



D5.1

Evidence based planning guideline for HILP events and a toolkit

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D5.1 Evidence based planning guideline for HILP events and a Toolkit

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Abstract

This deliverable presents the AGILE Guideline for Evidence-Based Planning for High Impact Low Probability (HILP) events and an accompanying planning Toolbox designed to strengthen preparedness under conditions of deep uncertainty. Building on the research outputs of the AGILE project, including the HILP Reference Library, tiered stress-testing exercises, expert consultations, and validation activities, the Guideline translates scientific evidence into practical planning principles for disaster risk management practitioners, policy makers, civil protection authorities, and critical infrastructure operators. It adopts a threat-agnostic and systems-oriented approach that shifts preparedness from predicting specific hazards towards understanding systemic vulnerabilities, interdependencies, and organisational behaviour under stress. The Guideline is structured around six evidence-informed planning pillars addressing evidence governance, multi-level governance, HILP-specific planning, planning under data scarcity, adaptive capacity building, and risk communication. These principles are operationalised through a practical Toolbox comprising six step-by-step planning tools that support organisations in integrating diverse forms of evidence into emergency preparedness, business continuity, and resilience planning. Together, the Guideline and Toolbox provide a coherent framework for improving decision-making, strengthening organisational resilience, and enhancing preparedness for future HILP events across sectors and governance levels.

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SEN	Sensitive, limited under the conditions of the Grant Agreement	
CL	Classified information under the Commission Decision No2015/444	

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¹ Deliverable types:

R: document, report (excluding periodic and final reports).

DEM: demonstrator, pilot, prototype, plan designs.

DEC: websites, patent filings, press and media actions, videos, etc.

OTHER: software, technical diagrams, etc.

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Abbreviations

AGILE	AGnostic Risk management for high Impact Low probability Events (Project name)
HILP	High Impact Low Probability
HIHP	High Impact High Probability
DM	Disaster Management
DRM	Disaster Risk Management
RQs	Research Questions
SOP	Standard Operating Procedure
ICT	Information and Communication Technology
UCL	University College London
WP	Work Package
RA	Risk Assessment
TRIZ	Theory of Inventive Problem Solving
RDR	Research Data Repository
ML	Machine Learning
NRR	National Risk Registers
FGDs	Focus Groups Discussion
DT	Digital Twin
STT	Stress Test Tier

Executive summary

High Impact Low Probability (HILP) events represent one of the greatest challenges for contemporary disaster risk management. Their rarity, complexity, systemic nature, and high uncertainty limit the effectiveness of conventional emergency preparedness approaches that primarily rely on historical frequencies, probabilistic risk assessments, and hazard-specific planning. Experience from recent global crises has demonstrated that many catastrophic events occur outside established planning assumptions, requiring organizations to develop preparedness capabilities that remain effective even when future threats cannot be accurately predicted.

This Guideline presents the AGILE project's Evidence-Based Planning Framework for HILP events, translating the scientific knowledge, stress-testing results, historical analyses, and stakeholder consultations developed throughout the project into practical planning guidance for policy makers, emergency management authorities, critical infrastructure operators, civil protection organisations, and other practitioners responsible for preparedness and resilience.

Rather than focusing on predicting individual hazards, the Guideline adopts a threat-agnostic and systems-oriented approach that emphasizes understanding how critical functions, organisations, and interconnected infrastructures behave under conditions of extreme stress. Within this context, evidence is understood not simply as historical disaster data but as a combination of empirical observations, lessons learned from previous crises, stress-test outcomes, expert judgement, operational experience, and research findings that collectively support decision-making under deep uncertainty.

The first part of the Guideline introduces six interconnected planning pillars that establish a common framework for evidence-informed preparedness. These pillars address evidence governance, multi-level governance and decision-making, HILP-specific planning principles, planning under conditions of limited or uncertain data, adaptive capacity building, and risk communication. Together they provide a meta-framework that helps organisations determine what evidence should inform planning, how different forms of knowledge can be combined, and how preparedness decisions can remain robust when probabilities are unknown or unreliable.

The second part translates these principles into an operational Toolbox consisting of six practical planning tools. The Toolbox provides a structured, step-by-step methodology that enables practitioners to transform evidence into actionable preparedness measures. The tools guide organisations in translating evidence into planning assumptions, identifying critical functions and continuity requirements, clarifying governance arrangements and responsibilities, strengthening communication systems, building organisational capabilities, and establishing mechanisms for continuous review and improvement. A common evidence classification and rating methodology is integrated throughout the Toolbox to improve transparency, consistency, and traceability of planning decisions.

The Guideline has been developed through an iterative validation process involving project partners, case study organisations, subject matter experts, and members of the AGILE Advisory Board. Findings from AGILE stress tests, the Reference Library, qualitative interviews, focus group discussions, and operational validation exercises have been

systematically incorporated to ensure that the recommendations are scientifically grounded while remaining applicable in operational environments.

Ultimately, this Guideline supports a fundamental shift in emergency preparedness—from planning for known hazards toward building resilient systems capable of anticipating, adapting to, and recovering from unforeseen disruptions. By integrating diverse forms of evidence with practical planning methods, it provides organisations with a coherent and scalable framework for strengthening preparedness, improving decision-making under uncertainty, and enhancing resilience against future High Impact Low Probability events.

1. Introduction

The purpose of this Guideline is to a) translate the results from AGILE HILP generated evidence into emergency preparedness planning principles and follow up steps and b) to enhance traditional emergency preparedness planning and business continuity methods for better management of High Impact Low Probability (HILP) events. This approach is reflected with the structure of the Guideline with the first part describing the planning principles through six Pillars and the second part the Toolbox which offers guidance for implementation to practitioners and other interested entities in the AGILE approach.

Historical analyses suggest that HILP events are becoming increasingly more “normal”, encompassing both unpredictable ‘black swans’ (Taleb, 2007) and known hazards for which many are ill-prepared due to various reasons such as a lack of predecessors or the high cost of mitigation measures (Sornette, 2009; Pescaroli & Alexander, 2016, 2018; Hynes et al., 2020). HILP events therefore require enhanced preparedness approaches because traditional planning and training methods often fail to equip professionals with the necessary skills to respond effectively to HILP events, as these tend to fall out of the “normality” spectrum (Linkov et al., 2014; Woods, 2018; Florin & Linkov, 2018). This Guideline is designed specifically for Disaster Management (DM) practitioners, policy makers, first responders, and critical infrastructure operators aiming at translating HILP evidence into practical planning instruments.

Working assumptions:

- HILP events are increasingly occurring, and it has become evident that conventional approaches to emergency preparedness and planning are insufficient to effectively anticipate, absorb and manage such situations. The limitations of traditional methods highlight the need for the adoption of additional and more innovative strategies tailored to the unique characteristics of HILP events.
- To address this gap, it is essential to build upon established emergency planning frameworks while integrating the AGILE approach designed around risk agnosticism and a tiered stress test methodology. This combined approach should also foster an environment that encourages creative thinking and problem-solving. By merging traditional methods with advanced stress-testing techniques and promoting a culture of innovation, the likelihood of achieving successful outcomes in the management of HILP events is significantly increased.
- The development and implementation of a comprehensive Guideline for Evidence-Based Planning for HILP events and a toolkit, alongside a dedicated manual for capacity building, will provide organizations with the tools necessary to enhance their internal processes. These resources will support organizations in better understanding, anticipating, and

managing the challenges presented by HILP events, ultimately strengthening their overall resilience and preparedness at the organizational level.

Approach

The aim of this deliverable is to create a Guideline for evidence-based planning for HILP events and a toolkit, setting boundaries for the analysis of evidence, and leveraging existing disaster risk management (DRM) resources using a systems perspective.

The chapter with the 6 Pillars focuses on synthesising the evidence base established in the preceding AGILE deliverables, including that of the HILP Reference Library; AGILE Stress Tests including both the methodology design and implementation results; and research findings from expert interviews. The approach is structured around five refined Research Questions (RQs) derived from the project's foundational research to move from theoretical evidence to actionable planning:

- ❖ **RQ1:** How do interactions between societal, organisational, and political systems shape decision-making and planning for HILP events under conditions of deep uncertainty?
- ❖ **RQ2:** What are the key similarities and differences between HILP and High Impact High Probability (HIHP) events most relevant for Evidence-Based Planning, preparedness, and governance?
- ❖ **RQ3:** Which methodological and organisational elements enable effective use of planning tools under data scarcity and lack of precursors for HILPs?
- ❖ **RQ4:** How can training, scenario-based exercises, strategic foresight, and lateral thinking enhance organizational readiness and adaptive decision-making for HILPs?
- ❖ **RQ5:** How can risk communication support evidence-based planning and decision-making for HILPs under uncertainty and low probability perception?

The insights derived from these research questions were synthesised and translated into a set of thematic planning pillars that structure the evidence-informed approach to HILP preparedness presented in this Guideline.

Each pillar is then structured to guide practical planning. Except for Pillar 1, which is cross-cutting and sets the context, all other pillars start by a) identifying the key planning challenges, then b) present evidence from the AGILE Reference Library and stress tests to show why these challenges matter, c) they explain the planning implications, highlighting what this evidence means for decision-making and finally, d) they provide recommended actions that practitioners can take to strengthen systems.

The chapter with the Toolbox builds on the six Pillars and transforms them into concrete planning steps. Each of the 6 tools follow a step-by-step approach, they all have a similar structure to allow uniformity of implementation and are supported by hypothetical examples to allow visualization of end results.

Validation Process

The validation of this Guideline followed an iterative, transdisciplinary co-creation process designed to bridge theoretical research with the operational requirements of disaster risk management. Using a qualitative approach, the planning framework was refined through triangulation, semi-structured interviews and focus group discussions (FGDs) with project consortium members (case study personnel and Project Advisory Board members), ensuring the

findings are grounded in operational-level expertise, including both tactical and strategic. To ensure practical utility, the Guideline underwent 3-4 iterative cycles, incorporating field observations from tiered stress tests and feedback from stakeholders.

Initial feedback was collected during the end-user committee meeting on 24 March 2026 using short live feedback questions. During this session, the first draft of the Evidence-Based Planning Guideline was presented to project partners, allowing participants to provide immediate reflections on its clarity, structure, and relevance. All the feedback, including suggestions and ideas, was reviewed carefully to prepare the next revised version.

Ethics process:

The validation activities were limited to members of the project consortium and Project Advisory Board who are formally affiliated with the funded project and participate in their professional capacity. The purpose of meetings (feedback session) or semi-structured interviews one by one or focus group discussions was to obtain professional feedback on the clarity, structure, and practical usefulness of the Guideline, supporting the internal validation and refinement of project deliverables. No external stakeholders or members of the public were involved in this stage of the validation process, which is aligned with what UCL regulations on ethics define as a case for ethics approval exemption².

The validation process draws on qualitative data generated through conducting semi structured interviews and focus group discussions by UCL research team as a part of the project. Consequently, the collection, management, analysis and use of these qualitative data fall under UCL's research governance, ethics and data protection procedures. For this reason, the applicability of UCL's requirement was reviewed to ensure that the use of qualitative data within this work package was consistent with the ethical conditions under which the data were collected and processed.

As an additional precautionary measure, a formal confirmation of the exemption case was sought from the UCL RDR Ethics Committee. It was confirmed in this instance that the activity undertaken within this work package was considered an internal project activity rather than research involving external human participants and therefore does not require a new ethics application under UCL procedures. This confirmation provided assurance that the use of interviews and FGDs data for the validation and refinement of the Guideline was consistent with UCL's ethical governance and data management requirements.

All information gathered during these activities related exclusively to participants' professional feedback on the content of the Guideline. The discussions were conducted with consortium members in their professional roles and did not involve the collection of sensitive personal data. Any notes or transcripts generated during these internal validation activities were handled in line with UCL data protection and data management practices, with access limited to the UCL research team. A thematic analysis approach was applied to the notes and transcripts to support the review and refinement of the draft Guideline. These activities were conducted solely for the purpose of reviewing and refining the draft Guideline, and all contributions were treated and used only within the scope of the project's validation and refinement process.

² UCL Research Ethics Service, *Do I Need Ethical Approval?* Available at: <https://www.ucl.ac.uk/research-innovation-services/compliance-and-assurance/research-ethics-service/do-i-need-ethical-approval>

2. Need for Evidence Based Planning for HILP Events

HILP events stand out from typical emergencies due to their complexity, unpredictability, and severe consequences. They often involve interrelated risks, sudden or gradual onset, high uncertainty, and failures in tightly coupled systems. HILP events can stem from unusual combinations of physical and social dynamics, leading to unexpected outcomes. Limited occurrence and experience make them difficult to manage, and their impact can result in significant casualties, economic losses, and irreversible damage. These events may severely affect closed systems, exhibit cascading effects, and lack mitigation measures. Effective response requires specialised expertise and resources, sometimes prompting changes in policy at national or international levels.

With D1.1, project AGILE defines HILP events as the following:

"Rare events, which may potentially result in catastrophic impacts such as on people, infrastructure, utilities, critical services, and wider societal function. These events are characterised by a lack of precedence and high levels of uncertainty in their predictability and combinations of effects; they often come as surprises or shocks. They may not meet the defined thresholds of mitigation actions and will require innovative, creative approaches to raise awareness, leverage established capabilities, and enhance short- and long-term preparedness."

To support this description, the AGILE Reference Library provides historical examples of HILP events. Using the Grenfell Tower Fire from 2017 as a concrete HILP example, the event meets the criteria in the following way:

- Existence of interacting dynamics - a malfunctioning refrigerator on the fourth floor + the presence of combustible cladding and insulation that had been installed during a recent refurbishment.
- Recombination of known and unknown patterns - fire in a high-rise building (known) + combustible cladding and insulation (unknown and unexpected: the actions of the fire brigade assumed that the cladding and insulation would *not* be highly combustible).
- The role of history – learning from it – was no longer correct. The (wrong) learning/lesson was that modern buildings would not have highly combustible cladding and insulation.
- Quantitative measures – the context-specific impacts were serious: 72 people died and many were injured.
- Contextual impacts – the damage to Grenfell Tower was irreversible.
- System dynamics – the fire had widespread effects, and there was no adequate mitigation.
- Emergency response – the event triggered broader building-regulation reviews and changes in high-rise safety policies.

Traditional approaches to disaster risk assessments, emergency planning and business continuity management serve as reliable platforms for evaluating well-characterised, predictable threats. However, these methods are insufficient for HILP events because they are dependent on linear cause-and-effect relationships and historical data, factors that are often absent for rare shocks. Moreover, conventional risk matrices often misclassify HILPs as low-priority outliers

because they focus on statistical likelihood rather than *plausible materiality*, leading to chronic underfunding and a *failure of imagination*.

If traditional risk management tools cannot provide reliable evidence for HILPs, then we must look at other forms of evidence and particularly, how people and organisations behave during emergencies. In his work on the importance of evidence-based disaster planning, Auf der Heide (2006) argues that in preparing for disasters (in our case, HILP events), there is a need to shift from *planning for response* to *organising for learning*. The reason behind this shift lies in the evidence he captured from what repeatedly happens in real disasters in the context of the behaviours of response organisations and disaster victims. Auf der Heide (2006) claims that despite the existing empirical evidence of how people and organisations really behave during impact, our preparedness plans are usually based on ideal command and control conditions and compliance principles to policy and legislation. Furthermore, he is convinced that plans based on these elements only and without empirical grounding on the behaviour of people and organisations during emergencies are likely to fail when most needed.

“Planning should take into consideration how people and organisations are likely to act, rather than expecting them to change their behaviour to conform to the plan.” (Auf der Heide, Ibid.)

His recommendation towards building a culture for evidence-based planning would be a set of logically connected actions that start with observation of what happens, then move towards identification of recurring patterns and end with redesigning systems to accommodate those patterns. In practice, this approach means using each incident and near miss as a research subject. This requires utilisation of methodological approaches in data collection and analysis that will provide unbiased interpretations of what happened, what was learned and how that learning can lead to a change.

While Auf der Heide highlights the gap between plans and real behaviour, Faludi and Waterhout (2012) remind us that behaviour during impact is only part of the challenge. How evidence is interpreted and acted upon is equally shaped by political and institutional dynamics. They argue that planning is never a technical exercise but a political and interpretative process. In such a setting, evidence is only one of the many resources used and, as such, competes with other attributes such as organisational values, personal interests, institutional power and professional judgement. Therefore, evidence does not dictate outcomes but strengthens or weakens arguments within debates that are already shaped by normative goals, institutional mandates, stakeholder interests and power relations.

Translating the above mentioned into a HILP context, the use of the term ‘evidence’ reveals a creative dilemma: evidence is indispensable, yet never sufficient; essential yet inherently incomplete. If HILPs are defined as unpredictable events, located below risk assessment thresholds and characterised by a low political risk appetite to deal with, the question of the nature of evidence for such events remains. What constitutes evidence when frequency data is absent or when past events are too few or too different?

While the dilemma is real, it does not invalidate the concept of evidence; it only changes its nature. While HILP events provide little event-specific evidence due to their rarity and unpredictability, they do not exist in an evidentiary vacuum. Evidence for HILP preparedness emerges from observed behavioural patterns in past emergencies, from near misses, from the outcomes of systemic stress tests, and from the political and institutional dynamics that shape emergency

preparedness planning. Thus, the role of evidence in HILP contexts is not to predict the event but to reveal how systems are likely to behave when confronted with the unexpected and based on this knowledge, develop preparedness strategies and mitigation measures.

Recognising that the evidence for HILPs must be broader and more systemic creates the foundation for AGILE's threat-agnostic approach, which focuses not on predicting hazards but on understanding systemic behaviour under stress. It means that the traditional evidence seen in the form of historical frequencies or hazard specific scenarios or probabilistic risk curves must be understood in a broader and more functional way because HILPs simply are not predictable in type, timing and magnitude. In the threat-agnostic way, the relevant evidence is not about *what caused the disruption*, but *what were the impacts and how did the system respond*. When the evidence is no longer tied to a specific hazard but to the detection of systemic vulnerabilities, then it becomes a substantial part of the resilience debate, making HILP preparedness possible without needing hazard-specific data (that might never exist).

2.1. Pillar 1: Evidence Governance

The recommendations in this Guideline are informed mainly (but not only) by the insights derived from already completed Tier 1 and Tier 2 stress testing exercises conducted across AGILE case study areas (documented in Stress Test reports) within the AGILE consortium. These stress tests use a risk-agnostic and systems-oriented approach to explore how essential services and critical infrastructures perform under extreme, overlapping disruptions. In many scenarios, different hazards converged on similar systemic vulnerabilities, particularly strong dependencies on electricity, digital systems, and communications networks, where disruptions quickly affected multiple services such as water supply, healthcare, transport, logistics and emergency coordination.

The stress tests also highlighted how tightly interconnected infrastructures can produce cascading failures when one component is disrupted, especially where single physical bottlenecks or critical transport nodes constrain mobility and supply flows. Governance and coordination challenges were frequently observed during compound crises, as responsibilities and decision-making processes across organizations can become unclear under time pressure. In addition, many essential supply chains were shown to operate with limited buffers, meaning that interruptions in logistics, fuel availability, or digital payment systems can rapidly translate into shortages of essential goods. Communication with the public was also identified as a key vulnerability, particularly when official channels are disrupted and misinformation spreads quickly.

Finally, the stress tests revealed pressures on human resources during prolonged emergencies, where limited personnel, specialized roles, and responder fatigue can weaken operational capacity. Taken together, these observations highlight the importance of strengthening cross-sector coordination, ensuring redundancy in lifeline infrastructures and communication systems, planning for mobility and logistics disruptions, and enhancing organizational and community preparedness for complex and cascading crises.

If evidence for HILP events must be reimagined, then preparedness must be reimagined as well to fit the purpose. The challenge is not to predict the next rare shock but to build systems capable of learning, adapting, and absorbing the unexpected. The following chapter turns this shift in thinking into practice, outlining the core pillars that enable organizations and societies to plan for the unimaginable:

- multi-level governance
- HILP-specific planning logic

- tools for data-scarce environments
- capacity building for adaptive readiness,
- and risk communication that supports informed decision-making.

3. Pillars for Evidence-Informed Planning of HILP Events

HILP events pose a persistent challenge to planning and decision-making because they are rare, deeply uncertain, and often characterized by cascading and systemic impacts that exceed the scope of conventional risk-based approaches. As established within the AGILE project, HILPs are context-dependent shocks that may lack recent precedent, combine known hazards in unexpected ways, and primarily manifest through disruptions of critical services and essential societal functions rather than isolated losses.

The Pillars for Evidence-Informed Planning of HILP Events provide a meta-level framework to support planning and preparedness under these conditions. This means they do not prescribe actions, methods, or tools directly, but instead organize how other frameworks, methods, and evidence are used and connected. The concrete actions following this meta-level framework with the six Pillars are later on elaborated with the Toolbox chapter of this Guideline.

They (the Pillars) answer questions such as:

- *What kinds of evidence matter when probability is deeply uncertain?*
- *How should different forms of knowledge (data, scenarios, expert judgement, lessons from past crises) be combined?*
- *How do we decide what is “robust enough” to plan on when prediction is unreliable?*
- *What types of vulnerabilities are most likely to amplify disruption across interconnected systems?*

The Pillars will not tell the end user *how to do a risk assessment, how to run a scenario, or how to stress-test a system*. They inform how those activities should be oriented, interpreted, and aligned when dealing with HILP events. Rather than replacing risk assessment, scenario planning, or resilience analysis, the Pillars integrate insights from these approaches and orient them toward planning that remains robust under deep uncertainty. They reflect AGILE’s core findings that effective HILP planning must move beyond prediction of specific hazards and instead focus on system behaviour, vulnerability, cascading dynamics, and the capacity to maintain and restore critical functions.

The Pillars are therefore hazard-agnostic, context-sensitive, and evidence-plural, drawing on conceptual frameworks, empirical insights, historical case analysis, expert judgement, and foresight-based methods. They offer a shared structuring logic for evidence-informed planning across sectors and governance levels, supporting anticipatory, adaptive, and resilience-oriented decision making for events that sit outside the boundaries of “normal” risk.

As mentioned earlier this meta nature of the Pillars creates a clear bridge to the AGILE Toolbox, a collection of practical methods, tools, and supporting instruments designed to operationalise evidence-informed planning for HILP events. The nature of the Toolkit is to remain coherent and adaptable as individual tools may evolve or differ, while being consistently guided by the same meta-level logic established with the Pillars.

3.1. Pillar 1: Evidence Governance

Evidence-informed planning for HILP events requires explicit governance of evidence because in HILP contexts, evidence is indispensable yet inherently incomplete, and its role is not to predict the next shock but to reveal how systems behave under stress and uncertainty. This reflects consistent AGILE findings that evidence in HILP contexts is inherently constrained, uneven across sectors, and shaped by complex, interconnected systems, requiring adaptive and structured approaches to its use.

Within the AGILE framework, evidence is regarded not as a retrospective justification for decisions already made, explaining why an outcome was unavoidable or defending choices that were already made or demonstrating compliance rather than improving preparedness but as a managed planning input that actively shapes the planning process. This reflects empirical insights showing that evidence is often applied inconsistently in practice and may be influenced by governance structures, organizational dynamics, and political considerations rather than being shaped slowly by technical reasoning.

This approach emphasizes that evidence must be intentionally selected, critically questioned, thoughtfully combined, and regularly revisited before an impact occurs. Evidence should therefore guide priorities, support adaptive judgement, and help identify vulnerabilities and dependencies, and potential cascading failures across systems. The objective is to use evidence to inform priorities and guide options for action under conditions of uncertainty. This aligns with established evidence on interconnected vulnerabilities and cascading and compounding risks across systems and sectors. By identifying these critical points, planners can better anticipate vulnerabilities and address them proactively. In such a context, the evidence can be used to develop scenarios, not with the goal of predicting specific future events, but rather to enhance decision-making capacity under conditions of high uncertainty. Scenario development, informed by diverse forms of evidence, supports the cultivation of adaptive skills and robust strategies that are critical for surviving unpredictable environments.

What counts as evidence under the Guideline?

The understanding of evidence within this Guideline includes the following:

- Historical and comparative case evidence captured in the AGILE Reference Library (used to identify recurrent failure patterns across sectors/geographies and support scenario building).
- Stress-test and simulation insights are reported at a high, non-identifying level, focusing on recurrent systemic vulnerabilities (e.g., dependencies on electricity/digital systems/communications, cascading failures, governance and coordination frictions, supply chain buffers, and responder fatigue).
- Expert-elicited operational evidence (semi-structured interviews, focus group discussions (FGDs), and consortium validation) is used to support the translation of research into actionable planning implications and recommended actions.

To be fit for HILP planning, the evidence within the understanding of the Guideline should:

- a) Illuminate system behaviour under stress,
- b) Reveal patterns of escalation or adaptation,
- c) Support judgement under uncertainty (not precise forecasting) and

d) Remain valid even when probabilities are unknown or unstable.

As the problem with HILP events is not always related to the absence of evidence but also to the fact that evidence can come from different sources in different formats and with different strengths, the Guideline suggests that every “evidence claim” used in the Toolbox should be tagged to two different attributes:

Attribute A - Evidence type

This identifies the source or category of evidence being used. The evidence may derive from:

- a HILP case or a group of cases from the Reference Library,
- stress test observations,
- expert judgement,
- operational lessons identified through exercises or crises,
- or other validated planning inputs.

Explicitly identifying the evidence type strengthens transparency and traceability within the Toolbox.

Attribute B – Common 0 to 3 rating scale

This identifies the strength and the confidence of the current situation. It’s a format of self-assessment based on the 0-3 model proposed by Pescaroli et al. (2020) for benchmarking operational capacity, organizational resilience and disaster risk reduction capacity with an additional “Don’t know” option. The common evidence rating scale is presented in Table 1.

Table 1. Common 0-3 evidence rating scale used within the AGILE Guideline

Rating	Label	Meaning
0	Critical / absent	No meaningful capacity or arrangement is in place, or the issue represents a critical gap.
1	Basic / limited	Some initial capacity exists, but it is fragmented, underdeveloped, or inconsistently applied.
2	Developing / defined	Capacity exists and is partly structured, but important inconsistencies, limitations, or update needs remain.
3	Established / integrated	Capacity is comprehensive, consistently applied, regularly reviewed, and improving.
Don't know	Unknown	There is not enough information to make a justified rating.

3.2. Pillar 2: Multi-level Governance and Decision Making

HILP events are increasingly characterized by compound, interacting, or cascading dynamics that span societal, organizational, and political systems. Traditional hierarchical governance models designed for predictable hazards may delay decision-making in rapidly evolving crises where system failures propagate across tightly coupled networks.

Stress Test Tier1 (STT1) case studies indicate that cascading crises overwhelm centralized command structures due to delayed decision-making and fragmented situational awareness across governance levels. With the scenarios developed through STT 1 cascading disruptions across electricity supply, digital communication networks, logistics systems, and emergency coordination functions were captured pointing also to the concentration of decision authority at

higher governance levels. These exercises also highlighted constraints due to physical bottlenecks and limited supply chain buffers, pressures on human resources, and vulnerabilities in public communication, all of which compound challenges for timely and coordinated decision-making.

In addition, evidence from Deliverable D1.2 highlights that governance and decision-making for HILP events are strongly shaped by political and institutional constraints, including limited political will, short-term policy cycles, resource competition, and fragmented responsibilities across public and private actors. These constraints can restrict the practical implementation of decentralized decision-making, even where it is operationally desirable.

Evidence Base

Through AGILE's evidence base, common failure points related to multi-level governance and decision-making include the following:

- A lack of resources or "risk appetite" often prevents mitigation because HILP probabilities do not reach the traditional cost-benefit thresholds required for political or financial buy-in.
- A failure to institutionalize lessons from past crises or "near misses," often exacerbated by high staff turnover and a reluctance to document failures due to regulatory scrutiny.
- A condition exists where systemic failures occur because no single entity feels responsible for the entire networked risk, leading to the "someone else will manage it" bias.
- Responding agencies often operate using different protocols and data systems, leading to fragmented situational awareness and siloed efforts.
- Communication gaps between technical experts and decision-makers can slow the translation of risk information into operational decisions.
- Public sector innovation often emerges from across the organization, not just from the top leadership, highlighting the importance of enabling staff at all levels to contribute ideas.
- Stress test findings highlight that dependencies on electricity, mobility logistics, ITC systems, and human resources consistently amplify cascading failures, demonstrating the need for redundancy and cross-sector preparedness.
- Evidence from D1.2 further shows that political prioritization tends to favour high-probability, visible risks, leaving HILP preparedness underfunded and deprioritized. Decision-making authority is often fragmented across governance levels and sectors, creating accountability gaps and coordination challenges during crises.

Planning Implications

To move from risk management to resilience management, preparedness planning must assume that "disruptions will happen" despite the focus placed on prevention.

- Decisions should be decentralized to the most local level possible; higher levels of governance should only be activated when local capacities are exceeded.
- In practice, decentralization should be understood as operational flexibility within governance constraints rather than a complete redistribution of formal authority. Political, legal, and institutional structures may limit decentralization, requiring hybrid models that combine centralized strategic oversight with decentralized operational decision-making.
- Planning must prioritize flexibility and improvisation over rigid, predefined playbooks that may no longer apply when a cascade begins.
- Governance should shift from "most likely" scenarios to the "worst plausible manifestation" of a risk to ensure system performance under degraded conditions.

- Leadership is often the most significant driver of innovation, rather than a large budget; influential leaders are instrumental in creating space for employees to explore various solutions from multiple perspectives.
- Preparedness strategies should include mechanisms to integrate scientific expertise and real-time data into decision-making processes.
- Cross-sector coordination mechanisms must anticipate overlapping system stress and bottlenecks identified through stress tests, ensuring that decision-making remains functional even under compound crises.
- Insights from collaborative governance literature (e.g., Ansell & Gash, 2008; Kapucu & Garayev, 2011; Ferraro et al., 2015) suggest that effective decision-making in complex and uncertain environments depends on iterative coordination, shared responsibility, and adaptive problem-solving across institutional boundaries. These approaches provide a conceptual foundation for operationalizing more flexible and adaptive governance arrangements in HILP contexts.
- Empirical evidence also demonstrates that centralized systems can restrict local responsiveness, particularly when decision authority lacks operational information. Conversely, more flexible arrangements such as multi-agency coordination structures and the integration of non-governmental actors can enhance adaptability during cascading crises.
- Concrete examples from stress test scenarios (e.g., cascading failures across electricity, ICT, and logistics systems) illustrate how delays in centralized decision-making can hinder responses, reinforcing the need for empowered local decision-making supported by coordinated escalation mechanisms.

Recommended Planning Actions

- Develop protocols that support leaders in making interim decisions when evidence is incomplete. This includes identifying "leverage points" for early intervention to prevent a manageable emergency from cascading into a systemic crisis.
- Institutionalizing lessons from previous crises through knowledge management systems and creating prearranged triggers for escalation across governance levels will strengthen organizational resilience.
- Regular joint exercises and simulations across societal and organizational layers should be conducted to embed adaptive decision-making capabilities.
- Empower individuals for decision-making and responsibility by using wargame scenarios that push trainees out of their comfort zones, making them more comfortable with stress and ambiguity.
- Foster cohesive teamwork by delegating authority and promoting unity through collective responsibility, which strengthens organizational resilience.
- Creating cross-sector coordination or liaison roles to bridge institutional boundaries during crises.
- Planning must address accountability considerations within applicable regulatory frameworks for third-party providers of critical services, who often bear only a fraction of the cost of a HILP disruption while end-users absorb the full societal impact.
- For greater efficiency, organizations should codify "emergency mode" decision chains. By doing so, it will shorten the path between municipal and national authorities. This includes pre-assigning authority for the rapid prioritization of scarce resources (e.g., fuel and transport capacity) so that funding and triage rules are not negotiated during the acute phase of a crisis.

- To combat person-dependence and personnel exhaustion, preparedness should move from person-based to role-based response capacity. Key posts must be made interchangeable through SOPs, ensuring that coordination does not falter if specific individuals are unavailable during prolonged multi-hazard events.
- Integrate insights from multiple stress tests to identify recurring vulnerabilities in electricity, mobility, logistics, ITC, and human resources capacity and include these in scenario-based planning and contingency SOPs.
- Provide practical tools to operationalize decentralized decision-making, such as decision-making templates, escalation trigger frameworks, role-based authority matrices, and scenario-based coordination exercises, enabling implementation even under political and institutional constraints.
- Establish pre-defined coordination mechanisms with non-governmental actors (e.g., NGOs, volunteer organizations, and private sector operators) to enhance surge capacity and flexibility where formal governance structures may be constrained.

3.3. Pillar 3: HILP-Specific Planning Approach

Planning Challenge

HILP events cannot be addressed using the logic applied to HIHP events. While HIHPs are familiar and predictable, HILPs are characterized by unknown risk, low recurrence and a recombination of risks that lack historical precursors. Traditional approaches fail to anticipate cascading effects or interactions across interdependent systems.

Evidence Base

Through AGILE's evidence base, common failure points identified include the following:

- Evidence of taxonomy misclassification as events that are often labelled as “Black Swans” actually show identifiable precursors and preventability when examined retrospectively.
- Psychometric analysis shows that HILPs occupy the high-dread/high-unknown quadrant of risk perception, unlike HIHPs which have high familiarity.
- Focusing on the probability of events often disincentivizes action, as these rare events are viewed as too unlikely for immediate budget allocation.

Planning Implications

- Planners must recognize that the classification of an event as HILP is fluid; a rare event like a flash flood in one region may be a HIHP event in another where the community has already developed adaptive responses.
- Adopt a hazard-agnostic, consequence-driven logic, where the main focus is on maintaining critical societal or organizational functions regardless of the source of risk.
- Preparedness strategies should account for sudden-onset creeping crises and the interdependent interactions between concurrent hazards and prepare for the possibility of cascading failures that could occur across multiple sectors.
- Concrete examples include long-term power outages, cascading cyber-physical failures, or major port closures which can quickly spread across many important systems and sectors.
- Planners must recognize that they are operating with limited historical data and accept that traditional HIHP probabilistic models are insufficient for decision-making amidst the uncertain nature of HILP events.

- Utility/transport corridors often physically concentrate Lifeline infrastructures. A disruption at these chokepoints simultaneously threatens power, water, fuel, and mobility, triggering a national-scale outage with a localized trigger.

Recommended Planning Actions

- Implement frameworks that allow for flexible scenario construction and stress testing of critical functions. These exercises should incorporate compound, interacting and unanticipated events to stress organizational capacity.
- It is essential to document near misses and unusual events, enabling an interactive learning and future planning process.
- Civil protection authorities and relevant sectoral bodies should encourage collaboration between policymakers, scientific experts and operational agencies to ensure that emerging knowledge about systemic risks and complex crises is reflected in the planning framework.
- Engineering and planning must enable "islanded continuity," where local utility networks (power, water, heating) can operate independently of national grids when main corridors fail. Planners should deliberately maintain reserve capacity and "slack" in these systems rather than over optimize for normal-time efficiency.
- Practical tools, such as templates or worksheets for mapping critical functions and their interdependencies, can support planners in systematically analysing vulnerabilities and preparing for cascading failures.

3.4. Pillar 4: Planning Tools Under Data Scarcity

Planning Challenge

Against a backdrop of limited historical data, missing precursors and low-frequency occurrence, the complicated nature of HILP preparedness models is further undermined by the effectiveness of conventional planning models. Conventional approaches, such as National Risk Registers (NRR), treat hazards in isolation, and they often extrapolate from past events. Failures in imagination pose difficulties for planners to anticipate non-linear cascading impacts, leaving critical systems unprepared. In the absence of robust data, the calibration of predictive models and justifying the allocation of resources to senior leadership is difficult.

Evidence Base

Through AGILE's evidence base, common failure points identified include the following:

- Statistical models are reliable for frequent hazards but are inherently limited for HILP events, making long-term planning difficult.
- Risk registers are frequently inflexible, making it difficult to adjust for emerging or shifting threats, and they rarely account for cascading or compound impacts that can propagate across interconnected systems.
- DRM experts often face the challenge of trying to "predict the unpredictable," failing to recognize that precise prediction for HILPs is often unfeasible. This discourages creative and adaptive planning approaches.
- Planners often face "site-level tunnel vision," where local stakeholders dismiss HILP scenarios because "it wouldn't happen like that here".

Planning Implications

- Planning should focus on discovering breaking points in a systemic manner by using methods such as stress tests to push systems to their limits and identify where failures occur.
- Tools and approaches must account for the often “unseen interdependencies” in global and local systems. This approach can help recognize how the failure of one critical element can trigger extensive disruptions across interconnected systems.
- Because distinguishing between “serious” and “catastrophic” events is inherently subjective and varies across cultural and organizational contexts, planning principles should allow tools to reflect multiple local and social values rather than rely on a single fixed metric.
- Tools must move beyond power-law distributions to identify “dragon king” events, which possess distinct amplifying mechanisms that can be analysed to reveal how smaller disruptions self-organize into massive failures.
- To identify vulnerabilities and interdependencies due to data scarcity, planners should use qualitative mapping, stress test outputs and expert opinions. This scenario is different from cases with rich data, where models are reliable, and instead focus on working with incomplete information in a flexible way.
- Overall, planning tools should prioritize usability, interpretability, and rapid decision-support rather than analytical complexity alone.

Recommended Planning Actions

- When historical data is scarce and/or precursors are missing, planners must leverage creative and technological tools to visualize future shocks. This includes advanced analytics, including Machine Learning (ML), which can be leveraged to detect shared vulnerabilities and patterns despite historical data gaps.
- Differentiate between Horizon Scanning (imagining the mid-to-distant future), Emerging Risks (anticipating the near future), and Current Risks (managing the present) to ensure “blind spots” are systematically addressed.
- Counterfactual analysis should be encouraged to explore “what if” variations of past disasters to reveal hidden cascade pathways.
- Planners should complement traditional risk registers with dynamic tools such as stress testing and scenario-based modelling to examine how critical systems behave under extreme or unfamiliar conditions.
- Improving one aspect of a system may cause problems in another. Apply lateral thinking techniques such as TRIZ (Theory of Inventive Problem Solving) to stimulate creativity³. Instead of planning based on current resource limitations, planners should work backward from an “ideal” solution that resolves a system contradiction, such as increasing security without decreasing response speed, using minimal resources
- Utilize the “Anytown” tool, an abstract model that presents scenarios in a random location environment. This helps focus analysis on generic system failure modes and interdependencies, thereby reducing anchoring effects in planning discussions. Identified vulnerabilities can then be assessed within the relevant local context, where the likelihood and impacts of specific HILP events may vary.
- To overcome the “failure of imagination”, planners should use structured scenario variation techniques (e.g., hazard cards, infrastructure cards, and wild cards, AGILE

³ TRIZ is a systematic methodology for solving contradictions in complex systems by identifying inventive principles that have successfully resolved similar conflicts in other domains, encouraging innovative solutions without trade-offs (Altshuller, 1999).

Stress Test Tier 1) rather than static, predictable plans. This "risk-agnostic" approach forces fresh thinking by creating unlikely combinations of shocks that "break" standard procedures and reveal hidden systemic vulnerabilities.

3.5. Pillar 5: Capacity Building and Adaptive Readiness

Planning Challenge

Institutional resistance often significantly hinders the effective adoption and implementation of scenario-based planning for HILPs. This could largely be attributed to organizations viewing emergency exercises as "time overhead" or a non-essential task as opposed to a core strategic function, creating a substantial disconnect between documented plans and existing operational capacity. This gap reduces response effectiveness, leaving systems vulnerable to cascading failures.

Evidence Base

Through AGILE's evidence base, common failure points identified including the following:

- High staff turnover and a failure to document learning from "near misses" prevent organizations from evolving their response capabilities which leads to the erosion of institutional memory.
- Most teams train for success under familiar conditions. When HILP events break existing plans, creating an ambiguous environment, responders are often overwhelmed by the anomaly of the situation.
- Strategic, tactical and operational levels are often trained in silos, leading to fragmented training initiatives, thereby limiting shared awareness of regional cascades.

Planning Implications

- To enhance resilience, organizations must adopt a "Training for the Fantastic" mindset, exposing personnel to challenges that exceed routine contingency planning and fostering mental flexibility.
- Capacity building should be treated as a sustained "training diet", equipping staff at all levels with foundational skills to manage unforeseen crises.
- Exercises should function as controlled "sandboxes", where failures are embraced as opportunities to uncover systemic brittleness and strengthen adaptive capabilities. Digital twin (DT) technology can be used for this approach.
- When training for complex challenges, it is crucial to create a safe environment, i.e. where ideas can be tested and refined without fear of premature judgement.
- Concrete examples of training tools should be provided, such as scenario-based exercises, decision games or scenario sprints to illustrate how adaptive skills can be developed in practice.
- End users need clear guidance on what adaptive readiness means in practice, including types of training required and the skills and behaviours. For example, key skills such as taking decisions under uncertainty, managing stress, improving, and working across sectors should be supported and clearly identified. This should also include practical capabilities such as effective communication under pressure, collaborative problem-solving, situational awareness, and the ability to adapt quickly when existing plans no longer apply. Regular scenario-based training and cross-sector exercises can help embed these skills in routine practice and strengthen long-term organizational resilience.

Recommended Planning Actions

Building resilience is an iterative process that requires moving from "learning the plan" to "training for the unexpected".

- Establish a multi-level training roadmap by simultaneously engaging political (strategic), mid-management (tactical) and field (operational) levels to ensure alignment and shared understanding.
- Red teaming exercises, involving personnel from outside the planning team or from different disciplines and organizations can critically evaluate planning assumptions, can reveal hidden cascade pathways and test organizational resilience.
- Incorporate unconventional stakeholders such as citizens, business operators, students, anthropologists, novelists, etc., to disrupt conventional thinking and introduce fresh ideas to enhance adaptive readiness.
- Ensure feedback is presented in a constructive manner, as it aids learners to overcome fear, build confidence, and boost a sense of leadership and responsibility even in the absence of formal structures.
- Provide short and practical training modules on key adaptive capabilities, including decision making under uncertainty, stress management, communication under pressure, situational awareness and cross-sector collaboration.
- Give clear and practical guidance on how to create scenarios and run training and show how repeated practice helps build adaptive skills.
- For critical sectors:
 - Healthcare and social care planning must anticipate extended digital and power outages. Training should focus on manual workarounds for triage, patient record-keeping, and mortuary management.
 - For fuel-dependent logistics, planners must recognize that the coupling of power-comms-fuel is a primary cascade driver. Without electricity, fuel pumping stops, which in turn halts evacuation vehicles and backup generators. Organizations must pre-identify alternative re-supply routes, such as ferries, for waterborne fuel delivery when terrestrial roads or bridges collapse.

3.6. Pillar 6: Capacity Building and Adaptive Readiness

Planning Challenge

Failures in communication are a core driver of crisis escalation during HILP events. Stakeholders often underestimate or dismiss such events due to cognitive biases like optimism bias ("it won't happen to us") or the availability heuristic (judging risks based on what is easy to recall). This can result in delayed risk awareness, insufficient preparedness, and misallocation of resources, even before a crisis occurs. Risk communication must therefore be embedded as a core component of preparedness planning, not only as a response function, ensuring that awareness, understanding, and trust are built before crises occur. This aligns with evidence highlighting the importance of collaboration and co-creation with stakeholders in risk communication (Slovic, 1992; Paton, 2007; Dilling & Lemos, 2011; Morss et al., 2016; Vaughan et al., 2016).

Once a crisis unfolds, high levels of uncertainty amplify fear and confusion, generating misinformation, rumours, and conflicting narratives that undermine public trust and complicate coordinated responses. Organizations frequently struggle to deliver timely, accurate, and actionable information across diverse audiences, including government agencies, private sector partners, emergency responders, and the general public. These challenges differ significantly between internal communication (e.g., coordination between agencies and decision-makers) and

external/public communication (e.g., informing citizens, tourists, and businesses), requiring distinct strategies, channels, and messaging approaches. They are further intensified by differences in communication channels, technical literacy, and cultural or contextual factors, which can create gaps in understanding and hinder compliance with safety measures.

Evidence shows that risk perception differs significantly between experts and the public, with lay audiences incorporating broader factors such as catastrophic potential, uncertainty, and uncontrollability (Fischhoff et al., 1978; Slovic, 2000). Language barriers, unclear terminology, and culturally specific interpretations of risk can further amplify misunderstanding, particularly among tourists or transient populations unfamiliar with local systems. If these communication challenges are not addressed during planning, the result is a heightened risk of systemic collapse, misaligned priorities, and ineffective crisis response.

A detailed analysis of the challenges in HILP risk communication is provided in D5.3 *Guidelines on current risk communication for HILP*.

Evidence Base

Through AGILE's evidence base, common failure points identified include the following:

- Due to cognitive biases and other factors influencing risk perceptions, decision-makers may underprepare because they perceive HILP events as highly improbable.
- Crisis managers and communicators often attempt to appear fully in control instead of honestly communicating under dubious circumstances. This false impression and communication of certainty provide misleading reassurance, which erodes credibility later when events unfold differently than expected.
- Concurrently, admitting to uncertainty can lead to further anxiety among the public if no clear guidance or reassurance is provided, so leaders must be mindful of how information is presented while remaining honest, empathic, and supportive.
- Siloed communication practices lead to miscommunication between organizations. Coupled with a lack of trained communication specialists to craft engaging, accurate content, such a scenario results in fragmented, misaligned and sometimes contradictory messaging.
- Risk communication and preparedness plans work best when they are developed together with communities, as this approach builds awareness, trust, local relevance, engagement and overall preparedness. However, media coverage and public focus on rare catastrophic events can distort perceptions and lead to overestimation or underestimation of certain events (Eisenman, 1993; Park & Grow, 2008; Dilling & Lemos, 2011; Vaughan et al., 2016).
- The rapid spread of misinformation and disinformation, particularly through digital and social media, further amplifies confusion and undermines coordinated response efforts and individual action, as well as trust and credibility in authorities.

Planning Implications

- Effective risk communication must be framed as a two-way, interactive process, where planners actively listen to stakeholders' concerns and account for diverse belief systems and practical constraints.
- In line with evidence, communication should be co-created with stakeholders through iterative engagement processes to ensure that messages reflect real needs and perceptions, tailored to different target groups (Morss et al., 2016; Vaughan et al., 2016).

- Transparency and directness convey respect to the intelligence of audiences and safeguard trust in public information providers. Honestly acknowledging what is "unknown" during a HILP event is more effective than providing misleading information or assuming certainty.
- Communication during uncertainty should account for changing risks, including shifting probabilities, context, and the adaptive behaviour of complex systems (Sornette, 2009; Taleb, 2013; Higaki et al., 2021).
- Awareness-raising must challenge the "it couldn't happen here" mentality through situationally relevant messaging accompanied by practical preparedness actions.
- Multilingual communication is a structural vulnerability that, if unaddressed, causes disorientation and undermines public safety, particularly in emergency situations where clear and accurate information is crucial for effective response and recovery.
- Plans should clearly separate internal communication, which supports decision-making and operations, from external or public communication, which aims to build preparedness, foster trust, guide behaviour and ensure safety.
- Communication strategies should help societies understand, be aware and prepare for HILP risks, providing clear actionable information without being overly alarming, while balancing uncertainty and clear calls to action (Slovic, 2000).

Recommended Planning Actions

- Differentiate communication strategies for the public (which require tailoring messages to different target groups and action-oriented alerts and guidance), and for professionals (which need structured interagency coordination and resource mobilization support).
- Develop separate communication protocols and templates for internal and external communication to keep messages consistent and clear.
- Messaging should be designed in collaboration with operators of critical systems, local communities, and marginalized groups to ensure cultural relevance and accessibility.
- Apply co-creation approaches by involving communities in testing and validating communication strategies.
- Protocols must be established to manage information oversupply and counter disinformation, ensuring that accurate data is rapidly disseminated during crises and disinformation is quickly corrected.
- Enhance communication skills by understanding procedures and chains of command while practicing the assessment of information under conditions of limited communication.
- Providing training on communicating uncertainty and evolving risk scenarios effectively.
- To enable structural multilingualism, emergency alerting must be capable of reaching diverse language groups and tourists across both digital and analogue pathways (e.g., megaphones or loudspeaker vehicles).
- To maintain public trust when official services, internet and electricity falter, planning should systematically involve non-digital channels, neighbourhood networks and community leaders. These networks serve as vital fallback channels to support vulnerable groups and manage the spread of misinformation during "situational blindness" caused by ICT failure.

A detailed review of risk communication best practices, failures, gaps and lessons learned from past HILP events, as well as detailed guidelines for HILP risk communication are provided in D5.3 *Guidelines on current risk communication for HILP*.



Figure 1. HILP Evidence Based Planning and a Toolbox.

4. HILP Evidence Based Planning Toolbox

The Toolbox is designed as the planning uptake layer of the AGILE project. Its purpose is not to duplicate the AGILE stress-testing methodologies and toolkits developed under WP3 and implemented under WP4, but to help users interpret, organise, and apply the evidence generated through those activities in practical planning, preparedness, governance, communication, and learning processes.

Within this overall architecture, the role of the Toolbox is different. It supports the use of evidence generated through AGILE for planning purposes. The first implementation cycle of STT1 already demonstrates that stress tests can reveal recurring cross-hazard vulnerabilities and common points of failure, particularly around electricity, fuel, ICT, communications, transport, water, healthcare, logistics, governance, staffing, and public communication. It also provides cross-case recommendations oriented toward continuity standards, protected resource chains, redundant communications, analogue fallback procedures, flexible governance arrangements, support for vulnerable populations, and

regular joint exercises and audits. The Toolbox is therefore conceived as the place where such findings are translated into planning action.

The Toolbox is intended to help planners, emergency managers, civil protection authorities, infrastructure operators, communication teams, and other relevant actors answer practical follow-up questions such as: What do these findings imply for our plans? Which functions must continue under degraded conditions? Which governance arrangements need to change? What should be communicated differently? What capabilities need to be strengthened? And how should these lessons be tracked and reviewed over time? In this sense, the Toolbox complements AGILE generated evidence translating them in precise instructions for end users. The stress-testing materials for example generate and structure evidence while the WP5 Toolbox helps decision-makers use that evidence to strengthen preparedness and resilience.

The Toolbox, therefore, focuses on five practical functions.

1. It supports the translation of stress-test findings and other evidence into planning implications.
2. It helps identify and prioritise continuity needs, common vulnerabilities, and critical actions.
3. It supports the uptake of findings into governance, decision-making, and emergency-mode coordination arrangements.
4. It helps users convert evidence into risk communication, analogue fallback, and support for vulnerable groups.
5. It provides a structured way to capture training needs, lessons learned, and follow-through actions so that evidence is embedded in organisational practice rather than remaining an isolated output from an exercise or workshop.

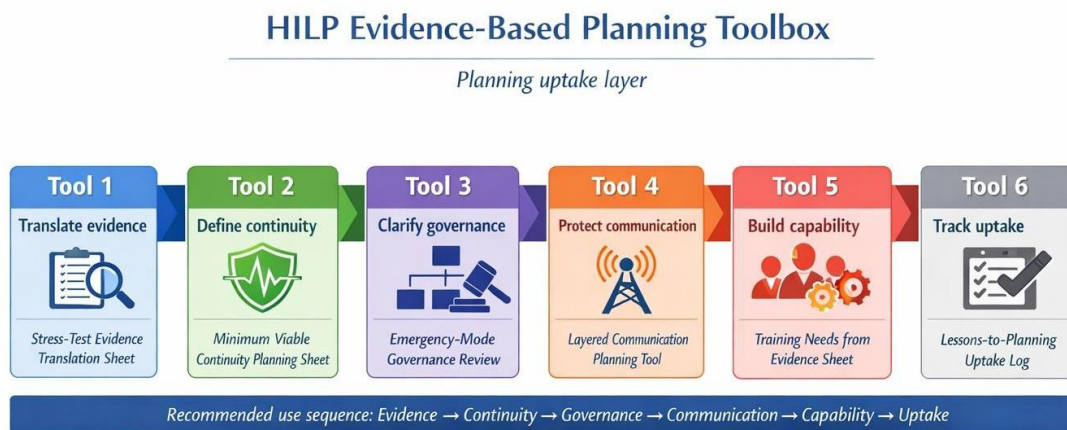


Figure 2.HILP Evidence Based Planning Toolbox.

To ensure consistency across the Toolbox, all tools are grounded in a shared evidence-use logic. Each tool is intended to make explicit:

- a. what evidence is being used,
- b. how strong that evidence is
- c. what the current capacity is
- d. what planning implication follows
- e. what action is required
- f. who should act
- g. and when the issue should be reviewed again.

This reflects the broader evidence-governance logic of the Guideline and addresses one of the main practical challenges identified across AGILE stress-testing activities: evidence does not automatically become planning change unless it is translated into an actionable format that organizations can use.

In summary, the Toolbox should be understood as the mechanism through which AGILE's generated evidence through stress-testing, historical HILP lessons, expert judgement, and operational learning are converted into planning decisions and preparedness improvements. It is therefore not a second stress-testing toolkit but a practical bridge between AGILE's evidence base and the day-to-day work of resilience planning.

4.1. Common Evidence and Rating Logic

The Toolbox uses a shared evidence and rating logic to ensure that findings from different sources can be interpreted, compared, prioritised, and used consistently across planning contexts. This common logic is necessary because the Toolbox is designed to draw on multiple forms of evidence, including AGILE stress-test outputs, historical HILP cases, expert judgement, operational lessons, and other validated planning inputs, and to turn them into practical planning implications rather than leave them as isolated observations.

Across AGILE stress-testing activities for example, evidence has emerged in different forms and at different levels of detail. Tier 1 identifies common points of failure, cascading effects, and shared vulnerabilities across severe disruption scenarios. Tier 2 produces participatory outputs such as interdependency maps, interdependency matrices, and decision tables. Tier 3 develops a structured quantitative modelling framework for exploring disruption pathways, service losses, accessibility constraints, and consequences for exposed populations. Because these outputs differ in format and analytical depth, a shared logic is needed so that they can be used coherently in preparedness and resilience planning.

The need for such a translation layer is reinforced by implementation experience. The first cycle of AGILE stress-test implementation showed that stress tests can identify recurring cross-hazard vulnerabilities and produce useful recommendations, but those outputs do not automatically become planning changes unless they are captured, structured, and assigned follow-up actions. Feedback from AGILE stress-testing activities also shows that time pressure, fatigue, language issues, group composition, and task complexity can affect the clarity and usability of outputs, which makes a consistent planning-use logic even more important.

For this reason, every tool in the Toolbox will answer the same basic questions:

- What evidence is being used?
- How strong is it?
- What remains uncertain?
- What planning implication follows?
- What action is required?
- Who owns that action?
- And when should the issue be reviewed again?

This shared structure ensures that the Toolbox remains practical, transparent, and comparable across users, sectors, and planning situations.

4.2. Core principles

Evidence traceability

Each planning judgement made through the Toolbox is linked to an identifiable source of evidence. The current Guideline already establishes that evidence claims used in the planning process should be tagged by evidence type and confidence level, while uncertainty should be made explicit alongside those attributes. This principle is especially important in HILP planning, where historical precursors may be limited, impacts may arise through indirect and cascading effects, and exact forecasting may be impossible.

Planning relevance

The purpose of the Toolbox is not to restate what a stress test found, but to determine what that finding implies for planning. In WP5, stress-testing outputs are intended to support Evidence-Based Planning, capacity building, and risk communication. The first implementation cycle of STT1 already produced cross-case recommendations oriented toward continuity standards, protected resource chains, redundant communications, analogue fallback procedures, flexible governance arrangements, and regular joint exercises and audits. The Toolbox therefore converts evidence into planning-relevant outputs such as actions, priorities, role clarifications, communication implications, and review triggers.

Simplicity and consistency

The common logic remains simple enough to be applied across different organisations, sectors, and governance levels. The 0–3 rating model proposed for benchmarking operational capacity, organisational resilience, and disaster risk reduction gaps is explicitly designed as a simple, replicable, and adaptable scale for contexts where more complex systems may be difficult to apply. At the same time, implementation feedback from AGILE stress-testing shows that overly complex tasks and unclear terminology can reduce usability, particularly in participatory settings.

4.3. Evidence used across the Toolkit

The Toolbox distinguishes between different evidence sources so that planners can understand what kind of knowledge is informing their judgement. The following categories are recommended for consistent use across all tools. The recommended evidence categories are summarised in Table 2.

Table 2. Evidence categories used across the AGILE Toolbox

Evidence category	Description	Typical AGILE relevance
Historical HILP case	Evidence drawn from past HILP events and reference cases	Supports analogy, pattern recognition, and reduction of bias against unlikely scenarios
Operational lesson	Findings from previous incidents, exercises, debriefs, or implementation reports	Useful when a local or sector-specific lesson already exists
Expert judgement	Structured or informal judgement from subject-matter experts, facilitators, infrastructure operators, or planners	Particularly relevant where data are limited or infrastructure information is sensitive

Evidence category	Description	Typical AGILE relevance
Plan or policy review	Evidence drawn from existing plans, procedures, legal arrangements, or governance frameworks	Useful for identifying where evidence is or is not embedded in current planning arrangements
Quantitative or model-based result	Numerical or model-derived output, including service-disruption scenarios, accessibility effects, or risk estimates	Most relevant for Tier 3 or other structured quantitative analysis

These categories do not need to be treated as mutually exclusive. A single planning judgement may rely on more than one category at the same time, for example, a stress-test finding interpreted together with a historical HILP case and expert judgement.

The Toolbox uses a simple shared rating scale answering the questions:

- How strong is the current arrangement?
- How mature is the capacity or resilience measure?

The most suitable basis is the 0–3 model proposed by Pescaroli et al. (2020) for benchmarking operational capacity, organisational resilience, and disaster risk reduction capacity, with an additional “Don’t know” option. The article explicitly introduces this model as a simple-to-use, replicable, and adaptable response framework intended for contexts where more complex scales may be unsuitable.

The recommended Toolbox evidence rating scale is presented in Table 3.

Table 3. Recommended 0-3 Toolbox evidence rating scale.

Rating	Label	Meaning for the Toolbox
0	Critical / absent	No meaningful capacity or arrangement is in place, or the issue represents a critical gap.
1	Basic / limited	Some initial capacity exists, but it is fragmented, underdeveloped, or inconsistently applied.
2	Developing / defined	Capacity exists and is partly structured, but important inconsistencies, limitations, or update needs remain.
3	Established / integrated	Capacity is comprehensive, consistently applied, regularly reviewed, and improving.
Don’t know	Unknown	There is not enough information to make a justified rating.

This rating should always be accompanied by a short qualitative explanation. The article referred to in the previous paragraph stresses that qualitative category labels are needed alongside numerical values so that users do not over-interpret numbers detached from meaning.

To maintain consistency, each tool that includes an assessment or judgement includes the following fields shown in Table 4.

Table 4. Standard evidence assessment fields used across the AGILE Toolbox

Field	Purpose
Issue / finding	What is being assessed or interpreted?
Evidence source	Where does the information come from?
Evidence category	Stress-test finding, historical case, expert judgement, operational lesson, etc.
Current rating	0–3 or Don't know
Desired target state	What should the desired planning condition look like?
Planning implication	What does this mean for plans, governance, communication, or capacity?
Action required	What should be done next?
Owner	Who should act?
Review trigger / date	When should the issue be revisited?

This structure is consistent with the evidence-governance logic of the Guideline, the benchmarking logic proposed by Pescaroli et al. (2020), and the practical need identified in AGILE implementation to turn findings into clear organisational learning and follow-up action.

4.4. Tool 1. Translate Evidence

The need for this tool is supported with the findings from STT1, which showed recurring cross-hazard vulnerabilities and common points of failure, especially around electricity, fuel, ICT, communications, transport, water, healthcare, logistics, governance, staffing, and public communication. The same evaluation also produced cross-case recommendations oriented toward continuity standards, protected resource chains, redundant communications, analogue fallback procedures, flexible governance arrangements, support for vulnerable populations, and regular joint exercises and audits. A structured translation tool is therefore needed so that these findings, that can come not only through stress testing, can be used in planning rather than remaining as isolated stress-test outputs.

Evidence Translation Sheet is designed to help users convert AGILE evidence collected through stress-test outputs or other forms (historical events, near misses, simulation exercises, expert judgement, research etc) into practical planning implications. Its role is to capture what the evidence means for preparedness, continuity, governance, communication, and learning.

The pillars supported by the Evidence Translation Sheet are summarised in Table 5.

Table 5. Linked pillars supported by the Evidence Translation Sheet

Primary Pillar	Secondary Pillars
Pillar 1: Evidence Governance	Pillar 2: Multi-level Governance and Decision-Making
	Pillar 3: HILP-Specific Planning Approach
	Pillar 5: Capacity Building and Adaptive Readiness
	Pillar 6: Risk Communication for Planning

This tool mainly supports Evidence Governance because it captures what evidence is being used, how strong that evidence is, what uncertainty remains, and what planning implication follows.

Use this tool:

- After an AGILE stress test to convert findings into planning implications;
- After reviewing a stress-test report, debrief, interdependency map, decision table, or modelling result;
- When comparing findings across case studies or scenarios to identify repeated vulnerabilities and planning priorities;
- When preparing revisions to plans, SOPs, continuity arrangements, governance structures, communication strategies, training programmes, or review cycles, it is important to base these changes on stress-test evidence.

This tool is especially useful when evidence is spread across multiple sources or where workshop findings need to be converted into a format that planners, managers, and decision-makers can act on.

This tool can be used by:

- Emergency planners;
- Civil protection authorities;
- Infrastructure operators;
- Municipal and regional preparedness teams;
- Policy and governance staff;
- Communication teams;
- Training and exercise leads;
- Case study hosts and reviewers using AGILE outputs for follow-up planning.

This user range is consistent with AGILE's intended audience for evidence-based planning and with the actors repeatedly involved in the stress-testing process, including public authorities, infrastructure operators, responders, coordination bodies, and other stakeholders relevant to critical functions and essential services.

Inputs to the tool:

The tool can be used with one or more of the following inputs:

- STT1 findings, including shared vulnerabilities, common points of failure, and practical implications;

- STT2 outputs such as interdependency maps, interdependency matrices, and decision tables;
- STT3 outputs such as explicit disruption pathways, scenario-based modelling results, service disruption, accessibility constraints, and consequences for exposed populations;
- Exercise debrief reports, implementation feedback, and operational lessons from case studies;
- Historical HILP case material or validated expert judgement should be used when it is directly relevant to the planning issue.

Tool worksheet is presented in Table 6.

Table 6. Evidence Translation Sheet worksheet

Field	Guiding question	Response
Evidence source	What document, workshop output, report, or finding is being used?	
Evidence category	Is this a stress-test finding, historical HILP case, expert judgement, operational lesson, plan review, or model-based result?	
Finding / observed issue	What did the stress test or evidence identify?	
Affected function or service	Which critical function, service, or operational area is affected?	
Affected actors / organisations	Who is directly affected?	
Cross-hazard relevance	Does this issue appear across multiple scenarios or hazards?	
Planning implication	What does this mean for planning?	
Required planning action	What should be changed, clarified, added, tested, or reviewed?	
Owner	Who should act on this?	
Time horizon	Is the issue relevant for preparedness, early response, early recovery, or all three?	
Current rating	0 / 1 / 2 / 3 / Don't know	
Desired target state	What should acceptable planning look like?	
Review trigger / date	When should the issue be revisited?	

Use one or more of the following prompts when completing the table. These questions are designed to assist the debate that will be instigated by the process of filling in the table. As such a formal answer is not required.

- 1. What exactly did the evidence gathered through different forms (stress testing, simulations, real examples etc.) show?**

This prompt helps avoid vague statements and encourages use of explicit findings. STT1 and STT2 materials for example both show that workshop outputs vary in quality and clarity, so the translation stage should be precise about what is actually being taken forward.

2. What is the planning problem behind this finding?

For example: unclear authority, weak continuity arrangement, missing fallback communication, or untested dependency. AGILE case-study findings show that many identified issues are not single technical failures, but cross-cutting planning weaknesses.

3. What must be preserved or improved?

This aligns with the resilience-oriented, consequence-focused approach of AGILE, where the key concern is maintaining critical functions and reducing system degradation under severe stress rather than only describing triggers.

4. What should change in plans, procedures, roles, communication, or training?

This is the central planning-uptake question for WP5.

5. What remains uncertain?

This ensures that planning does not overstate what the evidence proves, which is especially important under HILP conditions.

Suggested Use Process



Figure 3. Tool 1. Suggested Use Process for Translating Evidence.

Step 1 - Select the evidence item

Choose one concrete finding from a stress-test output, report, debrief, model result, or implementation lesson. Examples include a shared vulnerability, a critical interdependency, a governance bottleneck, or a communication failure. AGILE implementation materials show that these kinds of findings are produced at different tiers and in different formats, so the first step is to isolate the one you want to translate into planning action.

Step 2 - Describe the finding in plain language

Write the finding as clearly as possible without interpretation. This is important because STT2 feedback for example shows that ambiguity around wording and concepts can reduce usability and comparability.

Step 3 - Identify what the finding means for planning

State what the issue implies for continuity, governance, communication, training, or review. STT1 evaluation shows that the same types of weaknesses recur across hazards, which means the planning implication often has value beyond one scenario.

Step 4 - Assign an action and an owner

This ensures the evidence does not remain descriptive only. D4.2 repeatedly translates stress-test findings into recommendations for continuity standards, communication fallback, resource-chain protection, and governance improvements.

Step 5 - Record confidence, uncertainty, and rating

This ensures transparent planning under uncertainty and keeps all tools aligned with the common evidence and rating logic.

Step 6 - Set a review trigger

This is essential because AGILE materials repeatedly emphasise iterative learning, follow-up, and organisational uptake.

An example of the completed Evidence Translation Sheet for a shared electricity dependency is presented in Table 7.

Table 7. Example A. Evidence Translation Sheet completed for electricity as a shared dependency

Field	Example entry
Evidence source	STT1 cross-case findings
Evidence category	Stress-test finding
Finding / observed issue	Electricity is a foundational dependency whose failure quickly degrades communications, water, healthcare, transport, fuel access, and coordination
Affected function or service	Lifeline continuity / emergency operations
Affected actors / organisations	Utilities, hospitals, emergency services, communications providers, municipal coordination actors
Cross-hazard relevance	Yes — repeated across multiple AGILE case studies
Planning implication	Current plans should not assume electricity remains available or that backup systems will automatically function
Required planning action	Define minimum viable continuity arrangements for first 12–72 hours, including backup power, fuel access, manual procedures, and load-shedding priorities
Owner	Civil protection lead + utility coordination lead + healthcare continuity lead
Time horizon	Preparedness / early response
Current rating	1
Desired target state	Minimum continuity standards agreed, fuel and backup arrangements tested, manual workarounds documented
Review trigger / date	After next continuity exercise or annual plan review

This example is directly supported by the cross-case STT1 findings, which state that electricity is the most fundamental shared dependency and that its loss cascades into multiple essential systems. The same report also recommends building a “minimum viable continuity” model for lifeline systems and deciding in advance which services must continue, at what level, and with what power, fuel, staffing, and manual procedures.

A second example of the completed Evidence Translation Sheet for public communication and analogue fallback is presented in Table 8.

Table 8. Example B. Evidence Translation Sheet completed for public communication and analogue fallback

Field	Example entry
Evidence source	STT1 cross-case findings
Evidence category	Stress-test finding + operational lesson
Finding / observed issue	Public information can fail when digital channels are unavailable, inconsistent, or delayed; analogue fallback and multilingual communication may be insufficient
Affected function or service	Public warning / crisis communication
Affected actors / organisations	Communication teams, emergency coordination bodies, municipal authorities, community intermediaries
Cross-hazard relevance	Yes
Planning implication	Communication planning should not assume digital systems remain available or that one language will reach all users
Required planning action	Develop layered communication plans, including radio, loudspeaker, print, physical information points, and multilingual messaging; define when channels switch
Owner	Public communication lead / civil protection communication cell
Time horizon	Preparedness / early response
Current rating	1
Desired target state	Layered and tested communication architecture with clear fallback triggers and multilingual materials
Review trigger / date	After public information exercise or annual communication plan review

This example is supported by the cross-case STT1 findings, which identify communication, misinformation, trust failure, and analogue fallback as recurring issues.

After completing this worksheet, users should have a:

1. Clearly documented evidence item;
2. Transparent statement of confidence and uncertainty;
3. Explicit planning implication;
4. Defined action and owner;
5. Rating and desired target state;
6. Review trigger.

This is the minimum translation needed to ensure that stress-test outputs can be absorbed into planning and preparedness processes rather than remaining as stand-alone findings. That is exactly the gap this Toolbox is intended to fill.

4.5. Tool 2. Define continuity

The rationale for this tool is also strongly supported by AGILE stress-test findings. The first implementation cycle of STT1 identifies continuity of electricity, fuel, communications, transport, water, healthcare, logistics, governance, staffing, and public communication as recurring cross-case weaknesses, and its cross-case recommendations explicitly call for building a “minimum viable continuity” model for lifeline systems for the first 12–72 hours of disruption. This includes deciding in advance which services must continue, what reduced level of service is acceptable, and what power, fuel, staffing, and manual procedures are needed to maintain them.

This need is also supported by earlier resilience literature used in the Guideline development. The chapter on emergency facilities and infrastructure emphasises that emergency functions, command structures, personnel, plans, equipment, and organisational arrangements are all essential parts of operational continuity, and that disruption often arises through cascading effects and multiple infrastructure failures rather than through direct hazard impact alone. The same source provides self-assessment questions on extended energy, transport, and telecommunications failure, backup arrangements, and the need for short-, medium-, and long-term “Plan B” measures.

Tool 2. Define Continuity is designed to help organisations define, in advance, the minimum level of service that must be maintained under severe disruption, the conditions under which that minimum level can still be delivered, and the practical arrangements needed to sustain it. It is intended to support continuity-oriented planning for HILP conditions, especially where multiple disruptions, resource shortages, and cascading failures may occur at the same time.

The pillars supported by Tool 2: Define Continuity are summarised in Table 9.

Table 9. Linked pillars supported by Tool 2: Define Continuity

Primary Pillar	Secondary Pillars
Pillar 3: HILP-Specific Planning Approach	Pillar 1: Evidence Governance
	Pillar 2: Multi-level Governance and Decision-Making
	Pillar 4: Planning Tools Under Data Scarcity
	Pillar 5: Capacity Building and Adaptive Readiness
	Pillar 6: Risk Communication for Planning

This tool primarily supports HILP-Specific Planning because it shifts planning from broad generic resilience language to a practical question:

What must still work, at what minimum level, and for how long, when the system is under severe stress?

It also supports Evidence Governance because the continuity threshold should be based on evidence and explicitly note confidence and uncertainty, and it supports governance in general because continuity depends on clear authority, ownership, prioritisation, and resource allocation.

Use this tool:

- **During continuity-plan review**, especially where existing plans are too generic and do not define what reduced service is acceptable;
- **After incidents or lessons-learned processes** where disruption to essential functions exposed uncertainty about priorities, fallback procedures, or service thresholds;
- **Before exercises or audits** to clarify what continuity assumptions should be tested;
- **When preparing governance or resource-allocation protocols** for early response and early recovery under severe HILP conditions.
- **After a stress test or a simulation exercise** when shared vulnerabilities or continuity gaps have been identified and need to be converted into service-level standards;

This tool is particularly useful where planners need to move from statements such as “we must keep hospitals running” toward operationally meaningful definitions such as “the emergency department must remain functional for 48 hours under blackout conditions, using backup power and analogue admission procedures.” The STT1 evaluation gives this kind of service-level continuity logic as a core recommendation.

This tool can be used by:

- Continuity managers;
- Civil protection and emergency planning teams;
- Infrastructure operators;
- Health and social care services;
- Utilities and transport planners;
- Municipal or regional resilience officers;
- Crisis coordination bodies;
- Communication and public-care planners involved in continuity of essential services.

This user profile reflects the sectors and actors repeatedly identified as central to lifeline continuity in AGILE STT1 cross-case findings and in the earlier emergency facilities resilience literature. Those sources repeatedly identify utilities, responders, hospitals, transport actors, communication systems, local authorities, and governance bodies as interdependent actors whose continuity arrangements need to be clarified in advance.

The tool can be informed by one or more of the following:

- Existing continuity plans, emergency plans, SOPs, and service standards;
- Local operational lessons or previous disruptions;
- Expert judgement from operators, planners, and critical-function owners where formal data are limited.
- STT1 findings about common points of failure and shared vulnerabilities;
- STT2 outputs that show physical or organisational dependencies affecting service continuity;
- STT3 outputs on disruption pathways, service disruption, or accessibility constraints;

The Tool 2 worksheet is presented in Table 10.

Table 10. Tool 2: Define Continuity worksheet

Field	Guiding question	Response
Critical function or service	What must continue under severe stress?	
Why it matters	Why is this function essential? What happens if it stops?	
Minimum acceptable level	What is the lowest acceptable level of operation?	
Continuity period	For how long must this minimum level be maintained? (e.g. 12h / 24h / 72h / beyond)	
Time phase	Is this requirement mainly for preparedness, early response, early recovery, or all phases?	
Key enabling dependencies	What must remain available for this function to continue? (power, fuel, staffing, ICT, water, access, suppliers, etc.)	
Main continuity threats	What does the evidence say could interrupt this function?	
Fallback arrangements	What manual, analogue, backup, substitute, or “Plan B” measures exist?	
Decision triggers	At what point should fallback or reduced-service mode be activated?	
Responsible owner	Who decides and who manages continuity for this function?	
Supporting actors	Which other organisations or units are needed?	
Evidence source	What evidence supports this continuity definition?	
Current rating	0 / 1 / 2 / 3 / Don’t know	
Desired target state	What should acceptable continuity look like?	
Action required	What should be added, clarified, tested, resourced, or revised?	
Review trigger / date	When should this continuity arrangement be revisited or exercised?	

This structure applies the common evidence and rating logic of the Toolbox to continuity planning, ensuring that minimum service definitions remain evidence-linked, transparent, and reviewable.

Use one or more of the following prompts when completing the table. These questions are designed to assist the debate that will be instigated by the process of filling in the table. As such a formal answer to these questions is not required as they have only a supporting role.

1. If everything does not function normally, what absolutely must still work?

This reflects the stress-test focus on critical functions rather than routine full-capacity operation. AGILE stress tests results inform that severe events require prioritisation of minimum service levels, not assumptions of normal continuity.

2. What is the minimum acceptable service level, not the ideal service level?

The purpose of the tool is to define a viable minimum, not a full restoration target. This distinction is central to the “minimum viable continuity” concept recommended in the STT1 cross-case findings.

3. What assumptions are we making about power, fuel, staffing, ICT, access, and information?

Earlier literature and AGILE findings both show that these enabling dependencies are often where continuity breaks down.

4. What is the fallback if the normal system fails?

This includes analogue workarounds, substitute routes, temporary facilities, manual procedures, mobile generators, radio communications, or other “Plan B” arrangements. Earlier resilience literature explicitly asks whether there is short-, medium-, and long-term Plan B arrangements for extended energy, transport, and telecommunications failure.

5. What is the trigger to switch into continuity mode?

This prompt is important because several AGILE findings show that lack of clear authority and delay in decision-making weaken continuity.

Minimum Viable Continuity Planning – Suggested Use Process

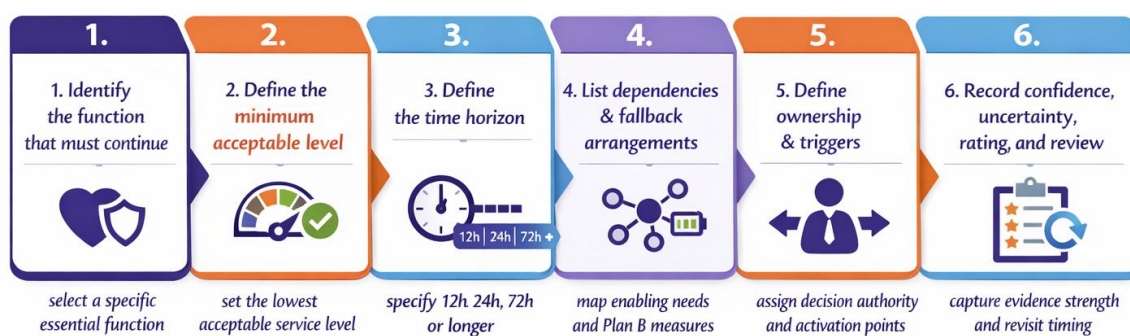


Figure 4. Tool 2. Minimum Viable Continuity Planning – Suggested Use Process.

Step 1 - Identify the function that must continue

Start with a specific essential function, not a general aspiration. Examples include “emergency department remains operational,” “public warning messages continue,” “water supply for shelters is maintained,” or “fuel distribution to critical facilities continues.” AGILE STT1 findings repeatedly show that broad systemic weaknesses need to be translated into concrete continuity functions.

Step 2 - Define the minimum acceptable level

Describe the lowest acceptable functioning level that still protects lives, safety, coordination, or essential welfare. This should be measurable or observable where possible. The STT1 evaluation explicitly recommends deciding what reduced level of service is acceptable and for how long.

Step 3 - Define the time horizon

Specify whether the continuity requirement is needed for the first 12 hours, 24 hours, 72 hours, or longer. The evidence base repeatedly points to the importance of planning for the first hours and days, not only for ideal recovery.

Step 4 - List dependencies and fallback arrangements

Identify what must still be available, and what the fallback is if it is not. Earlier emergency facilities guidance and AGILE case findings both show that continuity is usually constrained by combinations of power, fuel, ICT, transport, staffing, and communications rather than by one isolated failure.

Step 5 - Define ownership and triggers

Specify who decides when the system moves into reduced-service mode, and who owns continuity delivery. AGILE findings repeatedly point to governance fragmentation, unclear authority, and weak escalation rules as practical barriers to maintaining continuity.

Step 6 - Record confidence, uncertainty, rating, and review

Use the common evidence and rating logic so that continuity plans can be tracked and improved over time.

An example of the completed Tool 2 worksheet for emergency department continuity under blackout conditions is presented in Table 11.

Table 11. Example A. Tool 2 worksheet completed for emergency department continuity under blackout conditions

Field	Example entry
Critical function or service	Emergency department remains operational
Why it matters	Required to stabilise acute patients and coordinate emergency medical care
Minimum acceptable level	Triage, life-saving treatment, emergency communication, and patient transfer remain functional
Continuity period	First 48 hours
Time phase	Early response
Key enabling dependencies	Electricity, fuel, water, staffing, ambulance access, emergency communications, analogue records
Main continuity threats	Prolonged blackout, fuel shortages, transport access disruption, degraded clinical IT
Fallback arrangements	Backup generator, protected fuel delivery, analogue admissions and triage, transfer protocol to alternate hospital
Decision triggers	Generator endurance below threshold; fuel unavailable within defined window; water service disrupted; ambulance access blocked
Responsible owner	Hospital continuity lead + emergency operations manager
Supporting actors	Fuel supplier, utilities, transport coordinator, ambulance service, civil protection
Evidence source	STT1 cross-case recommendations.
Current rating	1
Desired target state	Minimum care delivery and transfer procedures defined, fuel protected, analogue fallback rehearsed
Action required	Define thresholds, secure fuel, test analogue procedures, rehearse transfer to alternate facility
Review trigger / date	After blackout exercise or annual hospital continuity review

This example is also supported by STT1 practical implications, which recommend agreeing in advance how hospital functions would continue or when patients would be transferred if reliable fuel or power cannot be assured, and by the cross-case recommendation to define minimum viable continuity for lifeline systems.

A second example of the completed Tool 2 worksheet for public warning continuity when digital systems fail is presented in Table 12.

Table 12. Example B. Tool 2 worksheet completed for public warning continuity when digital systems fail

Field	Example entry
Critical function or service	Public warning and protective action guidance continues
Why it matters	Needed to reduce panic, support compliance, and protect life and order
Minimum acceptable level	Basic warning messages reach affected populations through at least two independent channels
Continuity period	First 72 hours
Time phase	Early response / early recovery
Key enabling dependencies	Communication channels, multilingual templates, staffing, credible information source, power or battery backup
Main continuity threats	Mobile and internet failure, overloaded networks, contradictory messaging, loss of public trust
Fallback arrangements	Radio, loudspeaker vehicles, printed notices, physical information points, community intermediaries, pre-written multilingual scripts
Decision triggers	Major ICT outage; mobile warning failure; uncertain coverage; official channels unavailable
Responsible owner	Crisis communication lead / municipal civil protection communication cell
Supporting actors	Broadcasters, police, municipalities, community organisations, interpreters
Evidence source	STT1 cross-case recommendations on layered communication and analogue fallback
Current rating	1
Desired target state	Layered public-warning model defined, roles assigned, analogue channels and multilingual content tested
Action required	Create fallback communication matrix, define switch triggers, exercise public information protocols
Review trigger / date	After communication exercise or annual crisis communication review

This example is directly supported by the cross-case STT1 recommendations, which call for layered communications architecture, analogue fallback procedures, and support for vulnerable and multilingual audiences.

After completing this sheet, users should have:

1. A clear definition of which function or service must continue;
2. An agreed minimum acceptable level of continuity;
3. A defined time horizon;

4. A list of enabling dependencies and continuity threats;
5. Documented fallback and “Plan B” arrangements;
6. Clear ownership and activation triggers;
7. An evidence-linked rating, target state, and review point.

This is the minimum practical structure needed to make continuity planning actionable under HILP conditions. It also creates a usable bridge between stress-test findings and continuity management, which is one of the core purposes of the WP5 Toolbox.

4.6. Tool 3. Clarify governance

This tool is designed to help organisations assess whether their governance arrangements can shift quickly and coherently from routine management into a simplified emergency mode under HILP conditions. Its purpose is to identify whether authority, escalation, prioritisation, coordination, and funding responsibilities are sufficiently clear to support action when multiple systems are under stress and normal decision routes are too slow or fragmented.

This need is strongly supported by AGILE evidence. The STT1 first-cycle evaluation found recurring governance weaknesses across the case studies, including fragmented competences, unclear authority, weak inter-agency coordination, degraded situational awareness, slow decision-making, non-aligned plans, and limited preparedness follow-through. Those findings lead to recommendations such as redesigning governance for “emergency mode,” which includes shorter decision chains, pre-assigned authority to prioritise scarce resources, and clearer rules for “who does what” and “who pays” before a crisis occurs.

This tool also aligns with the broader resilience literature used for Guideline development. The literature emphasises that operational continuity depends not only on facilities and equipment but also on organisational arrangements, command structures, planning, and cross-sector communication. It recommends integrating cascading effects into contingency planning and strengthening organisational resilience through training, awareness, and communication.

The pillars supported by Tool 3: Clarify Governance are summarised in Table 13.

Table 13. Linked pillars supported by Tool 3: Clarify Governance

Primary Pillar	Secondary Pillars
Pillar 2: Multi-level Governance and Decision-Making	Pillar 1: Evidence Governance
	Pillar 3: HILP-Specific Planning Approach
	Pillar 5: Capacity Building and Adaptive Readiness
	Pillar 6: Risk Communication for Planning

This tool primarily supports multi-level governance and decision-making because it focuses on authority, decision rights, escalation, coordination, and prioritisation under severe disruption. It also supports evidence governance by linking governance judgements to stress-test findings and other evidence, and it supports capacity building

because governance arrangements often need to be clarified, trained, and exercised rather than simply written down.

Use this tool:

- **After a stress test** when governance fragmentation, coordination failure, or escalation issues were identified;
- **During plan review** when emergency decision routes, authority, or coordination roles need clarification;
- **Before exercises or audits** to define what emergency-mode governance should look like and what should be tested;
- **After incidents or debriefs** where delays, conflicting responsibilities, unclear funding, or weak prioritisation affected continuity or response;
- **When updating coordination arrangements across sectors or levels of government** for severe HILP conditions.

This tool is particularly useful where organisations already have plans, but those plans do not make clear how governance should operate when routine structures become too slow, too fragmented, or too dependent on normal ICT, staffing, or institutional conditions.

This tool can be used by:

- Civil protection authorities;
- Emergency planners;
- Municipal and regional crisis-coordination teams;
- Infrastructure and utility governance leads;
- Policy and governance units;
- Continuity managers;
- Multi-agency coordination bodies;
- Case study hosts or review teams using AGILE outputs for governance follow-up.

This reflects the actors repeatedly identified in AGILE case studies and tiered methodologies as central to decision-making, coordination, and continuity under HILP conditions.

The tool can be informed by one or more of the following:

- Existing emergency plans, SOPs, legal frameworks, crisis-management protocols, and continuity plans;
- Operational lessons from incidents, exercises, and debriefs;
- Expert judgement from crisis coordinators, responders, planners, and governance actors.
- STT1 findings on governance fragmentation, weak preparedness culture, situational-awareness degradation, or communication failure;
- STT2 decision tables and implementation feedback on how decision priorities, responsibility, and coordination were handled;

The Tool 3 worksheet is presented in Table 14.

Table 14. Tool 3: Clarify Governance worksheet

Field	Guiding question	Response
Governance function under review	What governance issue is being assessed? (e.g. escalation, authority, prioritisation, funding, coordination, situational awareness)	
Why this matters	Why is this governance function essential under HILP conditions?	
Current routine arrangement	How does this work under normal conditions?	
Required emergency-mode arrangement	How should this function work under severe disruption?	
Trigger for emergency mode	What condition should activate the emergency arrangement?	
Decision authority	Who has the authority to decide in emergency mode?	
Operational owner	Who is responsible for implementation or coordination?	
Supporting actors	Which actors, organisations, or sectors must be involved?	
Priority-setting rule	How will scarce resources, routes, services, or decisions be prioritised?	
Funding / payment rule	Who pays, approves, or releases resources when routine procedures fail?	
Fallback if ICT or communications fail	How will governance continue if dashboards, phones, or digital systems are down?	
Main evidence source	What evidence supports this review?	
Evidence category	Stress-test finding / operational lesson / policy review / expert judgement / model result	
Current rating	0 / 1 / 2 / 3 / Don't know	
Priority	High / Medium / Low or Immediate / Near-term / Longer-term	
Desired target state	What should a workable emergency-mode arrangement look like?	
Action required	What must be clarified, authorised, written, trained, or exercised?	
Review trigger / date	When should this issue be revisited or exercised?	

This structure is designed to separate the state of the current arrangement from the urgency of action, while still applying the shared evidence and rating logic of the Toolbox. It also addresses the AGILE finding that governance questions usually involve more than one dimension: authority, coordination, communication, prioritisation, and resource release which often fail together rather than separately.

Use one or more of the following prompts when completing the table. These questions are designed to assist the debate that will be instigated by the process of filling in the table.

As such a formal answer to these questions is not required as they have only a supporting role.

1. If the normal way of making decisions is too slow, what should happen instead?

This prompt reflects the STT1 recommendation to redesign governance for emergency mode and shorten decision chains.

2. Who decides, who acts, and who pays when the crisis exceeds routine arrangements?

This is directly supported by the findings in STT1, which stress the importance of clarifying authority, funding, and emergency prioritisation in advance.

3. What should trigger the shift into emergency mode?

AGILE findings repeatedly show that governance delays occur when activation thresholds are unclear or when organisations stay too long in routine mode.

4. How will governance continue if ICT, dashboards, or telecoms fail?

Multiple AGILE case studies show that governance is highly dependent on digital systems and that analogue fallback is often weak.

5. Is this arrangement written, trained, and understood, or is it assumed?

STT1 findings stress that institutional memory and written follow-through matter and that assumptions can remain implicit unless structured explicitly.

Emergency-Mode Governance Review – Suggested Use Process



Figure 5. Tool 3. Emergency-Mode Governance Review – Suggested Use Process.

Step 1 - Select the governance issue

Choose one governance function or bottleneck that matters under HILP conditions. Examples include:

- Emergency activation and escalation,
- Resource prioritisation,
- Authority to reroute scarce supplies,
- Who approves emergency spending,
- Fallback governance when communications fail, or
- How cross-sector situational awareness is maintained. AGILE STT1 findings repeatedly identify these as cross-case weaknesses.

Step 2 - Describe the routine arrangement

State how this issue is normally handled. This helps make clear whether the current arrangement is dependent on conditions that may not hold under HILP stress. STT1 and STT2 feedback both suggest that participants often default to current plans or ordinary procedures, which can obscure what must change in real crisis conditions.

Step 3 - Define the emergency-mode arrangement

- Describe what should be different under severe disruption. For example:
- Fewer approval layers,
- Temporary authority transfer,
- Predefined triage rules,
- Manual information tracking, or
- A simplified coordination structure.

This step is the practical core of the review. It directly supports the cross-case recommendation to create emergency-mode governance arrangements rather than rely on routine procedures.

Step 4 - Assign authority, owner, and trigger

Specify who decides, who coordinates, and what condition should activate emergency mode. This addresses one of the strongest recurring findings in AGILE: unclear authority and fragmented governance under compound disruption.

Step 5 - Record fallback, funding, and priority rule

Governance often fails not only because authority is unclear, but because communication, funding, or prioritisation pathways are not workable under degraded conditions. STT1 findings explicitly support reviewing these dimensions together.

Step 6 - Record evidence, rating, priority, action, and review

This keeps governance planning aligned with the Toolbox's shared evidence and rating logic and ensures the result can be tracked over time.

An example of the completed Tool 3 worksheet for emergency authority for scarce fuel allocation is presented in Table 15.

Table 15. Example A. Tool 3 worksheet completed for emergency authority for scarce fuel allocation

Field	Example entry
Governance function under review	Emergency allocation of fuel to critical services
Why this matters	Fuel is needed for generators, evacuation, healthcare, communications, water systems, and logistics; shortage cascades quickly
Current routine arrangement	Fuel procurement and release follow normal commercial and administrative procedures
Required emergency-mode arrangement	Pre-authorised authority can prioritise and release fuel to designated critical functions immediately
Trigger for emergency mode	Major blackout, logistic disruption, or fuel scarcity affecting critical services
Decision authority	Regional emergency coordination lead
Operational owner	Fuel coordination cell / utility coordination lead

Field	Example entry
Supporting actors	Hospitals, telecom operators, water utility, civil protection, transport authority, police
Priority-setting rule	Fuel first to life-saving and continuity-critical functions according to predefined list
Funding / payment rule	Emergency payment release allowed outside routine digital procurement if needed
Fallback if ICT or communications fail	Paper fuel release forms, radio confirmation, physical coordination point
Main evidence source	STT1 cross-case findings and recommendations
Evidence category	Stress-test finding
Current rating	1
Priority	High
Desired target state	Fuel prioritisation rule written, authorised, trained, and exercised
Action required	Clarify authority, create manual release procedure, define fuel triage list, test through exercise
Review trigger / date	After continuity exercise or annual critical-resource review

A second example of the completed Tool 3 worksheet for governance fallback when digital coordination systems fail is presented in Table 16.

Table 16. Example B. Tool 3 worksheet completed for governance fallback when digital coordination systems fail

Field	Example entry
Governance function under review	Cross-sector coordination when dashboards and digital systems fail
Why this matters	Loss of ICT can degrade situational awareness, coordination, prioritisation, and public messaging
Current routine arrangement	Coordination depends on digital platforms, dashboards, online communications, and live data feeds
Required emergency-mode arrangement	Coordination shifts to predefined offline status boards, scheduled radio check-ins, liaison officers, and paper reporting templates
Trigger for emergency mode	Digital dashboard unavailable or telecom outage exceeds agreed threshold
Decision authority	Crisis coordination lead
Operational owner	Emergency coordination centre
Supporting actors	Sector leads, municipal authorities, responders, communication officers
Priority-setting rule	Common operational picture maintained through agreed reporting sequence and intervals
Funding / payment rule	Not primary issue in this case
Fallback if ICT or communications fail	Radio, in-person coordination point, runners, printed maps, physical info board
Main evidence source	STT1 cross-case findings
Evidence category	Stress-test finding + operational lesson
Current rating	1

Field	Example entry
Priority	High
Desired target state	Offline coordination model documented, understood, and tested
Action required	Define emergency coordination fallback package and exercise it
Review trigger / date	After next multi-agency exercise

This example is directly supported by STT1 cross-case findings on situational-awareness degradation and communication fragility, and by STT2 implementation feedback showing the practical challenges of comparing infrastructure analysis to decision priorities and the need to simplify decision mapping while preserving analytical value.

After completing this review, users should have:

1. A clearly defined governance issue relevant to HILP conditions;
2. A comparison between routine and emergency-mode arrangements;
3. A defined trigger, authority, owner, and support structure;
4. A documented fallback for degraded communications or ICT;
5. A priority-setting and, where relevant, funding rule;
6. An evidence-linked rating and action plan;
7. A review or exercise trigger.

This output is necessary because the AGILE evidence base shows that governance weaknesses are often visible in stress testing but not automatically translated into plan revisions, role clarifications, or exercised emergency procedures.

4.7. Tool 4. Protect communication

This tool is designed to help organisations plan how communication will continue when normal digital channels are degraded, overloaded, or unavailable during HILP events. Its purpose is to define, in advance, a layered communication architecture that combines digital, radio, satellite, physical, and human communication channels, together with clear rules for when to switch between them. The tool supports both internal coordination and public communication under severe disruption.

This need is strongly supported by AGILE evidence. The first implementation cycle of STT1 found recurring vulnerabilities across case studies in ICT, telecommunications, public communication, trust, misinformation, and analogue fallback, and the cross-case recommendations explicitly call for a layered communications architecture with redundant and interoperable communication channels, analogue fallback procedures, and support for vulnerable and multilingual audiences.

The same cross-case evaluation also shows that communication failures are not only technical. Delayed, contradictory, or missing official messages can erode public trust, create space for misinformation, fuel panic, increase pressure on emergency services, and weaken compliance with protective guidance. Multiple AGILE cases directly linked communication breakdowns to degraded coordination, reduced situational awareness, congestion, hoarding, panic, or public-order concerns.

The emergency facilities and infrastructure literature stresses the importance of communication and cross-sector information sharing as core features of organisational resilience, especially when multiple lifelines fail or when crises become cascading and compounded. It also emphasises the necessity of “Plan B” arrangements when normal systems are unavailable.

For these reasons, the role of this tool is not to generate findings about communication, but to translate evidence into a practical communication continuity plan that organisations can embed in preparedness and resilience planning. That fits the role of the WP5 Toolbox as the planning uptake layer of AGILE.

The pillars supported by Tool 4: Protect Communication are summarised in Table 17.

Table 17. Linked pillars supported by Tool 4. Protect Communication

Primary Pillar	Secondary Pillars
Pillar 6: Risk Communication for Planning	Pillar 1: Evidence Governance
	Pillar 2: Multi-level Governance and Decision-Making
	Pillar 3: HILP-Specific Planning Approach
	Pillar 5: Capacity Building and Adaptive Readiness

This tool primarily supports risk communication for planning because it addresses how organisations communicate under disruption, how they maintain public trust, and how they continue to coordinate when normal channels fail. It also supports governance because communication arrangements depend on clear ownership, approved triggers, and role clarity, and it supports capacity building because layered communication systems need to be practised and maintained.

Use this tool:

- **After a stress test or a simulation exercise** when communications, public warning, misinformation, trust, or analogue fallback were identified as weaknesses;
- **When reviewing crisis communication plans** to ensure they do not rely on one channel or one digital assumption;
- **Before exercises or audits** to define what communication, continuity should be tested;
- **After communication failures or debriefs** where inconsistent messaging, low reach, or weak fallback channels created operational or public problems;
- **When updating support arrangements for vulnerable groups, multilingual audiences, tourists, or non-digital users.**

This tool is especially useful where current plans assume that digital communication remains available, that all relevant audiences are reachable through one platform, or that public messaging will remain coherent automatically during compound crises. AGILE findings repeatedly show that these assumptions are unsafe.

This tool can be used by:

- Public communication and warning teams;

- Civil protection authorities;
- Municipal and regional emergency coordinators;
- Infrastructure operators with public-facing continuity obligations;
- NGOs and humanitarian support actors;
- Tourism-facing organisations and local authorities;
- Community liaison and vulnerable-population planning teams;
- Continuity managers and governance lead responsible for communication fallback.

This is consistent with the AGILE case-study findings, which repeatedly link communication continuity to civil protection, municipalities, responders, utilities, healthcare, tourism, and community support systems.

The tool can be informed by one or more of the following:

- Existing communication plans, warning protocols, SOPs, media arrangements, or public-alerting frameworks;
- Debriefs from real incidents or exercises;
- Expert judgement from communication leads, responders, broadcasters, or community intermediaries;
- Continuity reviews or infrastructure dependency outputs showing that communication systems depend on electricity, telecoms, transport, ICT, or fuel.
- STT1 findings on communication fragility, public warning, misinformation, trust failure, and analogue fallback;
- STT2 implementation feedback

The Tool 4 worksheet is presented in Table 18.

Table 18. Tool 4: Protect Communication worksheet

Field	Guiding question	Response
Communication function	What communication function is being planned? (e.g. internal coordination, public warning, multilingual guidance, responder communications, misinformation management)	
Why it matters	Why is this communication function critical during HILP disruption?	
Primary channel	What is the normal/default communication channel?	
Secondary channel(s)	What alternative communication channels are available?	
Analogue / offline fallback	What non-digital fallback exists if ICT or telecoms fail?	
Dependent systems	What must remain available for this communication layer to function? (power, fuel, network, staffing, transport, printing, devices, etc.)	
Audience(s)	Who must receive or use this communication? (e.g. responders, public, tourists, vulnerable groups, infrastructure operators)	
Language / accessibility need	Are multilingual, simplified, or accessible formats required?	

Field	Guiding question	Response
Switch trigger	Under what condition should the organisation shift from the primary channel to the backup/fallback channel?	
Owner	Who is responsible for activating and managing this communication layer?	
Supporting actors	Which other actors are needed? (broadcasters, police, municipalities, utilities, NGOs, trusted intermediaries, interpreters, etc.)	
Message type	What kind of message is this? (alert, protective action, reassurance, logistics information, myth-busting, service update, etc.)	
Evidence source	What evidence supports this communication arrangement?	
Evidence category	Stress-test finding / operational lesson / plan review / expert judgement / model result	
Current rating	0 / 1 / 2 / 3 / Don't know	
Priority	High / Medium / Low or Immediate / Near-term / Longer-term	
Desired target state	What should an acceptable layered arrangement look like?	
Action required	What must be written, agreed, tested, resourced, translated, or exercised?	
Review trigger / date	When should this layer be reviewed or exercised?	

This structure aligns the communication tool with the common evidence and rating logic of the Toolbox while ensuring that communication remains practical, audience-aware, and continuity-oriented. It also separates the state of the arrangement from the urgency of action, which is essential for planning uptake.

Use one or more of the following prompts when completing the table. These questions are designed to assist the debate that will be instigated by the process of filling in the table. As such a formal answer to these questions is not required as they have only a supporting role.

1. If the normal channel fails, how do we still communicate?

AGILE STT1 findings repeatedly show that reliance on normal digital channels is unsafe under severe disruption.

2. How do we know when to switch channels?

This prompt is important because a layered system is only useful if organisations know when to activate backup or analogue fallback.

3. Who will miss this message if we use only one channel or one language?

This is strongly supported by the case-study findings.

4. What is our non-digital communication option?

AGILE cross-case recommendations explicitly call for analogue fallback procedures and public information methods beyond ICT.

5. How do we prevent contradictory or delayed messaging?

STT1 findings repeatedly link inconsistent communication to misinformation, panic, and erosion of trust.

6. Who are the trusted intermediaries?

This helps identify broadcasters, responders, hotels, community figures, NGOs, schools, health actors, or local structures that can help reach vulnerable or hard-to-reach audiences. The STT1 findings strongly support advance planning for vulnerable groups and trusted community channels.

Layered Communication Planning – Suggested Use Process

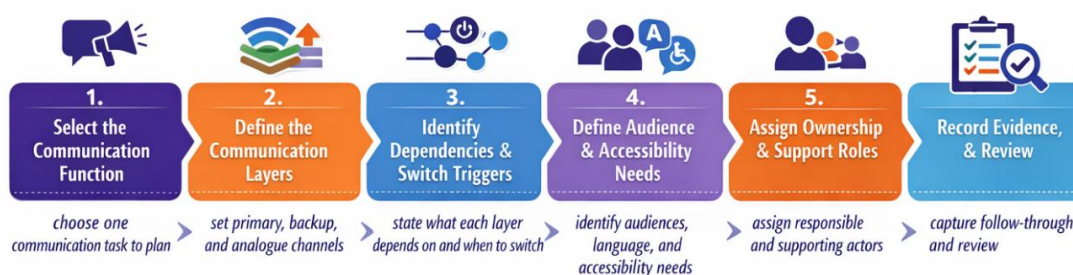


Figure 6. Tool 4. Layered Communication Planning – Suggested Use Process.

Step 1 - Select the communication function

Choose a specific communication function rather than trying to review all communication at once. For example:

- Operational coordination between responders,
- Public warning to the general population,
- Multilingual guidance for tourists,
- Offline updates to shelters,
- Misinformation management,
- Or communication with infrastructure operators.

The STT1 evaluation shows that communication problems appear in different forms, so it is useful to handle them function by function.

Step 2 -Define the communication layers

List the primary channel, backup channels, and analogue/offline fallback. AGILE cross-case recommendations explicitly support a layered architecture including digital, radio, satellite, physical, and human channels.

Step 3 - Identify dependencies and switch triggers

State what systems the communication arrangement depends on and under what condition the organisation should switch channels. Cross-case findings repeatedly show that communications are dependent on power, telecoms, staffing, fuel, access, and trusted information flows.

Step 4 - Define audience and accessibility needs

Specify who must receive the communication and what language or format requirements exist. STT1 case findings show that language, accessibility, and audience type strongly affect communication success.

Step 5 - Assign ownership and support roles

Communication is often treated as a generic function, but in practice it needs clear responsibility. AGILE findings repeatedly show that unclear ownership contributes to inconsistency and delay.

Step 6 - Record evidence, rating, priority, target state, and review

This ensures communication planning remains evidence-linked and reviewable rather than being based on assumption alone.

An example of the completed Tool 4 worksheet for public warning when mobile networks fail is presented in Table 19.

Table 19. Example A. Tool 4 worksheet completed for public warning when mobile networks fail

Field	Example entry
Communication function	Public warning and protective action guidance
Why it matters	Needed to reduce panic, support compliance, and direct people toward safe behaviour
Primary channel	Mobile alert and official digital channels
Secondary channel(s)	Broadcast radio, TV, municipal website, social media
Analogue / offline fallback	Loudspeaker vehicles, printed notices, physical information points, police / responder announcements
Dependent systems	Power, telecoms, staffing, message approval, transport for loudspeaker deployment
Audience(s)	General public, tourists, vulnerable groups
Language / accessibility need	Plain language, multilingual, non-digital formats
Switch trigger	Mobile alert unavailable or telecoms degraded beyond defined threshold
Owner	Civil protection communication lead
Supporting actors	Broadcasters, municipalities, police, NGOs, tourist-facing organisations
Message type	Alert + protective action instruction
Evidence source	STT1 cross-case recommendations
Evidence category	Stress-test finding
Current rating	1
Priority	High
Desired target state	Layered warning model with tested digital and non-digital fallback channels
Action required	Define fallback triggers, prepare multilingual templates, test loudspeaker and information-point procedures
Review trigger / date	After public warning exercise

This example is directly supported by STT1 cross-case findings and recommendations, which call for a layered communications architecture, analogue fallback procedures, multilingual messaging, and support for vulnerable audiences.

A second example of the completed Tool 4 worksheet for internal responder coordination when dashboards fail is presented in Table 20.

Table 20. Example B. Tool 4 worksheet completed for internal responder coordination when dashboards fail

Field	Example entry
Communication function	Internal coordination between responders and command
Why it matters	Needed to maintain situational awareness, priorities, and tasking when digital systems are unavailable
Primary channel	Digital dashboard + telecoms + online operational picture
Secondary channel(s)	TETRA / radio, satellite phones
Analogue / offline fallback	Paper situation sheets, whiteboards in coordination centre, runners or liaison officers, scheduled radio check-ins
Dependent systems	Power, radio coverage, staffing, physical meeting point, interoperability
Audience(s)	Command staff, sector leads, responders
Language / accessibility need	Operational terminology and local-language clarity
Switch trigger	Dashboard unavailable, telecoms overloaded, ICT outage beyond defined time
Owner	Emergency coordination centre
Supporting actors	Sector leads, communication officers, police, utility liaisons
Message type	Operational update / tasking / shared situational picture
Evidence source	STT1 findings
Evidence category	Stress-test finding + operational lesson
Current rating	1
Priority	High
Desired target state	Offline coordination package documented, trained, and tested
Action required	Define fallback reporting rhythm, role of liaison officers, radio check-in schedule, and paper templates
Review trigger / date	After next multi-agency exercise

This example is supported by STT1 findings on situational-awareness degradation and communication fragility, showing the importance of clarity, language, and practical task continuity in communication-heavy settings.

A third example of the completed Tool 4 worksheet for multilingual guidance for tourists and transient populations is presented in Table 21.

Table 21. Example C. Tool 4 worksheet completed for multilingual guidance for tourists and transient populations

Field	Example entry
Communication function	Protective-action guidance for tourists and non-local users
Why it matters	Tourists and transient populations may not know local procedures and may not receive official information through usual channels
Primary channel	Official public guidance through digital channels and tourism operators
Secondary channel(s)	Hotels, ferry operators, airport, printed signage, broadcasters
Analogue / offline fallback	Street-level displays, hotel briefings, physical information points, responder announcements
Dependent systems	Staffing, access to tourism intermediaries, translated content, electricity or battery support for displays
Audience(s)	Tourists, visitors, foreign residents
Language / accessibility need	Multilingual, simple instructions, trusted intermediaries
Switch trigger	High tourist exposure area affected; normal public warning not reaching non-local audiences
Owner	Municipal communication lead
Supporting actors	Hotels, tourism associations, transport operators, local authorities
Message type	Protective action / reassurance / service update
Evidence source	STT1 cross-case recommendations
Evidence category	Stress-test finding
Current rating	1
Priority	Medium
Desired target state	Multilingual communication arrangements pre-agreed with key tourism actors
Action required	Produce templates, clarify hotel/transport roles, identify physical fallback points
Review trigger / date	Before high-tourism season or after tourism-focused exercise

This example is supported by STT1 case-study findings and practical implications, which identify tourists and visitors as groups requiring clearer communication support, and by the cross-case recommendation to prepare messages that reach vulnerable and multilingual audiences through multiple trusted routes.

After completing this tool, users should have:

1. A clearly defined communication function;
2. A documented layered communication model with primary, secondary, and analogue/offline channels;
3. Explicit channel-switch triggers;
4. Audience-specific and accessibility-aware communication arrangements;
5. Assigned ownership and support roles;
6. An evidence-linked rating, priority, target state, and action plan;
7. A review or exercise trigger.

This output is especially important because AGILE findings show that communication weaknesses can transform technical disruption into panic, mistrust, disorder, and wider operational failure. A layered communication plan is therefore a core resilience measure, not merely a communication add-on.

4.8. Tool 5. Build capability

The tool is designed to help organisations convert evidence from AGILE stress tests, implementation feedback, debriefs, and other validated planning inputs into specific capacity-building needs. Its purpose is to identify what people, teams, or organisations need to learn, practise, or rehearse in order to reduce the vulnerabilities revealed by HILP-focused planning and stress testing. This tool supports the planning uptake function of the WP5 Toolbox by ensuring that evidence is translated not only into plans and governance changes, but also into capabilities that can actually be exercised and maintained in practice.

This need is strongly supported by AGILE evidence. The first implementation cycle of STT1 shows recurring weaknesses across case studies in situational awareness, communication, public messaging, surge capacity, continuity of essential services, coordination under degraded conditions, and support for vulnerable populations. The same report concludes with cross-case recommendations for regular joint exercises and audits, clearer analogue fallback procedures, continuity standards, and improved governance under compound crises. These findings imply that many issues cannot be solved by written plans alone; they require training, rehearsal, and organisational learning.

The STT1 facilitation guide adds further support by identifying a broad set of soft skills that are relevant to stress testing and crisis management, including situational awareness, decision-making, communication, leadership, coordination, adaptability, problem-solving, collaboration, and cultural awareness. It also explains that the stress test can be used for both diagnostic and training purposes, and stresses the value of rehearsal, structured reflection, and debriefing. This makes clear that capacity building is not an optional add-on; it is part of the logic of resilience-oriented stress testing.

For these reasons, the tool is intended to help users answer practical follow-up questions such as: What capability gap does this finding reveal? Who needs to strengthen what? Should the response be training, exercise design, briefing, simulation, cross-sector workshop, leadership rehearsal, or a simple awareness intervention? In this way, the tool complements the other Toolbox tools by ensuring that evidence is linked not only to planning action, but also to capability development.

The pillars supported by Tool 5: Build Capability are summarised in Table 22.

Table 22. Linked pillars supported by Tool 5: Build Capability

Primary Pillar	Secondary Pillars
Pillar 5: Capacity Building and Adaptive Readiness	Pillar 1: Evidence Governance
	Pillar 2: Multi-level Governance and Decision-Making
	Pillar 3: HILP-Specific Planning Approach

Primary Pillar	Secondary Pillars
	Pillar 6: Risk Communication for Planning

This tool primarily supports capacity building and adaptive readiness because it helps convert findings into concrete developmental needs. It also supports evidence governance because training priorities should be evidence-linked, and it supports governance and communication because many identified needs relate to decision-making, escalation, public messaging, and coordination under pressure.

Use this tool:

- **After implementation feedback or debriefs** when practical issues in understanding, facilitation, prioritisation, or role clarity emerge;
- **During exercise planning** to decide what kind of capability should be strengthened next;
- **During annual preparedness review** when organisations need to move from “identified gap” to “training or exercise action”;
- **When updating plans, governance, continuity arrangements, or communication protocols** and needing to identify the human capability component of those changes.
- **After a stress test** when findings point to uncertainty, poor coordination, weak communication, limited fallback capability, or unclear decision-making under HILP conditions;

This tool is especially useful because many AGILE findings imply not only that something should change in a plan, but that people must know **how** to act differently under stress.

This tool can be used by:

- Training and exercise leads;
- Emergency planners;
- Civil protection authorities;
- Organisational development and preparedness teams;
- Continuity managers;
- communication teams;
- Multi-agency coordination leads;
- Case study hosts or organisational reviewers translating AGILE outputs into follow-up actions.

This is consistent with the intended WP5 audience and with the stakeholder groups repeatedly involved in AGILE stress-testing and learning activities.

The tool can be informed by one or more of the following:

- STT3 outputs where model findings imply the need for better decision support, interpretation skills, or cross-sector understanding;
- Debrief reports, exercise observations, and operational lessons;
- Plan reviews or governance reviews revealing capability gaps in implementation;
- Expert judgement from facilitators, planners, operators, or training coordinators.
- STT1 findings on shared vulnerabilities, soft-skill pressures, communication issues, and capacity limits;
- STT2 outputs and implementation feedback

The Tool 5 worksheet is presented in Table 23.

Table 23. Tool 5: Build Capability worksheet

Field	Guiding question	Response
Evidence source	What report, finding, debrief, or lesson identifies the issue?	
Evidence category	Stress-test finding / implementation lesson / plan review / expert judgement / model result	
Observed issue or gap	What problem was identified?	
Affected capability area	What capability is implicated? (e.g. situational awareness, leadership, communication, decision-making, analogue fallback, multi-agency coordination, vulnerable-group support)	
Who needs this capability?	Which role, team, organisation, or stakeholder group needs development?	
Current behaviour or limitation	What is happening now that suggests a capability gap?	
Desired behaviour or capability	What should people be able to do differently?	
Suggested intervention type	Training / workshop / exercise / tabletop / simulation / briefing / SOP familiarisation / joint rehearsal / leadership coaching / awareness product	
Operational phase relevance	Preparedness / early response / early recovery / all phases	
Priority	High / Medium / Low or Immediate / Near-term / Longer-term	
Owner	Who should organise or sponsor this capacity-building action?	
Supporting actors	Which additional actors should be involved?	
Current rating	0 / 1 / 2 / 3 / Don't know	
Desired target state	What would acceptable capability look like?	
Action required	What should happen next?	
Review trigger / date	When should this need be revisited or tested?	

This table applies the Toolbox's common evidence and rating logic while making sure that capacity-building recommendations are linked to specific evidence and translated into practical interventions.

The following capability categories are suitable for repeated use across the Toolbox because they are explicitly present in the AGILE evidence base:

- **Situational awareness** — ability to maintain a shared operational picture under uncertainty or degraded communications.

- **Decision-making under pressure** — evidence-informed judgement under time pressure, overload, and uncertainty.
- **Leadership in emergency mode** — setting direction, simplifying arrangements, and assigning priorities in a crisis.
- **Multi-agency coordination** — collaboration across sectors, organisations, and levels of governance.
- **Communication and public information** — structured messaging, analogue fallback, multilingual support, and trust management.
- **Continuity under degraded conditions** — ability to continue operating with reduced power, ICT, staffing, or access.
- **Support for vulnerable groups** — planning and coordination for evacuees, tourists, elderly people, disabled people, and other groups with specific needs.
- **Use of plans and procedures** — understanding how to apply existing plans under HILP conditions rather than only under routine assumptions.
- **Cross-sector systems thinking** — ability to see common points of failure, cascading effects, and dependencies beyond one's own organisation or sector.

Training Needs from Evidence – Suggested Use Process



Figure 7. Tool 5. Training Needs from Evidence – Suggested Use Process.

Step 1 - Select the evidence item

Choose a finding, lesson, or implementation observation that appears to reveal a capability issue rather than only a plan gap. Examples include:

- Participants struggled to think from an overarching or strategic perspective;
- Analogue fallback was weak or untested;
- Multilingual communication was insufficient;
- Hospital continuity depended on manual procedures that were not rehearsed;
- Or coordination degraded once digital systems failed.

Step 2 - Define the capability gap

Translate the finding into a capability statement. For example:

- “Staff need better understanding of system interdependencies,”
- “Communication teams need practice switching to analogue channels,”
- Or “coordination leads need rehearsal of emergency-mode prioritisation.”

This step is important because implementation feedback from STT2 shows that discussion outputs can remain too broad or diffuse unless translated into a clear follow-up category.

Step 3 - Identify who needs development

Specify whether the need applies to:

- one organisation,
- one role type,
- one coordination body,
- or multiple sectors together.

This matters because AGILE findings repeatedly show that vulnerabilities are often cross-sectoral and cannot always be resolved by training one organisation in isolation.

Step 4 - Choose the right intervention type

Not every issue requires a formal training course. Some need:

- Briefings,
- Drills,
- Cross-sector workshops,
- Analogue walk-throughs,
- Role-based tabletop exercises,
- Or SOP familiarisation.

The STT1 facilitation guide explicitly frames the stress test as usable for training and teaching and provides a basis for identifying what type of rehearsal is useful.

Step 5 - Record priority, rating, target state, action, and review

This keeps the output consistent with the rest of the Toolbox and ensures capacity-building is linked to follow-through and not identified abstractly.

An example of the completed Tool 5 worksheet for cross-sector systems thinking is presented in Table 24.

Table 24. Example A. Tool 5 worksheet completed for cross-sector systems thinking

Field	Example entry
Evidence source	STT1 cross-case findings
Evidence category	Stress-test finding
Observed issue or gap	Different shocks produced similar impacts, but participants and institutions often focus on one sector or one hazard rather than shared vulnerabilities
Affected capability area	Cross-sector systems thinking
Who needs this capability?	Strategic and tactical planners across multiple organisations
Current behaviour or limitation	Planning and response remain hazard-specific or sector-specific

Field	Example entry
Desired behaviour or capability	Staff can identify common points of failure and cascading effects across hazards and sectors
Suggested intervention type	Multi-agency tabletop or workshop using shared-vulnerability focus
Operational phase relevance	Preparedness / early response
Priority	High
Owner	Preparedness lead / exercise coordinator
Supporting actors	Utilities, hospitals, municipalities, communication leads, infrastructure operators
Current rating	1
Desired target state	Cross-sector interdependencies routinely considered in planning and exercises
Action required	Develop and run a focused interdependency workshop or follow-up tabletop
Review trigger / date	After next annual exercise cycle

This example is supported by the STT1 cross-case analysis, which repeatedly shows that vulnerabilities cut across hazards and sectors and that the value of the stress test lies in identifying common points of failure and system-wide implications rather than only single-hazard effects.

A second example of the completed Tool 5 worksheet for leadership and prioritisation under pressure is presented in Table 25.

Table 25. Example B. Tool 5 worksheet completed for leadership and prioritisation under pressure

Field	Example entry
Evidence source	STT1 cross-case findings
Evidence category	Operational lesson
Observed issue or gap	Participants struggled to think from an overarching/strategic perspective and tended to focus on operational details
Affected capability area	Leadership and strategic prioritisation
Who needs this capability?	Tactical and strategic decision-makers
Current behaviour or limitation	Focus on immediate operational concerns rather than system-level priorities
Desired behaviour or capability	Decision-makers can prioritise critical issues from an organisational and whole-system perspective under time pressure
Suggested intervention type	Leadership-focused tabletop or decision game

Field	Example entry
Operational phase relevance	Early response / early recovery
Priority	High
Owner	Emergency planning lead
Supporting actors	Senior managers, crisis coordinators, facilitators
Current rating	1
Desired target state	Strategic decision-makers are comfortable with whole-system prioritisation under stress
Action required	Design a short leadership exercise focused on prioritisation and cross-sector trade-offs
Review trigger / date	After next crisis-management leadership session

This example is directly supported by the STT2 feedback, which noted the need for developing skills among individuals for overarching and strategic perspectives rather than only operational problem-solving.

After completing this tool, users should have:

1. A clearly identified capability gap linked to evidence;
2. A defined target group or role needing development;
3. A suitable intervention type;
4. A priority level and current capacity rating;
5. A desired target state;
6. An owner and supporting actors;
7. A review or exercise trigger.

This output helps ensure that evidence does not only produce revised documents but also produces people and organisations that are better prepared to operate under severe HILP conditions. That is consistent with the broader AGILE emphasis on learning, adaptation, and preparedness, and with the role of WP5 in supporting capacity building.

4.9. Tool 6. Track update

The tool is designed to help organisations track whether findings, recommendations, and actions identified through AGILE stress testing and related evidence are taken up in plans, procedures, governance arrangements, communication products, continuity measures, exercises, and review cycles. Its purpose is not to restate lessons, but to create a practical bridge between identified lessons and implemented change. This makes it a core follow-through tool within the WP5 Toolbox.

This need is strongly supported by AGILE evidence. The first implementation cycle of STT1 did not stop at identifying vulnerabilities; it also generated cross-case recommendations on continuity standards, protected resource chains, redundant communications, analogue fallback procedures, flexible governance arrangements, support for vulnerable populations, and regular joint exercises and audits. Those recommendations only improve

resilience if they are embedded in organisational practice. The role of this log is therefore to make that uptake visible and reviewable.

This tool is also consistent with the broader logic of the AGILE framework. D3.1 states that stress-testing results are intended to inform WP5 Evidence-Based Planning, capacity building, and risk communication. It also stresses the importance of learning and adjustment over time. The Lessons-to-Planning Uptake Log therefore provides a practical mechanism for showing whether AGILE evidence is being used, where it has been embedded, and what remains outstanding.

The pillars supported by Tool 6: Track Update are summarised in Table 26.

Table 26. Linked pillars supported by Tool 6: Track Update

Primary Pillar	Secondary Pillars
Pillar 1: Evidence Governance	Pillar 2: Multi-level Governance and Decision-Making
	Pillar 3: HILP-Specific Planning Approach
	Pillar 5: Capacity Building and Adaptive Readiness
	Pillar 6: Risk Communication for Planning

This tool primarily supports **evidence governance** because it tracks whether evidence is used. It also supports governance, continuity, communication, and capacity building because uptake can take different forms such as updates to plans, changes in authority, revised continuity arrangements, communication materials, exercises, or training interventions.

Use this tool:

- **After a stress test or exercise debrief or real response** to record which findings should be taken forward into planning;
- **After using Tool 1–5** to track whether proposed actions are implemented
- **During annual preparedness or resilience review** to see which recommendations are still pending;
- **Before exercises, audits, or management reviews** to identify what was promised but not yet embedded;
- **When multiple actors are involved** and ownership or progress needs to be made explicit.

This tool is especially useful because AGILE evidence shows that findings often emerge clearly, but organisational uptake is uneven unless actions, owners, and review points are documented.

This tool can be used by:

- Preparedness and resilience lead;
- Civil protection authorities;
- Continuity managers;
- Policy and governance units;
- Training and exercise coordinators;
- Communication leads;
- Multi-agency coordination structures;
- Case study hosts and reviewers responsible for follow-through.

This is consistent with the types of actors involved across AGILE case studies and with the need for cross-sector follow-through on shared vulnerabilities and recommendations.

The log can be informed by one or more of the following:

- STT3 outputs where model results imply continuity, governance, or communication changes;
- Tools 1–5 of this Toolbox, especially translated findings, continuity actions, governance reviews, communication adjustments, and training needs;
- Debriefs, annual reviews, and incident lessons.
- STT1 findings and cross-case recommendations;
- STT2 outputs and implementation feedback

The Tool 6 worksheet is presented in Table 27.

Table 27. Tool 6: Track Update worksheet

Field	Guiding question	Response
Lesson / finding / recommendation	What needs to be taken up?	
Evidence source	Where does this lesson come from?	
Evidence category	Stress-test finding / operational lesson / plan review / expert judgement / model result	
Relevant planning area	Where should this be embedded? (plan, SOP, continuity arrangement, governance structure, communication product, training, exercise, audit, etc.)	
Specific uptake action	What exactly should be changed, added, tested, or created?	
Owner	Who is responsible for ensuring uptake?	
Supporting actors	Which others need to contribute?	
Current status	Not started / In progress / Implemented / Partly implemented / Deferred	
Priority	High / Medium / Low or Immediate / Near-term / Longer-term	
Current rating	0 / 1 / 2 / 3 / Don't know	
Desired target state	What should successful uptake look like?	
Evidence of completion	How will uptake be demonstrated? (revised plan, signed SOP, completed exercise, approved protocol, communication product, etc.)	
Review trigger / date	When should implementation be checked again?	
Notes / barriers	What is blocking or slowing uptake?	

This structure applies the shared evidence and rating logic while adding a practical implementation-tracking layer. It is specifically designed to prevent lessons from remaining as recommendations without visible follow-through.

Use one or more of the following prompts when completing the table. These questions are designed to assist the debate that will be instigated by the process of filling in the table. As such a formal answer to these questions is not required as they have only a supporting role.

1. What lesson should change practice, not only knowledge?

This helps distinguish lessons that require real organisational uptake from those that are merely descriptive. STT1 produced many findings that imply explicit changes in continuity, communication, governance, and exercises.

2. Where exactly should this lesson be embedded?

For example: emergency plan, continuity annex, communication SOP, funding protocol, exercise plan, training package, or governance charter. This reflects the WP5 focus on translation into planning use.

3. How will we know this lesson has been implemented?

This avoids treating “agreed in principle” as the same as “embedded in practice.” The implementation feedback documents suggest that organisational learning requires visible outputs.

4. What is blocking uptake?

STT2 feedback repeatedly notes constraints such as time pressure, fatigue, participant availability, language, task complexity, and the need for additional explanation or training. Barriers should therefore be recorded, not hidden.

5. When will this be reviewed again?

This is essential because AGILE’s planning logic is iterative, and uptake should be revisited through exercises, audits, or review cycles.

Lessons-to-Planning Uptake Log – Suggested Use Process



Figure 8. Tool 6: Lessons-to-Planning Uptake Log – Suggested Use Process.

Step 1 - Select the lesson or recommendation

Choose one lesson from a stress-test report, implementation feedback note, continuity review, governance review, or training-needs assessment. Examples include:

- Define minimum continuity standards for power-dependent services,
- Create analogue fallback communication procedures,
- Rehearse emergency-mode prioritisation authority,
- Improve multilingual public guidance,
- Or simplify briefing materials and task structure before workshops or exercises.

Step 2 - Define the uptake action

Translate the lesson into a concrete action that changes policy, procedure, training, communication, or review practice. This is the key function of the log.

Step 3 - Assign ownership and evidence of completion

Specify who will ensure uptake and what will count as proof that uptake happened. Implementation feedback shows that without this step; findings may not move beyond discussion.

Step 4 - Record status, rating, and barriers

This allows organisations to track whether actions are progressing and what is preventing follow-through.

Step 5 - Review periodically

Use the review trigger to connect this log to annual planning review, exercises, audits, or management sessions.

Table 28. Tool 6 Example A: Uptake of continuity standards for lifeline services

Field	Example entry
Lesson / finding / recommendation	Build a minimum viable continuity model for lifeline systems in the first 12–72 hours
Evidence source	STT1 cross-case recommendations
Evidence category	Stress-test finding
Relevant planning area	Continuity annex to emergency plan
Specific uptake action	Draft service-specific minimum continuity thresholds and fallback arrangements for power, water, communications, and healthcare
Owner	Continuity manager
Supporting actors	Utilities, hospitals, civil protection, municipal crisis centre
Current status	In progress
Priority	High
Current rating	1
Desired target state	Minimum continuity standards approved, documented, and exercised
Evidence of completion	Approved continuity annex and exercise record
Review trigger / date	After next multi-agency continuity exercise
Notes / barriers	Requires operator input and agreement on fallback assumptions

This example is directly supported by the STT1 cross-case recommendations, which explicitly call for a minimum viable continuity model for lifeline systems.

Table 29. Tool 6. Example B: Uptake of analogue fallback communication procedures

Field	Example entry
Lesson / finding / recommendation	Create analogue and offline fallback communication arrangements
Evidence source	STT1 cross-case recommendations + STT2 feedback

Field	Example entry
Evidence category	Stress-test finding + operational lesson
Relevant planning area	Crisis communication SOP
Specific uptake action	Add fallback channel matrix, physical information points, loudspeaker procedures, and multilingual templates to crisis communication SOP
Owner	Crisis communication lead
Supporting actors	Municipal communication team, broadcasters, police, tourism-facing actors
Current status	Not started
Priority	High
Current rating	0
Desired target state	Layered communication SOP approved and exercised
Evidence of completion	Signed SOP and communication exercise debrief
Review trigger / date	After communication exercise
Notes / barriers	Translation support and role clarity still needed

This example is supported by the STT1 recommendation and STT2 feedback on language, facilitation clarity, and the importance of giving essential information in usable formats.

Table 30. Tool 6. Example C: Uptake of leadership-focused training for strategic thinking

Field	Example entry
Lesson / finding / recommendation	Tactical and strategic participants need support to think from an organisational / system-wide perspective under pressure
Evidence source	STT1 cross-case recommendations + STT2 feedback
Evidence category	Operational lesson
Relevant planning area	Training and exercise programme
Specific uptake action	Add leadership prioritisation tabletop to annual preparedness programme
Owner	Exercise coordinator
Supporting actors	Senior managers, crisis coordinators, facilitator team
Current status	Partly implemented
Priority	Medium
Current rating	1
Desired target state	Leadership-focused strategic decision exercise institutionalised annually
Evidence of completion	Exercise schedule and debrief report
Review trigger / date	After next leadership session
Notes / barriers	Senior availability is limited

This example is directly supported by the STT2 feedback, which notes difficulty in thinking from an overarching/strategic perspective and suggests the value of strengthening this capability.

After completing this log, users should have:

1. A visible record of what lessons or recommendations require uptake;
2. A clear statement of where each lesson should be embedded;
3. An assigned owner and implementation status;
4. Evidence-linked priority, confidence, uncertainty, and current rating;
5. A defined target state and proof-of-completion condition;
6. A review trigger and a record of barriers to follow-through.

Table 31. Overview of the Toolbox

Tool No.	Tool Name	Main Purpose	Typical Users	Typical Output	Main Linked Pillar(s)
1	Evidence Translation	Translates stress-test findings, debrief lessons, model outputs, and other validated inputs into practical planning implications, required actions, owners, and review triggers. It is the main entry point for turning evidence into planning use.	Emergency planners, civil protection authorities, infrastructure operators, preparedness teams, communication leads, review teams.	A documented evidence item linked to affected functions, planning implications, action requirements, ownership, and review points.	Pillar 1 primarily; also Pillars 2, 3, 5, 6.
2	Define Continuity	Defines which critical functions or services must continue, at what minimum acceptable level, for how long, and with which dependencies, fallback arrangements, and triggers. It converts resilience findings into continuity standards.	Continuity managers, emergency planners, utilities, health and social care services, municipal or regional resilience officers, crisis coordination bodies.	A service-level continuity definition with minimum acceptable operation, enabling dependencies, fallback measures, ownership, and review triggers.	Pillar 3 primarily; also Pillars 1, 2, 4, 5, 6.
3	Clarify governance	Reviews whether normal governance arrangements can shift into a simplified emergency mode under HILP conditions, including authority, escalation, prioritisation, funding, coordination, and fallback procedures.	Civil protection authorities, crisis-coordination teams, governance and policy units, continuity managers, infrastructure governance leads.	A documented emergency-mode governance arrangement with triggers, authority, responsible owners, support actors, and follow-up actions.	Pillar 2 primarily; also Pillars 1, 3, 5, 6.
4	Protect Communication	Designs a communication architecture that remains functional when normal digital channels are degraded or unavailable by combining digital, radio, satellite,	Public communication teams, civil protection authorities, municipalities, infrastructure operators,	A layered communication plan with primary channels, backup and analogue fallback options, audience	Pillar 6 primarily; also Pillars 1, 2, 3, 5.

Tool No.	Tool Name	Main Purpose	Typical Users	Typical Output	Main Linked Pillar(s)
		physical, and human communication channels with explicit switch triggers.	NGOs, tourism-facing organisations, community liaison teams.	requirements, ownership, and review or exercise triggers.	
5	Build Capability	Converts stress-test findings, debrief lessons, and implementation feedback into specific capability-development needs, target groups, and intervention types such as workshops, exercises, SOP familiarisation, or leadership rehearsal.	Training and exercise leads, emergency planners, preparedness teams, continuity managers, communication leads, organisational development staff.	An evidence-linked training or exercise action with capability area, target audience, intervention type, priority, ownership, and review trigger.	Pillar 5 primarily; also Pillars 1, 2, 3, 6.
6	Track Uptake	Tracks whether findings, recommendations, and actions identified through stress testing and related evidence are actually embedded in plans, SOPs, continuity arrangements, governance structures, communication products, exercises, and review cycles.	Preparedness and resilience leads, continuity managers, governance units, communication leads, exercise coordinators, multi-agency coordination bodies.	A visible record of lesson uptake, implementation status, evidence of completion, barriers, owners, and review points.	Pillar 1 primarily; also Pillars 2, 3, 5, 6.

The six tools of the Toolbox are designed to function as a practical planning uptake package. Together, they support the translation of AGILE evidence coming from stress-test findings and other validated evidence into continuity measures, governance improvements, communication arrangements, capacity-building actions, and visible organisational follow-through. The tools can be used individually, but they are intended to work in sequence: first translating evidence, then defining continuity needs, governance and communication adjustments, identifying capacity-building implications, and finally tracking whether agreed lessons are embedded in practice.

5. Conclusion

The development of this Guideline represents a critical shift from traditional disaster management toward a systemic resilience paradigm. The evidence compiled through the five pillars clearly confirms that HILP events demand unconventional and forward-thinking approaches. Expert feedback across the development process has informed the refinement of the pillars and overall framework. The research underscores that while hazard triggers may vary, the systemic failure points remain remarkably consistent, typically converging on a loss of power, ICT failure, and fragmented situational awareness. These recurring vulnerabilities are consistently highlighted across expert feedback and practical experience in crisis management contexts.

Consequently, effective planning must prioritize threat-agnostic, consequence-driven strategies that focus on maintaining critical societal functions regardless of the trigger event. This includes strengthening system-wide resilience against cascading failures and interdependencies across sectors. Evidence-informed planning for HILPs requires a decisive move from planning for response to organizing for learning. Continuous feedback loops actively challenge rigid assumptions, allowing societies to build adaptable and flexible capacities essential to thrive in an increasingly unpredictable risk landscape.

Overall, the Guideline translate this evidence into a structured planning logic (through the five pillars) and a practical operational layer (through the Toolbox), ensuring that principles and implementation remain closely connected. A key finding of this work is that resilience to HILP events depends less on predicting specific hazards and more on strengthening the critical functions and interdependencies that enable societies to operate under extreme conditions.

This Guideline aims to support practitioners in applying these principles effectively in practical settings. The Toolbox provides practical support for this approach by helping practitioners identify vulnerabilities, assess systemic interdependencies, facilitate learning processes, and develop consequence-driven planning measures. To maximize its effectiveness, the Toolbox should be applied as part of an iterative planning cycle that includes regular review, testing, stakeholder engagement, and adaptation to emerging risks and lessons learned.

The planning pillars and the tools serve as a roadmap for building resilient systems that can anticipate, adapt, and respond effectively to HILP events, both now and in the future. By combining evidence-based principles with actionable methods, the Guideline support decision-makers and practitioners in strengthening resilience across diverse governance and organizational contexts. They are designed to be practical, adaptable and aligned with operational realities across different governance and organizational contexts.

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