

EXPLOITATION STRATEGY



SMART MATURE RESILIENCE

EXPLOITATION STRATEGY

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Author (s)	Grimes, Clara - ICLEI Europe
Co-author(s)	Robrecht, Holger - ICLEI Europe, Latinos, Vasileios - ICLEI Europe, Hernantes, Josune – TECNUN, Labaka, Leire – TECNUN, Sarriegi, Jose Maria – TECNUN, Howick, Susan – University of Strathclyde, Eden, Colin - University of Strathclyde
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Reviewed by (if applicable)	Tim A. Majchrzak, Mihoko Sakurai, Jaziar Radianti (CIEM), Leire Labaka (TECNUN), Rene Lindner, Saskia Maresch (DIN),

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EXECUTIVE SUMMARY

The Smart Mature Resilience project responds to the need for enhanced resilience in European cities. Exploitation measures ensure that the project results will be effectively used also after project end. A provisional exploitation plan was presented as an annex to the revised Communication Strategy D7.4 and has been updated following feedback from internal and external partners and reviewers.

This document lays out the approach and methods to be utilised by the project in exploiting project results. The project tools have been compiled into two broad consultancy packages, which support strategic development in cities from a short-term and long-term perspective. These packages could be carried out by existing project partners or external actors, as the tools and supporting materials are available publicly through the Smart Mature Resilience website.

This exploitation strategy lays out the elements, logic and process behind exploitation of the SMR project outputs. Firstly, the individual tools, their added value in relation to available tools, the supporting materials provided and their function as part of these packages is outlined in detail. Next, the relationship between the consultancy packages and the European Resilience Management Guideline is explained. The European Resilience Management Guideline will be described in detail in D5.9, which will be submitted in M34. Following this section, packages produced for consultancy and training are introduced and use cases are proposed.

In the next part of the strategy, relationships to follow-up research and opportunities for informing further research are laid out. The project's work on standardization and potential for exploitation as a result of standardization activities are shown. This will be explained in more detail in D6.5, which will be submitted in M34. Finally, a timeline for dissemination and exploitation activities is listed.



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1. INTRODUCTION

The Smart Mature Resilience (SMR) project responds to the need for enhanced resilience in European cities. Exploitation measures ensure that the project results will be effectively used also after project end. A provisional exploitation plan was presented as an annex to the revised Communication Strategy D7.4 and has been updated following feedback from internal and external partners and reviewers.

This document lays out the approach and methods to be utilised to exploit project results. The project tools have been compiled into two broad consultancy packages, which support strategic development in cities from a short-term and long-term perspective. These packages could be carried out by existing project partners or external actors, as the tools and supporting materials are available publicly through the Smart Mature Resilience website.

According to Article 28 of the SMR Grant Agreement, each beneficiary must — up to four years after the period set out in Article 3 — take measures aiming to ensure ‘exploitation’ of its results by:

- 1 Using them in further research activities (outside the action);
- 2 Developing, creating or marketing a product or process;
- 3 Creating and providing a service, or
- 4 Using them in standardisation activities.

In the case of SMR, the type of exploitation is the use of project results in further research (1), the creation of consultancy packages employing the SMR tools (2/3) and the use of the tools in standardization activities (4).

This exploitation strategy lays out the elements, logic and process behind exploitation of the SMR project outputs. Firstly, the individual tools, their added value in relation to available tools, the supporting materials provided and their function as part of these packages is outlined in detail. Next, the relationship between the consultancy packages and the European Resilience Management Guideline is explained. Finally, the packages produced for consultancy and training are introduced and use cases are proposed.

EXPLOITATION STRATEGY



In the next part of the strategy, relationships to follow-up research and opportunities for informing further research are laid out. The project's work on standardization and potential for exploitation as a result of standardization activities are shown. Finally, a timeline for dissemination and exploitation activities is listed.



2. FUNCTION OF TOOLS AS PART OF CONSULTANCY PACKAGES

The central output of the Smart Mature Resilience project is the **European Resilience Management Guideline**, which is supported by five tools:

	<p>Resilience Maturity Model</p>
	<p>Risk Systemicity Questionnaire</p>
	<p>City Dynamics Model</p>
	<p>Resilience Information Portal</p>
	<p>Resilience Building Policies</p>



2.1 RESILIENCE MATURITY MODEL

3.1.1. TOOL TYPE

- Strategic framework that provides an ideal roadmap for how the resilience process should be in a CITY

3.1.2. ADDED VALUE

- Useable as part of strategic planning
- Facilitates common and holistic understanding of resilience concept
- Enhances communication, engagement and awareness level of the city stakeholders
- Enhances the identification of resilience-strengthening strategies
- Assists cities in assessing their current resilience maturity stage
- Provides a guideline about the steps to follow in the resilience building process, providing policies and indicators to monitor the progress
- Cities can monitor and compare their progress through periodic re-assessment

3.1.3 TOOL SUMMARY

The Resilience Maturity Model is a strategic tool that provides an ideal roadmap for how the resilience process may be through the policies defined in each stage. The Resilience Maturity Model enables, from a strategic level, the identification of areas that need to be improved in each city and reflect these in policymaking and planning.

This tool also helps enhancing the communication among stakeholders since it facilitates a continuous process of discussion and participation of the city stakeholders, which increases their awareness, engagement and commitment on the resilience building process. This tool also helps increasing common understanding of resilience understanding resilience as a multidimensional objective.



The tool is already available in its online version whereby users can filter the extensive information in the form to find policies that apply to them. The tool is available at <http://smr-project.eu/tools/maturity-model-guide/>.

3.1.4 SUPPORTING MATERIALS

- Resilience Maturity Model Handbook (See [handbook online](#))
- Supporting videos
- Poster
- Interactive online tool

3.1.5 PACKAGE

[Strategic City Resilience: Planning and Implementation Package](#)

3.1.6 FUNCTION WITHIN CONSULTANCY PACKAGE

3.1.6.1 Framework and foundation for strategic approach

The Resilience Maturity Model provides the structural and operational framework and logic behind the strategic planning and implementation of the city's resilience strategy. It is the underlying basis of the other tools and functions as a reference point throughout the process.

3.1.6.2 Self-assessment, internal audit and categorization of resilience policies

The Resilience Maturity Model is used to carry out an audit of the resilience-relevant policies, projects and activities already undertaken in a city and by its stakeholders and provides generic policy label with which to categorise these actions. Once this process has been completed, this allows the city to compare their activities with those of other cities, to identify and prioritize policies for future investment and to communicate with stakeholders about their role in the resilience strategy. Further, this labelling process, which results in the policy titles of the Resilience Maturity Model, supports communication by the city with its citizens and media, as it helps to summarize complex and technical projects and processes into short and easily communicable phrases, which the media or city press office can then translate into media-friendly narratives.



3.1.6.3 Evaluation and goal setting

The indicators in the Resilience Maturity Model are used as a basis for an evaluation process following the initial implementation period. The Resilience Maturity Model can be used to set out the next policies to be implemented in the upcoming period.

3.1.7. STEPS OF THE EUROPEAN RESILIENCE MANAGEMENT GUIDELINE WHERE THE RESILIENCE MATURITY MODEL IS USED

- (1) Baseline Assessment
- (3) Co-creation of Resilience Strategy
- (4) Implementation & Monitoring
- (5) Evaluation & Reporting

3.2 RISK SYSTEMICITY QUESTIONNAIRE

3.2.1 TOOL SUMMARY

- The Risk Systemicity Questionnaire (RSQ) presents a series of possible risk scenarios that a city might need to respond to. Scenarios are presented in either text or using diagrams. Each scenario depicts a chain of events/risks that come together to form a potential stress requiring resilience in a city. Many of these scenarios represent vicious cycles where the stress on the city escalates over time.
- As the scenarios are assessed, the RSQ reflects an interaction between them – the answer to one scenario affects the potential impact of other scenarios and also whether other scenarios need to be assessed. The RSQ is presented using Excel to enable background programming of these interactions and continual calculations of the risk levels in response to answers.
- The RSQ covers 10 topics where the answers in one topic affect the significance of answers in other topics.
- The RSQ is not a predictive tool. The risk scenarios represent valid possibilities but they must be



assessed in the national and local context.

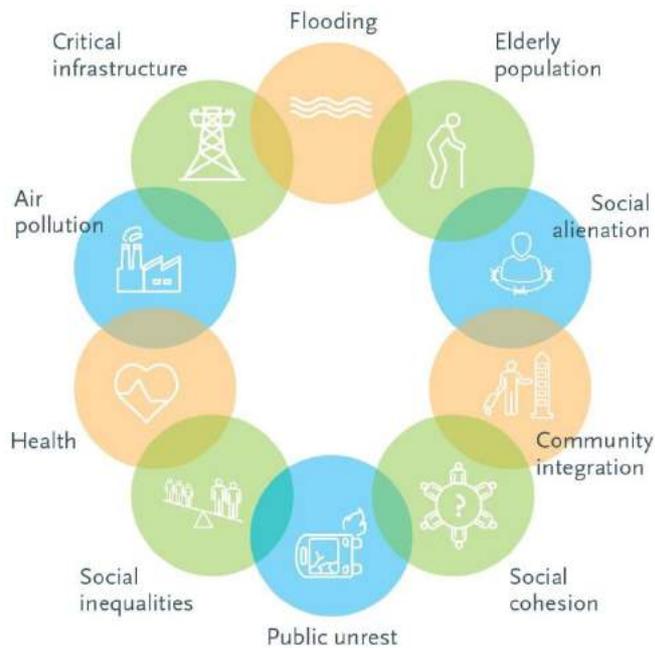
- ➔ The RSQ provides the user with an ability to prioritize the risk scenarios. The priorities are based on user's answers and on the impact of the given risk scenario relative to the broader network of risks.
- ➔ For many of the scenarios tried and tested risk mitigating actions are provided, and these can be used as suggestions to address those risk scenarios by the city.

3.2.2. ADDED VALUE

- The tool is designed to encourage respondents to think about interacting risks rather than individual risks. Thus, it is primarily designed to provide a group of respondents with a vehicle for focused discussion which can bring together a range of expertise and experience from members of the group.
- Groups using the RSQ may be key policymakers, those who advise policymakers and stakeholders who have expertise and experience that will enhance understanding of risk.

3.2.3. TOOL DESCRIPTION

The Risk Systemicity Questionnaire is an Excel based tool where users are asked to consider the relative likelihood of a broad range of risks in their cities. These risks are spread across ten topics and are considered as networks of interrelated risks:



These networks of risks are presented as risk scenarios, some of which result in vicious cycles. Users progress through the tool by completing questions, which ask them to consider whether defined risks scenarios are likely or not to occur in their cities.

Based on the responses to the questions contained in each of the topics of the RSQ, scenarios are prioritized with respect to the risk which they may impose on the city. In addition to this, users can access risk mitigating actions that may be used to address those risk scenarios that are of most threat to the city.

Not only does completing the Risk Systemicity Questionnaire help cities to assess their exposure to risk, but it also indicates their level of awareness of risk and where cities should prioritise their efforts. The purpose of the questionnaire is for it to be used by groups of users with diverse areas of expertise so that it can prompt valuable discussions where different stakeholders' experiences can be brought together to determine a city's priorities to enable them to anticipate and appropriately respond to future challenges.



3.2.4. SUPPORTING MATERIALS

- Short explanatory videos
- RSQ handbook (See Annex 1)

3.2.5. PACKAGE

City Resilience to Risk: Evaluation and Discussion Package

3.2.6 FUNCTION WITHIN CONSULTANCY PACKAGE

3.2.6.1 Discussion structure

The Risk Systemicity provides a replicable format for guided discussion, which allows municipalities to hold meetings on risk including diverse stakeholders and municipal department representatives.

3.2.6.2 Self-assessment, reporting and review of progress of outcomes

The Risk Systemicity Questionnaire allows users to save their results and comments as outcomes of facilitated sessions. Following several implementations of the RSQ, the development of results across time could be presented to map the changing results as risk awareness develops, different sectors are reached and the city's perceived risks change due to local context and current affairs.

3.2.6.3 Contribution to preparedness planning, risk awareness assessments, communication strategies and recommendations for further research

The topics raised in the RSQ sessions, the participants' opinions on the severity of different risk scenarios and the results of discussions could contribute to the structuring of quantitative risk assessments, which the city may also be carrying out. The insights gleaned from the sessions as to different groups' perceptions of the relative likelihood of risk scenarios provides the city with valuable information on how best to communicate with that particular group, how to address their fears and benefit from their existing risk awareness.



3.2.7. STEPS OF THE EUROPEAN RESILIENCE MANAGEMENT GUIDELINE WHERE THE RISK SYSTEMICITY QUESTIONNAIRE IS USED

- (1) Baseline Assessment
- (2) Risk Awareness
- (4) Implementation & Monitoring
- (5) Evaluation & Reporting

3.3 CITY RESILIENCE DYNAMICS TOOL

3.3.1 TOOL TYPE

- ➔ Interactive online training tool

3.3.2 ADDED VALUE

- Supports interactive learning
- Helps to parameterise the resilience building process problem, as users need to determine the values of the main parameters which characterize the cost and the time needed to achieve a resilient city as part of preparations for using the tool
- Supports in budgeting for resources needed for the resilience building process and also analysing budgetary deviations during the development of resilience
- Supports deep understanding of reasons for budgetary decisions for resilience strategising and the logic behind prioritising one policy over another



- Supports deep understanding on the impact of the temporal order in which the policies should be implemented
- Useable as part of strategic planning of the resilience building process
- Applicable at any governmental level: local, national and international
- Useable by CI providers
- Useable by municipal staff outside of facilitated environment to support learning for resilience decision-making
- Supports understanding of the Resilience Maturity Model
- Builds understanding of prioritising policies of the Resilience Maturity Model and how the temporal order of policies implementation
- Helps to make explicit the precedence relationships among the resilience policies of the Resilience Maturity Model.

3.3.3 TOOL DESCRIPTION

The City Resilience Dynamics is an online serious game where initially the users need to calibrate the tool for their cities by determining the values for the main parameters of the model. Then, the users, based on their resilience building planning, select their current level of investment in different types of policies as a starting point. Using this as a basis, they ‘invest’ units of budgetary resources in some policies, and run a simulation. The result of this simulation shows the effects of their choices as progress compared to their starting point. The results will be effective when the policies are implemented in the proper order, otherwise, the resilience level of the city won’t increase. They once more ‘invest’ in the policies, and continue the process for 40 sets of 1-year simulations.

The goal is to have the overall maturity level improve across all of the dimensions and increase in maturity stage. If unwise investment choices are selected, the user will not progress, and can start again to see how other choices would have resulted in more effective outcomes.

The aim of the City Resilience Dynamics model is to explain the structure that develops the behaviour that the cities should achieve during the Resilience Building process. The model will allow the cities to understand the precedence relationship of the policies included in the Resilience Maturity Model and it



will provide a learning environment to better understand how the Resilience Maturity Model works, and how the Resilience Maturity Model should be implemented.

The City Resilience Dynamics tool should accompany use of the Resilience Maturity Model to help to link the Resilience Maturity Model's abstract concepts to a decision-making and budgeting mindset. First of all, the users need to calibrate the model determining the values of the most important parameters of the model: the implementation cost of the policies, the implementation time of the policies and the depletion time of the policies. Once the model has been particularized for each city, the decision making process starts, where the user needs to plan which policies will be implemented yearly. Taking into account that the policies are related each other through precedence relationships, at this stage, they have identified which policies they need to implement first, which policies in the second place, which policies afterwards and so on. The City Resilience Dynamics runs simulations of the effects of implementing certain policies over a realistic timeframe (yearly to a total of 40 years). When users implement the policies in the appropriate, wise and effective order, they achieve effective results and their resilience level increases eventually until reaching 100% in each of the resilience dimensions.

3.3.4. SUPPORTING MATERIALS

➔ Screencasts with instructional voiceovers

3.3.5 PACKAGE

Strategic City Resilience: Planning and Implementation Package

3.3.6 FUNCTION WITHIN CONSULTANCY PACKAGE

3.3.6.1 Budget planning support for high-level policymakers in cities

The City Resilience Dynamics (CRD) tool provides policymakers with a means to understand the reasoning and justification for budget priorities according to the Resilience Maturity Model. The CRD tool also helps to parameterise the resilience building process in budgetary terms since the user need to estimate the implementation cost of each policy, the implementation time of each policy and the depletion time of each policy. Furthermore, it also helps to make explicit the precedence relationships that exist among the policies, since in order for the policies to be effective they need to be implemented in the proper order. It can help city decision makers to prepare budgetary planning for a long-term period and to understand the benefits and consequences of alternative investment



prioritization scenarios. In this case, the tool would be applied during the preparatory period for policy implementation and budget planning. Furthermore, it can be used as a justification and argument for particular policy investment prioritization options.

3.3.6.2 Planning and capacity Building of technical staff

Once a strategy has been established and funds allocated to particular policies, technical staff tasked with carrying out the resilience building policies can use the tool to understand the Resilience Maturity Model and the practical application of the high level tool in a simulated city reality.

3.3.7. STEPS OF THE EUROPEAN RESILIENCE MANAGEMENT GUIDELINE WHERE THE CITY RESILIENCE DYNAMICS MODEL IS USED

- (1) Baseline Assessment
- (3) Co-creation of Resilience Strategy
- (4) Implementation & Monitoring

3.4 RESILIENCE BUILDING POLICIES

3.4.1. TOOL TYPE

- ➔ Policy collection including case studies and examples from literature

3.4.2. ADDED VALUE

- Useable as part of strategic planning
- Provides references and examples of initiatives undertaken by cities to support policies identified in the Resilience Maturity Model
- Provides further detail and links to connect theoretical planning to transformative action



- Clickable online interface that is intuitive and easy to use

3.4.3. TOOL DESCRIPTION

The Resilience Building Policies tool is an extension of the online version of the Resilience Maturity Model. It is hosted online and searchable using the Resilience Maturity Model as a filter tool. It combines custom ways to view policies contained in the Resilience Maturity Model with detailed information and examples from initiatives identified in the Risk Systemicity Questionnaire as well as case studies from SMR cities and further details from scientific literature to encompass a comprehensive reference centre for high-level strategic managers in cities as well as municipal workers tasked with implementing the policies that have been planned. It is adaptable and interactive through the SMR Policy Wiki, where cities can request login details to contribute their own case studies to the tool.

To support “learning from on-going processes through city and cross-regional collaboration”, the purpose of the RBP tool is to offer a portfolio of case studies that provide detailed examples that demonstrate how cities have implemented initiatives to strengthen their city resilience. The examples have been chosen as they exemplify policies included in the associated SMR Resilience Maturity Model (RMM) tool. The RBP is intended to be used together with the RMM and the case studies included in the RBP illustrate, in a practical way, the formulation and implementation of the policies included in the RMM. The practicality of these case studies is ensured by providing cases grounded in cities’ real experiences that describe relevant city context, goals, challenges faced by cities, resources required, and the achieved outcomes. The cases included have been gathered from city partners of the SMR project as well as other cities across the world as reported in the literature.

3.4.4. SUPPORTING MATERIALS

Deliverable D3.4¹. Resilience Building Policies manual²

3.4.5. PACKAGE

Strategic City Resilience: Planning and Implementation Package

¹ Deliverable 3.4 is available at http://smr-project.eu/fileadmin/user_upload/Documents/Resources/WP_3/D3.4_Final.pdf

² Resilience Building Policies manual is currently undergoing layout and design and will be uploaded to the SMR website during M34



3.4.6 FUNCTION WITHIN CONSULTANCY PACKAGE

3.4.6.1 Reference source for replicable examples

The Resilience Building Policies collection provides a source of real-life examples to provide applications of the high-level policies outlined in the Resilience Maturity Model. This provides background information, contact people and inspiration for technical staff and for strategic planners both for the drafting and during implementation of the resilience strategy.

3.4.6.2 Reporting of activities to other departments and other cities

At the end of a policy implementation period, the city can use the Wiki function to add their case study report. This provides both their colleagues in the city and other cities working on resilience with information and an update on their implemented policy.

3.4.7. STEPS OF THE EUROPEAN RESILIENCE MANAGEMENT GUIDELINE WHERE THE RESILIENCE BUILDING POLICIES TOOL IS USED

- (1) Baseline Assessment (review mitigating actions)
- (3) Co-creation of Resilience Strategy
- (4) Implementation & Monitoring
- (5) Evaluation and Reporting

3.5. RESILIENCE INFORMATION PORTAL

3.5.1. TOOL TYPE

- ➔ Online platform and transferable toolbox



3.5.2 ADDED VALUE

- Supports awareness-raising of resilience in a city
- Provides software to cities to use as part of their intranet system and a public site exposed to the Internet
- Allows different levels of permissions and users
- Can complement and enhance the platforms and software that cities already have in place
- Online content management system that is easy to use
- Facilitates city resilience with technological means
- Enhances cross-sector collaboration within the city
- Supports communication and collaboration between city and citizens, city and stakeholders, and among different cities
- Enables cities to empower their citizens through the proper information provision

3.5.3 TOOL DESCRIPTION

The Resilience Information Portal serves as a toolbox that can complement and enhance the platforms and software that cities already have in place. It allows cities to display data internally or publicly that is already available to the city as it applies to resilience, vulnerability and crisis situations. The portal allows for different levels of users to allow for city managers, critical infrastructure providers, citizens or other stakeholders to be able to contribute information as applies to a given city context. The portal offers added value not available otherwise to cities (as they self-reported), as the cities have multiple (for example, SMR core city Glasgow reported dozens) of platforms in place in their municipalities for internal communication, but the wealth of information available to them is not integrated, streamlined or fully utilized. Furthermore, the tool includes a number of levels of users, which accounts for the complexity of the network of stakeholders and target groups that are to be considered in building resilience. Lastly, the toolbox format facilitates the practical reality in cities, which is that replacing existing communication systems is impractical and would cause unwarranted



disruption. Therefore, providing the platform as a toolbox allows cities to select the elements not already available to them without undoing or disrupting facilities and channels that already function effectively.

3.5.4. SUPPORTING MATERIALS

Handbook, video tutorial series

3.5.5. PACKAGE

Strategic City Resilience: Planning and Implementation Package

3.5.6 FUNCTION WITHIN CONSULTANCY PACKAGE

3.5.6.1 Planning for upgrade of municipal web infrastructure

The portal facilitates an evaluation of the existing communication infrastructure run by the municipality and its design principals show IT managers the recommendations for what their websites should provide. This allows IT managers or decision makers responsible for IT department budget to plan website infrastructure revision and upgrade.

3.5.6.2 Technical implementation of website upgrade

The tool provides technical resources and code for IT professionals to upgrade the municipal website and supplement existing communication platforms.

3.5.7. STEPS OF THE EUROPEAN RESILIENCE MANAGEMENT GUIDELINE WHERE THE RESILIENCE INFORMATION PORTAL IS USED

(1) Baseline Assessment (communication plan development)

(4) Implementation & Monitoring



3. CONSULTANCY AND TRAINING

According to the SMR Grant Agreement (p.21), the Resilience Management Guideline as main result of the SMR project is not regarded for commercial exploitation. However, the tools that SMR will develop to assess and monitor risks and resilience maturity levels could have a commercial potential by embedding them into a broader service strategy and portfolio to be offered to clients.

The SMR tools have proven in a series of training workshops held for regional city groupings and global cities at the UN Habitat World Urban Forum to be easily understandable, attractive and applicable for cities, including cities from outside Europe. They have proven to be a user-friendly basis for city-focussed training.

Three consultancy formats are proposed below. The first two are based on the implementation of the Risk Systemicity Questionnaire (RSQ). It should be noted that consultancy support with respect to the RSQ can be helpful but it is not necessary as the tool is designed to be easy to use.

The first consultancy package comprises a train-the-trainer focused kick-off training, whereby the city can subsequently organize independently-run sessions where municipal staff provides the training after the initial kick-off session. For the second package, the city contracts regular visits from the consultants to prepare and provide repeated trainings as well as reports and recommendations based on the outcomes of the sessions.

3.1 CITY RESILIENCE TO RISK: DISCUSSION AND EVALUATION KICKOFF PACKAGE

Key Partners

→ Facilitation experts, municipal departments and city decision makers

Key Activities

The key activity will be the provision of one-day training in person to groups in municipal departments as part of support and evaluation of carrying out resilience projects in the city. 'Train the trainer' format where one initial group would be introduced to using the Risk Systemicity Questionnaire tool and a responsible person in the city could thereafter carry out follow-up implementations of the tool.



Key Resources

- ➔ RSQ Excel tool, Supporting video clips and printed RSQ handbook

Added Value of the Tool

- Designed to encourage respondents to think about interacting risks rather than individual risks.
- Provides a group of respondents with a vehicle for focused discussion about risk scenarios – an unfolding picture of interacting risks which can bring together a range of expertise and experience from members of the group.
- Groups using the RSQ may be key policymakers, those who advise policymakers, and those who have expertise and experience that will enhance understanding of risk.
- Calculates a prioritised list of risk scenarios indicating which scenarios are likely to be most important for mitigation
- Introduces a range of ‘tried and tested’ strategies and actions for risk mitigation.
- Cities can monitor and compare their progress through periodic self-assessment
- Uses facilitation staff from inside the municipality following initial kick-off training
- Time-efficient method to bring different departments together and focus their discussion to share their knowledge of risk from different municipal departments and non-governmental organisations (or, for example, citizens’ perception of risk)

Relationships between instigators and receivers of training

Relationships would be based on a period of short-term intensive training, after which point the city carries out subsequent RSQ sessions independently with the use of the Excel tool and handbook.

Customer Segments

- City decision makers/ politicians
- Municipal project teams



- Resilience Office team
- New staff working on risk or resilience topics
- NGOs

Channels for publicising training

- ➔ Direct selling, word of mouth and recommendations through other cities and city networks

Revenue Streams

- Facilitators' fees for intensive kick-off training period with training materials for future sessions provided. Note: the RSQ manual is freely available as a PDF online and limited printed versions are available free of charge from the SMR project.

2.1.1 USE CASE: KICK-OFF PACKAGE

Possible participants: Project teams, resilience team, municipal staff working on topics relevant to risk

Timeline: 4 hours training over 2-day period

One half-day session would be sufficient to introduce to the concept of risk systemicity and to familiarise the participants with the purpose and features of the RSQ and to run through a pilot use of the RSQ. Longer sessions could be organized if desired, or if future trainings among internal staff wished to bring specific queries.

Use: The City Resilience to Risk: Discussion and Evaluation Kickoff Package is contracted in the context of staff training of project teams. The Risk Systemicity Questionnaire (RSQ) is used as part of this package to promote and facilitate a designed and structured discussion about risk assessment and risk mitigation across teams that are working on city projects that bring together a range of stakeholders from across the city. The process would be expected to help develop consensus and to flush out different perspectives on resilience.



Project team sessions

8 sessions are carried out, whereby 8 of the 10 topics of the RSQ are discussed. These sessions could include the same participants for the whole 2-day training, or the city could put together a mixture of different groups most relevant to the topics to be discussed.

Train-the-trainer sessions

The package is supplemented with two closed tailored sessions on the further 2 topics of the RSQ specifically for the training of selected team leaders, who should be responsible for carrying out follow-up sessions after the kick-off period. The trainer would also be introduced to the process for tracking and following the areas for particular focus as raised in the sessions.

Materials

As part of the package, the Excel based tool and a supply of RSQ manuals would be provided to the city.

Follow-up sessions

Following the kick-off, the city would independently organize internal sessions whereby the trained project team leaders would facilitate the group through completion of the RSQ. The process would highlight those areas, which require most attention by the project team and support discussion about the development of risk mitigation strategies with respect to the likely risk scenarios and through inspection, in the RSQ, of suggested tried and tested strategies and actions. This can be supported through discussion about the portfolios of initiatives that have been successful in other cities.

Timing: The RSQ kick-off should be ideally carried out at the beginning of a project in order for the team to think differently about risks that may affect the success of their project. The RSQ can help to guide discussions considering interconnections between potential risks outside of the obvious project risks, and to arrive at a consensus on the awareness of different risk and their systemic impact on other aspects of the city. Subsequently, the questionnaire should be re-used periodically to appraise the issues raised during the initial application and discussion in order to evaluate and monitor risk mitigation.



2.1.2 VARIATION: ENGAGEMENT WITH CITY STAKEHOLDERS

Use: The RSQ can be used as a way of awareness-raising among a wide set of city stakeholders. The RSQ would be the basis for focus group meetings involving, for example, pressure and voluntary groups seeking to help the city become more resilient. In particular, given the significance of social cohesion as a force for making a city more resilient, the RSQ could be used to promote discussion about the potential risks to social cohesion. This can help to build social capital with respect to resilience and risk.

Timing: Periodically when opportunities arise. The city could use the same target group periodically to compare possible improvements. For this variation, the elected ‘trainers’ could include representatives of community groups, or could be municipal employees responsible for community outreach and engagement.

2.2 CITY RESILIENCE TO RISK: DISCUSSION AND EVALUATION SUPPORT PACKAGE

As part of a longer-term support package, a city would apply the Risk Systemicity in repeated cycles, supported by follow-up recommendations provided by the trainers.

This case is in most aspects the same content as 2.1, so the entirety of the package description will not be repeated. Instead, where there are differentiations, this will be detailed under the applicable headings.

Key Partners

→ Municipal staff and stakeholders, heads of department, city decisionmakers and advisors

Key Activities

The key activity will be the provision of periodic training in person to groups in municipal departments as part of support and evaluation of long-term risk awareness and risk assessment work in the city. 8 1.5-hour sessions would include a collection of participants including external stakeholders as identified by the city. If needed, the training providers can support in recommending which groups to



invite. As part of the initial training, 2 closed sessions are held for high-level strategic planners with a focus on long-term risk planning in the city. Following the initial implementation, subsequent sessions would build on outcomes from previous sessions and facilitators would provide reports, recommendations and guidance in addition to session facilitation.

Key Resources

→ RSQ Excel tool, Supporting video clips, printed RSQ handbook and, in addition to the materials provided, a tailored city risk awareness and action recommendations report will be delivered following the training session.

Added Value

- Cities are provided with written reports of their progress through periodic re-assessment with tailored action recommendations
- Does not require expert knowledge or research
- Long-term program can continue without reliance of availability of trained staff
- Repeated implementations can reach new groups and take a different angle as the city's risk awareness needs progress

2.2.1 USE CASE: SUPPORT PACKAGE

Possible participants: Municipal staff and stakeholders, heads of department, city decisionmakers and advisors

Timeline: Initial 8 hours total training over a 2-day period and subsequent periodic training visits

- 4 1.5-hour sessions with participants, heads of department, city decisionmakers and advisors
- 2 1-hour specialized sessions with heads of department, city decisionmakers and advisors

Use: The City Resilience to Risk: Discussion and Evaluation Support Package is contracted in the context of long-term risk awareness work carried out by a city. The Risk Systemicity Questionnaire (RSQ) is used as part of this package to promote and facilitate a designed and structured discussion



about risk assessment and risk mitigation across teams that are working on city projects that bring together a range of stakeholders from across the city. The process would be expected to help develop consensus and to flush out different perspectives on resilience, as well as building a comprehensive, wide-reaching and long-term view of risk awareness and its development in the city.

Project team sessions

8 sessions are carried out, whereby 8 of the 10 topics of the RSQ are discussed. These sessions could include the same participants for the whole 2-day training, or the city could put together a mixture of different groups most relevant to the topics to be discussed.

Decisionmaker sessions

The package is supplemented with two closed tailored sessions on the further 2 topics of the RSQ specifically for strategic risk considerations in the context of city planning.

Materials

As part of the package, the Excel tool and a supply of RSQ manuals would be provided to the city. Following the initial session, the trainers would also provide the city with a report and list of recommendations on the basis of the training outcome.

Follow-up sessions

Following the initial training, the city would receive periodic training visits where the RSQ training would be repeated with the same or different groups. The process would highlight those areas, which require most attention by the project team and support discussion about the development of risk mitigation strategies with respect to the likely risk scenarios. This can be supported through discussion about the portfolios of initiatives that have been successful in other cities.



2.5 CITY RESILIENCE STRATEGY: PLANNING AND IMPLEMENTATION SUPPORT PACKAGE

Combining the Resilience Maturity model, the Resilience Building Policies, the City Resilience Dynamics and Resilience Information Portal tools produced by the SMR project, a fully complementary training package can support cities in a holistic strategic resilience building process.

Key Partners

Experts in facilitation and in strategic resilience management taking a holistic perspective

Key Activities

- Providing training in person to strategic managers in municipal departments to inform long-term strategic planning for resilience in the city
- Continuing relationships with training groups and revisiting periodically to update city resilience strategy

Five-stage process of application of the tools, which should be repeated periodically after implementation of policies:

- 1 Assess resilience maturity level according to the Resilience Maturity Model
- 2 Explore repercussions and benefits of implementing certain policies before others in order to accurately assess the impact of the implementation order of the policies in the resilience building process by using the System Dynamics Model
- 3 Research case studies, examples and literature as a basis for replication of policies through the Resilience Policies tool
- 4 Strategise and implement selected policies, including use of the Resilience Information Portal to upgrade communication infrastructure
- 5 Repeat process after implementation period to establish the most effective next policies to implement



Key Resources

- Network of cities and close relationships through SMR project
- Readily useable tools
- Supporting handbook, poster, tutorials and online tools
- Authority and image through expertise of project's partners

Added Value

- System dynamics model provides a training tool
- Consultancy and training for strategic decisionmakers for resilience planning, where many cities have no established methods or departments for resilience planning
- Can involve multi-stakeholder groups, including citizens
- Can help senior management inform multiple departments coherently
- Users do not require expertise or prior experience with resilience in order to use the tool
- Cities can monitor and compare their progress through periodic re-assessment
- In the case of the City Dynamics Model: Supports decision-makers in confirming the value of prioritising certain resilience policies over others on the basis of their assessment of their current maturity stage

Customer Relationships

Long-term relationships with short periods of more intensive interaction before and after trainings

Customer Segments

- Managers and politicians in local, regional and national governmental departments establishing and coordinating resilience management strategies
- Where a city has staff working explicitly on resilience, or a 'Resilience Office', this team could be



involved

Channels

- Direct selling
- Word of mouth
- SMR website, city portal
- ICLEI website, ICLEI communication channels and ICLEI network
- Recommendations through other cities and city networks

Cost Structure

Minimal overheads

Revenue Streams

- Facilitators' fees
- Fee for customised assessment and policy recommendation report provided by facilitators following training

2.5.1 USE CASE: CITY RESILIENCE STRATEGY SUPPORT PACKAGE

Resilience management in cities, strategic planners in cities in cross-departmental teams, critical infrastructure providers

Timing: The Maturity Model can be used as a tool to guide the resilience building process when a city starts defining its resilience strategy. Once this strategy is already being implemented, this tool also helps cities to assess their progress, providing an ideal roadmap of the policies that need to be implemented to move on to a more advanced maturity stage.

Use: The City Resilience Strategy support package assists cities in assessing current maturity stage and identifying future resilience demands and capacities in order to advance to a more mature level. It



also allows end users to understand resilience as a multidimensional objective, gaining a holistic understanding of each dimension and their interrelationships. The package guides cities through identification and implementation of resilience policies.

The process to follow in order to assess the city's current maturity stage is the following. The city stakeholders should research, categorise and record policies that have been implemented in their cities related to resilience. Afterwards, a training session can be held where the Resilience Maturity Model purpose and structure is explained. The participants of this session would categorise the policies that have been implemented or are in place in their cities, relate them to policies in the Resilience Maturity Model, and on that basis, make a self-assessment of their maturity level for each dimension included in the Maturity Model: Leadership & Governance, Preparedness, Infrastructure & Resources and Cooperation.

Politicians

Timing: systematically when a new city council or government is elected and annually before budget decisions

Use: to inform decision making prior to establishment of budgets

Other organisational Stakeholders: businesses, utilities etc

Timing: as per own initiative to identify where cities or regions may benefit from certain measures

Use: as argument to 'sell' the value of prioritising measures in their interest over others Stakeholders according to resilience maturity level



4. INFORMING FURTHER RESEARCH

The research undertaken is likely to inform and encourage follow-up research. Current follow-up research includes:

Proposals submitted:

- ➔ “Blockchain based Collective Awareness Platforms for Resilient Cities in Europe” (BLOCKCAP) project led by SMR city Vejle and involving SMR partners TECNUN, ICLEI and DIN, building on work into resilience established through SMR project
- ➔ “Smart Cities and Regions” project led by SMR city Kristiansand and planned to involve SMR partners Glasgow, San Sebastian, Riga, Rome, Vejle, University of Strathclyde
- ➔ SEC-21-2017 application involving ICLEI and TECNUN
- ➔ “Nordic Resilience for Societal Security” project led by CIEM involving SMR partners University of Linköping, Kristiansand and Vejle



4.1 TECNUN, UNIVERSITY OF NAVARRA

Research papers

- Marana, P., Labaka, L., & Sarriegi, J. M. (2017). A framework for public-private-people partnerships in the city resilience-building process. *Safety Science*. In press.
- Marana, P., Labaka, L., & Sarriegi, J. M. (2017). Hiri erresilientziaren eraikitze prozesua hobetzeko erakunde publiko, konpainia pribatu eta pertsonen arteko elkarlan markoa. *ALDIRI*. In press.
- Gimenez, R. Labaka, L. & Hernantes, J. (2017). A maturity model for the involvement of stakeholders in the city resilience building process. *Technological Forecasting and Social Change* Volume 121, August 2017, Pages 7-16
- Hernantes, J., Gimenez, R. Marana, P., Labaka, L., & Sarriegi, J. M. (2018). Towards resilient cities: a maturity model for operationalizing resilience. To be submitted
- Labaka, L., Marana, P., Gimenez, R. & Hernantes, J. (2018) Defining the roadmap towards city resilience. To be submitted

Conferences

- Marana, P., Iturriza M., & Sarriegi, J. M. (2017). Coordination of fragmented efforts among city stakeholders to address upcoming city challenges. *Cities and Climate Conference 2017*. Potsdam
- CRITIS (International Conference on Critical Information Infrastructures Security) 10th October 2017, Lucca (Italy) TECNUN <http://www.critis2017.org/>



4.2 UNIVERSITY OF STRATHCLYDE

- Igor Pyrko, Susan Howick, Colin Eden. (2017). “Smart Mature Resilience”. Presentation of the SMR project at the University of Strathclyde’s internal research conference held on the 30th May in Glasgow, UK.

Igor Pyrko, Susan Howick, Colin Eden. (2017). “Smart Mature Resilience”. Poster presentation at the ECCA conference held between 5-9th June in Glasgow, UK.

- Igor Pyrko, Susan Howick, Colin Eden. (2017). “Risk Systemicity and City Resilience”. EURAM conference, held between 21-24th June in Glasgow, UK.
- Colin Eden, Igor Pyrko, Susan Howick. (2017). “Knowledge Acquisition Using Group Support Systems”. Group Decision and Negotiation Conference, held between 14-18th August in Stuttgart, Germany. Won the Springer Best Paper Award.
- Susan Howick, Colin Eden, Igor Pyrko. (2017). “The Risk Systemicity Questionnaire: using causal risk mapping to support resilience building in cities”, Operational Research Society Conference, Loughborough, September 2017.
- Colin Eden, Igor Pyrko, Susan Howick. (2018). “Knowledge Acquisition Using Group Support Systems”. Paper under review in the Group Decision and Negotiation journal.
- Igor Pyrko, Susan Howick, Colin Eden. (2018). “Risk Systemicity: promoting interdisciplinary working in Cities”. Submitted to the EURAM conference, 20-23rd June in Reykjavik, Iceland.
- Colin Eden, Susan Howick, Igor Pyrko. (2018). “Risk Systemicity and City Resilience”. Intended submission to the European Journal of Operational Research journal
- Igor Pyrko, Susan Howick, Colin Eden. (2018). “Risk Systemicity: promoting interdisciplinary working in Cities”. Intended submission to the journal of Technological Forecasting and Social Change.



- Susan Howick, Colin Eden, Igor Pyrko. (2018). “The Risk Systemicity Questionnaire”. Intended submission to the EURO conference, 8-11th July in Valencia, Spain
- Susan Howick, Colin Eden, Igor Pyrko. (2018). “The Risk Systemicity Questionnaire”. Intended submission to the OR60 conference, 8-13th September in Lancaster, UK

4.4 CIEM, UNIVERSITY OF AGDER

- Two planned journal paper submissions: one focuses on functional specification of the Resilience Information Portal, while the other discusses communication challenges and design principles along with the portal.
- One planned conference paper submission: Reviewing Resilience Tools for Communication and Community Engagement
- Reuse the SMR results for proposal application such as done in the “Nordic Resilience for Societal Security” project led by CIEM involving SMR partners University of Linköping, Kristiansand and Vejle (Still waiting for the evaluation results)
- Promoting project results in the national and regional venues
- Make use of the SMR products as show cases at the CIEMlab



5. IPR STRATEGY

The Guidelines on data management in Horizon 2020 ask for data produced, collected or processed on projects to be:

1. Discoverable.
2. Accessible.
3. Assessable and intelligible.
4. Useable beyond the original purpose for which it was collected.
5. Interoperable to specific quality standards.

The IPR policy was defined in the SMR Data Management Plan, D8.3. According to this Plan, the Consortium Agreement establishes that each partner is and remains the sole owner of its intellectual property rights over its Background. The partners have identified and list in the Consortium Agreement the Background over which they may grant access rights for the Project and the Background explicitly excluded. The Partner having generated Foreground in the course of carrying out the Project shall be the owner of such Foreground and have the right to apply for protection of such Foreground. Access Rights to Foreground and Background needed for the execution of the Project shall be deemed granted, on a royalty free basis, as of the date of the EU Contract entering into force.



6. STANDARDIZATION

Standardization of the project results is another opportunity for exploitation of the SMR project results. In this regard DIN, as the standardisation partner of the SMR project, assists various standardization activities based on the five tools and the ERMG. Further explanation on the background of the initiation of these activities can be found in D6.2, D6.3 and D6.4. Detailed information on the below standardization activities will be included in the upcoming D6.5.

In order to support the exploitation and dissemination in general the project introduced a series of standards on the topic of City Resilience Development. As most appropriate to exploit the SMR project results have been identified three key outcomes:

- 1) the European Resilience Management Guideline, uptaken in the standard "City Resilience Development – Operational Guidance";
- 2) the Resilience Information Portal, uptaken in the standard "City Resilience Development – Information Portal";
- 3) the Resilience Maturity Model, uptaken in the standard "City Resilience Development – Maturity Model".

In order to develop these standards, so called CEN Workshops have been established in which also project external organizations and stakeholders are taking part. The results of these three CEN Workshops will be three different but from each other depending CEN Workshop Agreements (CWA). The involvement of project externals and thus the further development and alignment of the project outcomes (five tools and ERMG) is supporting the exploitation of the project and the integration of other opinions and approaches.

Besides the development of the three CEN Workshop Agreements, it is foreseen that these standards will be further uptaken by different means. For example, within the standardization system the three CWAs will be handed over for possible adoption to the corresponding European and international Technical standardization Committees. In this regard the relations of the project and DIN with the European Standardization Committee on Societal and Citizen Security (CEN/TC 391) and the international committee ISO/TC 292 (Security and resilience) and ISO/TC 268 (Sustainable cities and communities) will be exploited. Also the development of secondary publications with relation to the three from SMR initiated standards, the development of further standards on the topic of City

EXPLOITATION STRATEGY



Resilience Development from other current or future research and innovation projects and the discussion of the three CWAs at upcoming conferences and events (e.g. Joint Conference of the DRS-7 projects, Open European Day in Bonn 2018) are envisaged to support the uptake of the standards.



7. EXPLOITATION CALENDAR

An intensive series of events and workshops was scheduled for the final period of the project to optimise exploitation of the project tools. The events are as follows:

- 1 Southern Europe Regional Workshop Malaga, 8 February 2018 - Audience: Tier 3 and European Tier 4 cities
- 2 Training session on Resilience Maturity Model, RSQ and Resilience Building Policies at UN Habitat World Urban Forum, Kuala Lumpur, 9 February 2018 - Audience: European and Global Tier 4 cities
- 3 Scandinavia Regional Workshop Kristiansand, 13 February 2018 - Audience: Tier 1, 3 and European Tier 4 cities
- 4 Central Europe Regional Workshop Berlin, 15 February 2018 - Audience: Tier 3 and European Tier 4 cities
- 5 South-eastern Europe Regional Workshop Athens, 28 February 2018 - Audience: Tier 3 and European Tier 4 cities
- 6 Stakeholder Workshop Brussels, 7 March 2018 - Audience: Policymakers, Tier 1,2, 3 and European Tier 4 cities
- 7 Brussels, CoU Thematic Days, 5-8 March 2018 - Audience: Critical infrastructure practitioners and policymakers
- 8 European Civil Protection Forum, 7 March 2018 - Audience: Critical infrastructure practitioners and policymakers
- 9 Final event, 10 April 2018 - Audience: Researchers, policymakers
- 10 Open European Day at Bonn Resilient Cities, 25 April 2018 - Audience: Tier 3 and European Tier 4 cities
- 11 Bonn Resilient Cities, 26-29 April 2018 - Audience: Tier 3 and European and global Tier 4 cities
- 12 ICLEI World Congress Montreal, 19-23 June 2018 - global Tier 4 cities

EXPLOITATION STRATEGY



- 13 Community of Users on City Resilience, 4-8 June 2018: Critical infrastructure practitioners and policymakers
- 14 BMBF Innovation Forum, 18-20 June 2018, Focus on Civil Security.



8. REFERENCES

Labaka, Leire, Tina Comes, Josune Hernantes, Jose Mari Sarriegi, and Jose J. Gonzalez. 2014. "Implementation Methodology of the Resilience Framework." In 2014 47th Hawaii International Conference on System Sciences, 139–48. IEEE.



ANNEX 1

**SMART
MATURE
RESILIENCE**



FOR MORE
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**RISK SYSTEMICITY
QUESTIONNAIRE USER MANUAL**

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RISK SYSTEMICITY QUESTIONNAIRE **USER MANUAL**

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RISK SYSTEMICITY QUESTIONNAIRE USER MANUAL

*“Resilience reflects the ability of systems to absorb and recover from shocks, while transforming their structures and means for functioning in the face of long-term stresses, change, and uncertainty. This **requires actively understanding the risk landscape**”*
(van der Vegt et al, 2015: 972)¹.

The Risk Systemicity Questionnaire (RSQ) has been developed as part of a H2020 funded project on Smart Mature Resilience² that has created a range of tools to assess and develop cities’ resilience. The RSQ seeks to support cities in “actively understanding the risk landscape” by improving their risk assessment beyond traditional methods through an innovative focus on the interactions between different types of risks. The RSQ has been co-created in close collaboration with representatives of seven European cities, and it presents a range of risk scenarios – perspectives of the future reflecting how one risk might cause others, thus presenting a ‘scenario’ of risks. By exploring a range of risk systemicity scenarios, the user is able to prioritise the high risk areas which may require particular attention. The RSQ enables cities to develop their knowledge of the risk landscape which affects them, thereby developing their resilience.

In contrast to traditional risk registers, the key advantage of using the RSQ is that it promotes a perspective on risks where risks are not seen as being independent from one another, but they form complex networks of interdependencies. A particular focus of the RSQ is on scenarios that are vicious cycles – scenarios that escalate and get worse. Such cycles can occur when the interdependencies between risks create feedback loops that reinforce themselves over time. Vicious cycles of risks are notoriously difficult to mitigate.

In order to tackle the risk systemicity scenarios identified as a priority for a city, the RSQ offers a range of possible mitigation actions – both tried and tested by at least one of the collaborating cities, as well as suggestions that might be considered. Using the RSQ, groups and individuals are invited to think more intentionally about the implications of risk systemicity for their city, and how to deal with its ramifications.

The RSQ is intended to support a group’s discussions regarding risks that are of importance to their city. Section 5 of this document describes a number of uses of the RSQ all of which involve the RSQ facilitating discussion amongst a range of stakeholders who have an interest in assessing and managing risks across a city. It should be noted that the intention of the RSQ is not to provide objective measures of risks. As a tool to facilitate discussion, it encourages users to think differently about risks, through interacting risk scenarios, and to consider the implications of these scenarios for their city.

The aim of this manual is to explain how to use the RSQ. This document is structured according to the following sections:

¹ Van Der Vegt, Gerben S., Essens, Peter, Wahlström, Margareta and George, Gerard. 2015. "Managing risk and resilience". *Academy of Management Journal*, 58(4): 971-980.

² www.smr-project.eu/home

Section	Title	Purpose
2	Using the Risk Systemicity Questionnaire: a quick guide	Explains key function of the RSQ
3	Summary of key points	Summary of key messages regarding recommended approaches for using the RSQ
4	Technical reference	Compliments the initial 'quick guide' section with a more detailed explanation of the functionalities of the RSQ
5	Uses of the RSQ	Approaches to using the RSQ in cities which target different user groups
6	Appendix A	Enabling macros in Excel
7	Appendix B	Editing scenarios in the RSQ
8	Appendix C	Mapping risks and building risk scenarios

1. USING THE RISK SYSTEMICITY QUESTIONNAIRE: A QUICK GUIDE

STEP 1: OPENING THE RSQ

The RSQ has been designed so that it does not require any specific technical skills.

Open the RSQ in Excel, and the use of ‘macros’ has to be enabled (see Appendix ‘A’ – enabling macros).

On the starting page of the RSQ (Figure 1), the user can fill in basic information about themselves, and can also i) view

a demonstration how to enable macros (see Appendix for further information); ii) view the built-in user instructions, iii) clear all answers from this copy of the RSQ if it has been completed previously. It is also recommended to save the RSQ with a new file name so as not to overwrite the ‘master copy’ which can be used in future applications.

The screenshot shows the starting page of the Risk Systemicity Questionnaire. At the top, it says "RISK SYSTEMICITY QUESTIONNAIRE" and "A city resilience tool developed as part of Work Package 3". There is a logo for "SMR Smart Urban Resilience". Below this, there is a section titled "PLEASE WRITE YOUR DETAILS BELOW" with three input fields: "YOUR NAME:", "YOUR ORGANISATION:", and "YOUR FUNCTION:". To the right of these fields is a button labeled "RSQ instructions". Below the input fields, there is a warning: "Please answer the questions on the next sheets, and remember to enable macros in your copy of Excel! Macros need to be enabled in order to allow the various essential functionalities of the RSQ." At the bottom of the page, there are two buttons: "How to enable macros? (based on Office 2013)" and "Clear all answers from the RSQ (if completed before)".

This button allows you to access built-in instructions for using the RSQ.

This button clears all answers from the RSQ - it is useful when you want to clear a previously completed copy of the RSQ.

This button explains how to enable macros, but it is useful only when demonstrating it to others on a large screen. Otherwise see the instruction included in this document.

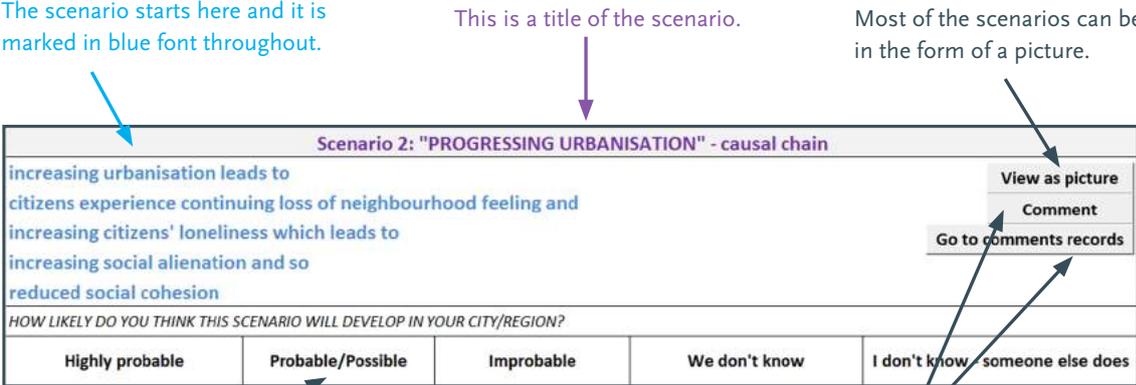
Figure 1: Starting page of the Risk Systemicity Questionnaire

STEP 2: COMPLETING THE RSQ TOPICS

Select one of the Excel tabs which explore the **10 risk topics** that are covered in the RSQ. Depending upon the focus of the user group's discussion, you may wish to select particular risk topics that are of interest to the group, or complete all 10 risk topics.

Each of these topics comprises of a number of risk scenarios, and the user is asked to consider how likely these scenarios are to occur in their city (Figure 2). There are five possible responses to each scenario which can be chosen by double-clicking on the respective response:

- *Highly probable* – signifying a >60% chance of occurring
- *Probable/possible* - signifying a 20-60% chance of occurring
- *Improbable* - signifying a <20% chance of occurring
- *We don't know* – which means that no-one in the City, or in the project team who are the RSQ users, is likely to be able to answer this question.
- *I don't know but someone else does* - which means that the user does not know the answer to this question, but believes someone else in the City, or in the project team, is likely to be able to answer this question



The scenario starts here and it is marked in blue font throughout.

This is a title of the scenario.

Most of the scenarios can be viewed in the form of a picture.

Double-click one of the answers to select it.

It is possible to save the users' comments with respect to the given scenario. The user can also go to the comments records where all previously saved comments are stored.

Scenario 2: "PROGRESSING URBANISATION" - causal chain				
increasing urbanisation leads to citizens experience continuing loss of neighbourhood feeling and increasing citizens' loneliness which leads to increasing social alienation and so reduced social cohesion				
HOW LIKELY DO YOU THINK THIS SCENARIO WILL DEVELOP IN YOUR CITY/REGION?				
Highly probable	Probable/Possible	Improbable	We don't know	I don't know - someone else does

Figure 2: Example of a risk scenario in the Risk Systemicity Questionnaire

As seen in Figure 2, in addition to reading the risk scenarios as text, **a scenario can also be viewed in the form of a picture** (by clicking a 'view as picture' button). Some of the pictures represent causal chains of risks, while other pictures represent

self-reinforcing, closed vicious cycle (see section 5 for a more detailed explanation of the difference between causal chains and vicious cycles), and so pictures may assist in understanding better the structure of the given risk scenario.

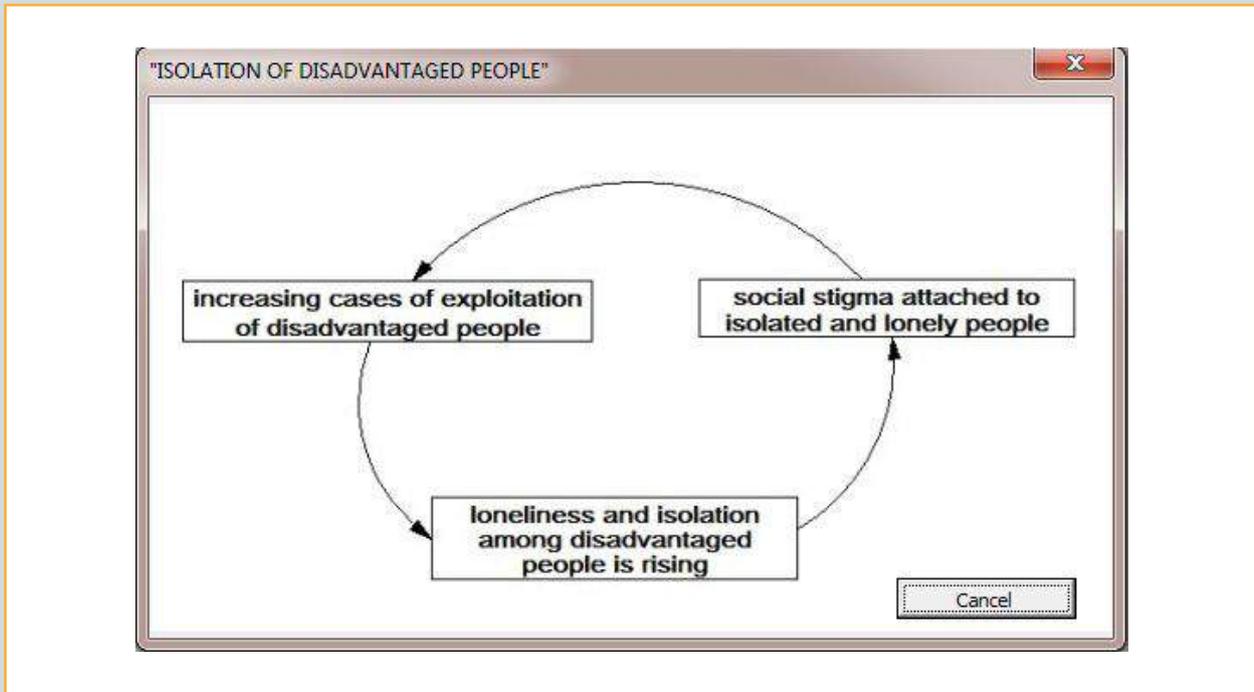


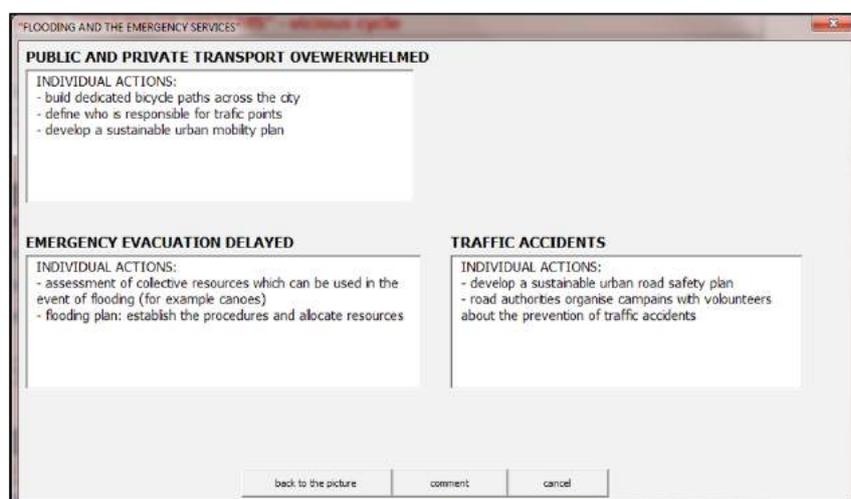
Figure 3: A picture of a vicious cycle in the RSQ

The **'comment'** button allows the user to save their own comments about the risk scenarios. All comments are stored on a separate 'comments record' page which can be accessed by clicking on the **'go to comments record'** button.

Upon completion of a given topic (tab), the user can click the **'see risk mitigating actions'** button at the bottom of the page. The user will then be taken back to the top of the topic, and, if mitigation actions are included, a new button (**'view mitigating actions'**) will appear for some of the risk scenarios which will

direct the user to a screen from where they can explore a portfolio of possible mitigating actions for that scenario (Figure 4).

Editing scenarios is possible. However, to avoid destroying the background programming in the RSQ it is necessary that lines in scenarios are not deleted. There are two ways of modifying scenarios: i) edit lines in a scenario (including making a line of a scenario blank), without changing the overall logic of a scenario, and ii) copying and pasting a scenario into a comment box and then editing it.



View mitigating actions

Upon completing each of the RSQ topics, a 'view mitigating actions' button will appear next to the relevant scenarios (right under the 'view as picture' button).

After clicking the 'view mitigating actions' button, you will be presented with a number of suggestions for risk mitigating actions with respect to the given scenario. You can copy those actions (using Ctrl+C shortcut) and paste them into the comment box (using Ctrl+V shortcut) which will allow you to edit and expand them.

Figure 4: Mitigating actions

STEP 3: CHECKING THE PRIORITIES

The ‘**priorities**’ tab in the RSQ provides a ranking of the completed scenarios according to their assessed priority (Figure 5). This ranking automatically updates itself as new scenarios are being completed, and it does not require that all scenarios are completed – which means that, for example, the user may choose to complete two topics only and still

receive a priority ranking. These priorities are based on an analysis of i) the extent of the scenario’s ramification, and ii) their impact on key outcomes. They are intended only as a basis of a discussion that leads to a revised set of priorities that take account of local context.

Clicking on the **RANK** button ranks all the scenarios by their priority (this ranking is also triggered automatically when opening this page). In addition to this, it is also possible to sort the scenarios by the priorities added by the user.

By clicking on a given RSQ topic, the scenarios from all other topics will be hidden from the list.

It also possible to reveal or hide those scenarios which have not been attempted yet.

In this column the user can enter their own priority ranking based on their judgment.

Sort by:		Elderly Social cohesion Social alienation Social inequalities Flooding Pollution						Hide 'no answer'	
RANK		Health		Integration		Public unrest		Infrastructure	
USER ranking		Show all scenarios							
PRIORITY RANKING OF ALL SCENARIOS									
SCENARIO	TOPIC	USER ANSWER	RANKING	USER RANKING					
5/9: AGED CITIZENS' FEAR OF CRIME IN THE CITY	elderly/cohesion	we don't know	1						
8/8: MENTAL HEALTH AND LONELINESS	elderly/health	probable/possible	2						
10/9: HEALTHCARE UNDER PRESSURE	elderly/health	probable/possible	3						
2/4/4: PENSION AGE	elderly/cohesion/alienation	probable/possible	4						
9: ALCOHOL ABUSE	elderly	highly probable	5						
6/5/8: DIGITAL MARGINALISATION	elderly/soc. cohesion/alienation	i don't know	6						
4/6: SINGLE HOUSEHOLDS	elderly/alienation	i don't know	7						
7/3/7: DEMENTIA AND THE ELDERLY	elderly/inequalities/health	improbable							
3/7/5: FAMILY MEMBERS CO-LOCATION	elderly/cohesion/alienation	improbable							
11/6: SOCIAL WELFARE AND FAMILY SUPPORT	elderly/cohesion	improbable							

Figure 5: Priority ranking

2. SUMMARY OF KEY POINTS

Before starting to work with the RSQ, please be reminded of the following list of ‘key points’ which help to clarify the purpose of this tool:

- RSQ is primarily a tool for facilitating group discussions about RISK SCENARIOS, it is not a quantitative diagnostic tool.
- It is recommended to take notes using the comment box both when completing the RSQ as a group or as an individual. However, remember about the limit of 8000 characters (including spaces) for each scenario (8000 characters amount to about 2 pages of text – see section 4 for more information). When the 8000 words character limit in the comment box is exceeded through copy-pasting, a new comment will not be saved by the RSQ and the user will be notified about it.
- It is very likely that you will disagree with a part of some of the scenarios – a focus of the group discussion should be on how the scenarios do, or do not, fit with your city context. When you disagree with a scenario, the group should discuss how the scenario should be presented with respect to their city, and save these comments in the comment box.
- When completing the RSQ, you will find that some scenarios appear in more than one topic – for example the same scenario about air pollution may appear under the ‘air pollution’ topic and under the ‘health’ topic. However, it is sufficient to complete the scenario only once – all other ‘repetitions’ of that scenario will be completed automatically. These types of repetitions serves two purposes: i) each topic will necessarily include scenarios and causal links that are in other topics, which thereby points to the systemic nature of risks and ii) it is anticipated that users may want to tackle only one or two topics and so it is important to ensure that the individual topics cover all the relevant scenarios from the RSQ.
- The main benefit of using the RSQ is in supporting users, and especially user groups, in conducting interdisciplinary conversations about the systemicity of risks faced by their cities – that is how different types of risks interact with one another. These discussion are further supported by an ability to i) prioritise the risk scenarios, and ii) access suggestions for risk mitigating actions.
- Priorities are suggestions only, where the suggested priorities are based on an analysis of the impact of a scenario within the full context of all scenarios and therefore should be adjusted to the local context of the city
- There is no imposed timeframe for working with the RSQ, which means that it is expected that it is the users who will select an appropriate timeframe for themselves. Although this can be determined based on the specific context for which the RSQ is being used, during the construction of the RSQ the city partners have found a period of 3-5 years a usual timeframe to consider.

3. TECHNICAL REFERENCE

In this section you will find additional information regarding the features of the RSQ described in section 2 ‘a quick guide’, as well other technical information relevant to the use of the RSQ.

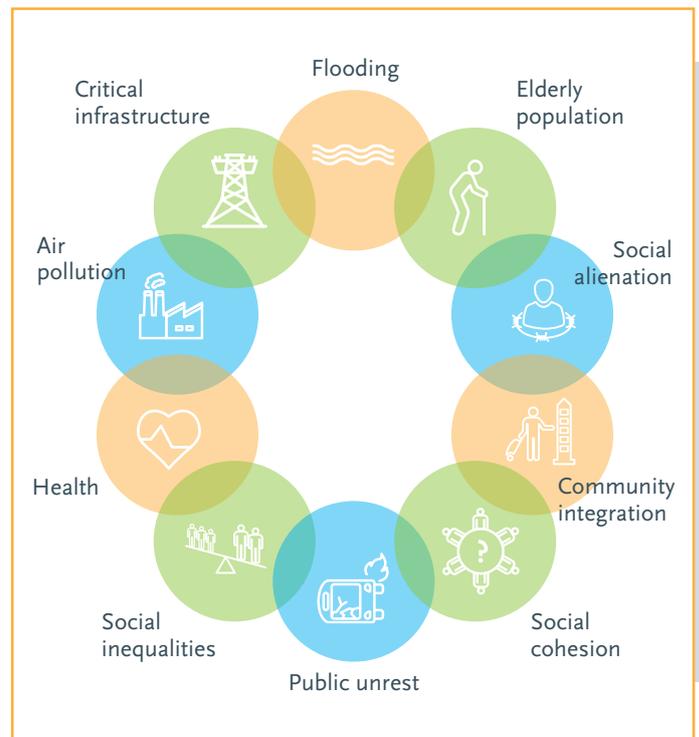
Computer requirements

The following are the recommended technical requirements for the machines running the RSQ:

- A ‘modern’ PC computer.
- MAC users are recommended to try using a PC emulator on their machines.
- Windows 7 operating system or later, and Windows must be fully patched and updated – especially with the Service Packs.
- MS Office 2013 or later, with Macros enabled in Excel (see Appendix).
- Avoid loading the RSQ from a pen drive – it is important that the file is transferred to a desktop before using the RSQ.
- Use a simple name for the RSQ file (e.g. “RSQ_city”) and avoid any dots in the name (dashes are fine).
- When using old PC machines, in situations when the RSQ is already processing a task, the user is recommended to wait until the ‘processing’ icon of the mouse cursor is ready before proceeding to another command.

RSQ topics

The RSQ comprises of 10 topics which fall under the three broad themes of the Smart Mature Resilience project, and which are: social dynamics, climate change, and critical infrastructure. Each topic can be accessed in a dedicated Excel tab, and it consists of around 10-14 risk scenarios. These ten topics are:



Although the topics can be explored individually, they are not separate from one another. Indeed, interaction between risk scenarios occurs across risk topics. Such interactions result in some scenarios appearing in multiple RSQ topics (for example a scenario may appear both under ‘health’ and ‘air pollution’). However, the user is only asked to provide an answer to that scenario once – the same scenario which also appears in a different RSQ topic will then be completed automatically. Thus, the interacting scenarios allow chains of arguments which cross between different RSQ topics to be captured. This feature of the RSQ emphasises the importance of considering the interdependencies between risks. Note

that those scenarios which interact across the different tabs can be differentiated by the purple font of their headlines, whilst the remaining scenarios have red headlines.

In addition to this, some scenarios act as triggers for other scenarios. When a trigger scenario is answered as being 'improbable', then the scenarios which would otherwise follow from that 'improbable' scenario are disabled and effectively hidden from the RSQ. This feature applies particularly to the first scenario in each tab, which tends to be a 'general' scenario which asks whether the given topic is of relevance to the user (e.g. 'is your city subject to increased social alienation?'). For these kinds of scenarios, upon given an 'improbable' answer, the entire topic is disabled, and the user can proceed to spending time on other topics which may be of higher relevance to them.

Risk scenarios: causal chains and vicious cycles

All elements of risk scenarios are linked causally, which means that one risk can lead to another risk – as when, for example, 'flooding disrupts the transportation system and also causes an increased number of traffic accidents in the region, which also constrains the mobility of citizens and emergency

services'. Therefore, each scenario describes a chain of risk events and some of these chains of events form vicious cycles as seen above in Figure 3. The characteristic feature which distinguishes vicious cycles from other types of causal chains is that vicious cycles tend to have a self-reinforcing nature.

For example, in Figure 6 is presented a causal chain where 'family members live increasingly far away from one another' and 'parents separate', which both lead to 'personalisation and individualisation of peoples' lifestyles in the modern age', which then leads to 'continued increased in single households', leading to 'isolation and loneliness of working age people', which means 'a continuous loss of neighbourhood feeling', and the causal chain finally ends on 'increasing loneliness of the elderly'.

In comparison to the causal chain in Figure 6, in Figure 7 is depicted a vicious cycle. In that picture, 'increase in the aged peoples overall health problems' leads to 'city faced with a significantly growing demand for increased health care and social care', leading to 'health services are under increasing pressure', which means that 'the quality of health services is reduced'. However, instead of the scenario ending on that last risk, it goes back to, and thus reinforces, the initial trigger 'increase in the aged peoples overall health problems'.

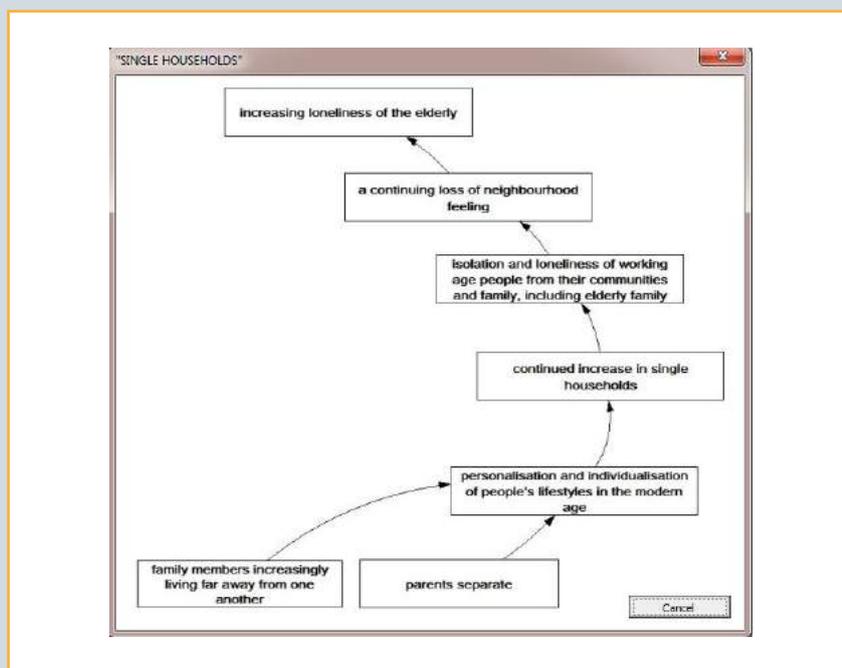


Figure 6: A picture of a causal chain in the RSQ

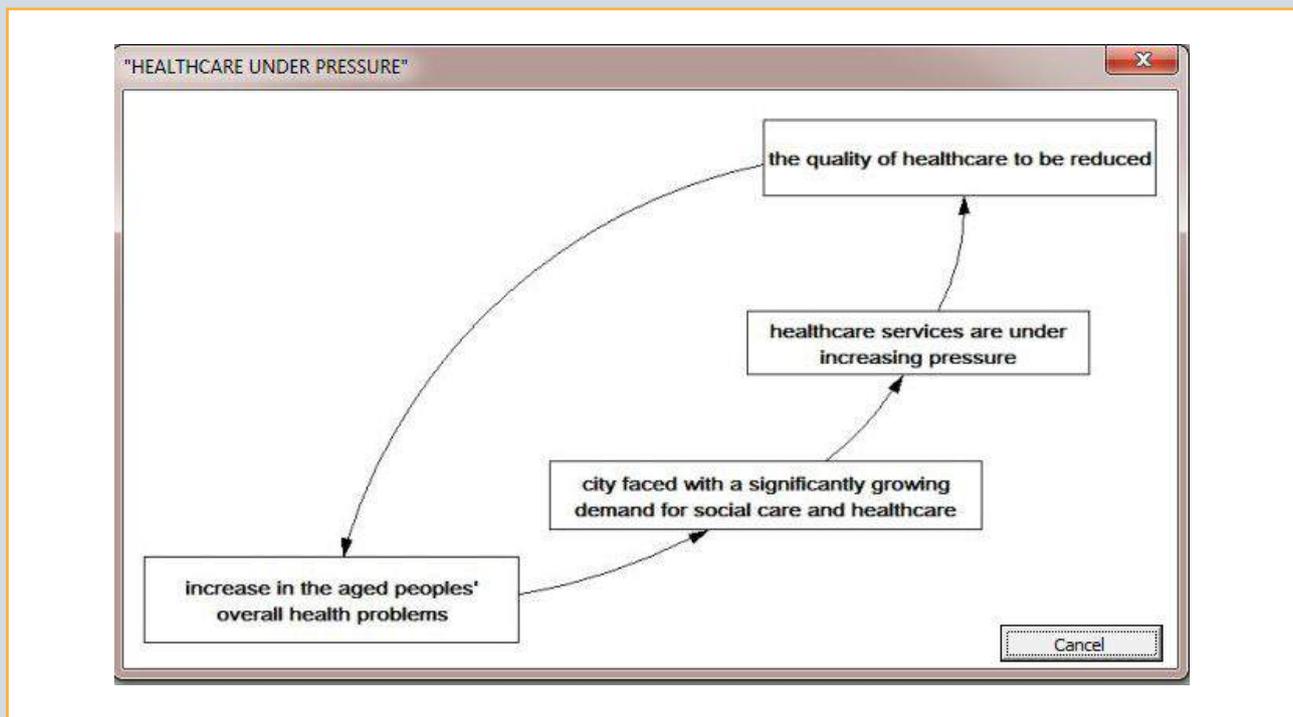


Figure 7: A picture of a vicious cycle in the RSQ (second example in this document)

The reason why vicious cycles are important is because i) they are often difficult to identify and ii) they are difficult to deal with. There is no defined beginning or end to a vicious cycle and so you need to consider which of the different elements of the vicious cycles need to be addressed in order to tackle the cycle. In contrast, with regards to causal chains, addressing the trigger, or the elements close to the trigger, may provide an effective way of resolving the risk scenario. The RSQ therefore plays an important role in helping users appreciate the nature of various types of vicious cycles which may target their city.

Comment box

Another key feature of the RSQ is that the user can save comments, which can for example be a summary of the group discussion, and can be later accessed and edited (Figure 8). Saved comments are automatically transferred to a separate comments record where the user can easily navigate between

the previously added comments (Figure 9). This feature enables a summary of any discussion that occurred when completing the RSQ to be captured alongside the scenarios, which prompted the discussion, providing a record of the most important aspects of the discussion.

The comment box can be accessed by clicking a **'comment'** button next to each scenario, or when viewing the risk mitigating actions which are explained in the next subsection. As shown in Figure 8, the comment box comprises of the following elements.

- A text box where the user can enter their text (CTRL+C and CTR+V short cuts work here respectively for copying and pasting text).
- **'Save'** button which saves the comment in a separate comments record. Clicking the 'Save' button does not close the comment box.

- **'Cancel'** button which closes the comment box.
- A box showing the current number of entered characters for the given scenario in the comment box. There is a limit of 8000 characters (including spaces) which can be added to the comment box, and that is equivalent to approximately 2 pages of text. When the 8000 words character limit in the comment box is exceeded through copy-pasting, a new comment will not be saved by the RSQ. For this reason, try to avoid copy-pasting long texts from external sources into the comment box.

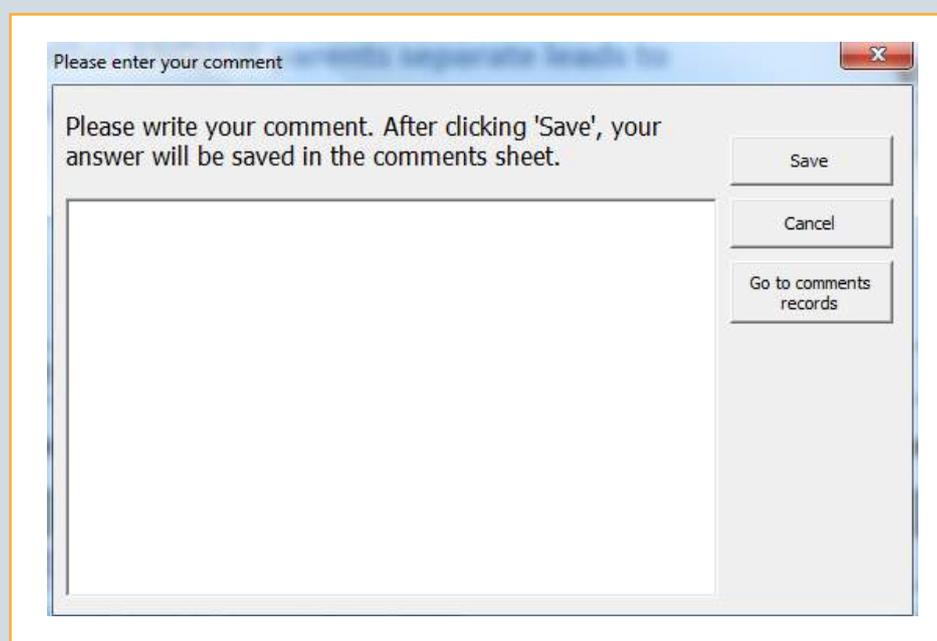


Figure 8: Comment box

Next to each scenario there is also a **'go to comments records'** button which takes the user to the comments record where all the previously saved comments are stored. The comments record is a separate tab in Excel (see Figure 9). At the top of that page there is a navigation bar with buttons which, upon clicking them, will scroll down the page to the relevant topic. The comments record represents the structure of the RSQ, with the 10 topics comprising of a number of risk scenarios. The risk scenarios can be identified by their headlines, and each scenario has a text box with any previously saved

comments (if applicable) which can be edited. The existing comments in the comments record can be edited, but it's better to avoid adding long texts in the comments record rather than in the comment box in order to avoid exceeding the 8000 character limit. In addition to this, each scenario in the comments record has a **'go to the scenario'** button which takes the user from the comments record to the original scenario in the RSQ topic. This way, the user can conveniently navigate between the scenarios in the RSQ and the comments record throughout their use of the RSQ.

Navigation

User's comments

ELDERLY POPULATION		
Scenario 1: "AGEING"	Scenario 2: "PENSION AGE"	Scenario 3: "FAMILY MEMBERS CO-LOCATION"
Scenario 4: "SINGLE HOUSEHOLDS"	Scenario 5: "AGED CITIZENS' FEAR OF CRIME IN THE CITY"	Scenario 6: "DIGITAL MARGINALISATION"
Scenario 7: "DEMENTIA AND THE ELDERLY"	Scenario 8: "MENTAL HEALTH AND LONELINESS"	Scenario 9: "ALCOHOL ABUSE"
Scenario 10: "HEALTHCARE UNDER PRESSURE"	Scenario 11: "SOCIAL WELFARE AND FAMILY SUPPORT"	
CLIMATE CHANGE: AIR POLLUTION		
Scenario 1: "AIR POLLUTION"	Scenario 2: "COLDER WINTERS AND CLIMATE CHANGE"	Scenario 3: "HOTTER, DRIER SUMMERS AND CLIMATE CHANGE"

Figure 9: Comments record

Risk mitigating actions

In addition to exploring the risk scenarios, for some of the scenarios it is also possible to view the suggestions for mitigating actions. As explained above in relation to Figure 4, the user can click the **'see risk mitigating actions'** button at the bottom of the page of the given RSQ topic. The user will then be taken back to the top of the topic, and, if mitigation actions are included, there will appear a new button (**'view**

mitigating actions') for each risk scenario which directs the user to a picture of the risk scenario in question, but with an addition of **'see actions'** button (Figure 10) which direct the user to a portfolio of suggestions for risk mitigating actions for that scenario (Figure 11). It is worth noting that whilst exploring the risk mitigating actions, it is possible to save comments in the comment box, which can for example include copy-pasting the risk mitigating actions of interest and then editing them to make them more relevant to the user's city.

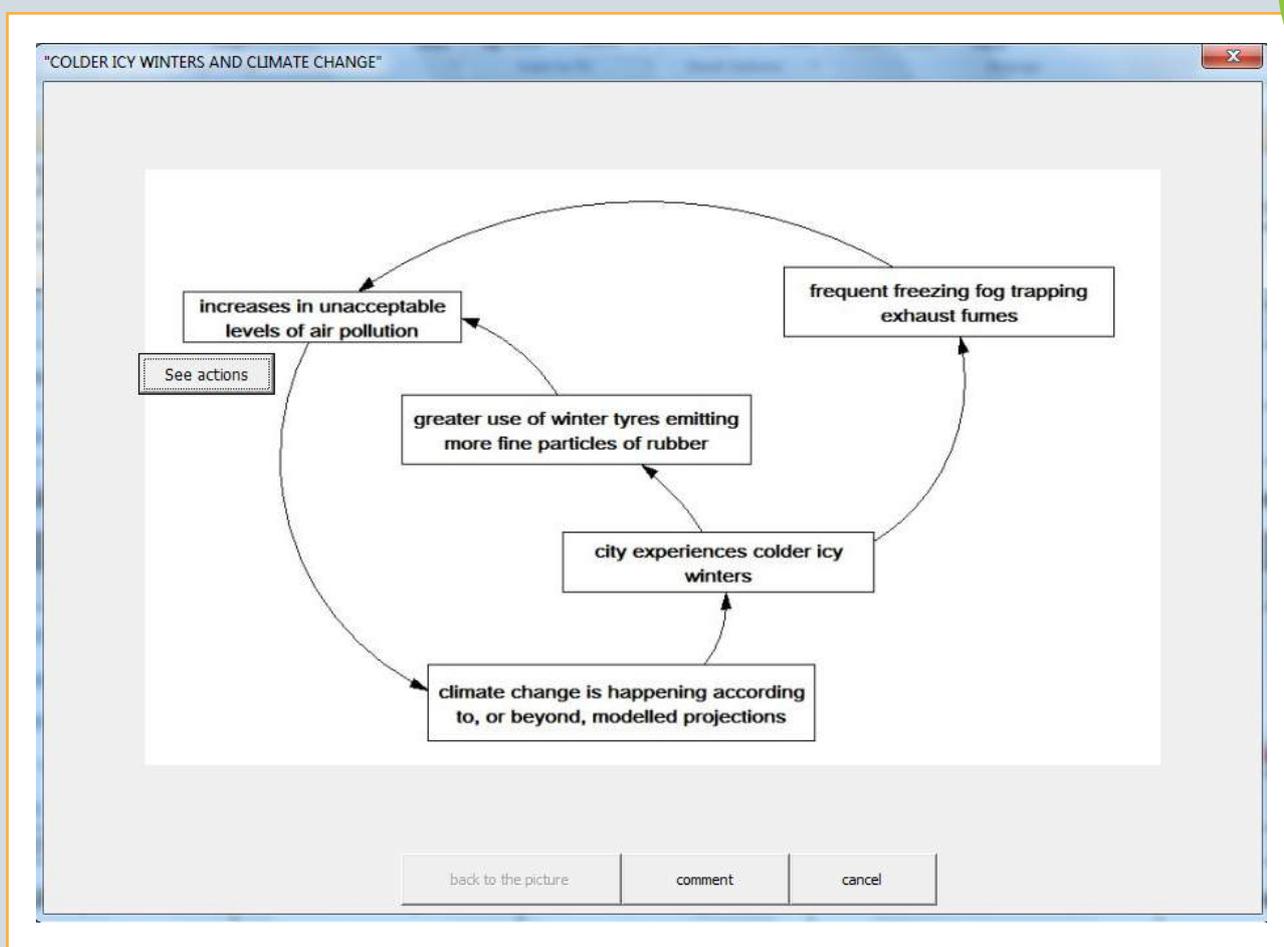


Figure 10: Picture of a risk scenario with an option to see the risk mitigating actions

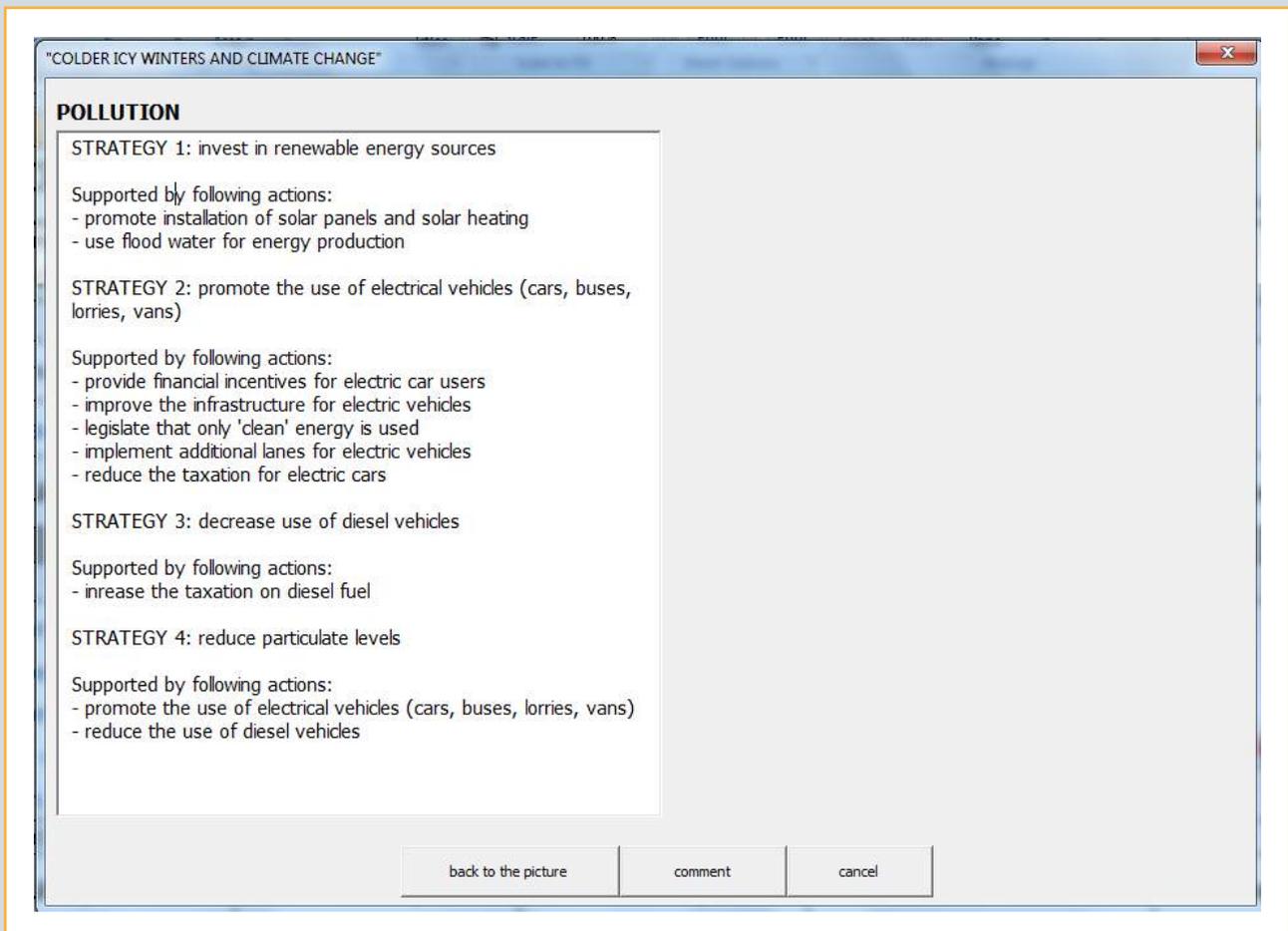


Figure 11: A portfolio of risk mitigating actions for an element of a risk scenario

Priorities

The completion of risk scenarios results in the generation of a priority ranking of scenarios which is automatically updated as the user continuously provides responses to more scenarios. The ranking of priorities of scenarios does not require that all scenarios are completed – which means that, for example, the user may choose to complete two topics only and still receive a priority ranking. These priorities are based on an analysis of i) the extent of the scenario's ramification, and ii) their impact on key outcomes. They are intended only as a basis of a discussion that leads to a revised set of priorities that take account of local context. It therefore needs to be emphasised that these priorities are not intended to serve as a form of quantitative diagnostic assessment of risks, but rather as a point of reference for interdisciplinary communication and sharing of knowledge.

As shown above in Figure 5, the priorities tab in the RSQ comprise of a number of elements. Each time the user opens the priorities tab, the ranking of priorities is immediately updated. All of the attempted scenarios are then ranked according to their priorities, with a rank of 1 signifying the possible highest risk. The scenarios which have been answered as being 'improbable' do not receive a priority ranking.

However, in addition to viewing the ranking of priorities, the user has a number of options to choose from. Firstly, in the navigation bar at the top of the screen, the user can click on one of the 'sort' buttons representing the RSQ topics which hides all of the scenarios from the ranking which do not belong to the chosen topic. Secondly, the user may go back to the original ranking of all scenarios by clicking

the **'RANK'** button. Thirdly, the user may click on the **'hide no answer'** button to hide those scenarios which have not been answered yet, and thereby simplify the current view. Fourthly, it is possible to show again all of the previously hidden scenarios by clicking the **'show all scenarios'** button. And fifthly, in the column **USER RANKING** (which is on the right side to the original **RANKING**), the user may enter their own ranking of scenarios based on their own judgment. The scenarios can subsequently be ranked according to the

user's own ranking by clicking on the **'USER ranking'** button on the left side of the 'sort by' navigation bar at the top of the screen.

Finally, it must also be emphasised that hiding the attempted scenarios from the ranking using the 'sort' buttons does not exclude those scenarios from ranking, but it only hides them from the display. The visible scenarios will therefore retain their original ranking.

Clicking on the **RANK** button ranks all the scenarios by their priority (this ranking is also triggered automatically when opening this page). In addition to this, it is also possible to sort the scenarios by the priorities added by the user.

By clicking on a given RSQ topic, the scenarios from all other topics will be hidden from the list.

It also possible to reveal or hide those scenarios which have not been attempted yet.

In this column the user can enter their own priority ranking based on their judgment.

Sort by:				
RANK	Elderly	Social cohesion	Social alienation	Social inequalities
USER ranking	Health	Integration	Public unrest	Infrastructure
				Hide 'no answer'
				Show all scenarios
PRIORITY RANKING OF ALL SCENARIOS				
SCENARIO	TOPIC	USER ANSWER	RANKING	USER RANKING
5/9: AGED CITIZENS' FEAR OF CRIME IN THE CITY	elderly/cohesion	we don't know	1	
8/8: MENTAL HEALTH AND LONELINESS	elderly/health	probable/possible	2	
10/9: HEALTHCARE UNDER PRESSURE	elderly/health	probable/possible	3	
2/4/4: PENSION AGE	elderly/cohesion/alienation	probable/possible	4	
9: ALCOHOL ABUSE	elderly	highly probable	5	
6/5/8: DIGITAL MARGINALISATION	elderly/soc. cohesion/alienation	I don't know	6	
4/6: SINGLE HOUSEHOLDS	elderly/alienation	I don't know	7	
7/3/7: DEMENTIA AND THE ELDERLY	elderly/inequalities/health	improbable		
3/7/5: FAMILY MEMBERS CO-LOCATION	elderly/cohesion/alienation	improbable		
11/6: SOCIAL WELFARE AND FAMILY SUPPORT	elderly/cohesion	improbable		

Figure 5: Priority ranking

4. EXPECTED USES OF THE RSQ

As emphasised throughout this document, the RSQ is intended as a tool for facilitating interdisciplinary group discussions about risk systemicity and resilience in cities. It is therefore recommended to use the RSQ as part of a facilitated workshop with groups. The facilitator will ideally be a team member or a manager, and needs to be familiarised with the RSQ. The typical RSQ workshop may consist of the following phases:

Phase 1: The group should agree on the RSQ topics that are relevant to them. The process starts with a facilitated small group meeting in which a facilitator/leader/manager helps the group to collectively complete the relevant RSQ topics. For each risk scenario within each topic, the facilitator reads out the headline of the scenario and then reads out the text of the scenario – it may be useful to display the corresponding picture of the scenario. The facilitator invites the group to discuss the scenario and consider collectively what response they may want to give to the scenario. The summary of the discussion can be saved in the comment box, including any disagreements with a part of the scenario, and ideas for new, related risk scenarios that are more relevant to the city's context. This stage is expected to help develop consensus, raise consciousness about risks, and to flush out different perspectives on risk assessment and resilience.

Phase 2: Having completed a full RSQ topic, the facilitator scrolls down the page and clicks on the 'see mitigating actions' button. The group is then invited to consider the available risk mitigating actions, and reflect on whether they could add some new risk mitigating actions, which can then be saved in the comment box.

Phase 3: The group investigates the priority ranking page and discuss the results. The facilitator may encourage the group to consider adding their own ranking in the dedicated column provided, and compare the group's own ranking with the ranking generated by the RSQ.

These three described phases can be used with any of the following uses of the RSQ, albeit due to the characteristic of the group the main focus of the discussions may vary. Typical user groups are:

Use 1 - Resilience Office Team: The RSQ could be used regularly by the resilience office team to monitor the changing impact of risk scenarios on the city's resilience strategy. The RSQ could help to identify those areas of the city that require most attention with respect to resilience and thus help the team prioritise limited resources.

Use 2 - Project Teams: The RSQ may prove useful for teams that are working on city projects that bring together a range of stakeholders from across the city. The RSQ could be used at the beginning of a project in order for the team to think differently about risks that may impact the success of their project.

Use 3 – Politicians: The RSQ can be introduced to politicians as a way of encouraging them to discuss long-term risks that can influence their City. The discussion involved in completing the RSQ is likely to raise a general awareness of risky futures and help promote a focussed discussion of policy priorities.

Use 4 - City stakeholders: The RSQ can be used as a way of consciousness raising among a wide set of city stakeholders – particularly a mixed group of representatives of key NGOs. The RSQ would be the basis for focus group meetings involving, for example, pressure and voluntary groups seeking to help the city become more resilient. In particular, given the significance of social cohesion as a force for making a city more resilient, the RSQ could be used to promote discussion about the potential risks to social cohesion.

5. APPENDIX A: ENABLING MACROS

It is necessary when the RSQ to have the ‘macros’, which are customised programs, enabled in your version of Excel. This can be done by following six steps (based on MS Office 2013). Firstly, click on ‘FILE’ in the top left corner of your screen (Figure 12). Secondly, click ‘Options’, go to ‘Trust Centre’, and click ‘Trust Centre Settings’ (Figure 13). Thirdly, select ‘Macro Settings’ and tick ‘Enable Macros’ (Figure 14).

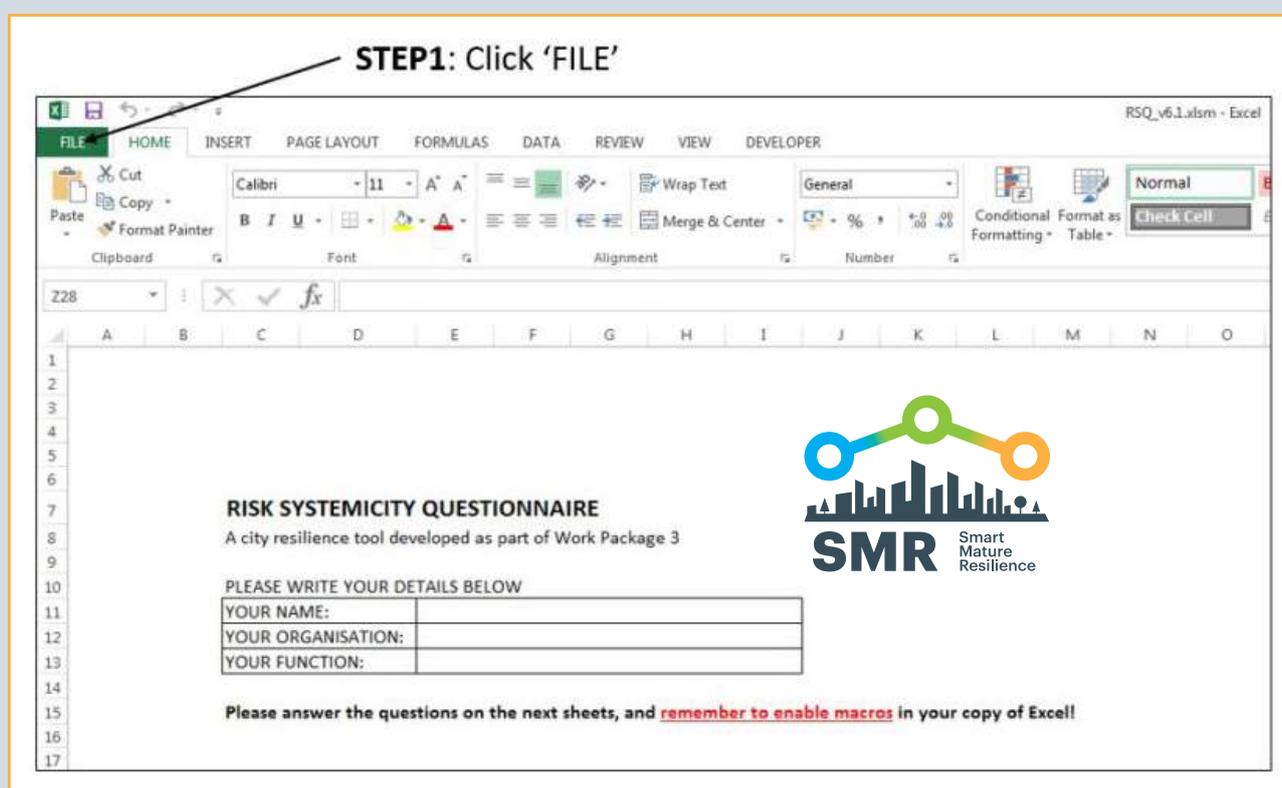


Figure 12: Enabling macros (part 1)

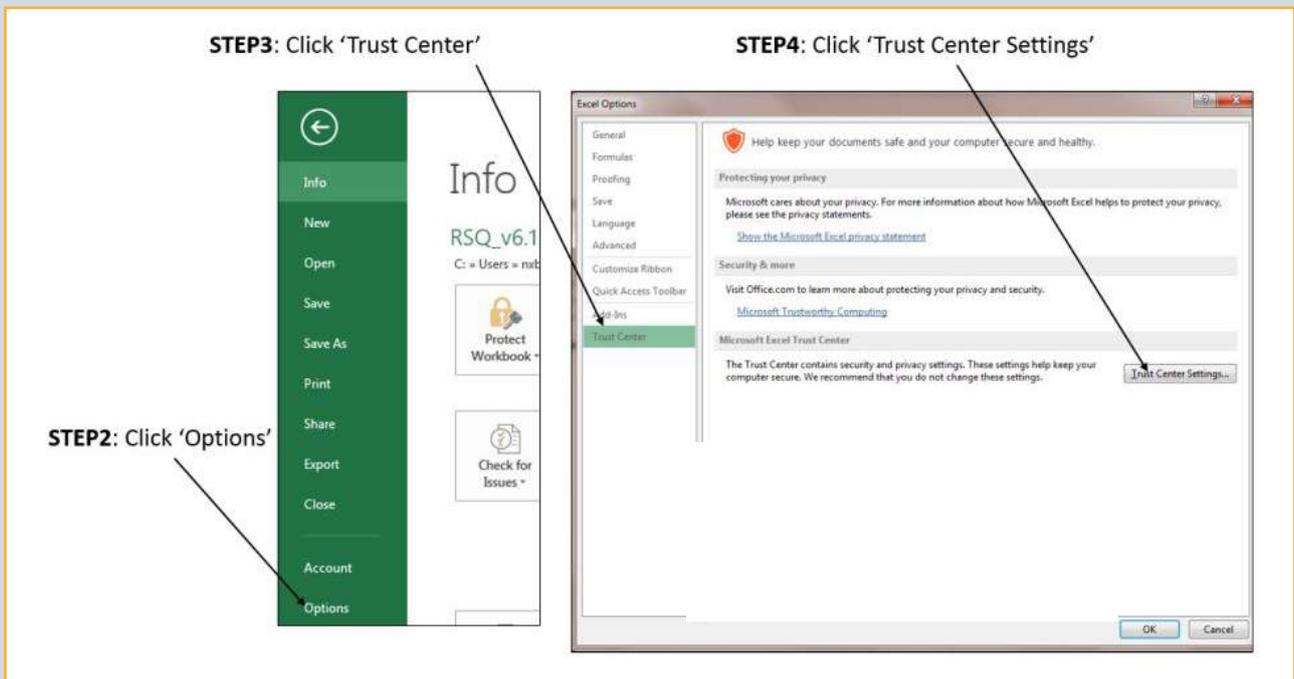


Figure 13: Enabling macros (part 2)

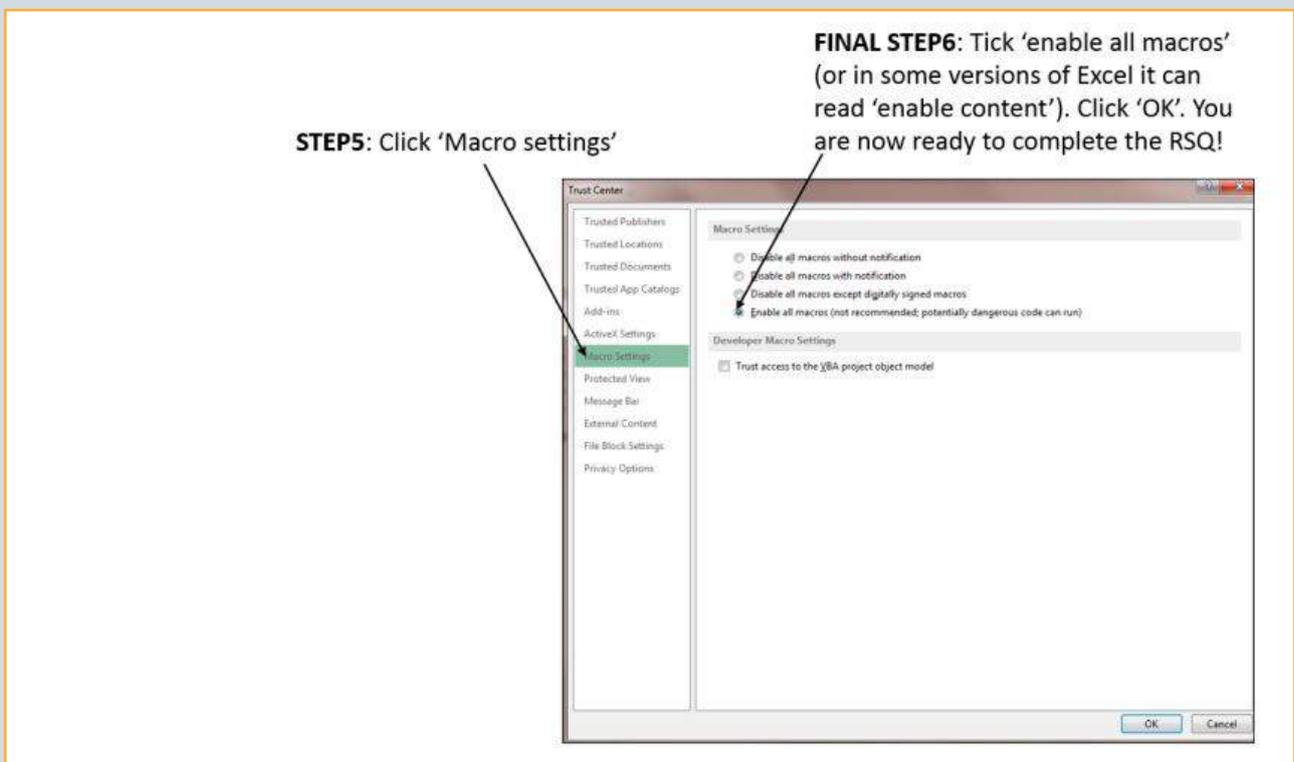


Figure 14: Enabling macros (part 3)

6. APPENDIX B: EDITING SCENARIOS IN THE RSQ

Scenarios in the RSQ can be edited by changing the text in the scenario. The text in the scenario can also be deleted and rewritten by the user (Figure 15). Also the headlines of the scenarios can be edited. However, the following rules need to be followed in order to avoid damaging the background programming which operates the RSQ:

- Do not change the number of rows.
 - If you want to make the scenario shorter, then keep the existing 'extra' rows empty.
 - If you want to make the scenario longer, then write two or more lines of the scenarios in one row. The text of the scenario can cross the original border of the table where the scenario is included.
- If you change the meaning of the scenario significantly, then the priorities assigned to this scenario may no longer be relevant.

Scenario 2: "COLDER WINTERS AND CLIMATE CHANGE" - vicious cycle				
				View as picture
				Comment
				View mitigating actions
HOW LIKELY DO YOU THINK THIS SCENARIO WILL DEVELOP IN YOUR CITY/REGION?				
Highly probable	Probable/Possible	Improbable	We don't know	I don't know - someone else does

Figure 15: Editing scenarios

7. APPENDIX C: MAPPING RISKS AND BUILDING RISK SCENARIOS

If the group wishes to develop some city specific risk scenarios, then the following material describes a process for doing this.

The material in this Appendix has been extracted and modified from Bryson, John M.; Ackermann, Fran, and Eden, Colin. *Visual Strategy*. San Francisco: Wiley; 2014.

The main objective of risk mapping is the creation of important risk scenarios that describe possible risky futures for a City. However the mapping process also seeks to address process issues. Risk mapping helps keeps groups of people from talking over one another and going around in circles (see the cartoon below). It helps keep groups from being unclear and confused in their reasoning, unable to listen to one another, and unable to agree. Instead, risk mapping helps people speak and be heard, produce lots of ideas and understand how they fit together, make use of causal reasoning, and clarify ultimately what they want to do in terms of strategies, and actions. Risk mapping join process and content in such a way that good ideas worth implementing are found and the agreements and comments needed to implement them are reached.

Determining who should attend the workshop is an important key to success. A balance needs to be struck between having sufficient participants to allow for a diversity of views – while not also having so many views that air time for each person is limited. We recommend around 5-7 participants.

Eliciting risks

The starting point has to be: *What do we think are the important risks that the City faces in the field of xxx?*

But, what is risk? The European Commission's staff working paper on Risk assessment and mapping guidelines for

disaster management³ describes a risk as a function of the probability of occurrence of a hazard, the exposure (total value of all elements at risk), and the vulnerability (specific impact on exposure). Risk = hazard impact * probability of occurrence.

However we recommend using a broader description: a risk can be any outcome in the future that represents a hazard, disaster, catastrophe, or crisis for the City.

Perhaps, one person thinks a risk the City is facing is: "drainage".

But this doesn't tell us much. The statement doesn't say enough to let us know what the nature of the risk is – meaning what is it that makes "drainage" a disaster.

There is a need for more words, such as: "drainage system gets blocked".

This now tells about a possible event in the future. The extra words help express more about the concern.

Sometimes two risks are embedded in one statement. For example, someone might say, "drainage system gets blocked and so roads become blocked" The "and" here indicates two separate ideas.

The best way to see the set of risks that participants see facing the City is to write them in rectangles rather than as lists and so spread them around so that all can see them. So, we use rectangular 'stick-notes' or better still use sticky 'ovals'⁴.

See Figure 16 for an example of the early stages of a risk dump in answer to the question "*What do we think are the important risks that the City faces in the topic of traffic management?*"

³ The European Commission. 2010. „Commission staff working paper: Risk assessment and mapping guidelines for disaster management“; retrieved from: https://ec.europa.eu/echo/files/about/COMM_PDF_SEC_2010_1626_F_staff_working_document_en.pdf

⁴ <http://banxia.com/ovalmap/> 'ovals' help a group to see connections between risks whereas 'sticky-notes' tend to encourage seeing columns and rows

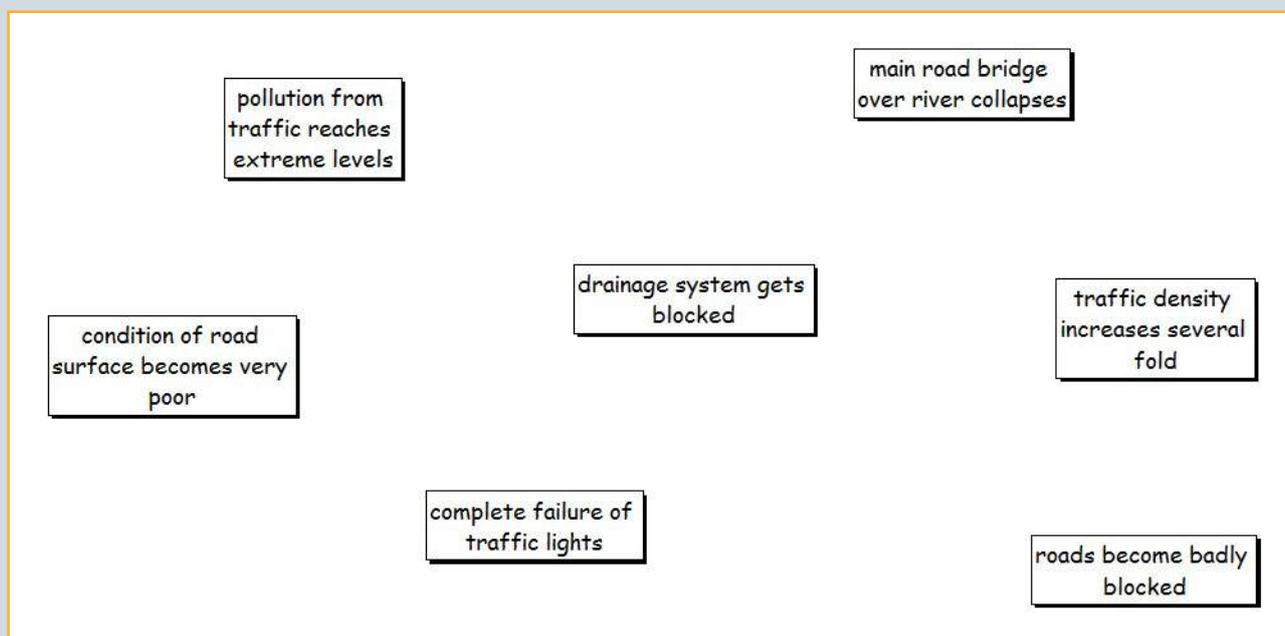


Figure 16: An early dump of risk relating to traffic management

The sticky-notes or ‘ovals’ should be placed on flip-chart sheets on a flat wall. Typically 6 flip-chart sheets are required set out in a 3x2 format (3 across and 2 down).

The group should be encouraged to dump risks until it is clear that participants have exhausted possibilities. In practice a group can often identify up to 50 risks before they ‘run down’ and also the map on the wall becomes overwhelming.

Building risk scenarios – adding causal links

An arrow is used to represent a causal link. The arrow implies “may lead to” or “may cause” or “might result in.” For example, in Figure 17 below, the arrow indicates the “and so” in the statement “drainage system gets blocked and so roads become blocked”.

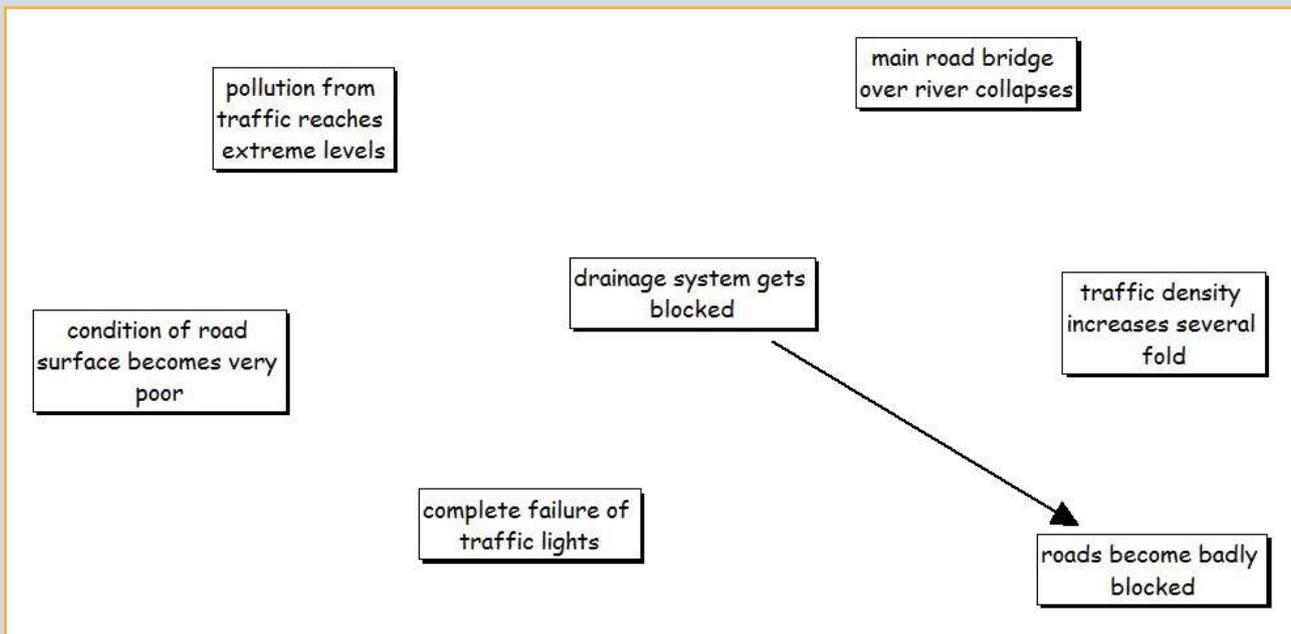


Figure 17: Causal links are shown by an arrow leading from one risk to another. The arrow shows the direction of causality: a blocked drainage system CAUSES roads to become badly blocked

Thus, the next step in creating risk scenarios is to get the participants to draw in the arrows they believe exist – show where they believe one risk causes another.

There is a danger of having the arrow point the wrong way and thus not express an action leading to an outcome. Thus, in a chain of arrows, the bottom of a chain of arrows (the first statement in the chain) is taken as the triggering risk.

It is easy to get the direction of arrows wrong by confusing chronological relationships with causal relationships.

Alternatively, thinking in terms of *if – then* statements can help get the causality right. For example, *if* we “[overcome] lack of good signposting,” *then* “people [will be] able to use our website effectively.”

As the risk map develops it will become messy (a lot of causal links). One way of creating a less messy initial causal

map is to avoid drawing in long links by instead drawing in a short arrow that does not go to the distant statement to which the first statement is linked, but instead points to the number of the statement written in at the end of the short arrow.

For example if one risk statement was to link to another risk statement on the opposite side of the map then adding a reference number to these ‘stick-notes’ enables a very short arrow out of the first risk and a short arrow in to the second risk. For example, the risk numbered 45 to the one numbered 23. However, while this is apparently less messy it can impede seeing the emergent structure and some of the interesting insights that emerge.

Often a coffee break is required to allow the facilitator to ‘tidy up’ the risk map by redrawing it on another set of flip-charts (or alternatively using mapping software).

This is why ‘tidying up’ by remapping the material can be helpful. In order to do so, however, a break in the workshop (perhaps for coffee) usually will be required so that the facilitator and one or two participants can do the remapping.

Risk Scenarios can now be identified. The important scenarios are vicious cycles – because these are much more difficult to mitigate than chains of risks. Vicious cycles usually require concerted strategies to attack many of the elements (risks/ events) that make up the cycle.

Risk scenarios are therefore: vicious cycles and causal chains that suggest a risk ‘story’ of significance to the city. The causal chain scenarios will usually consist of 6-10 events that are causally related, and have a triggering event (which could be the outcome from another scenario) and an outcome that represent a summary for the scenario and also represents an outcome that obviously matters to a strategic arena within the city overall strategy for the future.

Vicious cycles

Vicious cycles occur when there is circular causality, which in a map shows up as a circle of arrows. These cycles, or feedback loops, are an important means of identifying priority risk scenarios. The feedback loop can represent either a “vicious” or “virtuous cycles.” In risk assessment the loops will usually be vicious cycles – that is the situation/scenario gets continuously worse over time.

Sometimes feedback loops can be counterintuitive, so that without seeing them on a map nobody is aware of their effect on the future of the City. Loops also can just be hard to see on a big map. When identified, however, loops are always worth exploring as they can be particularly problematic for a city with the scenario getting continuously worse over time.

Facilitating a risk workshop

One particularly helpful way to get started is to jointly facilitate a risk workshop with a colleague. This allows for a sharing of effort. Managing the volume of material that can be generated (the content) as well as the group and its interactions (the process) is demanding. For first time facilitators, the demands can be too great if the stakes are high and the group is new to the facilitator. Working together also allows for sharing of experiences and therefore accelerated learning. It is also more fun and can tap into different competences, skills and knowledge bases. However, when working in pairs,

be clear about who is taking the lead at any one time (this might change over the course of the workshop), as this will avoid the danger of pushing in different directions or tripping over one another.

One of the real tensions for a facilitator in working with groups undertaking risk mapping is knowing when to finish with particular mapping tasks, for example, when to stop generating material, linking material, or tidying material up and identifying risk scenarios. Sometimes it will help to break the workshop into several small workshops so that the facilitators have time to ‘regroup’ and assess the material.

It is worth keeping in mind the Pareto Principle or the 80 – 20 rule. In this case, the rule suggests that 80 per cent of the work can be achieved in 20 per cent of the time and that successive elaborations and refinements can continue *ad nauseam* and not be very productive. Do not feel that you have to get everything perfectly right in terms of content. If there is time at the end of a workshop it is always possible to return to material that has been underexplored.

The attention facilitators pay to the workshop setting, equipment needs, and logistics can appear to non-facilitators as an excessive focus on what appears to be trivial concerns. Experienced facilitators know that getting the apparently trivial right can greatly increase the chances of success at very little cost. Developing your own facilitation *kit box* can be helpful. For risk workshops, lots of flipchart sheet paper; bullet-tipped, water-based flip chart marking pens (for writing up the issue statements and for drawing in links on the map); pencils (for drawing in tentative arrows); pads of sticky-notes (in possibly of two or three colours); a digital camera or another way to take photographs; etc. Ensuring there is plenty of everything is important, since running out is embarrassing, but more importantly means the workshop is not nearly as productive and mindful of participants’ time as it should be. In addition, make sure each participant gets the same colour pens since this will help separate proponents from their ideas about risks. In addition, make sure that the pen has a broad enough tip that participants will be forced to write in large text that it is easy for others to read.

One of the biggest mistakes that can be made is planning for a strategy workshop is not arranging to reserve the right room for workshop. Getting the room design right is fundamental. Be sure to visit the room well in advance of the workshop to make sure it is appropriate and to make sure there is plenty of time to seek an alternative, if necessary. A good room will

have plenty of wall space to which two rows of at least four flipchart sheets per row may be affixed with masking tape at the top of the upper row. This means walls with no fixed pictures, no textured wall paper, and no wall panelling or rail half way up the wall. Very large windows *without mullions* can be used for creating a mapping surface. Plenty of daylight is also helpful as this helps keep participants motivated and engaged (although note that too much sun can cause

discomfort). Avoid rooms with fixed heavy tables, particularly boardroom tables; heavy chairs; and many bookcases, since this will make it difficult to have participants seated in a semi-circle in front of the mapping surface. Too much heavy furniture will also make it difficult for participants to move around easily. Having comfortable (but not too comfortable) chairs on casters allows for good movement and will keep participants alert and engaged.

www.smr-project.eu

CONTACT

Tecnun

University of Navarra
20018 Donostia - San Sebastián
Gipuzkoa (Spain)

 Smart Mature Resilience Project

Email: SMRProject@tecnun.es

 Twitter: [@SMR_Project_eu](https://twitter.com/SMR_Project_eu)



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