



SMART MATURE RESILIENCE

RESILIENCE BUILDING POLICIES

University of Strathclyde | August 2018

Deliverable	Title
Deliverable No.	D3.4
Work Package	3
Dissemination Level	Public
Author(s)	Susan Howick (Strathclyde), Colin Eden (Strathclyde), Igor Pyrko (Strathclyde)
Co-author(s)	
Date	31.8.2018
File Name	D3.4_Final + RevisionsAug18
Status	Final version
Ethics Revision	Maider Sainz (TECNUN)
Reviewed by (if applicable)	Previous version reviewed by Maider Sainz (TECNUN) and Raquel Gimenez (TECNUN), Saskia Maresch (DIN e. V.)

This document has been prepared in the framework of the European project SMR – SMART MATURE RESILIENCE. This project has received funding from the European Union’s Horizon 2020 Research and Innovation programme under Grant Agreement no. 653569.

The sole responsibility for the content of this publication lies with the authors. It does not necessarily represent the opinion of the European Union. Neither the REA nor the European Commission is responsible for any use that may be made of the information contained therein.



Funded by the Horizon 2020
programme of the European Union



SUMMARY

This deliverable reports on the construction of the Resilience Building Policies (RBP) which is one of five tools that shall form the European Management Guideline developed as part of the Smart Mature Resilience (SMR) project. The RBP is a Web-based tool which is integrated with the SMR Resilience Maturity Model (RMM), as it offers practical information with regards to the resilience policies contained in the RMM, by illustrating them through real-life examples from cities. The contribution of the RBP is therefore in supporting cities to think strategically about developing resilience maturity, as it allows them to see both a broad overview of relevant policies as well as to explore those policies in more detail. The online RBP can be found at: <http://smr-project.eu/tools/resilience-building-policies/>

In term of the structure of this deliverable, it describes how the RBP fits into the overall aims of the SMR project, how it was constructed through an iterative process engaging scientific partners and city stakeholders, what features it comprises of, and how it is expected to be used in cities. The RBP is positioned as a tool for facilitating strategic thinking about resilience in cities that is used together with the RMM. Consequently, by offering a comprehensive report on the RBP, this deliverable may be helpful for anyone wishing to use the SMR tools, and in particular the RMM, for improving a city's resilience maturity.

TABLE OF CONTENTS

1. Introduction.....	5
1.1. Contribution of the Resilience Building Policies tool.....	5
1.2. Fulfilment of the cities' requirements.....	6
1.3. Structure of this report.....	8
2. Methodological approach.....	9
2.1. Timeplan of the RBP development.....	9
2.2. Conceptualising the RBP.....	11
2.3. Initial gathering of suggestions for case studies for the RBP.....	15
2.3. Gathering information for the construction of the RBP.....	18
2.4. SMR collaboration on the construction of the RBP.....	23
3. Description of the RPB.....	24
3.1. Web-based interface of the RBP and the RMM.....	24
3.2. Structure of the RBP.....	27
3.3. Future case studies.....	29
3.4. Example of an RBP case study.....	29
3.5. Integration of the RBP with other SMR tools.....	31
4. Implementation of the RBP in cities.....	32
4.1. WP5 stakeholder training in Glasgow - feedback.....	32
4.2. WP5 stakeholder training in Kristiansand - feedback.....	33
4.3. WP5 stakeholder training in San Sebastian – feedback.....	34
5. Future application of the RBP.....	34
6. Concluding remarks.....	34

1. INTRODUCTION

1.1. CONTRIBUTION OF THE RESILIENCE BUILDING POLICIES TOOL

This deliverable reports on the development of the Resilience Building Policies (RBP), which is one of the tools developed as part of workpackage 3 (WP3) of the Smart Mature Resilience (SMR) project. The RBP is to form, along with four other tools, the new European Resilience Management Guideline (ERMG). The ERMG is expected to support cities in improving their resilience. The definition of city resilience followed in this report is based on the definition constructed in the SMR project:

“... The ability of a CITY or region to resist, absorb, adapt to and recover from acute shocks and chronic stresses to keep critical services functioning, and to monitor and learn from on-going processes through city and cross-regional collaboration, to increase adaptive abilities and strengthen preparedness by anticipating and appropriately responding to future challenges.”

With regards to building city resilience, the purpose of the RBP is to offer a portfolio of case studies that exemplify Resilience Maturity Model (RMM) policies and so facilitate progression towards higher maturity levels. The development of the RBP has therefore been designed to meet the following objective of the SMR project:

SMR Objective 5: Develop a portfolio of Resilience Building Policies that enable the CITIES’s progression towards higher maturity levels.

More specifically, the RBP tool provides a range of case studies tailored to the needs of the SMR project. These case studies illustrate in a practical way the formulation and implementation of the policies included in the RMM.

The practicality of the case studies associated with the RMM policies 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 both the SMR Tier 1 and 2 cities as well as other cities across the world as reported in the literature.



As a result, the RPB both compliments the other SMR tools, and it supports the tool users with examples of how the policies can be implemented to progress to a higher maturity level of resilience.

It is worth noting that the RBP tool focuses on the policies contained within the RMM and that these are different to any strategies and actions contained in the Risk Systemicity Questionnaire (RSQ). The policies contained in the RMM focus on measures that cities should take in order to achieve a maturity stage. The risk mitigation actions and strategies contained in the RSQ can be used to mitigate against specific risk scenarios. RMM policies tend to be focussed at a general level for a city, whereas RSQ mitigation actions tend to be context focussed with respect to the specific risk scenario they seek to mitigate against. For example, RMM policies include:

(L1S2) Incorporate resilience into visions, policies and strategies for city development plans
and

(P1T1) Engage a wide range of relevant stakeholders in risk management process

These policies are general policies that are recommended across the city, whereas the RSQ mitigation actions are context specific actions that have been recommended by cities to mitigate against specific risk scenarios. For example, 'invest in green infrastructure in the city' or 'increase citizens' participation in urban neighbourhood design.'

1.2. FULFILMENT OF THE CITIES' REQUIREMENTS

Deliverable 2.5 reported on the requirements gathered from cities which each of the five SMR tools should fulfil. Those requirements were gathered during the WP2 workshops organised in Riga, Bristol, Rome, and Vejle. It was important to gather these requirements to ensure the co-creation process of working on the SMR tools which are intended to offer practical contribution for cities in the context of resilience. Table 1 describes how the general requirements have been met by the RBP.

Table 1: Fulfilment of the cities' requirements by the Resilience Building Policies tool

Requirement	How the requirement was met
Useful friendly tools tailored to	The RBP employs an intuitive, easy to use Web-based

relevant stakeholders.	format that can be accessed by anyone. Case studies can be explored by using a dedicated search function, or by browsing through the maturity stages, topics, dimensions, and sub-dimensions of the online version of the RMM which is tightly integrated with the RBP.
Tools developed should complement the tools, indicators, policies, methods and procedures that are currently being used in cities.	<p>The RBP is linked closely with other SMR tools, in particular the RMM. The RBP provides additional information and practical illustrations for the SMR policies, and this way it offers added value to the existing tools and methods used in cities.</p> <p>As the RBP is an extension of the RMM it complements any non-SMR tools which the RMM also complements. Consideration of a city's stage of maturity is a novel idea which cities have been enthusiastic to adopt as part of the SMR project. The RMM therefore provides a new perspective on resilience for cities and cities are able to consider this perspective along with other tools and methods they may use by following the approach detailed in the European Resilience Management guideline.</p>
Guideline to enable prioritisation of resilience building policies for CITY with respect to infrastructure resilience, climate adaptation and social issues.	By providing practical illustrations of the RMM policies, the RBP supports cities in prioritising which policies can be the most effective for them to progress to a higher resilience maturity level.
Need to standardize the resilience building process.	By exposing cities to other cities' 'best practices' captured through case studies, the RBP contributes to the standardisation of resilience building process.



1.3. STRUCTURE OF THIS REPORT

Having outlined the aims and contributions of the RBP, and how this tool meets the general user requirements as expressed by the SMR cities, the development and features of the RBP are described in more detail. Firstly, the methodological approach towards constructing the RBP is explained, including the gradual conceptualisation of the tool, the process of gathering case studies from cities, and the construction of the Web-based version of the RBP. Secondly, the key features of the RBP are described, such as the online visual interface, the structure of case studies, and the integration of the RBP with four other SMR tools. An example case is provided in order to illustrate the structure of the case studies. Finally, the anticipated future use of the RBP in cities is presented. We then end the report by summarising how the RBP addresses the goals of the SMR project, and how it contributes to cities' everyday efforts in developing resilience maturity.

2. METHODOLOGICAL APPROACH

In this section the process of constructing the RBP tool is described. Firstly, a time plan for the construction of the RBP is presented, including how the RBP was conceptualised based on engagement with the SMR city partners. Secondly, the process of gathering information required for the development of this tool is described, and how the different features of the RBP were developed. And thirdly, how the RBP was transferred into a Web-based environment which is accessible via the SMR project website is presented.

2.1. TIMEPLAN OF THE RBP DEVELOPMENT

The work on the RBP began in February 2017, as the SMR partners prepared group exercises to be undertaken during the workshop in San Sebastian in March 2017 (Figure 1). The main purpose of the group exercises was to achieve a good quality conceptualisation of the RBP through close collaboration among the SMR scientific and city partners. A more developed design of the RBP was then presented during the workshop in Glasgow in May 2017. Building on the results of the workshop in Glasgow (see D3.2, section 4.3), the SMR partners commenced data collection and development of this tool, which occurred between June – September 2017. Finally, during September – October 2017 the RBP was implemented in cities as part of WP5 sessions in the three Tier 1 cities, and the RBP was prepared for submission by the end of October 2017.

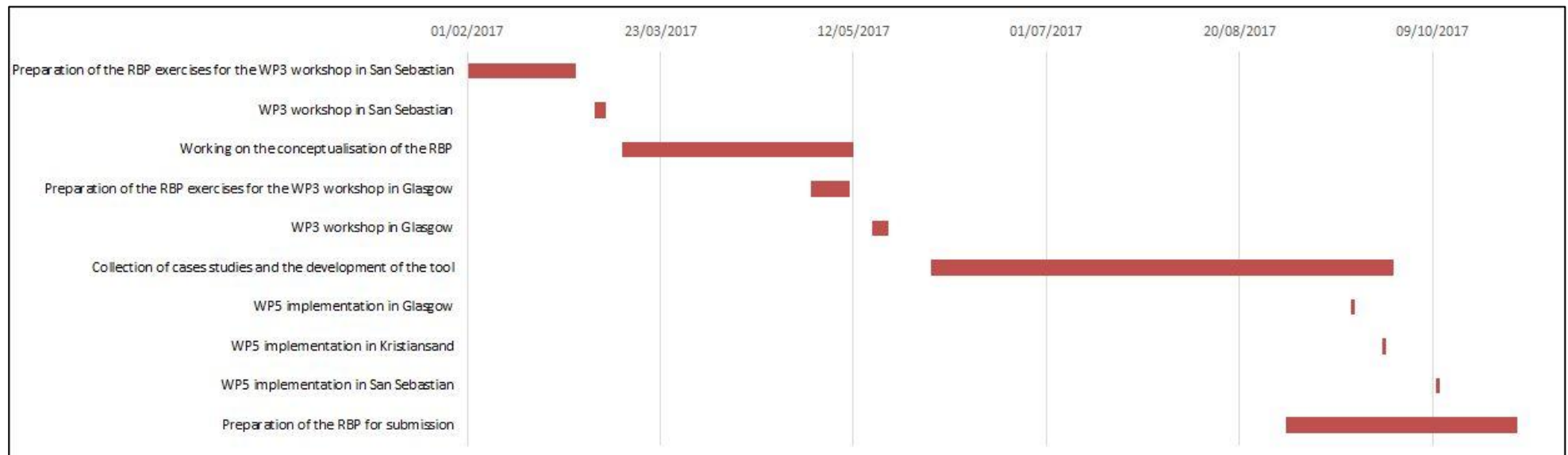


Figure 1: Timeline of the development of the Resilience Building Policies

2.2. CONCEPTUALISING THE RBP

The efforts to conceptualise the RBP took place during the WP3 workshops in San Sebastian and Glasgow, as described in D3.2, sections 3.3 and 4.3. The key objectives of the conceptualisation of the RBP were 1) to meet the SMR objective 5 (as seen above on page 5 of this report), and 2) to ensure a high degree of practicality and usefulness of the tool for cities. It was therefore agreed among the SMR partners that in order to meet these two objectives, it was necessary for the scientific partners to work closely with the city partners.

In the WP3 workshop in San Sebastian, the Strathclyde team presented to the city partners a draft concept of the RBP which translated the policies from the RMM tool into a causal means-ends map (extract shown in Figure 2). The construction of this means-ends map of the RMM was based on the expressed causality in the exact wording of the RMM policies, that is in the conjugative words such as 'because', 'in order to', 'thus', which were included in the wording of the policies and their descriptions. The advantage of this causal map was that it integrated all of the text in the RMM and facilitated a better understanding of the relationship between the RMM policies and their designed purpose and showed the inter-relationship between the RMM Policies. However, although the map was designed for analysis, the map was seen as complex and difficult to follow for the cities. Managing complexity by extracting parts of the map, as requested interactively by users of the RBP, proved to be impossible given the nature of the software packages used. Thus, it was decided it was important for the RBP to support the understanding and application of the RMM policies, but that a more accessible presentation was required for the RBP.

Building on the outcomes of the WP3 workshop in San Sebastian (March 2017), a new conceptualisation of the RBP was prepared for the workshop in Glasgow (May 2017). Central to this conceptualisation was that the RBP should support particularly the RMM which is rich in resilience policies. The new conceptualisation of the RBP was based on the idea that the complexity of the RMM would be managed through a Web-based interface, and the RBP would add interactivity to the online version of the RMM (Figure 3). The interactivity would entail an ability to browse selectively and interactively through the RMM and access additional information about the various policies, such as the examples of the implementation of the given policy (through case studies), and with links



to other relevant resources such as reference to 100 Resilient Cities (100 RC) themes. The RBP is linked with the 100 RC themes because the latter is a widely established network in the area of resilience which is underpinned by rich resources and case studies in this area.

The pilot version of the online RMM, which was presented to cities in the WP3 Glasgow workshop, with a few selected policies expanded as part of the RBP, was seen as helpful and user-friendly by the cities. Importantly, not only did this feedback mean that the proposed conceptualisation of the RBP was promising with respect to its usefulness for cities, but it also clearly had potential to add considerable value to other SMR tools, and in particular to the RMM. On this basis, it was agreed among the SMR partners to use this conceptualisation of the RBP for further development.

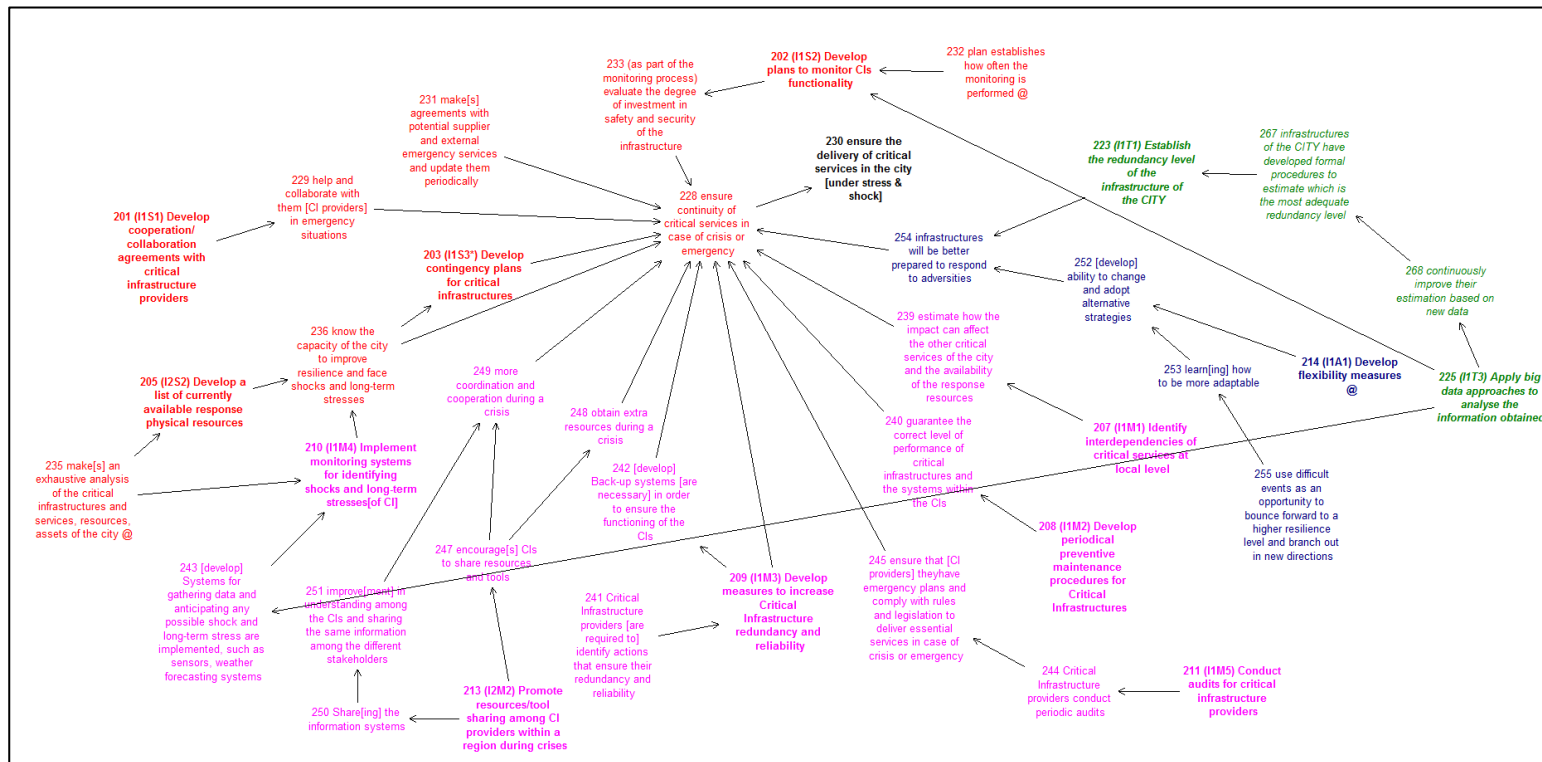


Figure 2: A segment of the Resilience Maturity Model policies map focusing on 'critical services'



*Numbers before statements represent the sequence in which they were added to the map. Causal arrows signify 'may lead to' relationships. The acronyms in brackets refer to the dimensions of the RMM. Red statements= Starting RMM stage; pink statements= Moderate RMM stage; blue statements= Advanced RMM stage;; green statements= Vertebrate RMM stage. Black statement is the goal










		STARTING	MODERATE	ADVANCED	ROBUST	VERTEBRATE
 PREPAREDNESS	Diagnosis and Assessment (P1) 	(P1S1) Assess and manage a wide range of risks  (P1S2) List and prioritize critical services and assets (P1S3) List existing plans and response mechanisms and guidelines for shocks and stresses	(P1M1) Take account of interdependencies between risks when assessing and managing risk 	(P1A1) Assess and prioritise risk scenarios and their implications through consideration of risk systemicity (e.g. using Risk Systemicity Questionnaire) 	(P1R1) Undertake regular and long-term risk assessment with a focus on risk systemicity	(P1T1) Assess the value added by CITY contributions to the resilience of other CITIES
	Education and Training (P2) 	(P2S1) Conduct training and arrange emergency drills with the emergency teams and Critical Infrastructure providers (P2S2) Inform citizens of volunteering opportunities in the local community (P2S3) Develop a common understanding of the resilience approach among stakeholders 	(P2M1) Conduct training and arrange emergency drills including volunteers	(P2A1) Provide training for citizens and public and private companies (P2A2) Conduct emergency drills at national level (P2A3) Develop education programs in schools about the resilience action plan  (P2A4) Assess and refine the training programs	(P2R1) Establish a strong network of volunteers  (P2R2) Conduct frequent joint training exercises between European cities 	(P2T1) Develop training plans in cooperation with other CITIES (P2T2) Develop training activities for other CITIES (P2T3) Support self-organisation of the involved agents to improve the resilience of the CITY

Figure 3: A section of the matrix-based version of the Resilience Maturity Model (basis for the Resilience Building Policies)

2.3. INITIAL GATHERING OF SUGGESTIONS FOR CASE STUDIES FOR THE RBP

Another key exercise conducted during the workshop in Glasgow, as described in D3.2, section 4.3, was the gathering of suggestions for case studies from cities. City representatives were split into 3 groups, and each group was coordinated by a facilitator and a note taker. Each group was given a series of flipchart papers with a matrix of policies relating to the dimensions of the RMM and the corresponding S-M-A-R-T stages. City representatives were asked to write on post-it notes examples of case studies from their city/region, which illustrated the policies contained in the RMM (see Figure 4). Facilitators explained that it was important to ensure that case studies are relevant to the RMM policies and thus needed to reflect the information contained in the RMM with respect to what the policy is aiming to do and how it achieves this. For this purpose facilitators checked the suggested case studies against the 'means-ends' causal map of the RMM policies which includes all of the relationships between policies that are discussed in the RMM.

Approximately 50 case study suggestions were collected across the different maturity stages. The information gathered on post-its during the exercise was recorded in a spreadsheet, which was shared among the scientific partners (Figure 5). Each case study example was signed by the respective city so that the scientific partners could contact them following the workshop in order to gather more information regarding the case study as part of the further development work on this tool. In the spreadsheet, the missing and incomplete information collected during the workshop was pointed out with question marks so that the scientific partners knew that they needed to get back to the respective cities to clarify or verify that piece of information. Thus, the exercise from the workshop in Glasgow enabled a first step towards shortlisting, planning, and structuring the available policies which could be included in the RBP.

RESILIENCE BUILDING POLICIES | 16



Leadership and governance	L1-1	Starting (L1S1) Establish a working team responsible for resilience issues in the city	Moderate (L1M1) Establish a resilience department or committee and a cross departmental coordination board and procedures [Vejle]	Advanced (L1A1) Align, integrate and connect the resilience action plan with national plans	Robust (L1R1) Align, integrate and connect the city resilience plan with regional, national and international resilience management guidelines [KRS]	Vertebrate (L1T1) Support the development of other city resilience plans aligned, integrated and connected with regional, national and international resilience management guidelines
		L1S1 Kristiansand: Yes we do	L1M1 Kristiansand: Rescue project with focus on flooding. Exploring inter-connectedness of infrastructure – including impact of flood-event [Glasgow]	L1A1 Kristiansand: Emergency plan	L1R1 Kristiansand: government agreement on environmental strategy. 30 mill euro agreement finishes at L1R1 – ok ***	
		L1S1 Glasgow: CRO team was created to work on holistic resilience. This was based on 100rc grant funding.	L1M1 Glasgow: we have a resilience steering group made of city wide stakeholders to shape + approve the resilience strategy ***	L1A1 Kristiansand: DSB has responsibility of doing this	L1R1 Kristiansand: City plan	
		L1S1 Bristol: Cro resilience team	L1M1 Vejle: Have a board	L1A1 Rome: Definition of an Action Plan With stakeholder		
		L1S1 Vejle: a team Yes	L1M1 Bristol: Resilience steering group	L1A1 Bristol: Core cities group – engagement(?) with uk national government on development of national adaption programme		
		L1S1 Donostia: Resilience board team	L1M1 Bristol: Sounding board – steering group including city partners for resilient strategy			
	L1-2	(L1S2) Incorporate resilience into visions, policies and strategies for city development plans	(L1M2) Align, integrate and connect the resilience action plan with regional plans	(L1A2) Develop a plan for multi-level governance approach involving the municipal, regional and national levels of governance		
		L1S2 Donostia: Resilience vision is incorporated in different policies and strategies: emergency plan, ?????, Climate plan	L1M2 Kristiansand: Municipality strategic plan. 10 year – every 4 years. And 4 year – every year with budget.	L1A2 Kristiansand The county level have a audit responsibility toward municipalities		
		L1S2 Vejle: 100 RC strategy	L1M2 Rome: ??? coordination ?? ?? ?? Siloed competencies	L1A2 Rome: ??? planning department		
		L1S2 Bristol: 50 year resilience strategy provides overarching framework				
	L1-3	(L1S3) Develop a strategy to create a resilience culture	(L1M3) Adopt climate change preventive actions [Vejle - L1M4]			??
		L1S3 Vejle: Risk steering. Plan for flooding	L1M3 Vejle: flooding + heavy rain plans/actioning ***			L1T3 Riga: Open Data platform
		L1S3 Bristol: Desktop assessment of infrastructure performed -once- as part of Preliminary Resilience Assessment (UK most infrastructure = Private Providers)	L1M3 Donostia: adaptation plan			
			L1M3 Glasgow: Working on this at a city level and a regional level to bring stakeholders together to address climate adaption actions			
			L1M3 Rome: C??? ? R??? C40			
			L1M3 Kristiansand: Binding city environmental ?? with NTA(?)			

Figure 5: Results from the case studies gathering exercise recorded in a spreadsheet

* Legend. The [???] signs mean that the information collected during the workshop exercise requires additional verification or clarification with the concerned cities. Maturity stages are coded as: S = Starting; M = Moderate, A = Advanced, R = Robust, T = Vertebrate. Resilience dimensions are coded as: L = Leadership and Governance; P = Preparedness, I = Infrastructure and Resources; C = Cooperation. Therefore, for example, policy L1S2 can be read as 'policy number 2 belonging to sub-dimension 1 of the Leadership and Governance dimension of the RMM'.

2.3. GATHERING INFORMATION FOR THE CONSTRUCTION OF THE RBP

In line with the agreed conceptualisation of the RBP, the SMR partners (Strathclyde, LiU, TECNUN, and ICLEI) began the development of this tool immediately after the WP3 workshop in Glasgow (May 2017). According to this plan, at the heart of the RBP would be a range of case studies collected from partner cities which would illustrate various policies in the RMM, and which would be embellished further with additional information by drawing on the available scientific literature.

To begin with, LiU conducted an initial search of the literature, drawing on D1.1, to extract existing case studies from other cities than those involved in the SMR project. Attention was focussed on a selection of RMM policies and resources were spent searching the literature review for the relevant pieces of information that could specifically inform those carefully selected policies. Collecting real case studies directly from the SMR city partners in order to cover the selected policies for the RMM also became an important focus for the RBP. The following criteria were followed in selecting the policies to be covered in the RBP:

- Availability of good quality case studies from the SMR city partners – as shown above, this was assessed during the group exercise as part of the workshop in Glasgow.
- Coverage of as many as possible of the 19 RMM policies, which are used in the standard (not extended) version of the System Dynamics (SD) model developed as part of WP3 (Figure 6).
- Ensuring that there is a generally even spread of covered policies across the maturity stages, and dimensions, of the RMM.

Dimension	Stage	Policy
Leadership & Governance	S	L1S2 Incorporate resilience into visions, policies and strategies for city development plans
Leadership & Governance	M	L1M2 Align, integrate and connect the resilience action plan with regional plans
Leadership & Governance	A	L1A1 Align, integrate and connect the resilience action plan with national plans
Leadership & Governance	A	L2A2 Conduct certification processes to achieve the conformity with existing standards
Leadership & Governance	A	L3A1 Formalize the learning process and institutionalize regular debriefing meetings
Leadership & Governance	A	L4A2 Develop leading indicators for assessing the performance of the resilience action plan
Leadership & Governance	R	L1R1 Align, integrate and connect the city resilience plan with regional, national and international resilience management guidelines
Leadership & Governance	V	L2T2 Contribute in the development of standards on resilience guidelines and policies
Preparedness	S	P1S1 Assess and manage a full range of risks
Preparedness	M	P1M1 Take account of interdependencies when assessing and managing risk
Preparedness	R	P2R2 Conduct frequent joint training exercises between European cities
Preparedness	V	P1T1 Engage a wide range of relevant stakeholders in risk management process
Infrastructure & Resources	S	I1S3 Develop contingency plans for critical infrastructures
Infrastructure & Resources	M	I1M3 Develop measures to increase Critical Infrastructure redundancy and reliability
Infrastructure & Resources	A	I2A1 Promote and provide incentives to stakeholders for investments in resilience
Cooperation	M	C1M1 Develop a stakeholder engagement plan defining its roles and responsibilities
Cooperation	A	C1A4 Develop a public communication platform to interact with stakeholders
Cooperation	R	C2R1 Participate proactively in regional, national and international networks of resilient cities to promote initiatives, exchange experiences and learn
Cooperation	V	C1T2 Involve all stakeholders in the learning process

Figure 6: Policies initially included in the System Dynamics model

**Legend. Maturity stages are coded as: S = Starting; M = Moderate, A = Advanced, R = Robust, T = Vertebrate. Resilience dimensions are coded as: L = Leadership and Governance; P = Preparedness, I = Infrastructure and Resources; C = Cooperation. Therefore, for example, policy L1S2 can be read as 'policy number 2 belonging to sub-dimension 1 of the Leadership and Governance dimension of the RMM'.*

Initial discussions with the cities revealed that (i) cities would not have case studies to cover all RMM policies, particularly given it is unlikely that cities have reached advanced levels of maturity at this time (ii) it would take some time for cities to put together case studies and each could only commit to developing a small number of case studies. It was decided that, as a starting point, researchers would seek to cover the 19 policies contained in the SD model. As these had been highlighted as the most important policies for cities to focus on when using the SD model, this would ensure that a city using the SD model would be able to drill down and find out further information on the policy which the SD model recommends that a city implements. Additional case studies were then sought, both from cities and the literature, in an attempt to cover of the 20 cells in the 4 x 5 RMM matrix. It was recognised that it would be beneficial if the RBP tool provided users with information on as many policies as possible, however it was also recognised that there may be limited case studies available for some policies, for example those at the Vertebrate stage which many cities have not, and indeed may not, reach.

The final list of policies both from the RMM and SD model which are covered by the RBP is presented in Figure 7. Moreover, in Figure 8 is shown a spread of policies in question with respect to the different dimensions and maturity stages of the RMM.



Dimension	Stage	Policy acronym	Policy text	City providing case study
Leadership & Governance	S	L1S2	Integrate resilience into visions, policies and strategies for city development plans with the goal of the city taking	Rome
Leadership & Governance	S	L3S1	Develop a strategy to create a resilience culture	Rome
Leadership & Governance	M	L1M1	Establish a resilience department or committee and a cross departmental coordination board and procedures	San Sebastian, Glasgow
Leadership & Governance	M	L1M2	Align, integrate and connect the resilience action plan with regional plans	Rome
Leadership & Governance	M	L1M3	Develop measures to increase critical infrastructure redundancy and reliability	Glasgow, Kristiansand, Vejle
Leadership & Governance	M	L3M1	Promote a culture of resilience	Glasgow, Kristiansand, Rome, Vejle
Leadership & Governance	A	L1A1	Align, integrate and connect the city resilience plan with national resilience management guidelines	Kristiansand
Leadership & Governance	A	L2A1	Develop a legislative framework for stakeholders involved in the implementation of the resilience action plan	Secondary: ICLEI, Eltis
Leadership & Governance	A	L3A1	Formalize the learning process and institutionalize regular debriefing meetings	Glasgow
Leadership & Governance	R	L1R1	Align, integrate and connect the city resilience plan with regional, national and international resilience management	Rome
Leadership & Governance	T	L2T1	The development of standards on resilience guidelines and policies	Bristol, Glasgow
Preparedness	S	P1S1	Assess and manage a full range of risks guidelines for shocks and stresses	Secondary: JORS, EJOR, EEA
Preparedness	S	P2S3	Develop a common understanding of the resilience approach among stakeholders	Kristiansand, Rome
Preparedness	M	P1M1	Take account of interdependencies when assessing and managing risk	Rome
Preparedness	A	P1A1	Assess and prioritise risk scenarios and their implications through consideration of risk systemicity	Kristiansand
Preparedness	A	P2A3	Developing education programs in schools about resilience	Glasgow
Preparedness	R	P2R1	Establish a strong network of volunteers	San Sebastian, Rome
Infrastructure & Resources	S	I1S2	Develop plans to monitor CIs functionality	Rome
Infrastructure & Resources	S	I1S3	Develop contingency plans for critical infrastructures	Bristol, San Sebastian
Infrastructure & Resources	M	I1M1	Identify interdependencies of critical services at the local level	Bristol
Infrastructure & Resources	M	I1M3	Develop measures to increase Critical Infrastructure redundancy and reliability	San Sebastian, Rome
Infrastructure & Resources	A	I2A1	Promote and provide incentives for initiatives that contribute to build resilience	Rome
Infrastructure & Resources	A	I2A4	Promote and provide incentives for the developemnt of sustainable urban infrastructures	Riga
Infrastructure & Resources	R	I1R1	Identify interdependencies of critical services at international level	Secondary: EEA
Infrastructure & Resources	R	I2R1	Promote and provide incentives to stakeholders for investment in R&D&I projects regarding resilience	Secondary: EEA
Infrastructure & Resources	R	I2R2	Monitor an effective use of resources to ensure the resilience building process performance	Secondary: EEA, Eltis
Cooperation	S	C1S1	Map relevant stakeholders to develop the resilience action plan	Rome
Cooperation	M	C1M1	Develop a stakeholder engagement plan defining its roles and responsibilities	Secondary: ICLEI, USEACT
Cooperation	M	C2M1	Establish alliances with cities facing similar risks	Rome
Cooperation	A	C1A1	Align the objectives of a different stakeholder and develop a common understanding of resilience	San Sebastian, Vejle
Cooperation	A	C1A2	Develop formal partnerships between academic and scientific entities	Rome, Vejle
Cooperation	A	C1A3	Undertake public consultations to receive feedback on the resilience action plan	Vejle
Cooperation	A	C1A4	Develop a public communication platform to interact with stakeholders	Bristol
Cooperation	A	C2A2	Develop formal partnerships with regional stakeholders	Secondary: INTERREG Europe
Cooperation	R	C1R1	Widen collaborative networks with stakeholders to reflect on and make decisions about the progress of the city r	Rome
Cooperation	R	C1R2	Arrange multi-stakeholder debriefing sessions with the goal of improving collaboration and developing a shared	Rome
Cooperation	R	C1R3	Develop a public platform to enhance sharing among city stakeholders	Secondary: INTERREG Europe
Cooperation	R	C2R1	Participate proactively in regional, national and international networks to promote initiatives, exchange experier	Secondary: INTERREG Europe

Figure 7: List of resilience policies covered in the Resilience Building Policies tool

**Legend. Maturity stages are coded as: S = Starting; M = Moderate, A = Advanced, R = Robust, T = Vertebrate. Resilience dimensions are coded as: L = Leadership and Governance; P = Preparedness, I = Infrastructure and Resources; C = Cooperation. Therefore, for example, policy L1S2 can be read as 'policy number 2 belonging to sub-dimension 1 of the Leadership and Governance dimension of the RMM'. When, in the column 'city providing case study', it says 'secondary' instead of a city's name, it means that this policy is covered using secondary sources only.*

	Starting	Moderate	Advanced	Robust	Vertebrate
L	L1S2 L3S1 2/4	L1M1 L1M2 L1M3 L3M1 4/8	L1A1 L2A1 L3A1 3/5	L1R1 1/4	L2T1 1/5
P	P1S1 P2S3 2/6	P1M1 1/2	P1A1 P2A3 2/5	P2R1 1/3	 0/4
I	I1S2 I1S3 2/6	I1M1 I1M3 2/7	I2A1 I2A4 2/5	I1R1 I2R1 I2R2 3/3	 0/4
C	C1S1 1/2	C1M1 C2M1 2/3	C1A1 C1A2 C1A3 C1A4 C2A2 5/6	C1R1 C1R2 C1R3 C2R1 4/4	 0/4

Figure 8: Spread of policies covered in the Resilience Building Policies in relation to the Resilience Maturity Model. In each cell the first number represent the number of policies that have a case study associated with it and the second number represents the total number of policies contained in the RMM cell.

**Legend: The column furthest to the left represents the dimensions of the RMM. For full explanation of the used acronyms see the legend under Figures 5 and 6.*

The collection of case studies took place between June – September 2017. LiU, Strathclyde, and TECNUN contacted all seven of the SMR cities with requests to provide information about case studies previously highlighted by the cities in the WP3 workshop in Glasgow. For the purpose of drafting the case studies, cities were asked to take into account a template around which included the following headings:

- Summary – brief summary of the case study

- City context – which type of cities this case study might be of interest for
- Goal of the initiatives described in the case study - particularly how this linked to the goals of the RMM
- Cooperation – how the relevant stakeholders worked together with respect to the resilience project
- Required resources for the implementation of the resilience project
- Outcomes – what was achieved
- Links – relevant links to online resources

For ease of use, it was also agreed that the case studies should i) be no longer than 1 page of A4 and ii) contain a picture where possible.

In most instances the cases were reported verbally by the cities and then drafted by the interviewer. The draft was then checked by the city. Typically the drafts prompted further detail and editing as cities checked their memories.

2.4. SMR COLLABORATION ON THE CONSTRUCTION OF THE RBP

The process of constructing the RBP was highly iterative and collaborative. The SMR partners (LiU, Strathclyde, TECNUN, and ICLEI) organised regular videoconferences and meetings during the whole summer of 2017. Partners divided responsibilities among themselves, so each scientific partner was in charge of gathering case studies, listed above, from a number of partner cities. Due to close collaboration among the partners, it was possible to ensure that there were no overlaps or duplication of work, and that a range of different RMM policies were covered by the RBP. Partners were also collectively sharing relevant resources, and they worked together on developing the structure of the RBP, as well as the Web-based version of the RBP. In addition to collecting the required information from cities listed above, scientific partners also added to the gathered case studies by using external sources such as case studies available on websites of ICLEI¹ and Eltis².

All involved partners were actively engaged in the whole process of constructing this tool, and each partner contributed a unique advantage to this work. LiU, who were in charge of WP1 which was

¹ <http://www.iclei.org/activities/resources/publications/iclei-case-studies.html>

² <http://www.eltis.org/discover/case-studies>

focussed on the literature review, helped to ensure that the RBP was faithful to the state of art of the current academic literature and resilience practices in cities. Strathclyde, who are WP3 coordinators (tool development), helped to improve the integration of the RBP with other SMR tools. TECNUN, who were lead developers of the RMM as part of WP3, played a central role in ensuring that the agreed design of the RBP, which was focussed on the structure of the RMM, was implemented correctly. ICLEI, who leads WP5 and WP7, helped to coordinate the work on the tool with partner cities, and played the main role in transferring both the RMM and the RBP into the Web-based environment. And finally, partner cities, based on their real experience of working in the area of resilience, provided case studies, as well as valuable feedback (see section 4), which was fed directly into the construction of the RBP. It is then through close collaboration among the partners that the different features of the RBP, described in more detail in the next section, could be orchestrated and integrated effectively into one online tool.

3. DESCRIPTION OF THE RPB

Building on the previous sections, this section concentrates on showing the features of the RBP, including the Web-based interface of the RBP and the RMM, the structure of the RBP, links of the RBP with the 100 RC themes, and the integration of the RBP with four other SMR tools.

3.1. WEB-BASED INTERFACE OF THE RBP AND THE RMM

The RBP can be accessed on the SMR website, and it is fully integrated with the online version of the RMM – this means that the RBP can be used together only with the RMM (the user needs to go to the ‘RMM’ sub-heading under the ‘tools’ heading as there is no separate RBP sub-heading). Because of this, the RMM and the RBP share the same navigation features on the SMR website.

On the main page of the RMM (and so of the RBP as well), a simple instruction how to use both tools is shown (Figure 9). This instruction explains that the online RMM can be browsed according to different criteria: i) the maturity stage of the RMM (e.g. Starting, Moderate etc.), ii) the dimension and the sub-dimension of the RMM (e.g. Leadership & Governance, Infrastructure & Resources), and iii) by the relevant stakeholders to the given policy. The user can then click on any element of these criteria in order to see the content of the RBP for that policy (Figure 10).

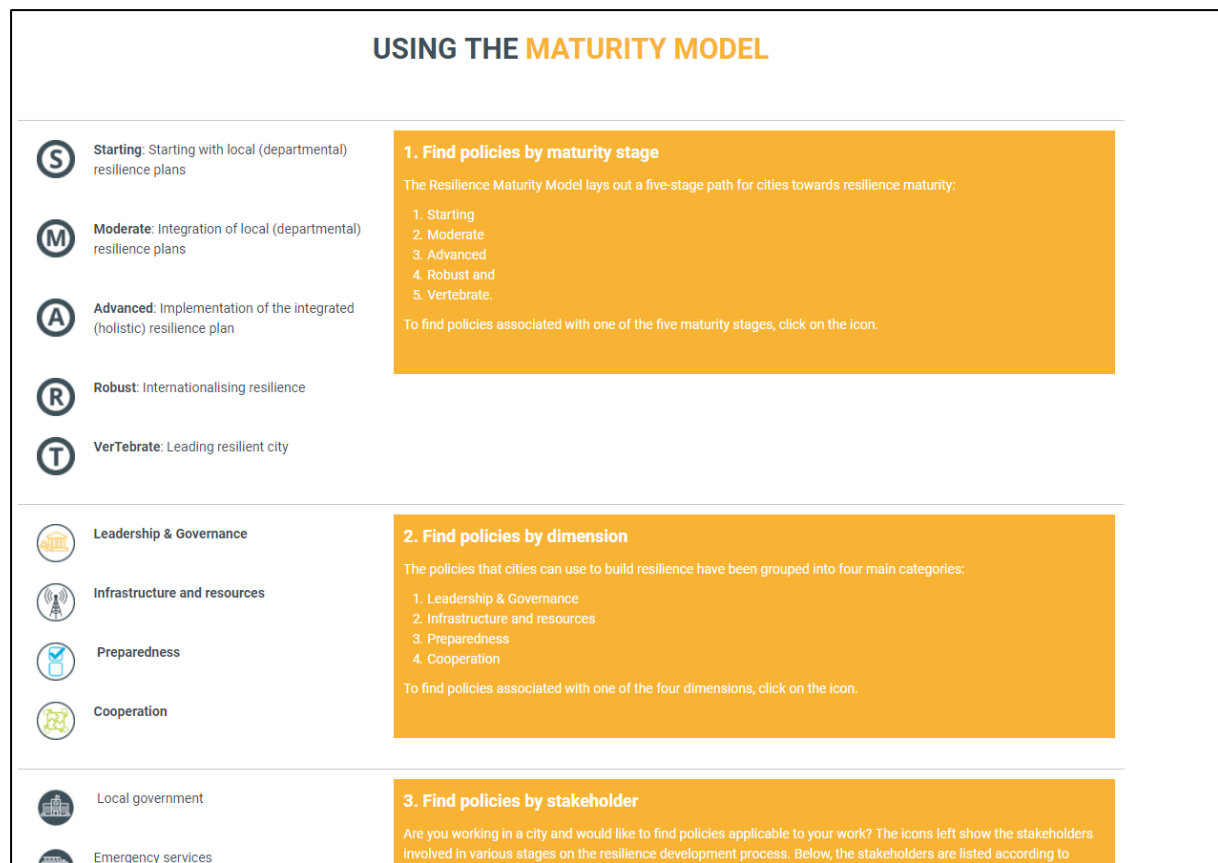


Figure 9: Using the Resilience Maturity Model and the Resilience Building Policies

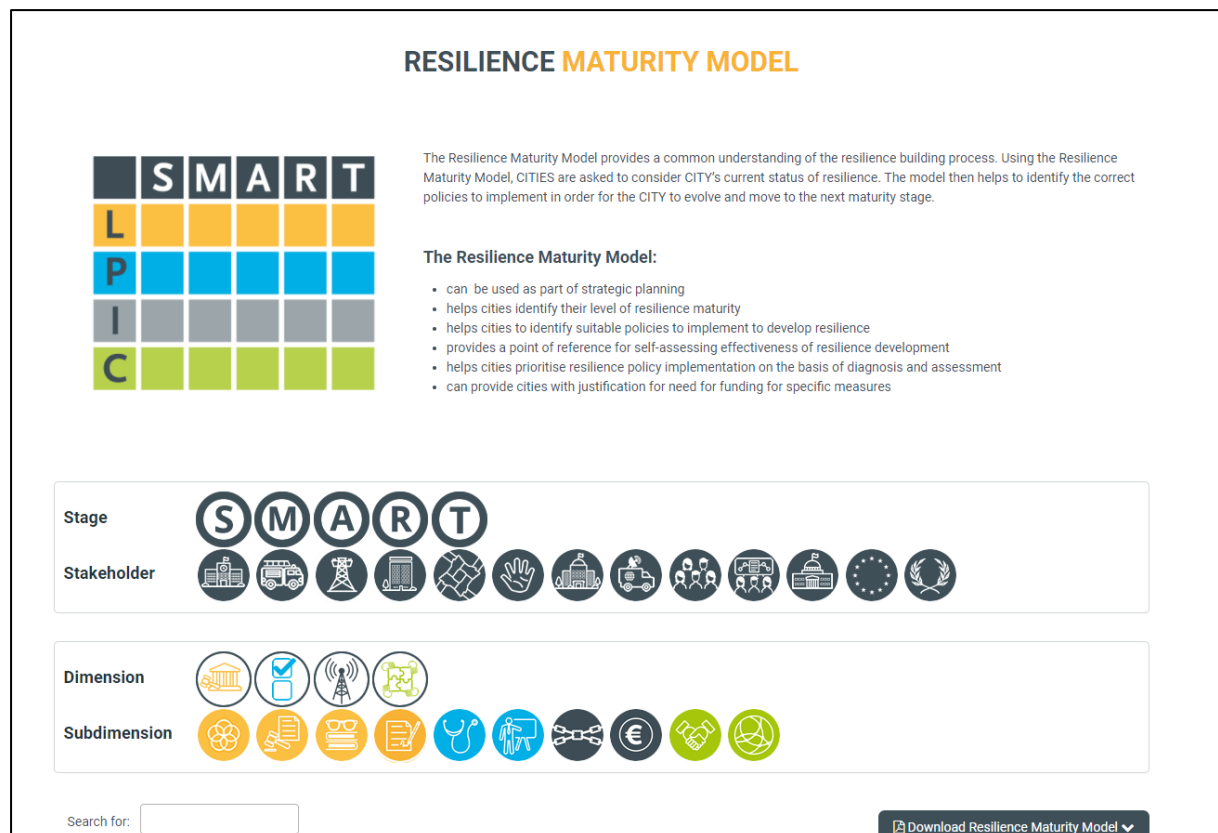


Figure 10: Navigating the Resilience Maturity Model and the Resilience Building Policies

For example, as it can be seen in Figure 11, upon clicking on the ‘Starting’ stage, the user can view all of the RMM policies under that stage. Those policies which contain a corresponding RBP content have an ‘i’ icon in their bottom right corner - by clicking on the policy, the user is shown the relevant case study with the supporting information. Each case study follows a standard structure, albeit, as explained above, some of the case studies were collected from partner cities, whilst other case studies were gathered from secondary sources.

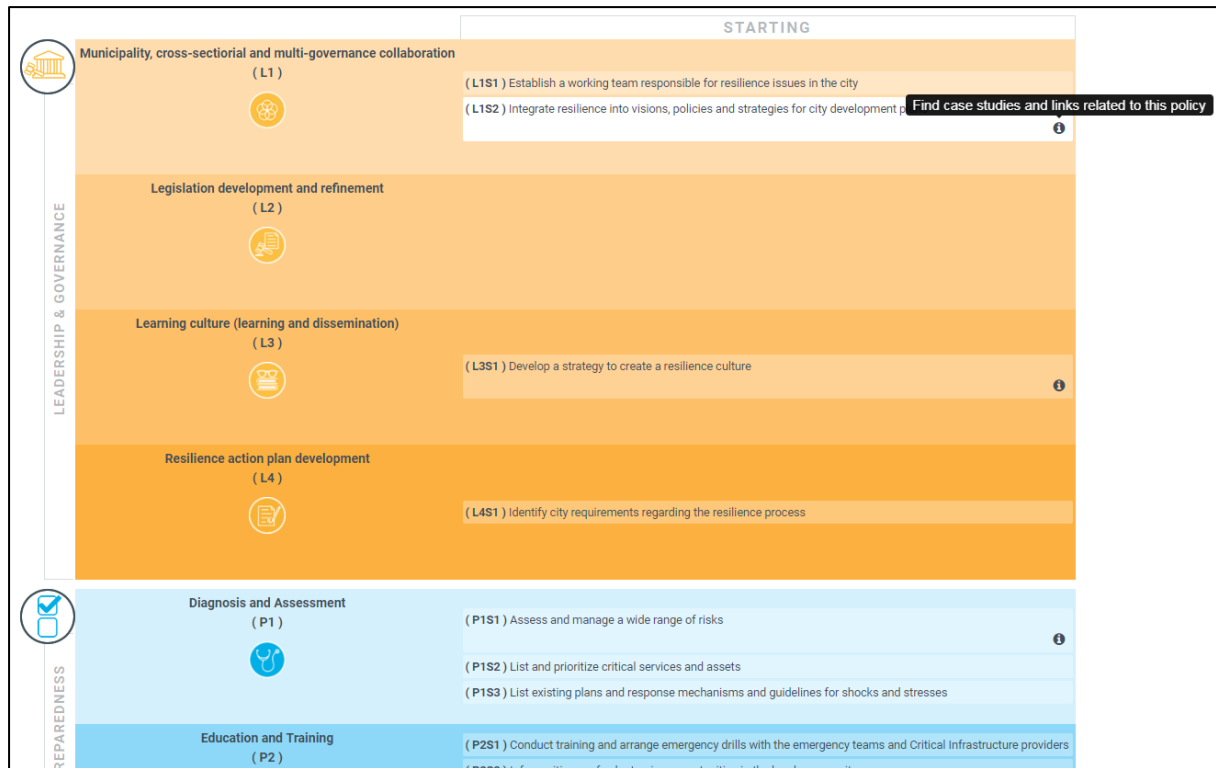


Figure 11: Accessing the content of the Resilience Building Policies

3.2. STRUCTURE OF THE RBP

As Figure 12 shows, the structure of the policies covered by the RBP tool is similar to the template used for collecting the case studies from cities, and it is as follows:

- Policy description – describes the RMM policy, for example ‘LS31: At this stage, resilience is a new concept to some citizens. This policy lays a framework for creating a resilience culture.’
- Case studies – lists the relevant case studies assigned to that RMM policy.
- Summary of the case study.
- Additional information:
 - City context – what kind of cities may find this policy of interest.
 - A picture illustrating the case study.
 - Goals – what the initiative in question was intended to achieve.
 - Cooperation between stakeholders – how different stakeholders worked together to

implement the resilience project in question.

- Outcomes – what was achieved with the resilience project discussed in the case study.
- Links to the relevant themes from the 100 RC network. This includes having reference to the different categories of resilience strategies which can be found on the Website of the 100 RC. As discussed above, the RBP is linked with the 100 RC themes because the latter is a widely established network in the area of resilience which is underpinned by rich resources and case studies in this area.
- Resources – what resources were required to implement the project.
- Other links – links to other resources which can be relevant to the case study.
- Indicators which can be used for evaluating the progress of the implementation of the policy.

POLICY L3S1

Develop a strategy to create a resilience culture

Policy description

At this stage, resilience is a new concept to some citizens. This policy lays a framework for creating a resilience culture.


Case studies

The Stakeholder Focus Groups of Rome

Summary

The efforts of Rome's local government to set a resilience agenda and increase engagement in building community awareness on urban resilience

▼ **Further information**



Relevant city context

The case study applies to all cities and towns developing a resilience action plan, including activities such as risk assessment and local stakeholder engagement.

Goals: increase engagement in building community awareness on urban resilience with local stakeholders; assessment of systemic risks

The City of Rome are setting an agenda for a resilience action plan, mainly led by the city's Urban Planning Department, "Risorse per Roma". It has been a challenge to define and operationalize the complex concept of resilience in the city, and one of the main topics has been to make a systemic risks assessment to

Filter policies

- S Starting
- M Moderate
- A Advanced
- R Robust
- T VerTebrate
- Leadership & Governance
- Infrastructure and resources
- Preparedness
- Cooperation

Indicators

Resources allocated to incentiveze CITY stakeholders to

Figure 12: Structure of a policy in the Resilience Building Policies tool

3.3. FUTURE CASE STUDIES

It has become evident from the WP3 workshops, and from the WP5 implementation sessions described in section 4 of this report, that it is important for the cities to be able to add new case studies to the RBP. This feature has been enabled, and it will be communicated on the SMR website that users can submit case studies by joining the Wiki of the SMR group. Anyone can join the group by contacting an ICLEI representative. Joining the group is also an opportunity for cities to develop partnerships and collaboration, and to learn from one another's experiences of using the SMR tools.

3.4. EXAMPLE OF AN RBP CASE STUDY

For illustration, one of the case studies included as part of the RBP is presented below.

Policy P2A3: Developing education programs in schools about resilience

Case Study; City of Glasgow: Community Resilience Development Officer

Summary

A national role was created for a Community Resilience Development Officer. The role was intended to help ensure resilience thinking reaches schools and children. The Officer was to encourage a consistent approach across teachers across the country in this area and to share best practice by getting teachers together and to let them know about all the tools and approaches that are available to them.

Relevant City Context

This case study is of interest to all cities whether they wish to consider the full case study or to adopt something on a smaller scale. Although the work was funded at a national level by the Scottish Government, a city could undertake something similar on a smaller level by having a reduced resource but still focusses on liaising with the City Education service. Children are the future of the city, so getting them engaged at an early age is important. Children can also be a key route in engaging parents.

Goal: Help with promoting a culture of resilience through increasing citizens awareness of resilience by (L3M1) developing education programs in schools about resilience (P2A3)



In Glasgow there is a great diversity of understanding of the term “resilience”, ranging from very simple conceptualisations to those which are extremely complex. The project was designed to create better understanding nationally (Scotland) across school age children (age 11-17) about issues of community preparedness as well as to prompt teaching staff to design exercises to build skills in relation to community resilience and action.

The plan was to liaise nationally with schools and produce a defined outcome around resilience. This depended upon enhancing teachers understanding of resilience and so encouraging their schoolchildren to do activities around resilience. The focus was mainly on being prepared in case of emergencies as it was felt there was not sufficient prominence placed on this through the national Curriculum for Excellence in schools. However the scope did touch on wider resilience issues such as self-esteem, community empowerment and mental health.

A full-time position was created, the Educational Officer, to encourage a consistent approach across teachers across the country in this area and to share best practice by getting teachers together and to let them know about all the tools and approaches that are available to them.

Evaluation of outcome

The impact of that Community Resilience Development Officer role on adult stakeholders was evaluated in 2017 by an independent organisation - The James Hutton Institute - using qualitative and quantitative data. The full project has been evaluated:

http://www.readyscotland.org/media/1390/crew_community-resilience-officer-evaluation-final.pdf

It was felt that schools were engaged with the process and thus wanted to keep this momentum up and not lose the initial enthusiasm. Therefore recommendations included keeping the post going beyond the two years and also focussing on how children can be proactive as well as reactive.

Resources

The Scottish Government funded full-time two year Community Resilience Development Officer position based in Education Scotland to co-ordinate communications and actions on a national level. The role was intended to help embed resilience thinking and online resources within the Curriculum for Excellence, i.e. to ensure resilience thinking reaches schools and children. A reduced role could be considered on a smaller scale to start the process.



Figure 13: Picture illustrating Policy P2A3 as part of the Resilience Building Policies

3.5. INTEGRATION OF THE RBP WITH OTHER SMR TOOLS

The RBP needs to be considered in relation to four other SMR tools which form the ERMG. The integration of the SMR tools can be seen in Figure 14. As explained throughout this report, the RBP is integrated with the RMM because it extends the information available with respect to the RMM policies, and it provides practical illustrations based on cities' real-life experiences. Also, the RBP and the RMM share the same Web-based interface, and so they are essentially used together. Along these lines, the RBP also covers most of the 19 RMM policies which are used in the standard (not-extended) version of the SD model, which means that the policies in the SD model can be explored further in the RBP, thereby providing a clear link between these two tools. The RSQ forms an important part of the policies contained in the Preparedness Dimension of the RMM and case studies exist in the RBP that demonstrate how cities have taken account of risk systemicity. And finally, in terms of the Resilience Information Portal, the Portal serves as an overarching framework for all SMR tools, including the RBP, because it provides an online environment where the users of SMR tools can share their experiences and learn together and from one another.

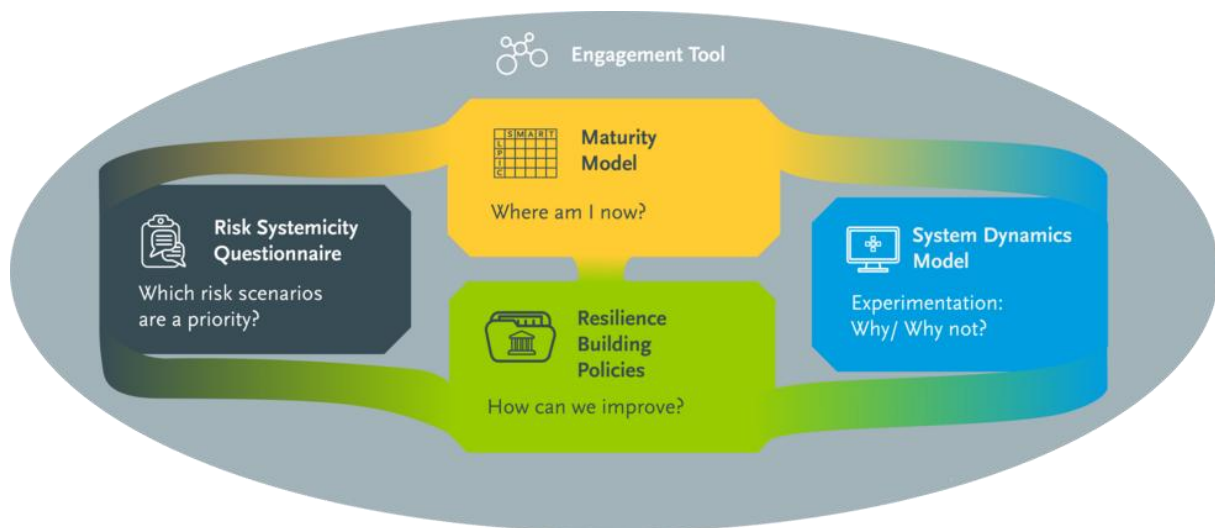


Figure 14: Integration of the SMR tools

4. IMPLEMENTATION OF THE RBP IN CITIES

The RBP was implemented September– October 2017 during three stakeholder training sessions in Glasgow, Kristiansand, and San Sebastian. Due to the integration of the RBP with the online version of the RMM, these two tools were presented together to the city stakeholders. As a result, it was typically not possible to decouple the feedback received with respect to the RMM and the RBP. The feedback obtained in these sessions with regards to these tools is presented below.

4.1. WP5 STAKEHOLDER TRAINING IN GLASGOW - FEEDBACK

Overall, participants thought that the RBP was well-structured and easy to navigate. They believed that it may be particularly useful for cities which are only starting their resilience journey, as it gives them rich examples of policies which they can implement. However, more broadly, the RBP can be helpful in understanding the different resilience maturity stages and what can be done to progress the city.

As part of possible changes to the tool, participants suggested a feature which would allow users to tick the policies which they have already implemented.

Participants also provided comments regarding how the RBP should be communicated in the ERMG manual, which was taken into account when developing the ERMG:

- Make it clear that the RMM/RBP is dedicated to baseline assessment of the particular aspect of city resilience in question.
- Emphasize the importance of communication of RMM policies to politicians as their support is required to implement the policies.
- It needs to be communicated clearly that the tools will have to be tailored by the cities. Tools are frameworks that need to be tweaked to the cities' needs by the cities.

4.2. WP5 STAKEHOLDER TRAINING IN KRISTIANSAND - FEEDBACK

Overall, participants found the RMM/RBP a helpful tool for thinking strategically about resilience in their cities, and an effective systematic way of discussing the state of the organisation. Participants recognized a need for tools which support strategic thinking. The consideration of the RMM/RBP helped participants realize the difficulty of getting leadership to work long-term, and so engage in long range planning which considers how to progress to higher resilience maturity stages. Moreover, with respect to the RMM/RBP, participants acknowledged the impact of people working in silos on an ability to develop long-term strategy. For example, they realised how difficult it was to move from moderate to advanced maturity stage because of the silo problem. Another question considered during the session was the importance of focussing attention on the shortage of resources to support strategic thinking. They thought that the RBP helped to address this problem, however they would like to see more information on resource requirements. They also found too many repeat case studies when navigating through the RBP. Finally, they welcomed enthusiastically an ability to add new case studies to the RBP, and expressed interest in the possibility of adding more case studies to the RBP.

With respect to the feedback on information on resource requirements, this led the tool builders to contact some cities who had provided case studies that lacked resource requirements. However, this did not always result in further information being provided due to either lack of availability of the information or cities not wishing to provide the information.

Repeat case studies occurred because the same case study was applicable to a number of RMM policies. It was felt that it was better to keep these links in, rather than remove them, as case study information on some policies would then be removed, providing less support to cities.

4.3. WP5 STAKEHOLDER TRAINING IN SAN SEBASTIAN – FEEDBACK

The session in San Sebastian reinforced the points made regarding the use of the RBP from the two previous WP5 events. Overall, the group liked the Web-based interface of the RBP and they found it easy to use. They also believed that it was helpful to see what other cities are doing in the context of resilience, and in such sense they found the RBP being very useful, especially when used in combination with the RMM. Moreover, participants expressed interest in contributing more case studies to the RBP.

5. FUTURE APPLICATION OF THE RBP

The RBP is expected to be implemented in the backbone of SMR cities as part of the ERMG. As it has been stated in this report, the RBP is linked particularly strongly with the RMM which is at the heart of the SMR tools. On this basis, the RBP will support the implementation of the RMM by illustrating policies at different maturity stages through practical real-life examples from cities. Through the integration with the RMM, the RBP serves as a tool for supporting strategic, long-term thinking about the improvement of resilience level of the city. The advantage of the RBP in this strategic process is placed on the need for collaboration and communication between relevant stakeholders, including politicians, and careful consideration of the required resources for the implementation of resilience policies. Furthermore, the RBP enhances the interactivity, and so the usability, of the Web-based version of the RMM as it enables the city users to access additional information with respect to the RMM policies which appear to be of high relevance to them. All of these above points have been reinforced by the received feedback during the WP5 implementation sessions. The RBP is thus seen as a promising tool which provides a practical contribution to the ERMG, and it particularly adds value to the future use of the RMM.

6. CONCLUDING REMARKS

The RBP is a Web-based, interactive tool which comprises of a portfolio of case studies and



supporting information which has been tailored to the resilience policies available in the RMM. The RBP has been developed through close collaboration between the SMR partners including LiU, Strathclyde, TECNUN, ICLEI, and the partner cities. As a result of this work, not only does the RBP practically illustrate, and elaborate, the resilience policies included in the SMR tools, but it also enhances the navigation and interactivity of the online version of the RMM. The received feedback from the WP5 implementation sessions in Glasgow, Kristiansand, and San Sebastian, reinforced the view that the RBP, combined with the RMM, offers helpful support to think more strategically about resilience in cities, and it enables both a broad overview of relevant policies as well as the ability to explore those policies in more detail. Consequently, it can be concluded that the RBP meets objective 5 of the SMR project, and it is seen as a promising tool with respect to the future implementation of the ERMG in cities.