which are embedded in our processes						
0.2. Our local evacuation plans and procedures are embodied in our processes (they are not just a document on a bookshelf)						
0.3. Our multi-agency partnership is working effectively						
0.4. We have appropriate systems and processes in place which assist in preparedness and response						

## Task 0.5: Train staff and exercise the plans

Owing to the rarity of mass evacuations, training and exercises are integral components of emergency preparation. You can train your staff so that they are knowledgeable about each part of the ERGO Framework for Evacuation. Training may be in the form of:

Training packages tailored appropriately for different levels of staff.

Exercises to test and evaluate: your communications to the public; multi-agency coordination among decision makers, first responder agencies, information-gathering organisations and public and private transport operators; warning dissemination telecommunication systems; transportation of evacuees; and the operation of shelters.

Training packages tailored for different roles e.g. communications training provided to staff responsible for communicating with the public.

Your organisation can use training and exercises to practice communication protocols, measure operational capabilities, test equipment (e.g. decontamination systems), train new staff and coordinate with humanitarian NGOs.

**Satisfactory standard:** All staff receive basic training on Parts 1-6 of the ERGO Framework of Evacuation. Advanced training is provided relevant to an individual's specific role.

**Best practice:** We have a commitment to training our staff to deliver relevant steps of the ERGO Framework for Evacuation. Training requirements are identified as part of the annual performance review. There is an annual budget dedicated to further training. We actively pursue opportunities to participate in multi-agency exercises covering the six parts of the framework.

## Task 0.6: Take an evidence-based approach to decision making underpinned by research

Your organisation can adopt an evidence-based approach to decision making by consulting existing research or conducting additional research to: inform the public preparedness strategy, understand the at-risk zone and evacuation decision, and as an evidence base for different inputs of evacuee behaviour to strengthen evacuee models. You may access existing research through:

- Academic research literature.
- Stated preference surveys (pre-evacuation).
- Post evacuation surveys.
- Practitioner reports and publications.

Your organisation may also conduct its own research to inform the different Parts of the ERGO Framework for Evacuation, for example to:

- Identify the public's information needs (Part 1).
- Build a GIS (Part 2).
- Gather public response information to inform the evacuation decision (Part 3).
- Identify the specific needs of vulnerable populations (Part 4).
- Collect data on evacuee transport choices (Part 5).
- Gather data on public emergency accommodation requirements (Part 6).

**Satisfactory standard:** We use the findings of existing research to inform our understanding of different parts of the ERGO Framework for Evacuation. We have some people who consult existing research and attempt to embed this into our organisation, but these attempts are not systematised. We identify research questions and have success in gaining funding to enable some to be answered.

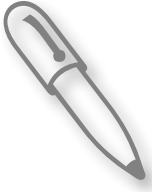
**Best practice:** Systems are in place to actively mine existing research and embed the lessons learnt into our organisation. Our organisation conducts research with the public and Emergency Planners to inform our response to different parts of the ERGO Framework for Evacuation. We have processes in place to identify new research questions/projects and we are very successful in getting funding to have these answered within a reasonable timeframe.

## Task 0.7: Evaluate your evacuation preparations

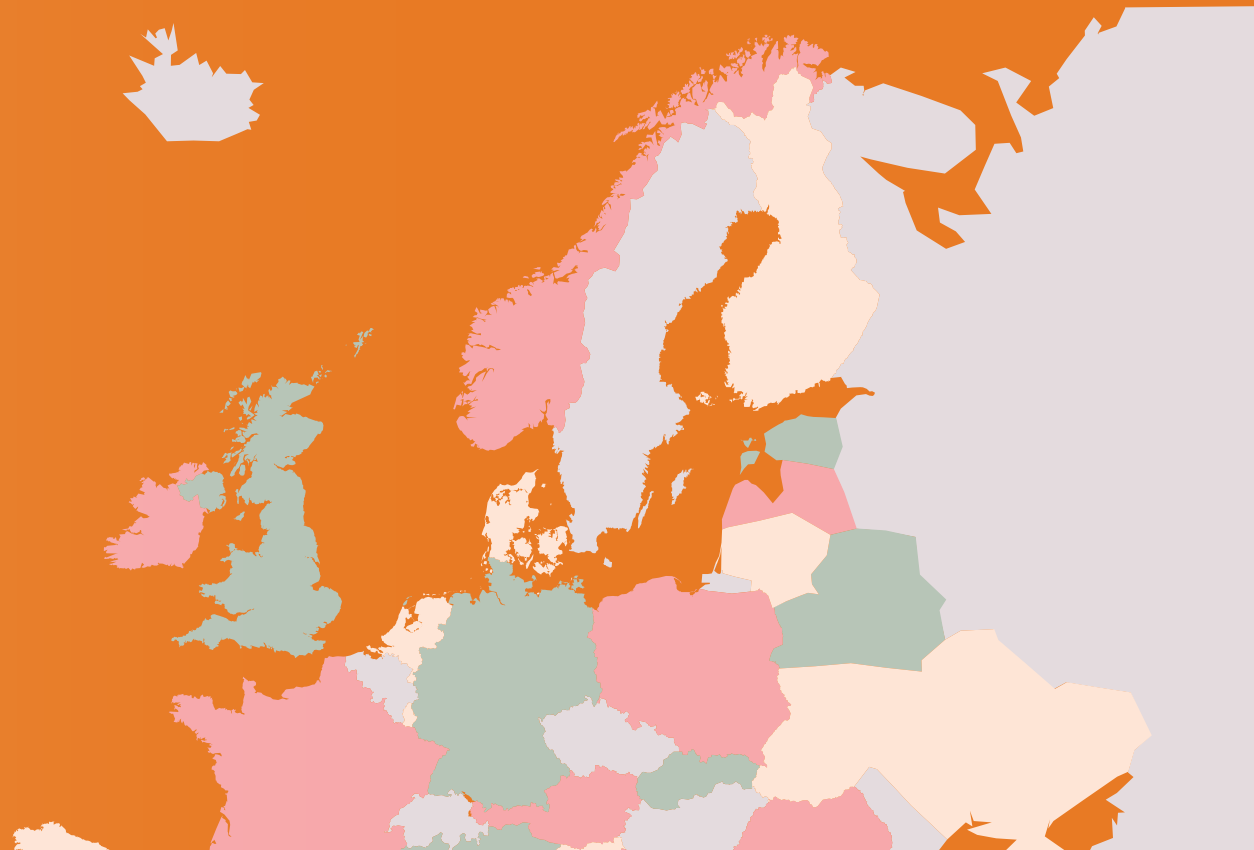
Your organisation will evaluate evacuation plans, as they are living documents that require updating as risk levels, new expertise, legislation and organisations change. There is the opportunity to evaluate your plans during evacuation exercises. Your organisation can also engage with senior practitioners and external subject matter experts to assess the completeness of your evacuation plans, identify best practice, share reusable materials and strive towards constant improvement. Decisions on how to evaluate your evacuation plan may be based on your available budget, time and expertise.

**Satisfactory standard:** We have established a formal process for updating and evaluating our evacuation plans. This process is documented within the emergency plan.

**Best practice:** Our organisation periodically reviews and updates our emergency plans whilst considering any changes to the environment in which we operate. We take an outward facing approach to these reviews, engaging with people outside our peer group. There is evidence that our plans are improving as a result of this evaluation work.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
0.5. We train our staff and exercise our plans for each relevant step of the ERGO Framework for Evacuation						
0.6. We take an evidence-based approach to emergency planning which is underpinned by research						
0.7. We have a process for reviewing and updating our evacuation plans						

# Part 1: How do we assess our preparedness to prepare our public?





# Part 1: How do we assess our preparedness to prepare our public?

Public preparedness for mass evacuation is important so that the public know the most effective response when an evacuation is called, thereby reducing the demand placed on those responsible for managing the incident. GOs can influence the public to prepare for mass evacuation well in advance (months/years) of an incident occurring. The development of a strategy designed to influence the public to prepare will involve considering the following:

- How do we want the public to prepare for mass evacuation? (Task 1.1)
- How are we going to develop and document the preparedness strategy? (Tasks 1.2 & 1.3)
- What are the existing approaches we can learn from to prepare the public for mass evacuation? (Task 1.4)
- What does the public currently know about preparing for mass evacuation and what additional information do they need in order to prepare? (Task 1.5)
- What do the public consider to be the benefits and barriers to preparing? (Task 1.5)

- Which members of the public do we want to prepare for mass evacuation and target with our preparedness strategy? (Task 1.6)
- How can we develop a marketing strategy that is effective in influencing the public to prepare? (Tasks 1.7-1.9)
- How can we train our staff to effectively deliver the preparedness strategy? (Task 1.10)
- How will we know that our strategy has been effective in influencing the public to prepare for mass evacuation? (Task 1.11)

Considering these different areas when developing a public preparedness strategy provides GOs with an opportunity to think strategically about how they prepare their public for mass evacuation. Instead of using limited budgets to develop communications materials that GOs do not know the effectiveness of, a strategic approach can be adopted to develop a preparedness strategy that is designed taking the public's information needs into account. Using a strategic approach to develop the preparedness strategy enables GOs to identify the effectiveness of their strategy in influencing the public to prepare for mass evacuation.

The different areas outlined above that should be considered in the development of a public preparedness strategy fall under 4 main areas; research and planning (Tasks 1.1-1.6), strategy development (Tasks 1.7-1.9), staff activities (Task 1.10) and monitoring and evaluation (Task 1.11). For further information on developing a strategy to influence different public behaviours, please refer to Kotler and Lee (2008) and Walsh et al. (1993). Detailed information on the 4 main areas and relevant tasks that are required to develop an effective public preparedness strategy, Part 1 of the ERGO Framework of Evacuation, is provided next. For further information on developing a strategy to achieve public preparedness for mass evacuation, please refer

to the ERGO report available from Aston CRISIS Centre.

In addition to the specific tasks for preparing the public, please also see the seven generic tasks in the section titled "What fundamentals need to be in place for effective planning and decision making" (page 17) including:

- Task 0.4: Ensure appropriate systems and processes are in place
- Task 0.5: Train staff and exercise the plans
- Task 0.7: Evaluate your evacuation preparations

# ERGO

## The challenges of mass evacuation

### Task 1.1: Identify how the public can best prepare for mass evacuation

To prepare for mass evacuation, you may want the public to adopt specific behaviours (what the public should do), knowledge (what the public should know) and/or beliefs (what the public should believe or feel) (Kotler and Lee, 2008). Setting the desired behaviours and knowledge as measurable objectives will enable you to evaluate your strategy. Measurable objectives include information on the desired preparedness behaviour or knowledge (e.g. creating an emergency kit), the desired change (e.g. increase by 15%) and the time period by when the increase should occur (e.g. 2015). Desired preparedness beliefs may be identified but not as measurable objectives due to the difficulties in measuring beliefs. To make them more realistic, the measurable objectives should be reviewed after conducting research (Task 1.5) and after identifying who you want to prepare (Task 1.6).

**Satisfactory standard:** Collaborating with a wide range of Emergency Management Agencies (EMAs) we have assessed, identified and formally documented the behaviours, knowledge and beliefs that the public should adopt to best prepare for mass evacuation. We use this information to drive our preparedness strategy.

**Best practice:** We have used our knowledge and understanding of the Emergency Management field to set realistic measurable objectives for the behaviours and knowledge the public should adopt to best prepare for evacuation. As we gather further information on our target audience, we recognise the need to review the objectives set. Our progress in achieving objectives will be formally monitored regularly and the strategy reviewed accordingly.

### Task 1.2: A documented preparedness strategy

A marketing plan may be used to document your preparedness strategy and provide information on Tasks 1.1-1.11. Detailing the different areas of your preparedness strategy will help to ensure that the different areas of a strategic approach are considered, act as a reference point for staff and include information necessary for evaluation. Potential sections of the marketing plan may include:

- The desired public preparedness behaviours, knowledge and beliefs.
- Research (both existing research and the findings of research you have conducted).
- The target audience.
- The preparedness marketing strategy.
- The evaluation of the preparedness strategy.

**Satisfactory standard:** Based on our research of developing preparedness strategies, we have identified each component of our preparedness strategy and have written a first full draft strategy which is being put out for wider review.

**Best practice:** Our organisation has documented and recorded our preparedness strategy and any decisions taken. This information is stored as a guide for staff and as evidence for evaluation purposes. The strategy is periodically reviewed, exercised and rigorously evaluated. All changes to the strategy are documented.

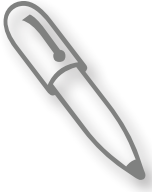
### Task 1.3: Systems in place for developing the preparedness strategy

The following systems can be put in place to develop and implement the preparedness strategy:

- An individual who has overall responsibility for the preparedness strategy.
- A process to continually develop the preparedness strategy, for example using coordination meetings held with different EMAs to produce communications.
- A team responsible for the public preparedness strategy.

**Satisfactory standard:** We have determined which members of the organisation are responsible for the preparedness strategy and the process used to develop the strategy. We have confirmed that each individual knows their responsibilities.

**Best practice:** In our organisation each individual's and the team's role in developing the preparedness strategy is clearly defined and all stakeholders know what these are. Set processes have been established to develop the strategy and we have regular meetings to formally monitor their effectiveness.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
1.1. We have identified how the public can best prepare for mass evacuation						
1.2. Our preparedness strategy is documented						
1.3. We have systems in place for developing the preparedness strategy, including:						
a. An individual responsible for the preparedness strategy						
b. A process in place for developing, reviewing and monitoring the public preparedness strategy						
c. A team responsible for preparing the public						

# ERGO

## The challenges of mass evacuation

### Task 1.4: Review existing research

It is important to learn from others and part of this involves appreciating the notable practices that other EMAs are using to prepare the public for mass evacuation. Lessons can be learnt from both successful and less successful preparedness approaches, as the lessons learned from unsuccessful approaches can inform your own strategy. Information on notable practice can be accessed in a variety of ways, such as from:

- Emergency management seminars and conferences.
- Academic research centres such as Aston CRISIS Centre [www.AstonCRISIS.com](http://www.AstonCRISIS.com).
- Professional books and academic journal articles.
- Practitioner organisations and their associated magazines.

Potential sources of information are included in the Reference List of the ERGO project report.

**Satisfactory standard:** A variety of sources are used to learn about the public preparedness practice of other organisations. Lessons have been learnt but there is currently no organisational process to embed these lessons into the development of our preparedness strategy.

**Best practice:** Our organisation has a strategic approach to actively mine a diversity of international research for notable practices. The lessons learnt systematically feed into our public preparedness strategy (and the wider organisation). We can defend our public preparedness strategy in the context of our reviews of existing research.

### Task 1.5: Conduct additional research with the public

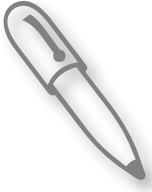
New bespoke research can be designed to address specific questions about the preparedness of your public. The results can then inform your decisions because they match your context. The research methods to generate reliable findings can include quantitative (e.g. questionnaires of large populations) and qualitative methods (e.g. interviews or focus groups with small numbers of people to understand issues in depth), for example to identify:

- a. Existing levels of public preparedness for mass evacuation.
- b. What the public perceive to be the barriers to preparing.
- c. What the public perceive to be the benefits of preparing.
- d. The public's information needs for the development of communications.
- e. Public expectations of GOs.
- f. The public's level of trust in GOs.

Once research has been conducted, the measurable objectives set for Task 1.1 may be reviewed.

**Satisfactory standard:** Individuals in our department identify research questions as they arise. They commission research and share the results widely. This practice is not yet joined up across the wider organisation and other agencies involved in mass evacuation.

**Best practice:** Conducting research to understand our public is embedded in our organisational culture. Our public preparedness strategy is based on the findings of research that has been conducted and analysed rigorously. We have short, medium and long term plans for the research questions that we want to answer. We can act as an intelligent research customer because we understand what good research practice is.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
1.4. We have reviewed existing approaches to public preparedness for mass evacuation including practitioner articles, international practices, and academic research						
1.5. We have conducted research with the public to identify:						
a. Their preparedness for mass evacuation						
b. What they perceive to be the barriers to preparing						
c. What they perceive to be the benefits of preparing						
d. Their information needs for the development of communications						
e. Their expectations of public organisations						
f. Their trust in public organisations						

# ERGO

## The challenges of mass evacuation

### Task 1.6: Identify your target audience

To maximise the effectiveness of limited resources, you can select specific groups of the public to target with your preparedness strategy. The first activity in selecting your audience is to identify all potential target audiences based on characteristics such as:

- a. Nationality and language spoken.
- b. Where the public live and their proximity to the risk.
- c. Whether they are in your area for a fixed period of time e.g. commuters, tourists, students.
- d. Their age and how this may affect their information needs.
- e. Vulnerability to the risk e.g. groups requiring additional support during evacuation.
- f. Special requirements, for example farmers and their livestock may be impacted during an incident.

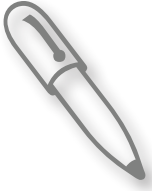
There may also be additional target audiences identified that are not covered by the above categories, for example the ERGO project report outlines how one country targets church and women's groups with preparedness information. Once your potential target audiences have been identified, the next step is to evaluate each potential audience to identify which you should target. Each of the potential audiences you identified can be evaluated based on:

- **Their size:** e.g. how many tourists / children / farmers are in the area?
- **Their existing levels of preparedness:** for example, how many people in each group have not considered preparing for mass evacuation? How many people have created an evacuation plan?
- **How easy each group is to reach:** for example, groups such as immigrants who do not speak the national language or those who are housebound may be harder to reach. When evaluating your potential target audiences you may decide that you want to target harder to reach groups, for example countries participating in the ERGO project targeted one hard to reach group, immigrants, through community meetings.
- **The cost of reaching each group:** for example, the cost of reaching children may be relatively low when compared to the cost of reaching vulnerable groups such as immigrants or the elderly who may require specially tailored communications materials.
- **How responsive each group is likely to be:** for example, your research may identify groups that are likely to be more responsive to your preparedness strategy.
- **Our organisational capabilities:** for example, which groups do we have sufficient resources and expertise to target with our preparedness strategy?

Once you have identified the groups you will be targeting with your preparedness strategy, the measurable objectives set for Task 1.1 may be reviewed.

**Satisfactory standard:** As a team, we have created a list of potential target audiences. We have discussed which of these groups to target based on the evaluation criteria outlined above.

**Best practice:** All available information (including area statistics, research findings and a risk register) are used to develop a comprehensive list of potential target audiences. We have adopted a method of ranking each of the different evaluation criteria and then evaluating and ranking each potential target audience against these criteria. We have conducted detailed research to understand who these groups are, their characteristics and their needs before, during and after an evacuation.

	Not relevant to our organisation	Justification for assessment				
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓	✓	✓	✓	✓	✓
1.6. Identified and evaluated potential target audience groups such as:						
a. Different nationalities/language speakers						
b. Different geographic locations						
c. Transient populations such as commuters and tourists						
d. Different age groups (e.g. children)						
e. The vulnerable groups in your area						
f. Special requirements (e.g. farmers)						



# ERGO

## The challenges of mass evacuation

### Task 1.7: Introduce a range of bespoke products and services

Your organisation can develop products and services that assist the public in undertaking preparedness behaviours and make preparing for mass evacuation easier. Preparedness products include tangible objects such as an emergency preparedness kit, whereas services are intangible such as a telephone warning service the public can register for in advance of an incident. Examples of preparedness products and services include:

- **Warning services:** In the UK, the public can register online to receive flood warnings by mobile phone, text message, telephone and email ([www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)).
- **Information centres:** In Belgium, Doel nuclear power plant has a visitor and information centre for people wanting to know more about nuclear power ([www.electrabel.com](http://www.electrabel.com)).
- **Hazard workshops:** The public in Hamburg, Germany can visit a Flood Animation Centre where they receive information on flooding and the opportunity to walk around 25 cylinders filled with different levels of water to experience how it would feel to be surrounded by water (<http://daad.wb.tu-harburg.de/?id=1296>).
- **Internet based services to check hazard activity:** Japan and Iceland provide websites where the public can monitor the activity of a specific hazard e.g. volcanoes (<http://en.vedur.is/>).
- **Educational computer software:** The UK has developed a computer game for children teaching them how to prepare for emergencies ([www.crucial-crew.org/what-if](http://www.crucial-crew.org/what-if)).

Not all of these products and services will be appropriate for the target audience you have selected or the hazards you are preparing for. You may also need to review existing products and services based on the information gained from the research and planning tasks completed.

**Satisfactory standard:** We have a comprehensive set of products and services that are periodically reviewed to ensure they support the public in their preparedness efforts.

**Best practice:** Decisions on our product and service offering are based on information from the research and planning tasks. Products and services are tailored to the public that we know (from research) will make their preparing for mass evacuation easier. We scan the international community for examples of best practice which inform our product and service development and delivery.

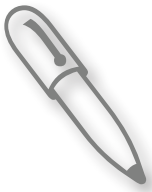
### Task 1.8: Reduce the effort the public needs to make to prepare

Undertaking preparedness behaviours and gaining knowledge requires effort from the public in exchange for the benefits of being prepared. Preparing may require effort **financially** (e.g. purchasing an emergency kit), **psychologically** (e.g. arousing public fear) and/or in terms of **time** (e.g. hours spent searching for information to create a family plan). The research you conducted (Task 1.5) will identify what your target audience considers as the main effort involved in preparing. A GOs task is to reduce the effort the public perceives they need to make to prepare and make preparing more attractive than alternative activities the public could undertake. Perceived effort may be reduced by:

- a. Working with retailers to provide discounts on emergency kit supplies.
- b. Promoting the benefits of preparing e.g. reduction of injuries.
- c. Providing checklists and ready made emergency kits.
- d. Ensuring that opportunities are available for the public to prepare e.g. public exercises.

**Satisfactory standard:** From our research, we have identified the effort the public perceives they need to make to prepare and the benefits they would like to gain from preparing. The team uses this information to make strategic decisions about public preparedness.

**Best practice:** We design our strategy to reduce the perceived effort and increase the perceived benefits identified from research with the public. We have developed an audit trail detailing how we reduce effort and increase the perceived benefits of preparing. We are able to point the public to sources of affordable preparedness materials and have relationships with suppliers.

	Not relevant to our organisation	Justification for assessment					We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓						✓	✓	✓	✓	✓
1.7. Introduced a range of appropriate products and services to support the public in their preparation efforts such as:											
a. Internet based services											
b. Information centres											
c. Telephone services / call centres											
d. Interactive learning groups											
e. Radios distributed to members of the public											
f. Transport disruption information											
g. Customised warning service with local information											
h. Games											
i. E-Learning systems											
1.8. Reduced the effort the public needs to make to prepare in terms of:											
a. Financial cost											
b. Psychologically (reducing fear in the public)											
c. Time (e.g. hours spent preparing)											
d. Available opportunities to prepare for mass evacuation e.g. public participation in training and exercises											

# ERGO

## The challenges of mass evacuation

### Task 1.9: Disseminate preparedness information through a variety of locations and channels

The public has to receive information that influences them to prepare for mass evacuation. The first activity in disseminating preparedness information is for you to **decide the messages** you will use to communicate information to the public. When making message decisions consider:

- How you want the public to prepare (behaviours, knowledge and beliefs).
- How the public can perform the desired behaviour.
- The benefits your target audience desire from preparing for mass evacuation.
- How the public can access your preparedness products and services.

It is important to deliver preparedness messages using a **source the public trusts**, as the source of the message can influence the public's response. Additional research with your target audience will identify whether your chosen messages are likely to achieve your objectives. This provides an opportunity to modify messages if necessary.

The second activity required for Task 1.9 is to **determine the locations and communications channels** you will use to disseminate your information and messages to the public. Potential locations and communications channels include:

Locations	Communications Channels
Schools	Printed materials (leaflets, brochures)
Exercises and training venues	Advertising (newspapers, television, radio, telephone book, direct mail)
Public information sessions (lectures, community workshops and meetings)	Websites
Places of work	Outdoor signage (information signs, posters)
Call centres	Promotional items (calendars, mugs)
Neighbourhood groups	

Deciding which communications channels to use to deliver your messages should be informed by:

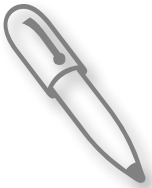
- **Your objectives and the increase in how many people you want to prepare:** Mass media channels (such as television) will reach significantly more people than channels such as information signs.
- **Your target audience:** Your research (Task 1.5) will identify your audience's information needs and their preferred channels of receiving information.
- **Your budget:** There are high costs associated with some channels such as television that may not be within your budget.

- **The nature of the communications channel:** Each communication channel has advantages and disadvantages that may make it more or less suitable for achieving your objectives.

You can use the information gained from conducting audience research (Task 1.5) to make informed decisions on both your messages and communications channels.

**Satisfactory standard:** We have researched how the public want to receive information on mass evacuation and we base message decisions on the results of that research. Communications decisions are informed by how many people we want to prepare and our budget.

**Best practice:** Decisions on messages and communications channels are explicitly linked to our objectives and are informed by research on (a) what the public want, and (b) the effectiveness of each channel. Before communicating widely, we carry out additional research with a sample of our target audience to ensure the messages we decide upon are likely to influence our target audience to prepare. Our communication strategy is joined up with other government agencies that may complement/compromise our initiatives.

	We have made no meaningful progress	We are approaching a satisfactory standard	We deliver to a satisfactory standard	We have exceeded a satisfactory standard	We are an example of best practice	Justification for assessment	Not relevant to our organisation
	✓	✓	✓	✓	✓		✓
1.9. Disseminated preparedness information through a variety of locations and channels							
a. Decided upon the messages that will be sent to prepare the public considering:							
i. Your objectives							
ii. How the public can prepare							
iii. The preparedness benefits your audience desires							
iv. How the public can access your products and services							
b. Determined the locations and communications channels you will use to disseminate preparedness information and messages							

# ERGO

## The challenges of mass evacuation

### Task 1.10: Organise training for your staff

You can train your staff so that they are knowledgeable about the preparedness strategy and how to work towards achieving the objectives set for Task 1.1. Staff can also be trained to communicate preparedness information to the public effectively before, during and after an incident occurs. Training may be in the form of:

- a. Training packages tailored appropriately for different levels of staff.
- b. Exercises to test and evaluate your communications to the public.
- c. Communications training provided to staff responsible for communicating with the public.

**Satisfactory standard:** All staff receive training on our preparedness strategy.

**Best practice:** We have a commitment to training our staff to deliver the preparedness strategy. Training requirements are identified as part of an annual performance review. There is an annual budget dedicated for staff to undertake further training.

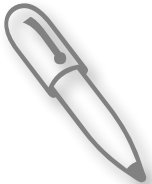
### Task 1.11: Monitor and evaluate your public preparedness strategy

You can monitor your preparedness strategy to identify whether any changes are required for you to meet the objectives set for Task 1.1. Research or interaction with the public can be used to monitor your preparedness strategy. Evaluating your preparedness strategy is also important to identify whether you have achieved the objectives set for Task 1.1. Activities you can undertake to evaluate your strategy include:

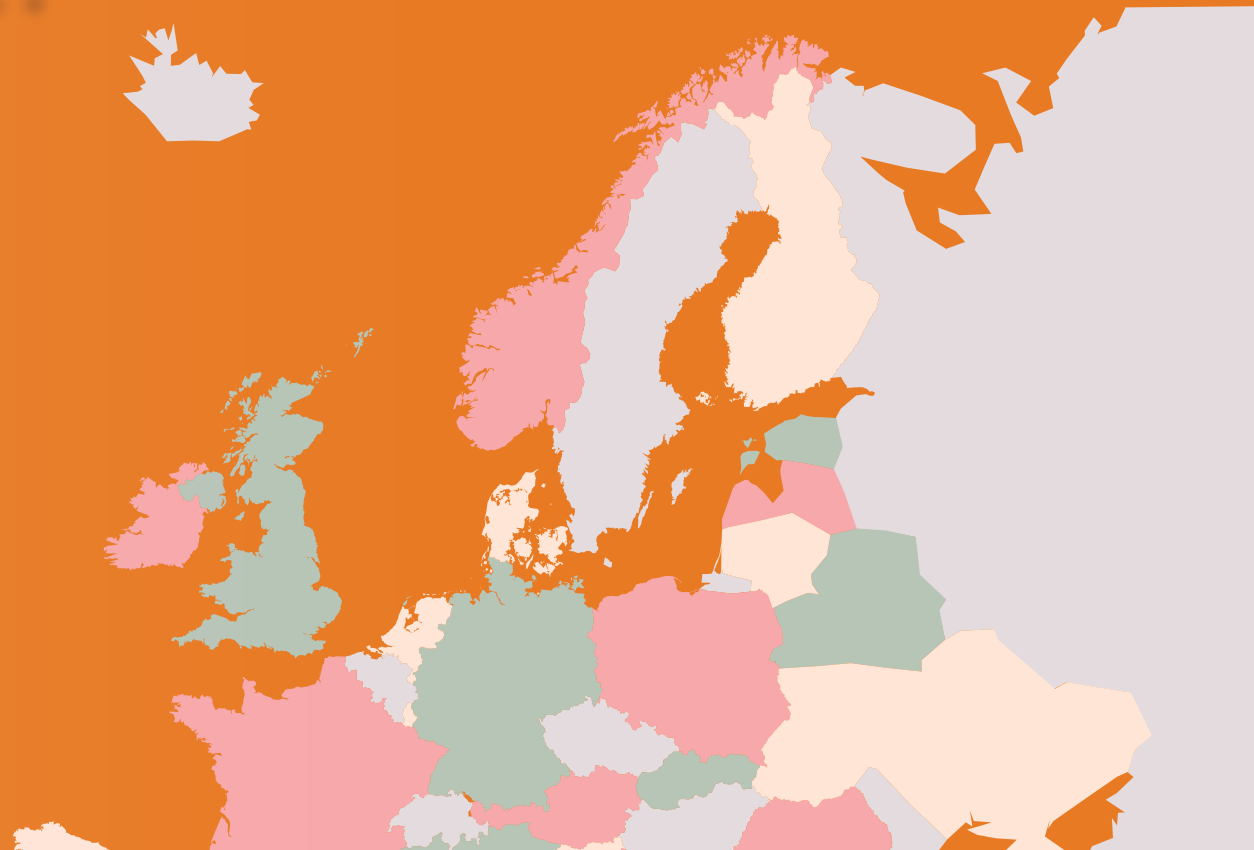
- **Outlining the evaluation process in the preparedness plan you created for Task 1.2.**
- **Identifying the outputs of your preparedness strategy:** for example how many leaflets were distributed to the public, how many people have you reached with your strategy and what media coverage has the strategy gained?
- **Conducting research with the public to identify whether you have achieved your objectives.**
- **Identifying lessons you have learnt and creating an audit trail:** to ensure learnt lessons are implemented in future strategy iterations.

**Satisfactory standard:** We have outlined how our strategy will be evaluated in our marketing plan including what the likely outputs of the strategy will be. We have documented measures in place to evaluate its effectiveness.

**Best practice:** The strategy is monitored to identify if any changes are required to meet the objectives set. We will identify whether we have achieved the projected outputs and objectives of the strategy. Any lessons learnt will be embedded into a revised version of the strategy. We routinely conduct research on the effectiveness of the strategy and formally work with the public to further improve our practice e.g. through a public representative.

	Not relevant to our organisation	Justification for assessment					We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓						✓	✓	✓	✓	✓
1.10. Organised training for relevant staff:											
a. Designed tailored training packages for different levels of staff											
b. Tested and evaluated communications using training exercises											
c. Provided communications training for communications staff											
1.11. Monitored and evaluated your public preparedness strategy:											
a. Identified how the strategy will be monitored											
b. identified how the strategy will be evaluated including:											
i. Outlined the evaluation process in the preparedness plan											
ii. Identified the different outputs of your preparedness strategy											
iii. Conducted research to identify if objectives have been achieved											
iv. Identified lessons learnt and developed an audit trail for implementation											

## Part 2: How do we assess our preparedness to understand our evacuation zone?





## Part 2: How do we assess our preparedness to understand our evacuation zone?

Zone knowledge refers to the geographically located data that can influence evacuation decisions. Spatial information can include different population groups in an evacuation zone, transport networks and environmental data. The use of this data and the method in which it is collected and analysed will be discussed during this section.

While the most common method in which spatial data was collected and manipulated was within a geographic information system (GIS), less complex applications were also observed such as table-top maps and leaflets. The main components of understanding the evacuation zone are the collection of appropriate spatial data, the manipulation of that data, the expertise required to accomplish the tasks, and ways in which the spatial data can be used to support evacuation planning and operation.

The completion of this portion of the EPAW can be used by emergency managers to assess their own use of spatial data and understanding of areas that may need to be evacuated. It

can also strengthen partnerships between emergency agencies and GIS practitioners who can provide important expertise to support evacuation preparations.

There are nine proposed tasks for assessing the preparedness to understand the evacuation zone, including:

- Having spatial data for zone visualisation (Task 2.1)
- Supporting decision making with visualised data (Task 2.2)
- Assessing our spatial data for quality (Task 2.3)
- Having the expertise available to help with zone visualisation (Task 2.4)
- Ensuring the compatibility of spatial data from multiple sources (Task 2.5)
- Having hazardous event simulation available (Task 2.6)
- Analysing population movement (Task 2.7)
- Analysing emergency management resources (Task 2.8)
- Assessing risk (Task 2.9)

In addition to these specific tasks, please also see the seven generic tasks in the section titled “What fundamentals need to be in place for effective planning and decision making” (page 17) including:

- Task 0.2: Understand local evacuation plans and procedures
- Task 0.3: Identify who is important in the multi-agency collaboration
- Task 0.6: Take an evidence-based approach to decision making underpinned by research

# ERGO

## The challenges of mass evacuation

### Task 2.1: We have spatial data for zone visualisation

The visualisation of information is a common tool used by emergency managers during evacuation planning and operations. Zone visualisation tools can take many forms including the use of paper, tabletop maps or geographic information systems (GIS). There is a wide variety of information types that were observed among ERGO countries. The visualisation of this information is represented as both the location of important concepts and a database that includes aspects of that information. Identified information themes include:

- a. Settled population (e.g. including non-native speakers).
- b. Transient population (e.g. tourists).
- c. Built environment (e.g. transport networks).
- d. Natural environment (e.g. topography).
- e. Emergency resources (e.g. police stations).
- f. Critical infrastructure (e.g. electricity sub-stations).

**Satisfactory standard:** There exists visualised information in a form where it can be updated and disseminated to participating organisations for use during an incident. Visualised information is used in evacuation planning, operations, training and review.

**Best practice:** Electronic dissemination of zone visualisation is available along with other forms of information. Real-time information can be included in the visualised data. Underlying data is also available to organisations when preparing evacuation operations.

### Task 2.2: Visualised data is used to support decision-making

Spatial data can be used during all phases of an emergency. During an operation, dynamic mapping with a GIS can provide an overall picture of evacuation operations. Training can also be supported using spatial data by creating realistic scenarios for exercises. Post-event review can also be supported by spatial data to improve future evacuation planning.

**Satisfactory standard:** Emergency maps are used to provide information during the appropriate phases of an evacuation. Maps provide an overview of either planning or actual at-risk areas and are only updated by a single controller.

**Best practice:** Emergency maps are available that provide action-specific information to the appropriate organisation. Real-time updating of the map is possible by a range of organisations and is viewable immediately by all other users.

	Not relevant to our organisation	Justification for assessment				
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓	✓	✓	✓	✓	✓
2.1. We can visualise our evacuation zone in terms of:						
a. Settled populations						
b. Transient populations						
c. The built environment						
d. The natural environment						
e. Our emergency resources						
f. Critical infrastructure						
2.2. We use our visualised spatial data to:						
a. Support planning						
b. Support emergency operations						
c. Support training						
d. Support post-event review						

# ERGO

## The challenges of mass evacuation

### Task 2.3: Our spatial data is assessed for quality

The quality of spatial data is important if it is going to support evacuation planning and operations. Spatial data quality includes a number of different aspects including:

1. frequency of the information being updated
2. the source that collects the data
3. methods of gathering the data
4. level of aggregation of the data

Each of these aspects can be used to assess the quality of the spatial data which is presented to a decision maker.

**Satisfactory standard:** Available spatial information is assessed according to its data quality for inclusion in evacuation planning and operations. Where multiple sources are available, the highest quality data is used to support decision-making.

**Best practice:** Following the assessment of spatial data, actions are taken by emergency managers to improve the data that is available to them. Emergency managers continue to actively search for improved sources of spatial information. Information specific to evacuation management is gathered to support government actions.

### Task 2.4: We have expertise available to help with zone visualisation

Spatial information that is used within a GIS requires a high level of expertise to perform tasks appropriate for evacuation planning and operations. The availability of expertise can be a limiting factor to the use of spatial data and its application to evacuation.

**Satisfactory standard:** GIS expertise is available through an outside organisation. This support allows for the creation of basic maps to support evacuation planning. Some additional spatial analysis support is provided by other organisations.

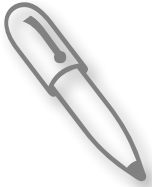
**Best practice:** GIS expertise is available to support expert analysis which is requested by emergency managers for evacuation planning. Data manipulation of spatial information is possible within emergency management organisations.

### Task 2.5: The compatibility of spatial data

Many different agencies gather spatial data for their own analyses. Data compatibility indicates that the aggregation level and type are consistent across organisations i.e. that different databases can be combined and analysed. Where spatial data is compatible, emergency managers will be able to draw on the widest range of sources to support evacuation analysis.

**Satisfactory standard:** An assessment of compatible spatial data sources has been performed by emergency officials. Spatial data that is compatible is used to provide evacuation analysis.

**Best practice:** Actions have been taken by emergency managers to manipulate spatial data so that they can be included with other compatible sources. Negotiations are underway with data-gathering agencies to align their data with other potential sources.

	Not relevant to our organisation	Justification for assessment	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓		✓	✓	✓	✓	✓
2.3. We have assessed spatial data quality for:							
a. Settled population information							
b. Transient population information							
c. Built environment information							
d. Natural environment information							
e. Emergency resource information							
f. Critical infrastructure information							
2.4. We have expertise available to help with zone visualisation							
2.5. We have spatial data systems that are compatible with:							
a. Emergency responders							
b. Utility agencies							
c. Transport agencies							
d. Environmental agencies							
e. Local authorities							
f. Other organisations _____							

# ERGO

## The challenges of mass evacuation

### Task 2.6: Hazardous event simulation is available

Spatial data can be used to support dynamic zone-based analysis of the evacuation zone. Flood and plume modelling are the most common types of event simulation where decision makers can watch simulations of what might happen given input assumptions.

**Satisfactory standard:** Evacuation simulation is available through outside agencies with limited consultation with emergency managers. Simulations are only available for worst-case scenarios.

**Best practice:** Event simulation is created in collaboration with emergency managers. A wide range of scenarios are available to support evacuation decision-making. Emergency managers have direct access to simulation models and are able to update assumptions and data and re-run the scenario.

### Task 2.7: Population movement is analysed

Population movement in spatial terms can take two different forms. The first is a simulation of population movement during an evacuation. The second aspect of population movement is to predict the settlement of populations in order to analyse risk levels in an area.

**Satisfactory standard:** Population movement for both transport and general trends are available through non-emergency management organisations. These models use non-emergency scenarios and are not specifically created for mass-evacuation.

**Best practice:** Evacuation-specific population movement models are available for use by emergency managers. These models have been verified either through continued testing or through operational exercises.

### Task 2.8: Emergency management resources are analysed

Emergency management resources can be spatially placed using a GIS. Additional analysis is possible when location and distance are vital to the placement of these resources. In the case of evacuation planning this can be the placement of gathering points for public transport or sheltering sites.

**Satisfactory standard:** Emergency management resources are spatially placed to support evacuation decision-making. These maps are available on short notice to participating agencies. Updating of information is done on a regular basis.

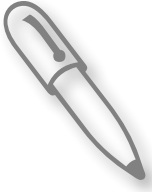
**Best practice:** Emergency management resources as well as other related resource locations are available to support evacuation decision-making. All organisations participate in updating this information.

### Task 2.9: Risk assessment

A risk assessment can include a wide range of spatial information. In many cases risk assessments are completed based on hazard/threat information. This initial assessment can be combined with transport or population information to further understand the distribution of risk in an area.

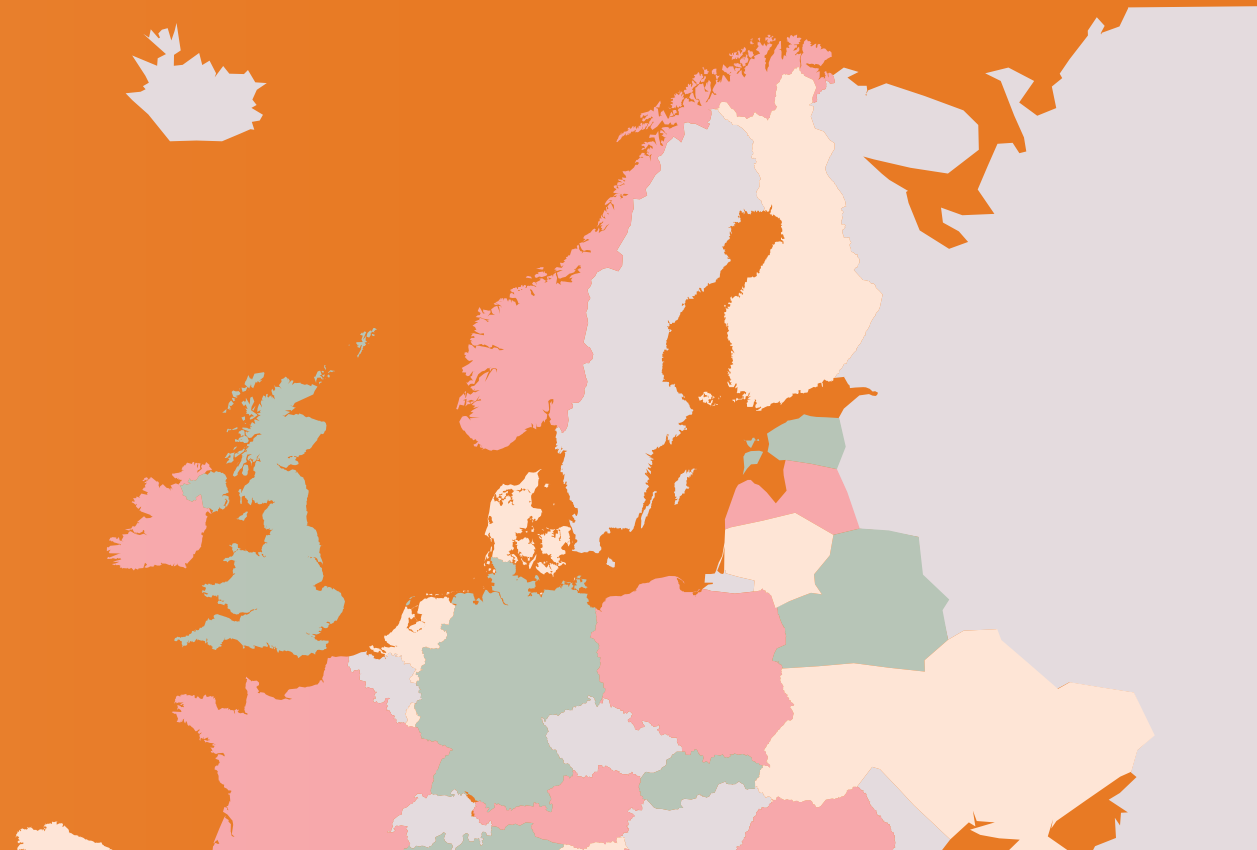
**Satisfactory standard:** Risk assessments are created that incorporate both hazard and population-based information for possible evacuation scenarios. This assessment is used internally to influence resource management and evacuation actions.

**Best practice:** Risk assessments for multiple scenarios are available to emergency managers. The public are also given access to non-sensitive risk assessment information. Risk assessments are updated as new spatial data is received from different sources.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
2.6. We use spatial data to support hazardous event simulation						
2.7. We use spatial data to support population movement simulation						
2.8. We use spatial data to support emergency management resources						
2.9. We use spatial data to support zone risk assessment						



# Part 3: How do we assess our preparedness to make the evacuation decision?



# Part 3: How do we assess our preparedness to make the evacuation decision?

An emergency manager must decide when the hazard/threat is great enough to warrant an evacuation. In some cases the amount of time it takes to effectively evacuate the area means that the actual evacuation decision must be made when there is a highly uncertain likelihood of the event even occurring.

Much of the EPAW for evacuation decision-making works towards facilitating a systematic approach to making an evidence-based evacuation decision. Evacuation values represent the ways in which a decision-maker (DM) can tell whether they made a correct decision. These goals should include consultation with the many organisations that will participate in the evacuation process. The identified evacuation values include:

- . Minimising loss of life
- . Minimising panic and disorder
- . Minimising business disruption
- . Minimising cost to emergency organisations

- . Minimising public disregard of future orders
- . Maximising public confidence in officials
- . Maintaining integrity of criminal investigations

These values can be used to measure possible outcomes that are conditional on actions taken by emergency officials.

Effective evacuation decision-making also includes a clear understanding of the structure and responsibilities of organisations that will participate in evacuation operations. Because emergency operations for catastrophic events are often a multi-agency process; communication, familiarity and training are vital components of evacuation decision-making.

There are also many uncertainties that must be considered before an evacuation decision can be made. The quality, quantity and ability to analyse this information is also vital to making optimal decisions.

The combination of these evacuation goals and uncertainties can then be used for: policy analysis of actions that are directed toward the improvement of evacuation outcomes; improved decision logging for after action analysis; and the creation of hazard/threat thresholds to begin evacuation processes. The information that is gathered during this process can support simulation and other evacuation computer models concerning evacuation operations. The following tasks are illustrative and also include examples of good/best practice for each action.

The EPAW offers thirteen tasks to assess GO's preparedness for evacuation decision making, including:

- . Understand the decision-making processes including: the evacuation decision (Task 3.1); requesting additional resources (Task 3.2).
- . Understand the evacuation objectives e.g. evacuation as an effective response (Task 3.3); resolve conflicting

objectives (Task 3.4); measure objectives (Task 3.5).

- . Take a multi-agency approach e.g. engage stakeholders (Task 3.6); establish communications between information-producing organisations and decision-makers (Task 3.7); train for group decision-making (Task 3.8).
- . Understand information needs e.g. to plan for evacuation (Task 3.9); to make the evacuation decision (Task 3.10).
- . Prepare to make the decision e.g. identify thresholds for effective evacuations (Task 3.11); assess the quality of information (Task 3.12); log decisions made (Task 3.13).

In addition to these specific tasks for making the evacuation decision, please also see the seven generic tasks in the section titled "What fundamentals need to be in place for effective planning and decision making" (page 17) including:

- . Task 0.1: Understand the laws and guidance for evacuations
- . Task 0.3: Identify who is important in the multi-agency collaboration
- . Task 0.6: Take an evidence-based approach to decision making underpinned by research

# ERGO

## The challenges of mass evacuation

### Task 3.1: Develop an evacuation decision-making process

The individual/organisation that makes the evacuation decision for small-scale emergencies may be different from the DM for catastrophic disaster. An explicit decision process includes the leadership structure of the emergency organisations for catastrophic disaster. Where multiple organisations participate in decision-making, an orderly structure to analyse information and develop effective evacuation strategies is important.

**Satisfactory standard:** Our decision-making system is explicitly known by emergency management organisations for high probability emergency scenarios. These systems are formally written either into law or standard practice and these are routinely reviewed and updated.

**Best practice:** Our decision-making process is transparent to those individuals/organisations that will make the actual decision. We have established and practiced how this may change for dynamic scenarios or hazard/threat intensities. This structure is known by all participating organisations and is routinely exercised. Close and effective partnerships are apparent between participating organisations.

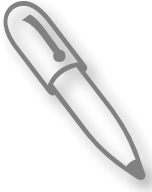
### Task 3.2: Understand the process to request additional resources

In cases of catastrophic disaster the resources of any given emergency organisation may not be sufficient for mass evacuation. An explicit process to request additional aid from state/national governments or private organisations is vital for catastrophic disaster. Perhaps the most common example of this during evacuations is the use of local transport agencies to support the movement of the public away from at-risk areas. Resource requisitions for catastrophic disaster should include:

- a. A process to requisition resources from other levels of government (i.e. local, national, international).
- b. A process to requisition resources, transport services, and shelter provisions from other organisations (e.g. NGOs, local suppliers).

**Satisfactory standard:** A process to requisition additional resources has been established. Initial engagement has been made with government and private organisations concerning availability of emergency resources.

**Best practice:** Explicit contracts and memoranda of understanding have been made in advance with various organisations to support evacuation, shelter and provide necessary resources during times of catastrophic disaster. The process of resource requisition is exercised and refined to minimise delivery time of additional support for mass evacuation efforts. An adjudication process is in place where multiple government agencies request resources from a single source.

						Justification for assessment	Not relevant to our organisation
	We have made no meaningful progress	We are approaching a satisfactory standard	We deliver to a satisfactory standard	We have exceeded a satisfactory standard	We are an example of best practice		
	✓	✓	✓	✓	✓		✓
3.1 We have developed evacuation decision-making processes for emergency decision-makers							
3.2. We understand our process to request additional resources including:							
a. A process to request resources from different levels of government has been formalised, agreed and tested							
b. A process to request resources from other organisations has been formalised, agreed and tested							

# ERGO

## The challenges of mass evacuation

### Task 3.3: We know when an evacuation would (not) be an effective response

There is a need to identify evacuation values to determine when an evacuation would be effective. Simple identification of these objectives can then be supported with additional data gathering for precise definition of these objectives. This can help managers to explain the reasons behind evacuation actions. Emergency managers can also be asked the opposite in order to understand objectives that are met by NOT calling an evacuation.

**Satisfactory standard:** Values have been identified that indicate appropriate/inappropriate evacuation actions (e.g. vertical evacuation, warning messages) requested by emergency managers. Data gathering is in place to measure these objectives in advance of an evacuation.

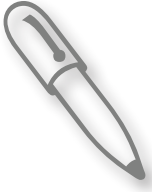
**Best standard:** A value identification process has been conducted amongst all participating organisations for evacuation operations. Multi-organisations objectives have been shared and discussed for compatibility. Objectives can be measured prior to and during evacuation operations.

### Task 3.4: We discuss and resolve conflicting evacuation objectives

A conflicting pair of values is where any action taken by the DM will result in an increase to one value coupled with a decrease to another value. An example of conflicting values in an evacuation scenario is limiting the loss of life as well as minimising economic disruptions caused by an evacuation as this might be mutually exclusive. Another way in which objectives may be in conflict is if different organisations have different priorities of objectives. Identifying and discussing these conflicting objectives prior to an emergency can help to avoid delays to the evacuation decision.

**Satisfactory standard:** Discussions are held between different emergency responders to prioritise evacuation objectives. A common view is reached between organisations concerning evacuation objectives.

**Best practice:** A standard priority of evacuation objectives has been performed for all likely evacuation scenarios and for different geographic locations. Reviews of both exercises and actual events are completed to minimise evacuation decision delays. These values are measured given different possible evacuation zones and the public who may be in those zones immediately prior to an evacuation.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful Progress	
	✓	✓	✓	✓	✓	✓
3.3. We know when an evacuation would (not) be an effective emergency strategy including:						
a. Reasons why an evacuation would be an effective emergency strategy						
b. Reasons why an evacuation would NOT be an effective emergency strategy						
3.4. We discuss and resolve conflicting evacuation values						

# ERGO

## The challenges of mass evacuation

### Task 3.5: Identify ways to measure key evacuation objectives

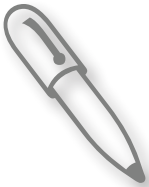
The following is a list of evacuation values that can be used to evaluate evacuation planning. While the complete evacuation objective list may not be appropriate for any single evacuation scenario, planning for multiple scenarios may lead to the development of each value.

- a. **Injury/fatalities to the public:** A common objective when calling an evacuation is the protection of the public from a hazard/threat. This means that fatality and injury rates to the public must be assessed both for the hazard/threat but also for the evacuees who are leaving at-risk areas.
- b. **Economic disruption due to evacuation:** One of the primary objectives during an evacuation is to limit economic disruption that may be caused by the operation. Measurements of this objective can be defined as the monetary loss to local business and the public caused by different evacuation actions.
- c. **Cost of evacuation to emergency organisations:** Some emergency managers felt that these costs should be considered when making the evacuation decision. It is possible to explicitly measure this objective as the monetary cost of evacuation actions on all participating evacuation organisations (e.g. emergency services, NGOs).
- d. **Panic and disorder due to evacuation orders:** Evacuation orders and the wording of information provided to the public may heighten/lower panic and disorder. While emergency managers are concerned with panic caused by evacuation orders, research has shown that the public typically reacts in an orderly fashion during emergencies.
- e. **Public disregard for future evacuation orders:** An evacuation order without the anticipated disaster actually happening may have an effect on the public's future response to evacuation orders. Emergency managers can measure this objective by performing research or incorporating the possible effect that false evacuation will have on the public.
- f. **Public confidence in officials:** The evacuation order can have an effect on the amount of confidence that the public has in emergency officials. Possible measurements include surveys of public attitudes about how different evacuation scenario outcomes affect their confidence in emergency officials.
- g. **Maintaining the integrity of criminal investigations:** An evacuation may limit investigators' collection of evidence if an evacuation area is also a crime scene (e.g. terrorist attack). A measure would be the hours/days that investigations would be delayed due to the evacuation decision.

**Satisfactory standard:** We have identified value measurements to support evacuation decisions. Verification of these values has been completed by emergency organisations.

**Best practice:** We conduct active and regular measurement of appropriate evacuation objectives both prior to and during emergency operations. Identified data sources and research are performed to understand the interaction between these objectives and the evacuation scenario. Experts are consulted to understand the behavioural aspects of these values. Once values have been measured a system of benchmarking has been established to actively monitor them.



	We have made no meaningful progress	We are approaching a satisfactory standard	We deliver to a satisfactory standard	We have exceeded a satisfactory standard	We are an example of best practice	Justification for assessment	Not relevant to our organisation
	✓	✓	✓	✓	✓		✓
3.5. Identify ways to measure key evacuation values:							
a. We have developed measures of injury/damage to the public							
b. We have developed measures of economic damage due to evacuation							
c. We have developed measures of cost to emergency organisations							
d. We have developed measures of panic and disorder due to evacuation							
e. We have developed measures for public disregard for future evacuation orders							
f. We have developed measures of public confidence in officials							
g. We have developed measures of maintaining integrity of criminal investigations.							
h. We have developed a measure for _____ value not listed above							

# ERGO

## The challenges of mass evacuation

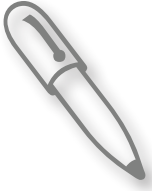
### Task 3.6: Engage participating organisations

Once participating organisations have been identified, emergency managers must engage with them to facilitate multi-agency actions during evacuations operations. Engagement can take many forms (e.g. consultation, participation, support) and will depend on the exact evacuation scenario and command & control structure of the area. Some of the organisations that could be involved include:

- a. *Emergency services*
- b. *Transport officials*
- c. *Local government officials*
- d. *Health service officials*
- e. *Domain experts*
- f. *Non-governmental organisations*
- g. *Environmental agency officials*
- h. *Local media and communications*
- i. *Representatives of the public*
- j. *Military services*
- k. *Utility companies*

**Satisfactory standard:** Organisations have been consulted and have an established role during evacuation operations. A method of contact with these organisations has been set to facilitate rapid interaction if needed.

**Best practice:** Organisations have been consulted for planning, operations and review of evacuation policies. Expert knowledge has been incorporated into existing evacuation plans. Contact methods for organisations include out-of-hour contingencies. Budgetary concerns of participation have been organised to speed inclusion of additional organisations and their resources. If participating in evacuation actions, personnel dangers have been assessed.

		We have made no meaningful progress	We are approaching a satisfactory standard	We deliver to a satisfactory standard	We have exceeded a satisfactory standard	We are an example of best practice	Justification for assessment	Not relevant to our organisation
		✓	✓	✓	✓	✓		✓
3.6. We have included the following agencies in our planning for evacuation:								
a. Emergency services (fire, police, ambulance, etc.)								
b. Transport officials								
c. Local government officials								
d. Health service officials								
e. Domain experts (e.g. nuclear experts, seismologists)								
f. NGOs								
g. Environmental agency officials								
h. Local media and communications								
i. Public								
j. Military								
k. Utilities								

# ERGO

The challenges of mass evacuation

## Task 3.7: Establish communications channels between information-producing organisations and decision-makers

Clear communications channels between organisations are necessary in order to transfer orders and information to decision-makers. Because evacuations are often seen as a measure used primarily for catastrophic disasters, the conditions under which an evacuation may occur rarely occur. This means that in some cases the organisations/individuals that transfer needed information to emergency managers rarely do so during day-to-day activities and so are not practiced. As communications between participating organisations increase in frequency emergency responders will be further prepared for disaster conditions.

**Satisfactory standard:** Clear communication channels exist between organisations and decision-makers. Necessary information can be clearly communicated to the needed emergency managers and is exercised.

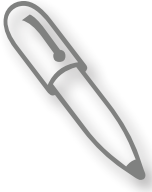
**Best practice:** Communication channels between organisations include normal and out-of-hours links. Where appropriate, information is automatically given to emergency officials on a real-time basis. All communication channels for highly unlikely events are also established and exercised. Information producers are able to anticipate the data needs of emergency DMs. Decision-makers are able to independently manipulate received data.

## Task 3.8: Conduct multi-agency training for emergency group decision-making

During large-scale evacuation events, decision-making typically takes place within a collective setting because of the need for inter-agency coordination. While this does not explicitly mean that a consensus must be reached by participating organisations, it does mean that they have some interaction with those who make the evacuation decisions. Training and exercises become important as they allow for understanding of group dynamics and how groups interact with one another.

**Satisfactory standard:** Multi-agency training is performed during exercises. Organisations' participation is passive and limited. Consultation during exercises extends to only key participating agencies.

**Best practice:** Multi-agency training performed on a regular basis. All participating organisations take an active role throughout the exercise. Communication channels between agencies are exercised as they would be during possible evacuation operations. Review and suggestions are incorporated from all participating organisations.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
3.7. We have established clear communications channels between information-gathering organisations and decision-makers.						
3.8. We conduct multi-agency training for emergency group decision-making.						

# ERGO

## The challenges of mass evacuation

### Task 3.9: Clearly identify the information needed to plan for evacuation

The information needed for evacuation planning represents the pre-event status of available resources, the distribution of the public to be evacuated, and available information on potential hazards/threats.

During an emergency, much of the information required to make evacuation decisions will be ambiguous, uncertain and contradictory. Decisions are required even on the basis of imperfect data so it is important to prepare decision makers to operate with important uncertainties. Each task of this section represents different types of information used by decision-makers. A broad category of information that has been observed as being vital to making evacuation decisions include:

- a. **Risk-based information:** Risk-based information refers to uncertainty surrounding the hazard/threat. This can take the form of flood risk maps or risk assessments of critical infrastructure and other high-risk targets.
- b. **Weather information:** For natural disasters, weather information may have a significant effect on evacuation outcomes. Rain, snow and other weather-related hazards can affect casualty rates that can also influence the evacuation decision.
- c. **Public response information:** This information refers to the way in which the public will react to different evacuation orders. Additional information regarding public response includes public reactions to evacuation orders and how that can lead to panic and disorder.
- d. **Population information:** Population information refers to the distribution and characteristics of the public that will evacuate from an at-risk area.
- e. **Other information:** Because geographic, cultural and

scenario nuances also affect a scenario, emergency managers should actively search for information that can be used to support evacuation decision-making.

**Satisfactory standard:** Information has been identified along with appropriate sources. All planning decisions are derived from the information provided from these sources. Where information is not available to support planning, the underlying assumptions made by managers is explicit and a research programme is in place to fill the gap.

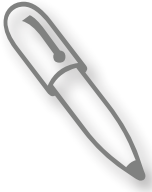
**Best practice:** Information used to plan for evacuations are conditional on the time of day and other temporal aspects. Multiple sources of key factors have been identified. Where multiple sources of information are available the best available source is used.

### Task 3.10: Clearly identify the information needed to make the evacuation decision

When making evacuations this task represents the time when a potential hazard/threat is monitored by emergency officials. This information is different from Task 3.9 as it represents real-time conditions.

**Satisfactory standard:** All possible information has been identified by emergency officials and interaction with the relevant data gathering organisations has been made. An explicit process is available to gather needed data during an evacuation operation and provide usable formats to DMs.

**Best practice:** Real-time information is automatically available to emergency managers. Where real-time information is unavailable, emergency managers have a process to get information from the appropriate information-producer or domain expert. Appropriate data for actual events have been anticipated and validated in advance of evacuation operations.

	Not relevant to our organisation	Justification for assessment				
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓	✓	✓	✓	✓	✓
3.9. We have identified information needed to PLAN for evacuation:						
a. Risk-based information						
b. Weather information						
c. Public response information						
d. Population information						
e. Other						
3.10. We have identified information needed to MAKE the evacuation decision:						
a. Hazard/Risk information						
b. Weather information						
i. Public response information						
ii. Population information						
iii. Other						

# ERGO

## The challenges of mass evacuation

### Task 3.11: Identify points (thresholds) at which evacuation is an effective strategy

An evacuation threshold represents a set of conditions under which an evacuation could be called when all appropriate objectives are considered. This represents the point where the probability of a hazard/threat is so great that the losses possible by not evacuating are greater than those by not taking the same action. While the creation of thresholds should not assume a set of static conditions for evacuation, this point can be used to provide guidelines both to emergency managers and the public.

**Satisfactory standard:** Catastrophic disaster planning includes identified conditions under which escalation toward evacuation actions occur. These threshold plans include a list of participating organisations that will be consulted as the probability of an evacuation increases.

**Best practice:** Conditions for an evacuation operation are known by all participating organisations. Hazard/risk conditions can be monitored by participating organisations in order to anticipate evacuation actions. The consequences of following/not following the guidelines have been exercised and are understood.

### Task 3.12: Explicitly understand the quality and sources of this information

Emergency managers must carefully assess the quality of the information that they use to make their decisions. Such examinations of quality will ensure that they rely on the high quality information and less so on the (potentially contradictory) low quality information.

**Satisfactory standard:** The source, update time and gathering method of the information are known by gathering agencies. Information gaps are known by emergency DMs.

**Best standard:** Improvement to the accuracy and reliability of information is a constant process. There is close interaction between emergency managers and outside organisations to fill information gaps in evacuation planning and operations. External auditing of information and processes are in place for collected data.

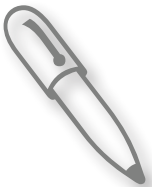
### Task 3.13: Develop a system to track and log decisions made

Decision logging is vital during catastrophic disasters as it records the timing and reasoning behind important actions taken by emergency managers. This can help in post-decision reviews, and be used when learning from past exercises/events. A decision log can be as simple as written or recorded accounts of the actions and their rationale.

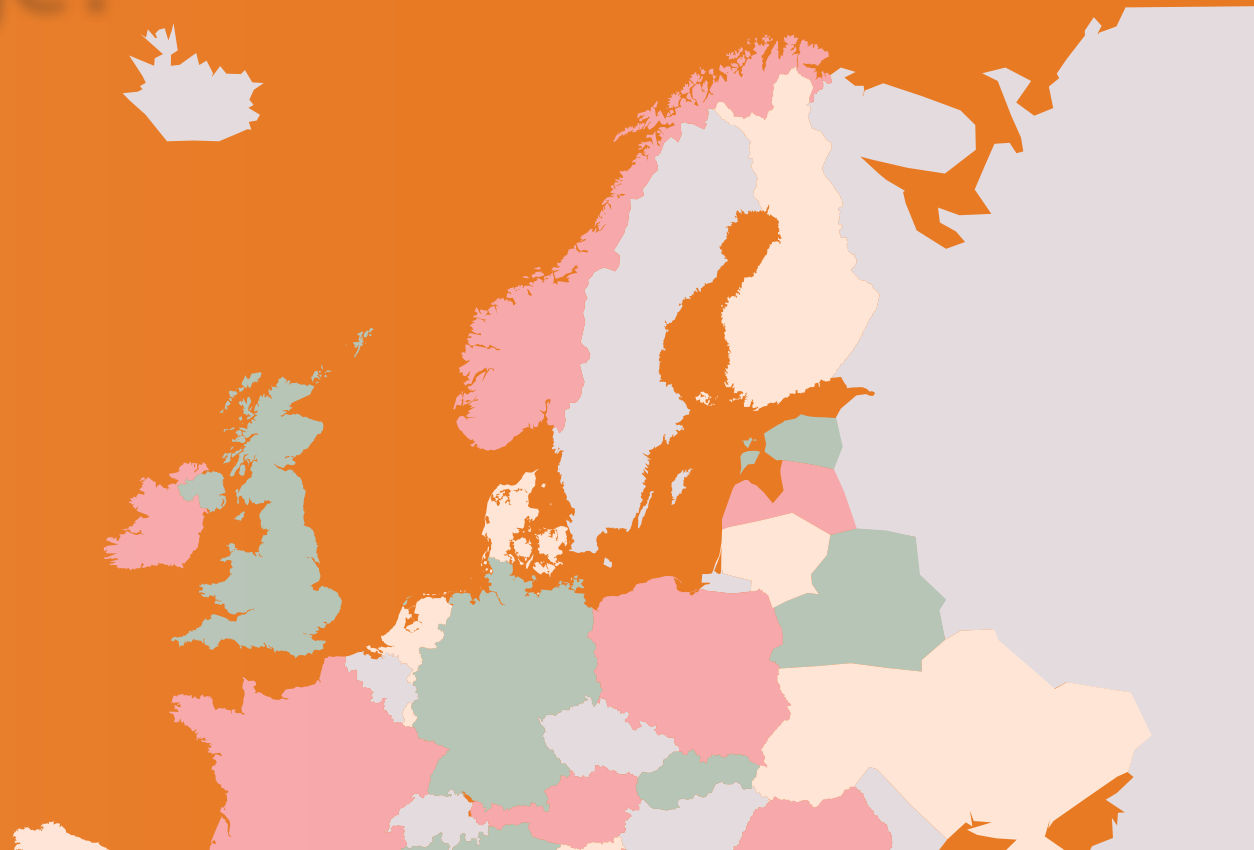
**Satisfactory standard:** A logging system is available for primary decision-makers in the command centre. The log consists of a list and time stamps of decisions made during the evacuation operation.

**Best practice:** Logging system can be accessed remotely, if necessary. Actions taken and reported in the log are viewable by participating organisations. The log includes both the decision/action taken and the reasoning behind that action. Rigorous post-action review uses operational logs to inform and improve future evacuation planning. These reviews are actively used to learn from best practice.



	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
3.11. We have identified points (thresholds) at which evacuations are an effective strategy.						
3.12. We have an explicit understanding of the quality and sources of this information:						
a. Risk-based information						
b. Weather information						
c. Public response information						
d. Population information						
e. Other						
3.13. We have developed a system to track and log decisions made						

# Part 4: How do we assess our preparedness to disseminate the warning message?



## Part 4: How do we assess our preparedness to disseminate the warning message?

Once the evacuation decision is made (in Part 3), GOs need to notify the public about the situation and encourage those who are in a place of danger to move to a place of safety. In the preparedness phase, GOs can analyse a wide range of issues, for example, to understand:

- . The existing legal frameworks and how these may effect the warning and informing of evacuees
- . How they can warn the public in a timely manner
- . The effectiveness of the channels to disseminate the message
- . The effect of different policies on the speed of message dissemination (e.g. the impact of telling neighbours and community-based systems)
- . The proportion of people who receive the message during the life of the incident
- . How they can evaluate their capability to warn people

To emphasise how important it is to disseminate a warning message effectively, warning and informing of the public can help to ensure that evacuees respond appropriately. For example, after the 2004 Indian Ocean tsunami which claimed 230,000 lives, assertions were made that “if there was a warning system, about 80% of them could survive” (Telegrafia, 2010).

The challenge of disseminating a warning message effectively is partly a technical one of having the right infrastructure available to reach and warn people, but it also covers a wider range of social issues as well as GO preparedness. On social issues, this links to Part 1 of the EPAW and the need to:

- . Prepare the public to expect a warning
- . Know what to do if a warning is issued
- . Actually do what they have been advised to do

On preparedness, to assess their preparedness to effectively disseminate a warning message, GOs might consider their progress towards:

- . Developing a comprehensive evacuation warning plan (Task 4.1).
- . Having agreements with dissemination channels through the media (Task 4.2), channels that GOs control (Task 4.3), and community-based channels (Task 4.4).
- . Developing communications with various stakeholders (Task 4.5).
- . Designing warning message templates (Task 4.6).
- . Analysing how long it will take to warn the public (Task 4.7).

For each task, in order to prepare the GOs involved could use this EPAW to assess their preparedness to adequately warn the public within appropriate target times. Modelling the social and preparedness characteristics could enable GOs to understand the possibility to meet targets and test the impact of policy

alternatives in achieving these targets.

In addition to the bespoke tasks for disseminating the warning message, please also see the seven generic tasks in the section titled “What fundamentals need to be in place for effective planning and decision making” (page 17) including:

- . Task 0.1: Understand the laws and guidance for evacuations
- . Task 0.4: Ensure appropriate systems and processes are in place
- . Task 0.7: Evaluate your evacuation preparations

# ERGO

## The challenges of mass evacuation

### Task 4.1: Develop a comprehensive evacuation warning plan

A warning plan documents the strategies for alerting the public about the evacuation decision and how to respond. It will identify the various steps that the lead organisation will take for initiating emergency broadcast systems. The warning plans should comply with the laws and guidance/standards operating at the international, national, regional and local levels - particularly Data Protection Laws which may influence the adoption of new technologies e.g. alerts to all mobile phones in the area.

**Satisfactory standard:** We have a lead organisation to coordinate and implement our evacuation warning plan for a range of planning scenarios. We have identified, documented and complied with the different levels of laws, guidance and standards.

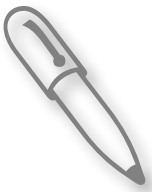
**Best practice:** Strategic partners for warning dissemination are fully involved in developing our warning plan. We actively monitor and assess how changes in legislation affect our plan and we achieve voluntary international standards. We feed our experiences back to law/standard makers. Our plan has been peer reviewed by an external body and has been further developed in alignment with any feedback received.

### Task 4.2: Agree formal arrangements with media agencies

The media plays a key role in emergency broadcasting and has a strong influence on the public perception about the need to evacuate. To ensure the rapid dissemination of warning messages, GOs need agreements with media agencies to formalise their role. GOs might also want to assess the effectiveness of these channels.

**Satisfactory standard:** We have a lead organisation that coordinates with media agencies for warning and informing the public. We have ongoing relationships with our media partners, and they participate in evacuation exercises.

**Best practice:** Our formal agreements with media agencies are exercised on a wide range of scenarios. Our officials are trained in media and public communication. We have data on the effectiveness of using media channels for disseminating a warning message. We have learned from international best practice on positive media collaboration.

	Not relevant to our organisation	Justification for assessment				
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓	✓	✓	✓	✓	✓
4.1. We have developed a comprehensive warning plan that:						
a. Has been built with (and disseminated to) partners						
b. Identifies the lead organisation(s) and their role						
c. Details strategies to implement the plan						
d. Aligns with existing legal and statutory frameworks						
4.2. We have arrangements to collaborate with media agencies and these:						
a. Are formal arrangements that are written into our plan						
b. Media channels have been evaluated for their effectiveness						

# ERGO

## The challenges of mass evacuation

### Task 4.3: Access to warning message dissemination channels that GOs control

GOs can set up their own channels to disseminate the warning message to meet their operational targets. Examples of GO-owned warning channels include: tone alert, sirens, public announcements, television, radio, and automated dialling systems (e.g. Domino/Gedicom, TeleGraf, UMS Population Alert) - some of which require a significant investment. However, each channel has a different effectiveness in reaching the public and it is important to understand this effectiveness in order to select appropriate channels.

**Satisfactory standard:** We know what GO-owned channels are available and these are identified in our plan. We have selected a mix of different channels and have exercised each of these individually and together.

**Best practice:** We have used research to quantitatively analyse the suitability and effectiveness of each warning channel. We have evidence to measure our warning system performance and understand the effectiveness of individual warning channels under different situations (e.g. time of day, power outage).

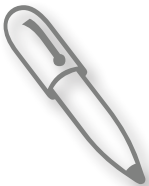
### Task 4.4: Promote a community-based warning system

Members of the public can share the warning message with family, friends, and neighbours. GOs can harness spontaneous communication among the communities' social networks by:

- Actively promoting behaviour to encourage the public to inform their neighbours
- Identifying community groups to disseminate the warning information
- Preparing advice for how such groups can act as a warning channel
- Integrating the technical capabilities of official channels with the social characteristics of community-based systems
- Using social networking and new technologies to encourage (and warn/inform) people (e.g. Facebook, Twitter, etc)

**Satisfactory standard:** Our evacuation warning plan balances formal warning message dissemination with community-based systems. We involve established community groups to speed up warning and informing message dissemination. We are able to activate a community-based warning system and our public know to pass the message on to their neighbours.

**Best practice:** We actively encourage individuals and community groups to get involved with the warning system and have advice for them to follow. We use existing social media and learn from other international GOs on community-based systems. We have analysed the effectiveness of our community-based system. Our system is seen as an example of best practice by other GOs.

						Justification for assessment	Not relevant to our organisation
							
	✓	✓	✓	✓	✓		✓
4.3. We control channels to disseminate the warning message and these:							
a. Are written into our plan							
b. Have been evaluated for their effectiveness							
4.4. We have a community-based warning system that:							
a. Has been evaluated for its effectiveness							
b. Has identified supportive community groups							
c. Gives prepared advice for how the community can act as a warning channel							
d. Actively promotes behaviours that encourage neighbours to warn each other							
e. Harnesses social networks							

# ERGO

The challenges of mass evacuation

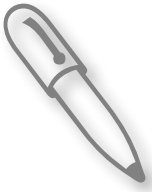
## Task 4.5: Develop protocols for communication with various stakeholders

Apart from warning the general public, lead organisations need to update decision makers and emergency responders with changes in the warning message. The warning plans need to specify protocols to support interagency communication with other GOs/response organisations, as well as various stakeholders such as business groups, politicians, and media agencies. Warning dissemination to special facilities like hospitals, prisons, locations of vulnerable people, and operators of critical infrastructure (etc) may need special attention.

**Satisfactory standard:** We have outlined how communications with various stakeholders and special facilities will take place. We have a list of contacts in these organisations and this list is routinely updated. Exercises are conducted based on this list.

**Best practice:** We have documented protocols to communicate with partners. We have single points of contact in special organisations to help them to develop their plans for dissemination of the warning message. We have a warning and informing group that supports collaboration with other stakeholders.



	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
4.5. We have documented communications protocols in which:						
a. We have a process to communicate effectively with other stakeholders on changes to the warning message , including:						
i. Emergency responders						
ii. Business consortia						
iii. Media						
iv. Politicians						
v. Others						
b. We have a process to effectively warn special facilities such as:						
i. Hospitals						
ii. Schools						
iii. Prisons						
iv. Major businesses						
v. Universities						
vi. Areas with a high density of vulnerable people						
vii. Others						

# ERGO

## The challenges of mass evacuation

### Task 4.6: Design and test a template for your warning message

Warning message content has a key role in effectively warning and informing the public. A good warning message needs to be simple, clearly worded, provide localised information, recommend response action and be consistent with what has been said before. GOs could develop warning message templates by:

- . Understanding the response of evacuees
- . Researching the public's potential information needs
- . Pre-testing sample messages with the public

**Satisfactory standard:** Our warning plan includes a warning message template based on our experience. The warning message is designed in different languages and coordinated by a single organisation.

**Best practice:** We develop localised warning message templates based on: behavioural research; information needs; and our experience. We have pre-tested these messages with the public. We have templates designed for different zones, providing localised information.

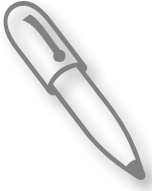
### Task 4.7: Analyse how long it will take to warn the public

GOs can seek to understand their warning capability for different scenarios by measuring 'how quickly they can warn the public?' (notification time) and 'what percentage of the public can be warned?' (warning level). Modelling/analysing these two metrics can help to measure the warning capability and set operational targets. GOs can:

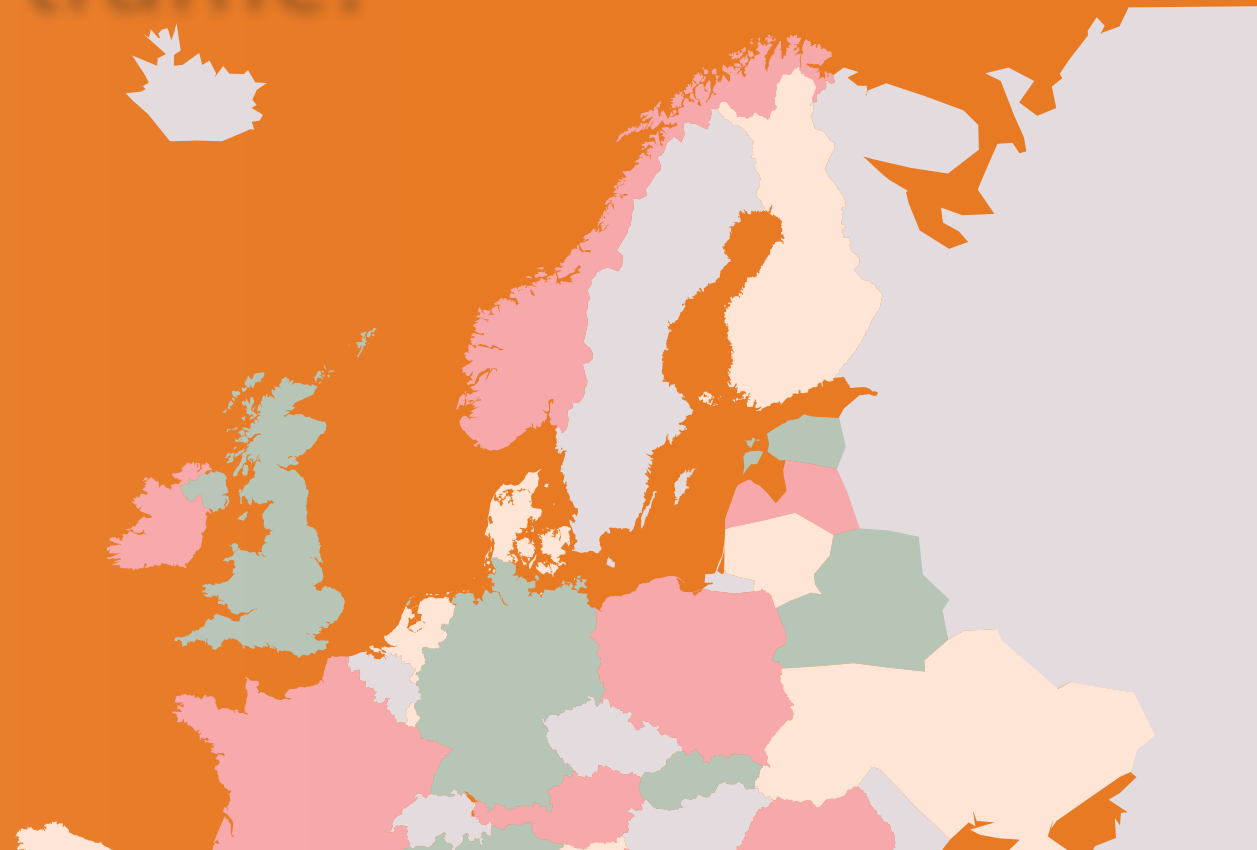
- . Understand the effectiveness of using multiple warning channels in different situations (e.g. times of the day)
- . Analyse the impact of combining different channels on meeting warning targets i.e. the effectiveness of channels
- . Identify the vulnerabilities of different warning channels (e.g. availability of phone network) and evaluate their impact
- . Design contingency plans for dealing with vulnerabilities

**Satisfactory standard:** We have research findings that show the notification time, the warning level and the effectiveness of each formal warning channel. Our warning plan identifies warning performance targets, potential vulnerabilities of individual warning channels and contingencies.

**Best practice:** We have researched the effect of time of day and vulnerability of warning channels on warning effectiveness. We have achievable targets for notification time and warning level and know the extent to which different warning channels help us to achieve these targets. We analyse different scenarios and explore the effect of policies on meeting targets.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
4.6. We have developed and tested a warning message template						
4.7. On analysing how long it will take to warn the public:						
a. We know how long it will take to notify the public (notification time) and the warning level						
b. We have evidence-based targets for warning performance						
c. We have analysed each channel and understand their ability to help meet these targets						

# Part 5: How do we assess our preparedness to evacuate pedestrians and traffic?



# Part 5: How do we assess our preparedness to evacuate pedestrians and traffic?

It may be important for GOs to know how long it could take to move people from an area that is at-risk to a place of safety. Such information might tell officials how long they have to make the evacuation decision and what the outcome of a decision might be in terms of evacuees in (or travelling to) emergency shelters when an incident takes place. Hence, GOs might wish to consider questions such as:

1. What are the existing policies that will affect our transportation plans?
2. What transport management strategies are available and which works best?
3. How do evacuees' preferred modes of transport affect the evacuation?
4. What information do the public need related to evacuation transportation?

To emphasise the importance of transportation and being able to leave the affected areas, during Hurricane Katrina around one million people were evacuated and "up to 100,000 people of New Orleans in the US had no access to transportation, and would have to remain there. An estimated 20,000 would go to the Louisiana Superdome, designated as the shelter of last resort" (Tate, 2010). In these situations, transportation becomes critical in ensuring the safety of thousands of lives.

This section of the EPAW focuses on the traffic management of evacuees moving from the place at-risk to a place of safety. In addition to traffic, it also recognises that some evacuees will prefer to walk away from the at-risk area if the conditions allow.

As with Part 4 of the EPAW, there is a strong focus on modelling the pedestrian and traffic movements to ensure that targets are met. This involves collecting data, building computer models, conducting experiments and analysing the results of those experiments to discover different ways of configuring policies to enable safe and quick evacuations.

To assess their preparedness to evacuate pedestrians and traffic, GOs are offered seven tasks that (when assessed) can provide insight into how they may further strengthen their level of preparedness. These tasks include:

- . Develop an evacuation transport plan (Task 5.1)
- . Understand evacuees' transportation needs (Task 5.2) and transport availability (Task 5.3)
- . Model the transport network (Task 5.4)
- . Identify performance targets (Task 5.5) and analyse strategies (Task 5.6)
- . Deliver transport information for evacuees (Task 5.7)

In addition to these specific tasks, please also see the seven

generic tasks in the section titled "What fundamentals need to be in place for effective planning and decision making" (page 17) including:

- . Task 0.3: Identify who is important in the multi-agency collaboration
- . Task 0.5: Train staff and exercise the plans
- . Task 0.6: Take an evidence-based approach to decision making underpinned by research

# ERGO

## The challenges of mass evacuation

### Task 5.1: Develop an evacuation transport plan

When an evacuation warning is issued, the public may evacuate from the place of danger to a place of safety. GOs can support the evacuation by developing effective transport policies and plans e.g. advising pedestrians on optimal routes, providing public transport and managing traffic flows. Also, the plan can include strategies for the effective coordination of various modes of transport to ensure a proportional transportation response.

**Standard practice:** Our transport plan identifies the main travel operators for providing transport support with clearly defined roles and expectations of service delivery levels. We have a coordinated approach to implementing different transport options, including supporting pedestrians.

**Best practice:** We have a well defined transport plan developed in cooperation with public and private travel operators. We have exercised the plan under different scenarios, including the unavailability of some transport options.

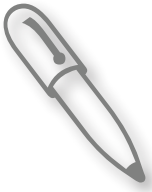
### Task 5.2: Understand the transportation responses of evacuees

It is important to know what the public might do if an evacuation is ordered. GOs can conduct research to answer questions that may influence their transport capacity and capability planning, such as:

- What percentage of the public will comply with the evacuation order, or not?
- When will they evacuate i.e. how long it will take them to prepare to evacuate?
- What percentage of the population will need additional help to evacuate and what sort of help?
- What percentage of the population will evacuate using cars, walking or public transport?
- Where will evacuees evacuate to – shelters or other destinations?
- What evacuation route will evacuees take?
- What percentage of evacuees have dependents or pets that need to be transported?

**Standard practice:** We have research findings that indicate the transportation response of evacuees. We use these findings to understand the potential traffic volume and potential demand for public transport.

**Best practice:** We use research findings on the behaviour of evacuees to build an overall picture of our public and the timing of their response e.g. transport preferences, popular routes. These feed into our evacuation analysis, decision making processes, transport plans, and contingency planning. We carry out pre- and post-evacuation studies to collect this data.

	Not relevant to our organisation	Justification for assessment					We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓						✓	✓	✓	✓	✓
5.1. Regarding our evacuation transport plan:											
a. We have an effective transport plan and the means to implement it											
b. Our transportation partners are effectively coordinated											
5.2. We have evidence-based estimates of evacuee behaviours, for example:											
a. Who will actually evacuate											
b. How long it takes them to prepare											
c. Additional help they need											
d. Preferences for modes of transport											
e. Destination choice											
f. Evacuation route											
g. Dependents and/or pets											

# ERGO

## The challenges of mass evacuation

### Task 5.3: Collect data on the demand, availability and capacity of the transport network

Transport authorities can seek to understand (a) the demand for the transport network, (b) the availability of transport options, and (c) the capacity of the network. Collecting data on these aspects is a first step to enabling analyses to be conducted, for example:

- Demand can be understood by collecting data on: the evacuating population (residential, transient and commuting); how many people and where they live (residential zone, commercial districts, high-rise areas); and the number of registered vehicles (e.g. cars, motorcycles); etc.
- Availability can be understood by collecting data on the resources available e.g. number of buses, drivers, etc, and issues of safety that will effect availability; etc.
- Capacity of the network can be understood by collecting data on: the number of passengers on each bus/train/tram/etc; traffic flows and routes; and conflicts between modes of transport e.g. buses and trams; etc.

Collecting this data will prepare GOs to conduct analyses on, for example: the time to evacuate; resources required; any congestion points where excess queues may build; and the effect of strategies/policy options.

**Standard practice:** Our transport planners have access to quality/timely data about the demand, availability and capacity of our transport network. We collect data that allows us to analyse where excessive queues may build as well as data about the potential analysed options to mitigate these queues.

**Best practice:** We collect data on a comprehensive array of issues around the demand, availability and capacity of our transport network. Daily estimates of usage are available for most types of transportation. Our data collection is open to external peer review and is constantly informed by the latest research findings.

### Task 5.4: Model the capacity of the transport network and test alternative strategies

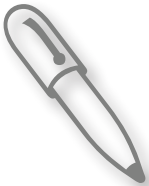
Modelling the transport network uses the data that has been collected to understand more about the transportation of evacuees as well as (a) informing the setting of operational targets, and (b) analysing the conditions under which targets are achievable e.g. the effect of evacuee behaviours, transport preferences, transport network capacity and availability.

One example of a model is a computer simulation of the transport network that can support GOs as they run different experiments to explore alternative policies.

**Standard practice:** We have the capacity and capability to quantitatively analyse our transport network and explore the effectiveness of different policy options using formal modelling/analytical techniques.

**Best practice:** Our analytical models estimate transport and allow us to interrogate the sensitivity of results to changes in assumptions/inputs. Our models have been peer reviewed. Decision makers have confidence in the models and their results and request analysis to be done.



	Not relevant to our organisation	Justification for assessment				
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓	✓	✓	✓	✓	✓
5.3. We collect data to understand more about our transport network, including:						
a. The likely demand on our transport network						
b. The availability of our transport options						
c. The likely capacity of our transport network						
5.4. We model the capacity of our transport network and:						
a. Have the functionality to conduct the right experiments						
b. Have confidence in interpreting the results and basing decisions on those interpretations						

### Task 5.5: Identify transport performance measures and targets

GOs can identify performance measures and set operational targets to ensure that the transportation of evacuees is adequate. Measures may include:

- 'Total evacuation time per evacuee' (TET) which is the time from the onset of warning to the evacuees reaching their place of safety.
- 'Overall evacuation time' (OET) which is the time required for the last evacuee (or an agreed proportion of evacuees) to reach their destination from the onset of evacuation.

Achievable operational targets (e.g. average TET of 120 minutes, OET of 6 hours for 97% of evacuees) can be set for different scenarios based on the analyses. Such targets can be informed by the data collected (Task 5.3) and the analytical models can help to set targets and investigate if they are achievable (Task 5.4).

**Standard practice:** Our transport plan identifies the TET and OET and sets achievable targets which are met using transport options.

**Best practice:** We are able to analyse the effect on meeting TET and OET targets of different policies and transport configurations. We know the potential limitations of our operational response.

### Task 5.6: Conduct diverse analyses to test transport strategies and policies

When conducting an evacuation there may be unexpected challenges which make the evacuation even more difficult. GOs can explore the impact of such challenges on meeting their targets, for example, the impact of:

- Unusable roads e.g. a flooded route or collapsed building blocking them.
- Different volumes of traffic due to variations in number of residents, commuters and transients.
- Vulnerability in the transport system (e.g. tunnels, bridges).
- Evacuation during a petrol strike when cars are already low on fuel.
- Unexpected behaviours by masses of evacuees.

Different strategies can be considered to mitigate the effects of these challenges, and these can be analysed in advance, including:

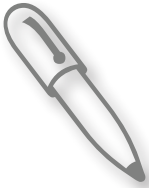
- Pre-planned evacuation routes and contraflows to redistribute the traffic volume.
- Reducing congestion through traffic signalling systems.
- Speed restrictions or the restricted usage of certain vehicles e.g. farm vehicles.
- Influencing evacuee behaviour through travel information.
- Staged evacuation of high-risk zones first followed by lower-risk zones afterwards.
- Road closures to distribute traffic and traffic signals to control flow.

- Identify special pickup points for public transport.

Data on some of these issues can be collected during 'normal' operations e.g. planned renovations of roads may implement road closures, contraflows or speed restrictions – all allowing data to be collected on the effects on traffic.

**Standard practice:** We have used a range of analyses to test and strengthen alternative responses to challenges. We understand the limitations of the analyses and how to apply the results for policy making.

**Best practice:** We formulate transport policies by bringing together analyses of the transport system, its capability, evacuee behaviour, etc. We test the interdependencies between these factors. We have combined the analysis with exercises and real-world experimentation (e.g. road closures).

	Not relevant to our organisation	Justification for assessment				
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress
	✓	✓	✓	✓	✓	✓
5.5. We have identified our transport performance measures and targets, including:						
a. Total evacuation time per evacuee (TET)						
b. Overall evacuation time (OET)						
c. Operational targets for each performance measure in different scenarios						
5.6. We analyse our transport policies to enhance our transport capacity and:						
a. We use analyses of challenges to test different strategies						
b. We have confidence in the results of such analyses						

# ERGO

The challenges of mass evacuation

## Task 5.7: Deliver transport information that is needed by evacuees

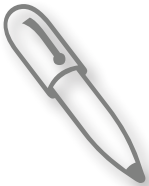
GOs can provide transport information to support evacuees, for example:

- . Evacuation routes and any planned road closures
- . Pickup points and schedules for public transport
- . Availability of shelters

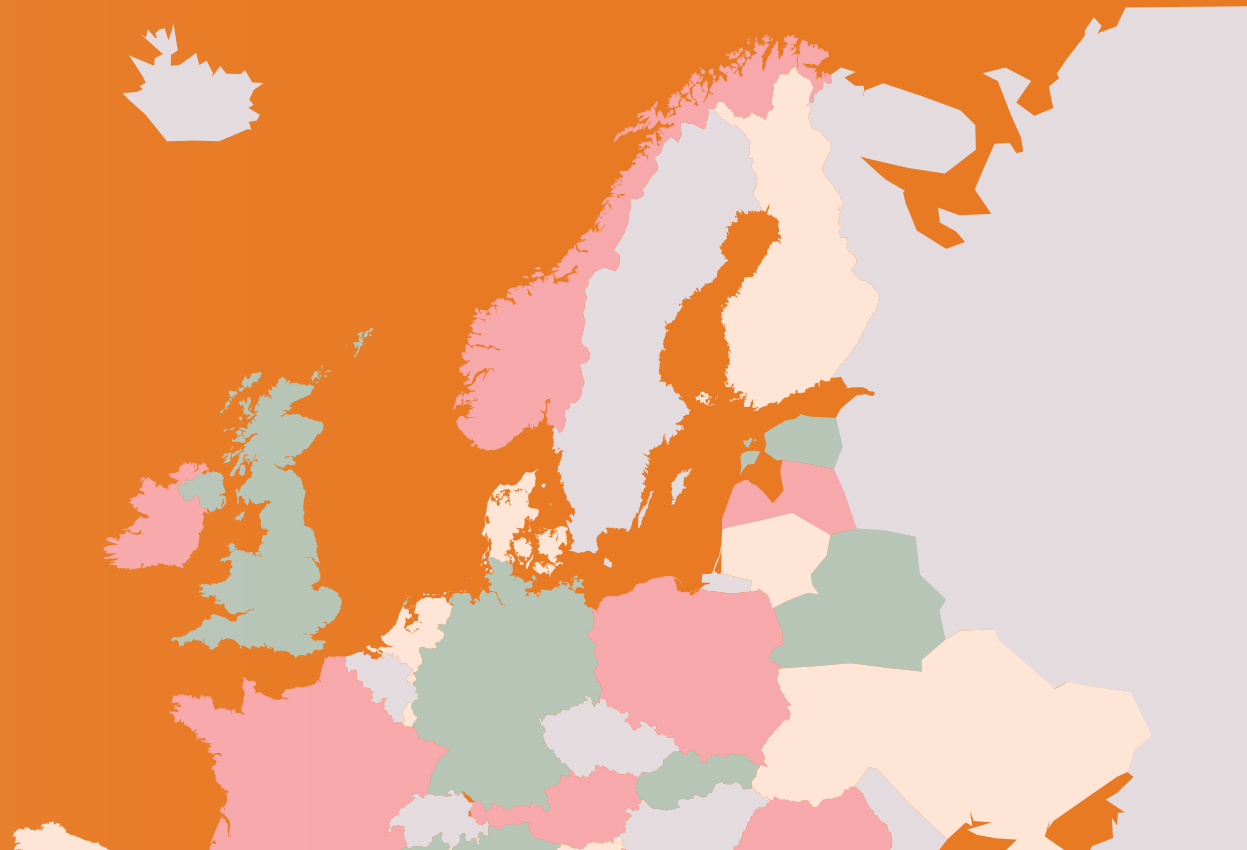
In addition to providing transport information as a preparedness activity, GOs may deliver this during an evacuation e.g. on evacuation maps in hazardous areas, digital information boards alongside roads and on bus stops, mobile phone alerts, mobile internet.

**Standard practice:** We have researched the transport information needs of evacuees and can provide essential information to support evacuees. We understand which channels are suitable for different information and behaviours.

**Best practice:** We can provide evacuation information to evacuees while they are evacuating e.g. over mobile phones, websites, digital signposts. Our public know where to get this information from. We are a national exemplar.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
5.7. We have identified the traffic information needs of the evacuees and:						
a. Have built the provision of this information into our transportation plan						
b. Can disseminate up-to-date information to evacuees on:						
i. Evacuation routes						
ii. Public transport						
iii. Location of shelters						
iv. Others						

# Part 6: Shelter management



## Part 6: How do we assess our preparedness to provide suitable emergency shelters?

This section presents the final part of the Evacuation Preparedness Assessment Workbook – assessing GOs' preparedness to provide emergency shelters. The diversity of a population may be represented in the shelter and so it is important to ensure that, when people arrive at available shelters with different needs, they are provided with a safe location which can attend to those needs. Also, to ensure the shelter is a place where evacuees are able to stay for a few days, it is important to ensure that the shelter is managed as effectively as possible. Some of the questions that GOs may ask of their plans include:

1. Do we have enough accommodation for the anticipated demand?
2. What needs will evacuees have when they are in a shelter?
3. How can we register people to ensure they can be found by family/friends?
4. Can we source enough supplies to provide these shelters?

### 5. How can we effectively return people to their home?

Research can help to answer such questions, but also GOs may assess the effectiveness of their plans for shelter provision and management by considering the following nine tasks in terms of whether they have:

- . Developed an emergency shelter plan (Task 6.1)
- . Estimated the demand for shelters (Task 6.2)
- . Identified suitable shelters (Task 6.3) and established shelter agreements (Task 6.4)
- . Monitored shelter availability during the incident (Task 6.5)
- . Developed a process to manage evacuee registration and support services (Task 6.6)
- . Organised the shelter supplies (Task 6.7) and mutual aid (Task 6.8)
- . Developed a safe return plan (Task 6.9)

In addition to these specific tasks for shelter management, please also see the seven generic tasks in the section titled "What fundamentals need to be in place for effective planning and decision making" (page 17) including:

- . Task 0.2: Understand local evacuation plans and procedures
- . Task 0.3: Identify who is important in the multi-agency collaboration
- . Task 0.7: Evaluate your evacuation preparations

# ERGO

## The challenges of mass evacuation

### Task 6.1: Have an emergency shelter plan

Emergency shelters are generally provided by GOs to support evacuees for anywhere from a few hours to a few days. The GO responsible can understand the needs of evacuees, coordinate with shelter owners and ensure humanitarian provisions. A plan must be developed for the location, activation and management of these emergency shelters.

The plan may also include alternative evacuation strategies e.g. in-sheltering (staying in a safe place within the premises), vertical evacuation (move to a higher floor or a cellar), or horizontal evacuation (leaving the threatened location to a place of safety).

**Standard practice:** Our plan documents our sheltering strategies and how they are implemented. Other stakeholders (e.g. shelter owners, humanitarian agencies, other regions that might provide supplementary shelters) are aware of the plan and have exercised it.

**Best practice:** Our shelter plan is underpinned by our research of evacuees' needs. Shelters owners, community groups, humanitarian organisations and other stakeholders have assisted in the development and exercising of our plan. We have agreements for activating shelters in other regions.

### Task 6.2: Estimate the demand for shelters

To enable them to plan shelter provision, GOs may wish to estimate the number of evacuees who intend to use public evacuation shelters. Estimates can be informed by: surveys of the public; post-evacuation reports; humanitarian agencies (e.g. Red Cross); other records and research. Estimates can also be made of the number of evacuees that will prefer to use alternative shelters e.g. private accommodation, friends/family.

**Standard practice:** We have estimated the number of evacuees who may use public evacuation shelters. We use these estimates to inform the capacity of shelters that we provide and the amount of resource needed in each shelter.

**Best practice:** We have recently conducted research that estimates the destination of evacuees and shelter demand. We can differentiate our estimates for different demographics and use these to predict wider demand.

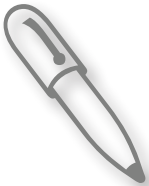
### Task 6.3: Identify, and collect details on, suitable shelters

Shelters can be pre-identified to ensure adequate capacity is available across an area. GOs can collect information on shelters including: location; contact details for the keyholder; capacity of shelter; special protection measures e.g. earthquake proofing; lifeline facilities available e.g. kitchen, toilets, disabled facilities; and public or private ownership.

**Standard practice:** We have identified and assessed each shelter and have detailed information about each.

**Best practice:** We have a process to regularly update information about each shelter to account for new development and changes in facilities.



	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
6.1. We have an emergency shelter plan:						
a. Our plan details strategies, needs and provisions						
b. We have a mechanism to coordinate shelter provision from multiple local authorities						
6.2. We can estimate the demand for public evacuation shelters						
6.3. We have identified (and collected details on) shelters:						
a. We have identified shelters						
b. We have comprehensive information records about each shelter						
c. We have plans to communicate shelter locations to the public						

# ERGO

## The challenges of mass evacuation

### Task 6.4: Establish agreements with shelter providers and partners

GOs need to collaborate with the public and private shelter owners to ensure smooth delivery of adequate shelter provision. GOs need to understand the demand and needs of evacuees and how to meet expected service levels in partnership with other agencies e.g. humanitarian agencies, disability groups, psycho-social support, and animal care groups.

**Standard practice:** We collaborate effectively with shelter owners and have contracts and service level agreements that have been exercised.

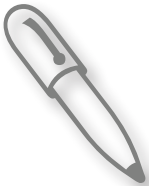
**Best practice:** We involve sheltering support agencies at the preparedness stage and have memoranda of understanding with a range of humanitarian organisations to support evacuees, their dependents and their pets. We have exercised the provision of shelters and have conducted information meetings for shelter owners.

### Task 6.5: Analyse shelters availability and capacity during the incident

Not all shelters will be available to evacuees as some may be within the danger zone, may have been damaged by the incident, or may be overcrowded and so unable to accept more evacuees. GOs may wish to use a feedback mechanism from shelter owners to know the availability/remaining capacity of shelters. Having this information will help GOs to advise evacuees on which shelters are available and to direct public evacuation transport to available shelters. Models can also analyse shelter demand, travel time and availability to ensure optimal allocation and usage. Using the results from such models during preparedness may allow the public to be directed to shelters that the models find are more likely to be under-utilised.

**Standard practice:** We coordinate with shelter owners to obtain updated information about shelter availability and remaining capacity. Once shelters are over capacity, we have plans to move/ redistribute any excess evacuees to other shelters.

**Best practice:** We use an optimisation model to allocate shelters and direct evacuee transportation to available shelters. We have a prioritised allocation plan for balancing the available shelters, estimated demand and travel time to shelters.

	We have made no meaningful progress	We are approaching a satisfactory standard	We deliver to a satisfactory standard	We have exceeded a satisfactory standard	We are an example of best practice	Justification for assessment	Not relevant to our organisation
	✓	✓	✓	✓	✓		✓
6.4. We have established agreements with shelter providers and partners including:							
a. Humanitarian organisations							
b. Supporting people with disabilities							
c. Psycho-social support							
d. Support for pets							
6.5. We analyse shelter availability and capacity during an incident:							
a. We coordinate with shelter owners to update our records of shelter availability							
b. We model shelter capacity, travel time and demand to optimise shelter allocation							
c. We coordinate evacuee transportation to ensure shelters are not over-crowded							
d. We reallocate evacuees from over-crowded shelters							
e. We use analyses to advise the public of the shelter we want them to go to according to model results							

# ERGO

## The challenges of mass evacuation

### Task 6.6: Develop a process to manage evacuee registration and support services

When evacuees arrive at the shelters, it is important to register their details e.g. identification details, address, family details, medical history, next of kin, etc. In nuclear/chemical incidents, whether decontamination has been carried out could be recorded. If this information is collected in a computer database and shared with other shelters/agencies, then it may allow people to find family and friends - particularly relevant in large-scale emergencies and when there are injuries and deaths.

**Standard practice:** We have a standalone registration system at each shelter location. We can update a centralised registration system to make the information more widely available, although it will be out of date.

**Best practice:** Our computerised registration system is centralised through internet technology and has authorised access for support services to real-time information. We can easily identify who is at each shelter and make this available to people who are searching for family/friends. This system is linked to hospital admissions systems so we can search them for information.

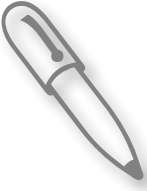
### Task 6.7: Organise the supplies for shelter operation

GOs can plan to collaborate with suppliers of lifeline resources, social care and welfare (etc) to ensure their immediate involvement. To prepare for this, GOs may want to:

- Know the range of needs that evacuees have e.g. incontinence pads, special chairs/cushions, psycho-social support
- Know demographic of evacuees in each shelter and so which resources are needed
- Have a minimum stock of resources available
- Have agreements with suppliers to provide more resources
- Get resources to the right shelters

**Standard practice:** We have researched the shelter needs of a diverse range of our community. We use the evacuee registration system to identify the needs of those in the shelter. We have immediate access to all resources and have contact details of suppliers to quickly provide additional quantities.

**Best practice:** We have arrangements with suppliers and involve them in the development of our plan. We centrally manage the supply of resources and have exercised (with suppliers) the sourcing and delivery of a wide range of resources targeted to each shelter's needs.

		Justification for assessment					Not relevant to our organisation
		We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
<div> <div>✓</div> </div>							
6.6. Our process for evacuee registration:							
a.	Collects the right level of details from evacuees						
b.	Is centralised and available to find family and friends						
c.	Includes hospital admissions and confirmed deaths						
6.7. On the supplies for each shelter:							
a.	We know the range of needs that evacuees have						
b.	We know who is in which shelter and so which resources are needed						
c.	We have a minimum stock of supplies available						
d.	We have agreements with suppliers to provide more resources						
e.	We can get supplies to the right shelters based on their needs						

# ERGO

## The challenges of mass evacuation

### Task 6.8: Formalise mutual aid agreements

A large-scale evacuation might require resources beyond those available to a single region. Mutual aid agreements can facilitate the sharing of resources (locally, nationally and/or internationally). In sheltering terms this can involve other regions providing shelter capacity and/or the resources that are needed to run shelters.

**Standard practice:** The sheltering plan clearly identifies the critical resources that we may need to source through mutual aid. We coordinate with other regions and exchange information on our needs.

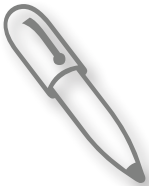
**Best practice:** We have formalised mutual aid agreements and have an estimate of time for the delivery of these resources from different locations.

### Task 6.9: Develop a safe return plan

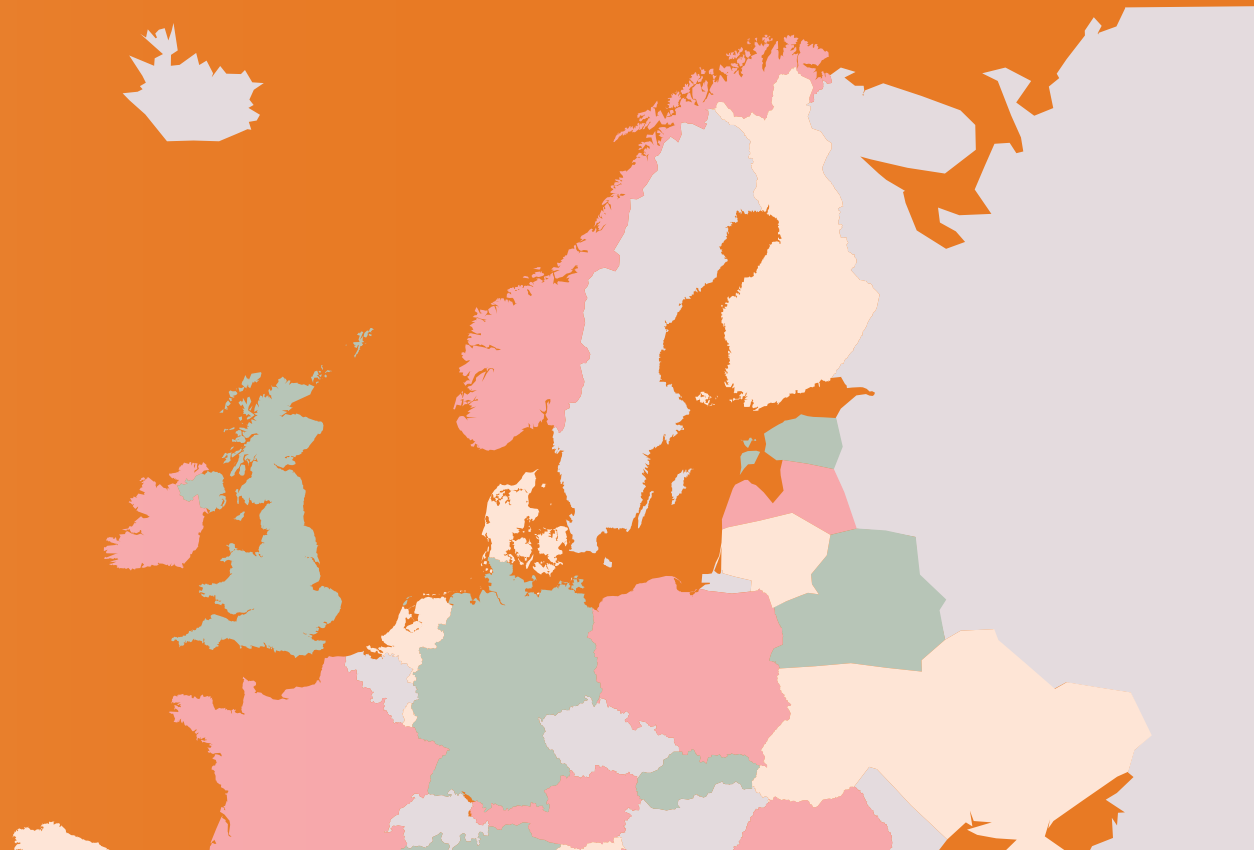
Evacuees and GOs aim for an evacuation to be a temporary measure. Hence, a plan is needed to safely return evacuees to their homes or, if their homes are not available, to more permanent emergency accommodation.

**Standard practice:** We have a clear plan to safely return evacuees to their homes or to more permanent accommodation.

**Best practice:** Our safe return plan works across humanitarian agencies and other partners (including suppliers of transport and domestic services). We have learned from international lessons on safe return and have exercised our plans.

	Justification for assessment					Not relevant to our organisation
	We are an example of best practice	We have exceeded a satisfactory standard	We deliver to a satisfactory standard	We are approaching a satisfactory standard	We have made no meaningful progress	
	✓	✓	✓	✓	✓	✓
6.8. Formalise mutual aid agreements						
a. We know the resources that we might need to source through mutual aid						
b. We have agreements to obtain resources locally, nationally and/or internationally						
6.9. We have a plan to return evacuees safely to their homes or to more permanent accommodation						

# Conclusion





# Conclusion

This workbook has been designed to support GOs and frontline managers in critically assessing their preparedness to conduct effective mass evacuations. The EPAW offers measurable tasks for Parts 1-6 of the ERGO Framework for Evacuation, as well as offering generic tasks that work across these 6 parts.

The EPAW encourages evacuation preparedness to be thought of as involving at least 63 tasks. This is not to say that evacuation planning only involves these specific tasks, as GOs will want to add their own tasks as well as not consider some of the tasks that are proposed in the EPAW. Essentially, the collection of 63 tasks aims to stimulate GOs' thinking about mass evacuation in diverse ways.

In terms of using the workbook, GOs may decide to use it in one of two ways:

1. Individuals assess their preparedness on the tasks (or Parts) and then assimilate those views to reach a common view.
2. Multi-agency partners come together in a workshop to discuss a series of tasks and collectively come to agreement on the assessment through debate.

Either way, the EPAW tasks are designed to be a focus for conversation to enable individuals to:

- . Explore their understanding of the tasks and build their understanding of what is possible regarding each task.
- . Make decisions on what level of performance is desired on each task.

- . Debate performance gaps that may exist and decide how important it is to close those gaps.
- . Identify actions that may close important gaps.
- . Develop a work package of complementary actions to close the gaps.

While the practical and theoretical underpinnings of the content of the EPAW is detailed in the ERGO Project Final Report, the strength of the EPAW is its combination of:

- . International best practice from ten countries involved in the ERGO project.
- . World leading experience and operational knowledge from the ERGO International Advisory Board which spent an intensive workshop series improving the EPAW.
- . A far-reaching review of published literature.
- . Three years of research and scientific endeavour from researchers on the ERGO Project.

However, we realise that the test of the EPAW will be in its application and we welcome comments on its content and any experience of applying the Evacuation Preparedness Assessment Workbook.

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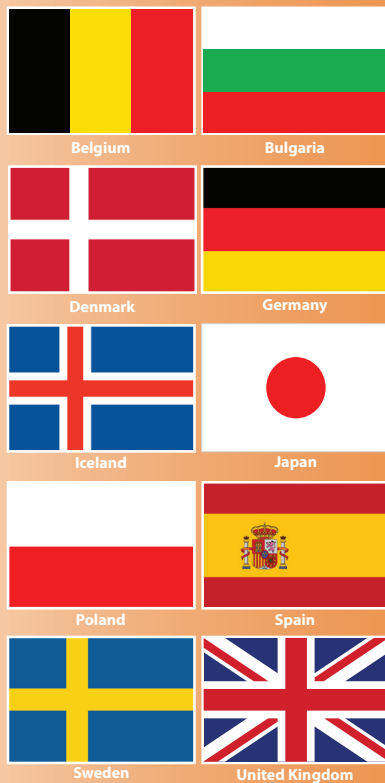
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