# SMART MATURE RESILIENCE

## DELIVERABLE 2.4: HOLISTIC RESILIENCE WORKSHOP

TECNUN | 31/05/2016

| | Deliverable 2.4: Holistic Resilience Workshop Report |
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# EXECUTIVE SUMMARY

The fourth workshop of the SMR (Smart Mature Resilience) project took place from the 9th to the 12th of May 2016 in Vejle (Denmark), and focused on integrating the results obtained in the previous workshops on critical infrastructures, climate change, and social issues. In this workshop, experts from the cities of Bristol, Donostia / San Sebastian, Glasgow, Kristiansand, Riga, Rome, and Vejle were invited to contribute to the development of the first preliminary version of the city-resilience maturity model and the risk assessment questionnaire. Furthermore, they had the opportunity to provide their feedback for improving these two tools.

The aim of this report is to explain the execution of the workshop, describing the activities carried out and the obtained results. First, the organisational and preparation issues, which took place in relation to the workshop are presented, including the invitation to the workshop, the agenda setting, and associated issues. Second, the main results from the exercises developed within the workshop are described. These exercises were developed to receive feedback from experts from the cities and develop the preliminary versions of the maturity model, the risk assessment questionnaire and the engagement tool. Finally, the evaluation and lessons learnt from the workshop are presented.

The exercise results from the workshop have helped to provide a better definition of the policies that need to be implemented in the specific stages of the city-resilience preliminary maturity model. These results are useful to understand better the dynamics of building resilience. Furthermore, the workshop has provided solid basis for the forthcoming work in other workpackages, including WP3 where the resilience tools will be developed and WP4 where the engagement tool will be developed.

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# INTRODUCTION

This deliverable reports about the fourth workshop on holistic resilience approach in the course of the SMR project, which is the acronym for “Smart Mature Resilience”. The workshop was organised by the City of Vejle and took place from the 9th to the 12th of May 2016 in Vejle, Denmark.

On the 9th of May, SMR partners attended an introduction session in which a number of experts invited from the City of Vejle made presentations about the evolution of resilience building in the city of Vejle. Then, the leaders from the different workpackages of the SMR project presented the current situation of the workpackages. The 10th and the 11th of May were the de facto workshop days with the SMR partners. Finally, on the 12th of May, a debriefing meeting to evaluate the execution of the workshop and obtain lessons learnt for the next ones was attended by all partners of the SMR project.

The aim of this deliverable is to explain the execution of the workshop, describing the activities carried out and the obtained results. First, the organisational and preparation issues are presented, including the invitation to the workshop, the agenda setting, and associated issues. Second, the main results from the exercises developed within the workshops are documented. These exercises were developed to receive useful information from cities in order to develop the preliminary version of the maturity model and the risk assessment questionnaire. Furthermore, input for developing the engagement tool from Work Package 4 (WP4) was obtained. Finally, the evaluation and lessons learnt from the workshop are presented.

# WORKSHOP PREPARATION

The main objective of the fourth workshop, which took place in Vejle, was to gather useful information and feedback from experts to develop a preliminary version of the maturity model and the risk assessment questionnaire. Furthermore, it served to receive information regarding the engagement tool that will be developed in Work Package 4. The steps for the workshop development (Figure 1) were first, to prepare the workshop. The agenda was defined, logistics arranged and the cities were asked to prepare some materials in advance. Then, the workshop was carried out using group exercises and a final debrief. Finally, the deliverable 2.4 was developed compiling all the information gathered during the workshop.


**Figure 1. Steps for the workshop development**

## PREPARATION ACTIVITIES

Several duties and activities were performed to prepare the workshop. Useful information to improve the organisation and the correct implementation of the workshop was provided in advance by all partners. The following information was given in the preparation period:

- Workshop agenda (Annex III).

- Cities were requested to prepare some materials in advance for the Maturity Model session (Annex II). City representatives were asked to review the description and the stakeholders involved in each maturity stage and add or change any information they consider convenient. Furthermore, they were asked to identify the most relevant policies/actions of their cities related to resilience and classify them in the most convenient maturity stage where each policy should start its implementation process. To carry out this exercise TECNUN (responsible for this

session) sent to cities a preliminary version of the maturity model so they could use it as a template (Annex IV). This previous reflection was essential to have successful workshop outcomes.

The setting of the agenda for the fourth workshop consisted of an iterative process in which the project partners participated and included the following steps:

- Periodic teleconferences were arranged among the workshop partners to prepare the structure and the exercises of the workshop and to identify the adequate experts that would participate in the workshop.
- The SMR partners from the City Council of Vejle developed a list of suitable experts regarding city resilience that could contribute to gathering information to accomplish the objectives of the workshop.
- TECNUN, with the help of Strathclyde, developed, based on the comments and suggestions received from the project partners in several weekly telephone conferences, the workshop agenda. This agenda included the main building blocks of the workshop with a rough time plan.
- The final version of the agenda for the workshop was approved one week before the workshop took place. This final version of the agenda (Annex III) included the description of the activities of the workshop, the timetable and the objectives of each activity.

# WORKSHOP EXECUTION AND RESULTS

Participants of the workshop included the SMR scientific committee (LIU, TECNUN, CIEM, STRATHCLYDE, DIN and ICLEI) and experts from the cities of Bristol, Donostia / San Sebastian, Glasgow, Kristiansand, Rome, Riga, and Vejle. Table 1 includes the profiles of the experts who participated in the workshop and Figure 2 presents a picture of all the workshop participants. The complete list of the workshop participants can be found in Annex I.

**Table 1. Experts profiles.**

| Profile | City |
|---|---|
| Project Manager (Bristol City Council) | Bristol |
| Strategic Resilience Officer (Bristol City Council) | Bristol |
| Head of European Projects Office ( City of Rome/Risorse per Roma) | Rome |
| Natural Hazard Assessment Expert (City of Rome/Risorse per Roma ) | Rome |
| Expert (Riga City Council) | Riga |
| International Project Manager-Coordinator (Riga City Council) | Riga |
| Glasgow Center for Population Health (Glasgow City Council) | Glasgow |
| Resilient Glasgow Officer (Glasgow City Council) | Glasgow |
| Project Manager (Kristiansand City Council) | Kristiansand |
| Security and Crisis Manager (Kristiansand City Council) | Kristiansand |
| Head of VIFIN (Vejle City Council) | Vejle |
| VIFIN technician (Vejle City Council) | Vejle |
| Chief Resilience Officer (Vejle City Council) | Vejle |
| Technical assistance of Strategic Planning (City Council of Donostia-San Sebastian) | Donostia / San Sebastian |
| Social Services Councillor (City Council of Donostia-San Sebastián) | Donostia / San Sebastian |
| Civil Protection Councillor (City Council of Donostia-San Sebastián) | Donostia / San Sebastian |

**Figure 2. Photo of the workshop participants.**

# INTRODUCTION TO THE WORKSHOP (9TH OF MAY)

On May 9th, the partners of the SMR project met at 15:00 on the Tårnværelse, Økolariet. The partners from the Council of Vejle, who were in charge of organizing the workshop, welcomed the SMR project partners. The objective of this meeting was, first to hear presentations regarding the evolution of resilience building activities in Vejle from the experts invited from the city of Vejle and put in common the development and results of the different workpackages of the project.

The Chief Resilience Officer (CRO) from Vejle did the first presentation. He presented the work done in Vejle within the 100 Resilient Cities[1] (100RC) programme. 100 RC is helping cities around the world to become more resilient to the physical, social and economic challenges that are growing as part of the 21st century. The framework proposed by 100 RC analyses shocks and stresses of the city and helps to identify the city capacity towards these shocks and stresses. Vejle has been the first city of Europe from the 100 RC that has launched the resilience strategy[2]. The CRO from Vejle explained that this resilience strategy of Vejle covers the new emerging threats that affect the city related to climate change, aging of the population, changing industries and labour market, and social tensions such as growing immigration. In order to develop this strategy, The Chief Resilience Officer explained that a number of workshops and conversations about resilience have taken place with the different stakeholders from the city to identify the shocks and stresses that people face with. Stakeholders included citizens, public and private organizations as well as politicians. This multi-stakeholder consultation were useful to find solutions and identify actions to improve the city resilience. The Resilience LAB of Denmark was presented as a successful initiative that focuses on public-private companies and fostering collaboration.

The second presentation was done by the Officer for Sustainable Resources, Climate and Resilience at the European Secretariat of ICLEI. ICLEI is an association of local governments that have committed to sustainability and supports a network of local governments and cities at local, national, and international levels. ICLEI is specialized in forging partnerships and engaging municipalities, companies and stakeholders to work jointly on projects. Furthermore, it provides technical consulting, information services and training to build capacity, share knowledge and support local governments. He presented the current European projects from the Horizon 2020 and EU 7$^{th}$ framework in which ICLEI is involved regarding urban adaptation and resilience. In addition, he presented on European cities that are developing innovative solutions in terms of resilience building at local level. An example of one of these innovative solutions is the Resilience Lab Denmark in the Green Tech Center of Vejle. This lab aims at being an internationally recognized Smart Grid testing facility in Europe.

Finally, the mayor of Vejle welcomed participants and gave information regarding the city of Vejle. Vejle is the 6$^{th}$ largest municipality of Denmark and has a population of around 55000 inhabitants.

[1] www.100resilientcities.org

[2] http://www.100resilientcities.org/blog/entry/vejless-strategy-release#/-_/

Furthermore, the mayor of Vejle described his experience in the 100 Resilient Cities and his recent visit to the Rockefeller Foundation.

After the presentations, the main current situation of the different workpackages (WP) of the SMR project was explained. A representative from the entity in charge of leading each workpackage made a brief description of the outcomes of the deliverables already finished as well as the deliverables and tasks that need to be sent in the short term. WP1 was presented by LIU. WP2 was presented by TECNUN. WP4 was presented by CIEM. WP5 and WP7 were presented by ICLEI. WP6 was presented DIN. Finally, WP8 was presented by TECNUN.

# MATURITY MODEL DEVELOPMENT SESSION (10TH OF MAY)

On Tuesday 10th, the maturity model development session started with a brief welcome and an introductory session. Afterwards, the exercises of this session were explained. During the morning, firstly, city representatives presented the policies and activities that they are carrying out in their cities to improve the city resilience and secondly, a preliminary version of the maturity model was presented to city representatives. The objectives of the exercise were threefold: to validate the policies already included in the maturity model, to review if all the policies were assigned in the correct stages, and to include new policies that cities had described in the presentations earlier. During the afternoon, the experts worked on finishing the previous exercise. Finally, a brief analysis of the obtained results concluded the session.

## PRESENTATIONS OF THE CITIES

Representatives from the cities of Bristol, Glasgow, Donostia / San Sebastian, Rome, Kristiansand, and Riga, presented the policies and activities that they are carrying out in their cities to improve the city resilience level. The representatives of each city firstly explained to the workshop participants what they have done and achieved in their city. Afterwards, they explained their remaining concerns about the city resilience. This information was useful to identify policies and get a grasp of the maturity stages in which those policies should be implemented in cities. Actually, these policies would be a useful input for the development of the preliminary maturity model.

**City of Bristol**

Bristol city representatives presented a snapshot of the activities carried out in the city of Bristol in terms of improving the city resilience. Many activities have taken place over the last 10 to 15 years but have foundations formed over decades. The city of Bristol is involved in different European resilience projects with other cities. It is also one of the 100 cities selected for the 100 Resilient Cities (100RC) network. The city of Bristol talked about three areas of resilient work: Building smarter infrastructure, tackling climate change, and bridging inequalities gaps to highlight the evolution of activities over time.

Regarding building smarter infrastructure, the Smart City Report identified the main strands of activity for future development – smart grid, smart transport, smart data. Bristol is involved in a European project funded by the H2020 named "Replicate", which aims to use smart city solutions to tackle urban problems such as unsustainable energy use. Furthermore, among other activities, the city is involved in the development of the "Bristol is Open" network. This network enables collaboration between the technology, media, and telecommunications industry, universities, local communities, and local and national government that aims at developing an open programmable city region.

In terms of tackling climate change, the city of Bristol has a strong history of grassroots activity. The city has developed and is implementing plans related to climate change, energy security, and low carbon with an extensive programme of investment for energy infrastructure. Furthermore, it is involved in numerous international initiatives such as Covenant of Mayors[3] programme whilst the city's Bristol Green Capital Partnership[4] has nearly 900 member organisations, ranging from business and the public sector to charities and community organizations.

Finally, regarding bridging the inequalities gap, the periodic Joint Strategic Needs Assessment reports on the health and wellbeing citizens and informs the Health and Wellbeing Strategy. The city of Bristol has also established 14 neighbourhood partnerships across the city which bring together local people, community groups, the council, police and local business to take action on things that are important for each area.

**City of Donostia / San Sebastian**

[3] http://www.covenantofmayors.eu/index_en.html

[4] http://bristolgreencapital.org

Donostia city representatives presented the activities the city of Donostia/ San Sebastian is doing in terms of improving the city resilience. The actions presented by Donostia/ San Sebastian were related to: mobility, energy, disaster risk analysis and management, adaptation to climate change and social challenges.

The city of Donostia / San Sebastian has recently started working on resilience as a concept although during the last years the local government has already implemented a number of actions that contribute to the development of the city resilience. The main areas in which the city has been working in the last 15 years are critical infrastructures, climate change adaptation, transport, and social challenges.

Actions related to climate change mitigation and adaptation started with the development and implementation of the local agenda 21 in 1998. In that moment, the city started to implement actions to reduce carbon emissions and adapt to climate change effects that increasingly affected the city such as flooding, waves and heavy storms. With regard to these increasing challenges, the city has implemented different plans based on their previous experience dealing with floods in the neighbourhoods next to the river. In relation to sustainability and energy efficiency, the local government is currently involved in the development of actions and plans, like the Sustainability Energy Plan or several pilot projects to generate renewable energy. As an example, in one neighbourhood of the city the waste heat produced in the maintenance of the local ice park is used to heat the water of the nearby swimming pools. The City is also developing a Smart City Plan, starting with a pilot “the Urumea Riverside District project”, within the EU H2020 “Replicate” project. In relation to mobility, the local government is trying to change the way citizens move, promoting sustainable ways of transport to enhance the use of public action. The policies seem to be successful because San Sebastian is the city of Spain with the highest rate of users per bus/year.

Finally, regarding social challenges, the ageing of population is a main concern in the city. Currently, 23% of the population is more than 65 years old. The department of wellbeing of the city council is in charge of providing funding and implementing a series of plans to help children, women, and aged people. The main difference from the last 4 years in this area, is that before these plans were implemented independently by one or two departments while now they are carried out in collaboration with different departments and with increasing participation and involvement of citizens and other stakeholders.

**City of Glasgow**

Glasgow city representatives were in charge of presenting the current activities the city of Glasgow is carrying out in terms of building the city resilience. As they explained, Glasgow has been an industrialized city which during the last 50 years has turned into a media and touristic city.

The city of Glasgow is involved in different resilience European projects with other cities. It is also one of the 100 cities selected for the 100 Resilient Cities (100RC). Within its involvement in the 100RC, the city of Glasgow has carried out a series of workshops and community consultations to identify the meaning of resilience and resilience challenges for the city stakeholders. As a result of these activities, it has been identified that there is a lack of a shared understanding of what resilience means. Furthermore, the social dimension of resilience particularly fairness and tolerance have been identified as an attractive feature of resilience in the city of Glasgow.

In addition to this, the main challenges that Glasgow faces have been identified. These challenges are related to the population change, health inequalities, and unqualified population. In this regard, the city has developed a resilience strategy that aims at embracing transformation, drawing on cultural assets, carrying out regeneration programmes and diversifying the economy. To achieve these objectives, 15 actions have been defined in the resilience strategy. Among these actions empowering citizens, fostering civic participation, unlocking place-based solutions and innovating for economic growth have been identified as crucial.

**City of Riga**

Riga city representatives was in charge of presenting the activities the city of Riga is carrying out in terms of resilience building process. The city of Riga aims at becoming a smart energy city by 2020. Its objectives are to reduce carbon emissions, increase the electric power driven public transport vehicles and develop innovative financial instruments. To achieve these objectives, the city of Riga has developed a sustainable development strategy as well as a development program. The city council developed the strategy and the programme with the help of municipal institutions such as public and non-governmental organizations as well as citizens.

Furthermore, the future plans of the city of Riga are to improve the city strategy for resilience development and integrating it within the municipal and national plan. In addition, the city aims at implementing a data analytic and monitoring platform, as well as exchange experiences with other cities.

**City of Kristiansand**

A Kristiansand city representatives presented the actions that the city of Kristiansand is carrying out regarding the improvement of the city resilience. As he explained, every 4 years a short term city action plan is developed and every 10 years they also develop long-term plans to deal with social issues, critical infrastructures, and climate change.

Furthermore, the city has preparedness actions plans to deal with specific emergency and crisis related to social issues, critical infrastructures, and climate change. In addition, the city is well known for its advanced crime prevention plans. Regarding the city infrastructure, the planning department of the City Council uses holistic check lists and urban district plans to control the construction in new and existing urban areas.

A long-term objective of the city of Kristiansand is to become a university city. This objective is included in the future plan of the city for 2040. In this regard, the city council is implementing actions in order to engage universities and private sectors to make the city an attractive place for studying.

**City of Rome**

A representative from Rome presented the actions implemented in the city of Rome regarding the city resilience development. The city of Rome is involved in different resilience European projects with other cities. It is also one of the 100 cities selected for the 100 RC. As he explained, the city of Rome is focused on improving four main domains: public and private abandoned property, cultural and natural heritage, vulnerable population, and critical infrastructures.

Regarding the activities, the city of Rome is currently carrying out to improve the city resilience, a control and monitoring room for managing cultural heritage has been created in addition to obtain a European Fund for Rural development. These policies aim at reducing the impact of climate risks on fragile, unique and unreplaceable assets as well as deal with the large number of resources that are poorly integrated into the life of the city.

The city of Rome is also working on the impact of immigration waves of the ordinary urban management. Therefore, it has created a protection system for refugees, and it is collaborating with voluntary and NGO organizations. Finally, in terms of effects of climate change to vulnerable infrastructures, environmental and cultural heritage, the city of Rome is involved in the Covenant of Mayors programme and in national insurance programs.

## EXERCISE DESCRIPTION

After the different cities had made the presentation regarding their resilience building process, a preliminary version of the maturity model was presented to city representatives. The objective of this exercise was to validate the policies already included in the maturity model, to review if all the policies were assigned in the correct stages and to include new policies that cities had described in the previous presentations. To carry out this exercise first, the preliminary maturity model was presented to the participants, this maturity model will be presented with the information collected in this workshop in the deliverable 2.6.

The maturity model serves to identify the ideal path for the evolution of the resilience building process from an initial stage to a more advanced stage, passing through a number of intermediate stages, where cities have different starting points. In this case, five are the identified stages: **Starting, Moderate, Advanced, Robust, and verTebrate.** Each of these maturity stages has five dimensions: *robustness, infrastructures and resources, cooperation, learning*, *preparation*, and *leadership and governance*.

The fulfillment of the policies included in each maturity stage will allow the city to move forward from one stage to the next one improving its resilience local level as well as enhancing the European resilience level. However, there is not a specific time to make this progress, so several years may elapse to move from the current stage to the next one. During this period in one specific stage, the circumstances of the city may change so they should use a control and continuous improvement management process to systemize the work and boost the efficiency avoiding managing tasks individually or silo-wise. The preliminary maturity model was developed using the data gathered in the three previous workshops which were focused on critical infrastructures, climate change, and social challenges.

For the development of the exercises, participants of the different cities were split into five small groups (see Table 2). Each group worked on one of the five dimensions of the maturity model: robustness, cooperation, learning, preparedness, and leadership. Participants could choose in which group they wanted to be. The main objective was to form groups in which their participants felt comfortable analysing policies regarding the chosen dimension. Furthermore, a group facilitator from the scientific committee was assigned to each group to enhance reflection and discussion about the results. In addition, two recorders were assigned to gather all the information that was obtained in the discussions. After the participants worked in small groups, the results obtained in each small group were presented in a plenary session by the group facilitator.

**Table 2. Roles and participants of the different groups.**

| Resilience Dimensions | Participants | Facilitator | Group recorder |
|---|---|---|---|
| **Robustness, infrastructures & resources** | 1 Participant from Donostia / San Sebastian<br>1 Participant from Kristiansand<br>1 Participant from Rome | 1 Participant from TECNUN | 2 Participants from TECNUN |
| **Cooperation** | 1 Participant from ICLEI<br>1 Participant from Kristiansand<br>1 Participant from DIN<br>1 Participant from Bristol | 1 Participant from CIEM | |
| **Learning** | 2 Participants from Riga<br>2 Participants from Vejle<br>1 Participant from Glasgow<br>1 Participant from Bristol | 1 Participant from CIEM | |
| **Preparedness** | 2 Participants from Strathclyde<br>2 from LIU | 1 Participant from CIEM | |
| **Leadership & governance** | 2 Participants from Donostia / San Sebastian<br>1 Participant from Rome<br>1 Participant from ICLEI<br>1 Participant from Glasgow | 1 Participant from CIEM | |

## RESULTS OF THE EXERCISES

As a result of this exercise, the policies assigned in each of the five dimensions of the preliminary maturity model were improved and validated. Following, the policies for each dimension are presented highlighting in red the changes proposed by experts and in blue the policies that where in an incorrect maturity stage. In the cases in which the policies had been implemented in a specific city, the name of that city that had implemented those policies was written in brackets. Furthermore, it should be highlighted that there are some policies that were initially included in the preliminary maturity model but finally, there were not included in the final list of policies that is presented below. The reason for excluding these policies is that participants of the exercises considered that these policies were already included in other policies. The following lists represent the policies that were validated for each maturity stage and each dimension.

**LEADERSHIP & GOVERNANCE**

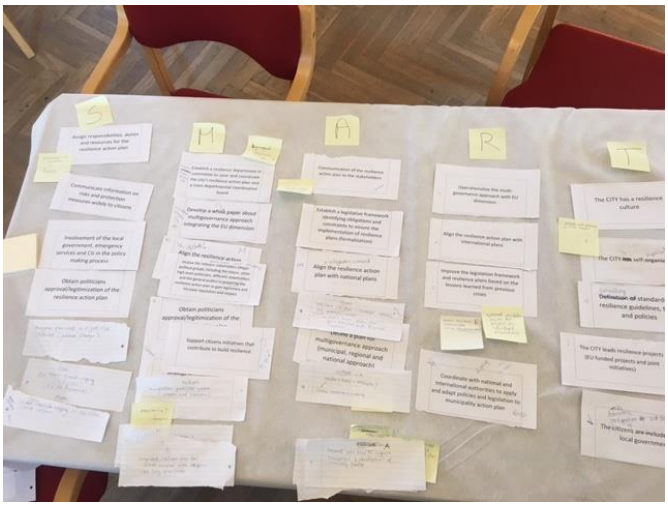


**Figure 3. Results of the leadership and governance dimension**

Starting Stage

- Assign responsibilities, duties and resources for the resilience action plan
- Promote National Risk Insurance (Rome)
- Communicate information on risks and protection measures widely to citizens
- Involve the local government, emergency services, and Cis in the policy making process
- Obtain politicians approval/legitimization of the resilience action plan
- Carry out a financial and political landscape mapping
- Plan Above-Ground mapping to obtain a full picture of the city (Glasgow)
- Conduct stakeholder mapping to identify key sectors that influence the city resilience (Bristol, Donostia / San Sebastian, Glasgow, Kristiansand, Riga, Roma, and Vejle).

Moderate Stage

- Stakeholder National Army (Deradicalization)
- Establish a resilience department or committee to steer and coordinate the city's resilience action plan and a cross-departmental coordination board (Glasgow, Rome, Bristol, and Kristiansand)
- Develop a white paper about multigovernance approach integrating the EU dimensions (Bristol, Donostia / San Sebastian, Glasgow, Kristiansand, Riga, Roma, and Vejle).
- Align the resilience action plan with regional, national and international plans (Bristol, Donostia / San Sebastian, Glasgow, Kristiansand, Riga, Roma, and Vejle).
- Involve the relevant stakeholders (Major political groups, including the mayor, other high-level politicians, different stakeholders and the general public) in preparing the resilience action plan to gain legitimacy and increase reputation and respect. (This policy has changed from Advanced to Moderate)
- Obtain politicians approval/legitimization of the resilience action plan (Bristol, Donostia / San Sebastian, Glasgow, Kristiansand, Riga, Roma, and Vejle).
- Support citizens' initiatives that contribute to build resilience

- Develop a communication strategy to inform the stakeholders about the resilience action plan (gaps, problems, achievements and opportunities) (Glasgow)
- Integrated resilience plan for critical services with respect to long term stress
- Foster microcooperation and microfinance among banks, region, and charity associations
- Develop an immigration protection system
- Collect, classify and share data as well as comply with legal implications (Glasgow)

Advanced Stage

- Communication of the resilience action plan to the stakeholders (Glasgow)
- Develop a local action plan in the short-medium term
- Establish a legislative framework identifying obligations and constrains to ensure the implementation of resilience plans (formalization)
- Align, integrate and connect resilience action plan with national plans (Kristiansand)
- Develop a long-term city plan that identifies challenges, statistics, geographic areas and short term plan that defines measures
- Define a plan for multigovernance approach (municipal, regional and national approach)
- Define thematic/topics in which all levels of governance are involved
- Identify specific topics to engage all governance level
- Plan a smart city as enabler for resilience governance (smart+grid) (Donostia / San Sebastian)
- Develop open data and open government (Donostia / San Sebastian, Glasgow, and Bristol)
- Develop an accessibility plan for the city (Donostia / San Sebastian)
- Involve researchers into how to support emergence and development of community leaders

Robust Stage

- Operationalize the multi-governance approach with EU dimension
- Align the resilience action plan with international plans
- Improve the legislation framework and resilience plans based on the lessons learned from previous crises
- Involve relevant stakeholders in the implementation of the resilience plan
- National guidelines how to run project on individual preparedness
- Coordinate with national and international authorities to apply and adapt policies and legislation to municipality action plan

Vertebrate Stage

- The CITY has a resilience culture
- The CITY is self-organized
- ~~Definition of~~ Embedding standards on resilience guidelines, tools and policies
- The CITY leads resilience projects (EU funded projects and joint initiatives)
- The participation of citizens is democratic ~~included~~ in the local government

**ROBUSTNESS, INFRASTRUCTURES & RESOURCES**

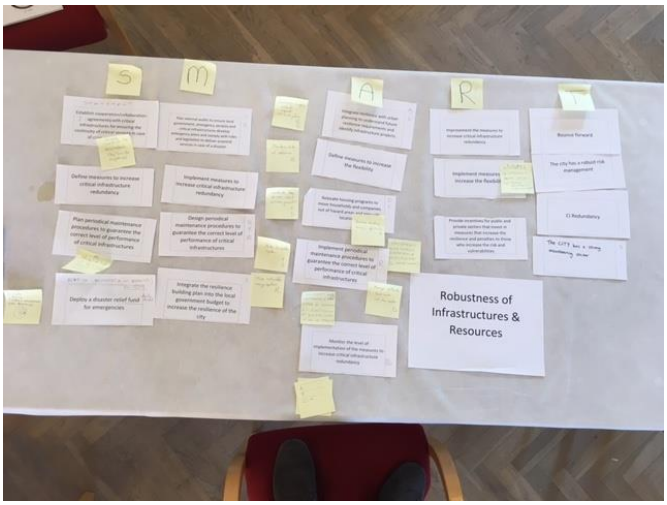



**Figure 4. Results of the robustness, infrastructure and resources dimension**

Starting Stage

- Establish cooperation/collaboration agreements with critical infrastructures for ensuring the continuity of critical services in case of crisis or emergency.
- Define measures to increase critical infrastructure redundancy.
- Plan periodical maintenance procedures to guarantee the correct level of performance of critical infrastructures
- Make a list of the current resources available today
- Define energy management best practices (Riga)

Moderate Stage

- Deploy a disaster relief fund for emergencies (This policy has changed from Starting to Moderate) (Vejle)
- Plan internal audits to ensure local government, emergency services and critical infrastructures develop emergency plans and comply with rules and legislation to deliver essential services in case of a disaster (Kristiansand and Riga)
- Implement measures to increase critical infrastructure redundancy
- Design periodical maintenance procedures to guarantee the correct level of performance of critical infrastructures (Kristiansand, Glasgow and Riga)
- Integrate the resilience building plan into the local government budget to increase the resilience of the city (Bristol)
- Monitor data of resilience (Riga)
- Coordinate services about crime prevention (Donostia / San Sebastian and Kristiansand)
- Promote sustainable transport systems (Donostia / San Sebastian and Kristiansand)
- Develop more sustainable energy systems (Riga)

Advanced Stage

- Integrate resilience with urban planning to understand future resilience requirements and identify infrastructure projects (Bristol and Glasgow)

- Define measures to increase the flexibility
- Relocate housing programs to move households and companies out of hazard areas and into safe locations (Donostia / San Sebastian and Kristiansand)
- Remove existing damaged infrastructures (Bristol)
- Implement periodical maintenance procedures to guarantee the correct level of performance of critical infrastructures (Riga)
- Implement a contingency plan aimed at keeping CI functioning at minimal level in case of disaster
- Manage differently black water and rain water (Donostia / San Sebastian)
- Implement overlapping competence overtaking (eg. Water management)
- Monitor the level of implementation of the measures to increase critical infrastructure redundancy (Rome)

Robust Stage

- Improvement of the measures to increase critical infrastructure redundancy
- Implement measures to increase the flexibility
- Integrate an emergency room setup (with single emergency communication)
- Provide incentives for public and private sectors that invest in measures that increase the resilience and penalties to those who increase the risk and vulnerabilities

Vertebrate Stage

- CI Redundancy
- The city has a robust risk management
- Bounce forward
- The city has a strong volunteering sector

**COOPERATION**

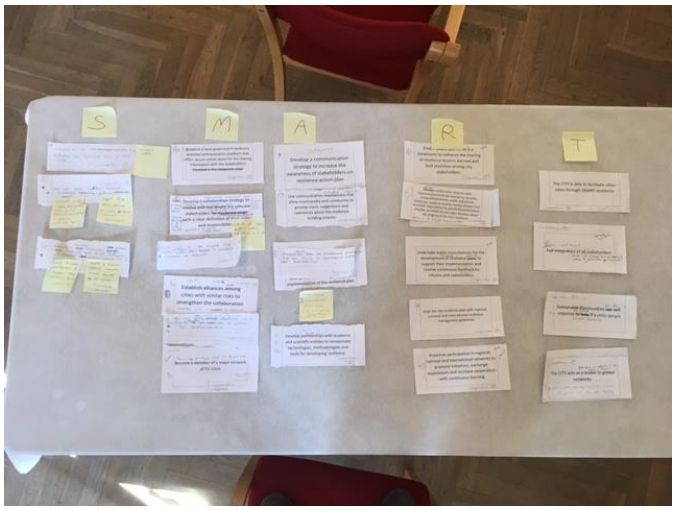


**Figure 5. Results of the cooperation dimension**

Starting Stage

- Establish a working team responsible for resilience issues in the city
- Map and bring together relevant stakeholders
- Establish small collaborative groups within a city (district, neighbourhood) on specific in smart city topics (Bristol is taking this policy)
- Start from most critical sectors to build resilience
- Communicate the city's resilience targets and goals highlighting co-benefits
- Create a common understanding of resilience among different actors
- Create a resilience narrative highlighting mutual benefits for different stakeholders

Moderate Stage

- Start to establish a local government resilience website/communication platform that offers secure online space for the sharing information with the stakeholders ~~involved in the moderate stage~~
- Develop a ~~collaborative strategy~~ stakeholder engagement plan to ~~involve and coordinate~~ structure the interaction with the relevant stakeholders ~~for moderate stage~~ of all relevant sectors (with a clear definition of their roles and responsibilities)
- Consider all different cultures and ethics of a city (Bristol is taking this policy)
- Reach out to the regional and national governmental level to establish cooperation's on resilience
- ~~Establish alliances among~~ Identify other cities with similar risks to ~~strengthen the collaboration~~ eventually form a collaboration
- Scout and assess current initiatives, projects and funding opportunities such as EU-Projects/Programmes to eventually join alliances
- ~~Become a member of~~ Join a major network of EU cities (This policy has changed from Advanced to Moderate) (Bristol and Kristiansand are taking this policy)

Advanced Stage

- Develop a communication strategy to increase the awareness of stakeholders on resilience action plan (This policy has changed from Moderate to Advanced)
- Use communication ~~mechanisms~~ platforms that allow municipality and community to provide input, suggestions and comments about the resilience building process
- Implement, monitor and widen the stakeholder engagement plan and review the definition of their roles and responsibilities (this policy instead of: Develop collaborative networks with representatives from the local government, critical infrastructures, academic and scientific entities and emergency services to monitor the implementation of the resilience plan)
- Develop partnerships (like research projects) with academic and scientific entities to incorporate technologies, methodologies and tools for developing resilience
- Become active in a major network of EU cities

Robust Stage

- Enable public platforms (i.e. databases) to enhance the sharing of resilience lessons learned and best practices among city stakeholders (Bristol is taking this policy)
- ~~Develop~~ Widen collaborative networks with representatives from the emergency services, critical infrastructures, public and private companies, academic entities, media, citizens, and volunteer organizations to ensure the performance of duties, to reflect on and make decisions about the progress of the city's resilience
- Develop, refine and apply a collaborative strategy to foster the involvement and coordination of all the relevant stakeholders for advanced stage with a clear definition of their roles and responsibilities
- Undertake public consultations for the development and design of resilience action-plans to support their implementation and receive continuous feedback by citizens and stakeholders (Bristol is taking this policy)
- Proactive participation in regional, national and international networks to promote initiatives, exchange experiences and increase cooperation with continuous learning (Bristol and Kristiansand are taking this policy)
- Align the city resilience plan with regional, national and international management guidelines

Vertebrate Stage

- The CITY is able to facilitate other cities through SMART resilience
- Secure involvement ~~Full integration~~ of all stakeholders
- ~~Sustainable~~ communities are able to ~~can~~ self-organize ~~to help~~ and respond if a crisis occurs (promote citizens resilience)
- The CITY ~~acts as a leader in global networks~~ is being contacted by other cities for advice and information sharing (~~Actively participate in a network to share lessons learned and best practices with other EU cities (or more networks))~~

**LEARNING**

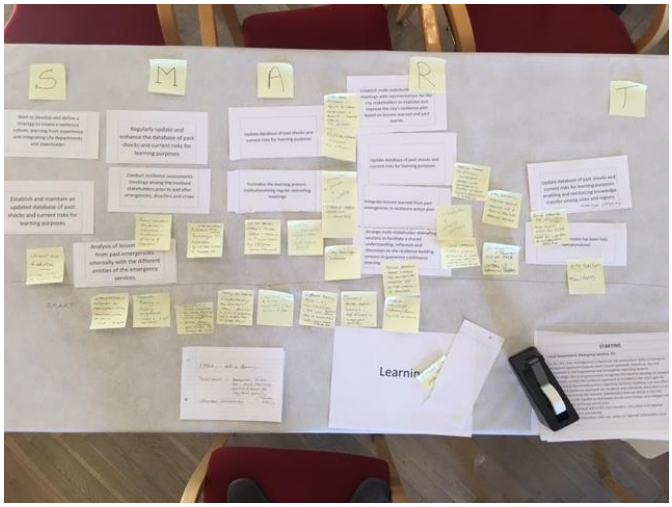


**Figure 6. Results of the learning dimension**

Starting Stage

- Start to develop and define a strategy to create a resilience culture, learning from experience and integrating city departments and stakeholder
- Establish and maintain an updated database of past shocks and current risks for learning purposes

Moderate Stage

- Regularly update and enhance the database of past shocks and current risks for learning purposes
- Analysis of lessons learned from past emergencies internally with the different entities of the emergency services
- Conduct resilience assessments meetings among the involved stakeholders prior to and after emergencies, disasters and crises
- Foster corporate learning and training programs
- Develop a national knowledge network

Advanced Stage

- Update database of past shocks and current risks for learning purposes
- Formalize the learning process, institutionalizing regular debriefing meetings
- Develop a city knowledge network
- Develop a business sector-based learning and self-directed on independent provider
- Develop evidence-based learning
- Consider communities as generation of knowledge
- Foster joint research project (collaboration with university)

Robust Stage

- Update database of past shocks and current risks for learning purposes
- Integrate lessons learned from past emergencies in resilience action plan
- Arrange multi-stakeholder debriefing sessions to facilitate a shared understanding, reflection and discussion on the resilience building process to guarantee continuous learning
- Establish multi-stakeholder debriefing meetings with representatives for the city stakeholders to evaluate and improve the city's resilience plan based on lessons learned and past events.
- Create a learning city that fosters partnerships to create and promote learning opportunities (all ages, all parts of city) (Bristol)

Vertebrate Stage

- Update database of past shocks and current risks for learning purposes enabling and reinforcing knowledge transfer among cities and regions
- The learning process has been fully operationalized
- Provide a city platform
- Foster social network within the city

**PREPAREDNESS**


**Figure 7. Results of the preparedness dimension**

Participants that worked on this dimension classified the policies into 5 groups: Risk, Plan, Train, Learn and Capability/Organization. The reason for this classification was the high number of policies in this dimension and the need to group together policies with similar characteristics. Regarding the policies that were classified into the “risk” group, participants noted that the evolution of these policies to more advanced stages implies their improvement as well as the focus of these policies on mitigation. On the other hand, the evolution of the policies classified into the “plan” group implies that these policies are implemented in the cycle in more advanced stages. Regarding the policies included into the “train” group, their evolution to more advanced stages implies that they become more exhaustive and appropriate.

Starting Stage

1. RISK
    - Create a simple Risk Register to evaluate proposed policies on the individual basis. This involves generation of a list of risks, and assessment of their impact and probability.
    - Establish priorities based on risk assessment of potential events at the city/regional level (probability x impact).
    - Develop risk mitigation strategies with respect to high priority risks at the city/regional level
2. PLAN

- Define a resilience action plan for the city

3. TRAIN
    - Conduct training and arrange emergency drills and exercises with the emergency teams
4. LEARN
    - Update existing action plans and response mechanism guidelines for emergency situation

Moderate Stage

1. RISK
    - Use of Risk Register to evaluate proposed policies AND to identify long-term risks for the city/region
    - Reflect on different types of interdependencies of risks that can affect the city/region based on the list or risks from Risk Register
    - Establish priorities based on risk assessment of potential events at the city/regional level (probability x impact).
    - Establish priorities established based on risk assessment of developing/'creeping' risks at the city/regional level
    - Develop mitigation policies/strategies with respect to high-risk areas. This involves identifying potential policies/strategies that can 'hit' many risks within the risk areas
2. PLAN
    - Implement the resilience city plan to respond to shocks and stresses using a holistic approach
    - Set up early warning, monitoring systems to alert for potential arising risks (this policy has changed from Smart to Moderate)
3. TRAIN
    - Conduct training and arrange emergency drills and simulation exercises with the stakeholders involved in this stage
4. LEARN
    - Make use of relevant examples and best practices both from the past and also from other cities/regions (this policy has changed from Advanced to Moderate)

Advanced Stage

1. RISK
    - Monitor key risks (changing impacts through re-evaluation of networks of developing scenarios).
    - Coordination of policies/strategies for targeting high-risk areas with relevant stakeholders at the city/regional level
    - Assess risk scenarios which involves exploration of possible long-term ramifications of risks and their cascading effects. Use of Risk Systemicity Questionnaire for policy analysis.
    - Reflect on different types of interdependencies of risks that can affect the city/region based on the list or risks from Risk Register

- Refine of Risk Register with respect to the risks experienced in the city/region. Use of Risk Register to evaluate proposed policies AND to identify long-term risks for the city/region.

2. PLAN
   - Monitor through indicators the progress of the resilience action plan's objectives (Advanced & Robust)
   - Evaluate the effectiveness of the policies included in the resilience action plan
   - Continuously improve the design the resilience city plan with lessons learned
3. TRAIN
   - Conduct frequent joint training exercises with city's relevant stakeholders of this stage to ensure their efficient collaboration
4. LEARN
   - Establish learning partnerships in the context of risk mitigation with relevant stakeholders at the regional/city level. Organisational capabilities modified in response to short-term risk assessment.

Robust Stage

1. RISK
   - Refine of Risk Register with respect to the risks experienced in the city/region AND in Europe. Use of Risk Register to evaluate proposed policies AND to identify long-term risks for the city/region/Europe.
   - Reflect on different types of interdependencies of risks that can affect the city/region AND other cities in Europe based on the list or risks from Risk Register
   - Evaluate regularly (twice yearly) overall evaluation of risk scenarios facing the city
   - Prioritize risks extended to the European level. Appropriate cost-benefit analyses undertaken which informs the prioritisation of risks
   - Include risk mitigation strategies informed by the European perspective. Active implementation of risk mitigation priorities with realistic resourcing including leadership
   - Coordinate policies/strategies for targeting high-risk areas with relevant stakeholders at the city/regional and European level. Monitoring of risk mitigation strategy/policy implementation and impact.
2. PLAN
   - Assess through indicators the progress of the resilience action plan's objectives (Advanced & Robust)
3. TRAIN
   - Provide training courses for citizens and companies based on their specific needs and conduct frequently public drills (national level)
4. LEARN
   - Establish learning partnerships in the context of risk mitigation with relevant stakeholders at the regional/city AND European level. Learning from effectiveness of risk assessment and mitigation
   - Arrange public debriefing sessions to facilitate a shared understanding, reflection and discussion on the resilience building process

5. CAPABILITY/ ORGANIZATION

- Encourage citizens and companies to have appropriate insurance coverage and develop household and business resilience plans
- Promoting a culture of resilience organizing resilience awareness activities such as campaigns, events and training activities (formation) for all the involved stakeholders
- The CITY has fully integrated with High-Reliability Organization (this policy has changed from vertebrate to Robust)

Vertebrate Stage

1. RISK
   - Develop the Risk Systemicity Questionnaire into a Policy testing simulation model.
   - Evaluate value for money which informs the prioritization of risks
   - Use of Risk Systemicity Questionnaire and simulation modelling to monitor and re-focus mitigation if necessary
2. PLAN
   - Coordinate policies/strategies for targeting high-risk areas with relevant stakeholders at the city/regional and European level.
   - Monitor risk mitigation strategy/policy implementation and impact.
3. TRAIN
   - Conduct frequent joint training exercises between European cities with the involvement of all the stakeholders included in this stage (international level)
4. LEARN
   - Embed learning through re-evolution of risk assessment and mitigation.
   - Development of new processes and tools to mitigate risks in collaboration with relevant stakeholders at the city/regional AND European level.

**Summary of the results**

The first outcome of the exercise carried out for improving and validating the preliminary version of the maturity model is to achieve a consensus regarding the stages and policies of the maturity model. As a result of these exercises, cities started to identify common processes that occur in every city at different stages and the policies that have already been implemented in all cities.

Furthermore, another relevant conclusion that was reached is that the maturity model is general and that it should be customized to the characteristics and contexts of each city. In this regard, it would be interesting to identify cities with similar characteristics and verify how the maturity model can be adapted specifically to those cities. In fact, the maturity model serves to identify the ideal path for the evolution

of the resilience building process using general and aggregated policies. Nevertheless, as the representatives from the different cities argued it is difficult to self-evaluate in which maturity stage each city is in. In line with this, representative from the cities believe that within a city there are more advanced policies and actions in a specific problem area than others. Thus, they believe that depending on which policy they analyze, the same city can be at different stages.

Regarding the validity of the maturity stages, city representatives exposed their doubts about the performance of a city that has reached the vertebrate maturity stage. In this regard, it was concluded that when a city reaches the vertebrate stage, the city should continue working on resilience building because the reality changes and continuous learning is required. Therefore, the final conclusion about this stage was that vertebrate stage implies maintenance as well as improvement.

Finally, and as a general conclusion, this exercise was helpful for cities to exchange information and best practices among them, learning how other cities are acting in terms of building the city resilience. In addition, the cities had the opportunity of receiving information about different problems or situations that they have not dealt with in their cities before. This information is useful for the cities to be able to prepare for unexpected problems that may arise in the future.

# RISK ASSESSMENT QUESTIONNAIRE DEVELOPMENT SESSION (11TH OF MAY)

## AIMS OF THE SESSION

The Risk Systemicity Questionnaire (RSQ) exercise took place throughout the morning of Wednesday on the 11th May, and it was run by the University of Strathclyde. In line with the aim of Work Package 2 (WP2), the session's goal was to refine the existing understanding of the perception of participating cities with regards to the risks which they were likely to face (Table 3). During the session, the Strathclyde team tested a draft sub-section of the RSQ with the participating cities, which contributed to objective 4 of the SRM project (Table 3) regarding developing and validating the RSQ. Whilst undertaking this task it was possible to refine the understanding of how cities perceived the risk scenarios presented in the form of questions in the RSQ and thus the session sought to address a part of the aim of WP2. In addition, at a more technical level, the purpose of the session was to: 1) explore users' reactions to the RSQ, 2) explore participants' views with respect to the future use of the RSQ in cities, and 3) test the initial weights assigned to each of the sample risk scenarios within the RSQ.

**Table 3: Relevant aims of the SMR project**

| **Relevant overall objective of the SMR project** | **How the objective 4 was met** |
|---|---|
| *Objective 4*: Develop and validate a Systemic Risk Assessment Questionnaire, which – beyond the capacity to assess the CITIES's risk – also can assist in determining the CITIES's resilience maturity level. | A draft Risk Systemicity Questionnaire was used in a group exercise with city representatives, which allowed testing and validating the initial work on this tool. This in turn provided good basis for further development and refinement of this tool in the forthcoming workpackages, in particular WP3 that is due to start in June 2016. |
| **Overall aim of WP2** | **How the WP2 aim was met** |
| The aim of this WP is to gather requirements from CITIES regarding the necessities to improve their resilience level. In particular, risks and problems | The draft RSQ comprised of risk scenarios in the form of questions, which had been identified by city representatives during the |

| | |
|---|---|
| derived from critical infrastructures dependencies, climate change and resulting natural disasters, and human dynamics will be analysed with the CITIES and their requirements will be collected. | three preceding workshops as part of WP2. As a result, as city representatives completed the questions from the draft RSQ, it was possible to refine further the understanding of the respective risk scenarios in the context of European cities. |

## TESTING THE WEIGHTS

The draft RSQ was constructed based on a small number of the risk scenarios identified in the three preceding WP2 workshops. For the experiment in Vejle, it was decided to concentrate only on two 'headline' social problems: social inequalities and social cohesion (explored in detail at the Rome workshop). The draft RSQ was programmed in Excel using Visual Basic for Applications, and each participant received the draft RSQ to complete.

Within the RSQ each risk scenario was assigned a weight that would contribute to the overall risk score along with the participants response to whether the risk scenario was: 'high likely' (to happen), 'possible/partially', 'unlikely', 'I don't know, but someone else does', and 'we don't know' (Figure 8). The weights were constructed based on analysis of the structure of the risk network created in Rome: the feedback loops and interactions between risks. The draft RSQ exercise in Vejle was designed to help test the analytical weights in contrast to the judgments of the city participants. The exercise showed, in principle, a high degree of variability in participants' judgments both within the cities and between the cities.

In addition, the exercise allowed comparison of the final summary risk scores derived from the draft RSQ and based on the existing weights and the cities' judgmental weights. The results are expected to help in calibrating the weights whilst developing the final RSQ.

## GATHERING PARTICIPANTS' FEEDBACK

In addition to testing the weights assigned to the risk scenarios, it was important to use the opportunity to collect feedback from participants regarding their experience of using the draft RSQ, and whether they saw the tool under construction as promising for use in their respective cities.

In general, participants did not have any technical problems with completing the questionnaire and the programmed functions (such as 'greying out' the sections chosen as unlikely to happen, comparing the risk scores, and generating reports of cities' answers) worked as expected on different types of computers and different versions of Excel. Thus, participants found the draft RSQ generally easy to use.

In terms of the suggested changes, the most frequent comment was that the risk scenarios, which in some cases comprised of fairly long chains of causal arguments, should be broken down to allow users to evaluate each part of the risks scenarios rather than decide on risk scenarios 'as a whole'. Participants also noted that the 'greying out' function, which disabled the risk scenarios from the questionnaire if initial questions regarding risk triggers had been answered as 'unlikely', performed a very important role in narrowing down the extent of questions in the RSQ and in effect making the questionnaire more relevant to the respondents' context.

Furthermore, participants thought that the RSQ was likely to be a useful tool for developing resilience. The RSQ was seen as a complement to the existing tools offered by the Rockefeller Foundation's 100 Cities, by offering its unique functions such as the assessment of risk systemicity, adapting to the particular context of cities, and dealing with risks in greater depth. Participants also thought that the RSQ could broaden the group of city employees and stakeholders who had access to the conversations about city resilience, and whose voices would otherwise be silenced.

| COMPLETE ONLY THE BOXES IN BLUE THROUGHOUT | High likely | Possible/ partially | Unlikely | We don't know | I don't know – someone else does | Show/hide calculations | | Please enter your weight for this risk scenario in the purple box below |
|---|---|---|---|---|---|---|---|---|
| **2. RISING INEQUALITIES** | **POSSIBLE RAMIFICATIONS** | | | | | | | |
| **HOW LIKELY DO YOU THINK THIS SCENARIO (OF THE POSSIBLE CONSEQUENCES OF HIGH RISING INEQUALITIES) WILL DEVELOP IN YOUR CITY/REGION?** | | | | | | | | |
| **Social inequalities rising towards an intolerable level...** | Please enter an "x" into the appropriate box (for the whole scenario). | | | | | | | |
| MIGHT CAUSE stigma associated with poverty AND marginalization<br>**CAUSING loneliness and isolation among all people rising towards an intolerable level** | | | | | | **Please provide an answer** | | |
| | | | | | | | | |
| **Social inequalities rising towards an intolerable level...** | | | | | | | | |
| MIGHT MEAN current economic systems works for some but not others | Please enter an "x" into the appropriate box (for the whole scenario). | | | | | | | |
| AND SO a black market growing towards an unacceptable level<br>WHICH LEADS TO a multi-disadvantaged underclass growing towards an intolerable level | | | | | | **Please provide an answer** | | |
| **WHICH CAUSES loneliness and isolation among all people rising towards an intolerable level** | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **YOU HAVE RECOGNISED loneliness and isolation among all people rising towards an intolerable level... WHICH** | Please enter an "x" into the appropriate box (for the whole scenario). | | | | | | | |
| MAY LEAD TO VICIOUS CIRCLE social stigma of isolated and lonely people<br>WHICH CAUSES the number of cases of bullying increasing towards an unacceptable level | | | | | | **Please provide an answer** | | |
| **AND SO REINFORCING loneliness and isolation among all people rising towards an intolerable level** | | | | | | | | |
| | | | | | | | | |
| **YOU HAVE RECOGNISED loneliness and isolation among all people rising towards an intolerable level... WHICH** | | | | | | | | |
| MIGHT MEAN citizens' social ties declining significantly | Please enter an "x" into the appropriate box (for the whole scenario). | | | | | | | |
| WHICH MAY LEAD TO risk of radicalisation (religious and political)<br>CAUSING social cohesion and integration of communities declining towards a problematic level | | | | | | **Please provide an answer** | | |

**Figure 8: Draft RSQ.**

# ENGAGEMENT TOOL SESSION (11TH OF MAY)

The Engagement tool session had several objectives. It should:

- bridge the work between the second and the third six-month period of WP4, i.e. to support the transition between the work on Deliverables 4.2 and 4.3 (as well as D4.4),
- raise awareness for the integration of topics within the SMR project,
- provide the first steps toward an integration of the WP4 findings with the maturity model, and
- receive feedback on the criteria for the Resilience Portal developed for D4.2.

The exercise carried out in this session is based on the work of the first eleven months of WP4. It particularly drew from the (by the time of the workshop almost finished) D4.2. The exercise thereby had to take into account WP4's role in the project. On the one hand, the core activities in WP4 are based on literature work and involvement of the CITIES, leading to deliverables and artefacts to be used in WP5. On the other hand, it needs to be interlined with the other work packages and also provide feedback to them. Moreover, it had to address the idiosyncrasy of WP4 for a constant balancing between theoretical, abstract, high-level work and its practical, low-level application. While WP4 has to provide *design principles*, i.e. an abstract notion of how to use social networking services to promote transdisciplinary collaboration and citizen engagement, it also needs to develop the prototype of the Resilience Information Portal. Being abstract enough for generalization yet concrete enough work successively refining the work in dialogue with the cities is a constant challenge.

In particular, the contents of the exercise to discuss and validate were extracted from the results of interviews with six cities and their stakeholders (12 stakeholders in total, leading to 20 sets of interviews with 33 total interviewees). Based on these interviews, we derived six design goals:

- Information Sharing
- Establish a Communication Structure
- Citizen Involvement and Raising Awareness
- Knowledge Sharing
- Information Sovereignty
- Usability

While the first four goals are close to actual functions and actions in an information system and on a city level, the latter two rather address quality aspects. This means that they describe *what* goals need

to be fulfilled while striving for the first four goals. For each goal, subordinate goals were derived as far as interviews provided the means for further categorization.

The design goals, and their justification and rationale are one part of D4.2. The second part is a functional specification that paves the way towards implementing an information system that facilitates reaching the design goals in the form of the Resilience Information Portal. Therefore, based on the interviews and taking into account the design goals, a set of about 40 functional criteria were designed. They act as the aims for system development and provide a bridging element between the abstract notion of design principles and concrete functions of an information system. Moreover, while interviews could only provide hints to actual best practices of functions to be provided by a resilience portal, criteria are well-supported by the interviews. As sketched in the process set out in D4.1., and also as will be shown in D4.3, the actual functions will be designed in the ongoing work of WP4 based on further work with the cities, the work on the portal prototype, and specifically also on the activities in WP5, which heavily will use the current results of WP4.

A summary of design goals and their (initial) mapping is given in Table 4. Three examples are given (and commented) for clarity:

- A01: *The portal must be a publicly available Web application.*
  This criterion described a fundamental aspect of the portal. It is needless to describe functions in detail since this criterion leads to a host of concrete requirements that, however, are well understood and reasonable to handle for experienced software developers.

- A16: *Accessibility standards as outlined by W3C must be followed. If applicable, national laws must be followed.*
  This criterion is more precise and directly leads to a limited number of functions. It of course required concretization for actual implementation, as e.g. the laws need to be specified in order to be followed by the developers.

- B04: *Frequently Asked Questions (FAQ) pages could be provided.*
  This criterion describes an aim that is rather close to actual functions. Again, in the further course of action actual functions needs to be defined. For example, it needs to be specified which kind of information should be included in the FAQ and how they should be represented on the portal.

The deliverable distinguishes between *Must* (A) and *May* (B) criteria to denote what an initial portal must provide, and what aims are desirable yet not necessary.

**Table 4: Design Goals and Principles**

| # | Principle | | Criteria |
|---|---|---|---|
| 1 | INFORMATION SHARING<WHAT > | | A01, A02, A03, A05, A06, A07, A08, A11, A12, B01, B04, B08, B09 |
| | 1-1 | Shared objective | A09, A10, B05, B16 |
| | 1-2 | Integration of information, system and people | A15, A19, A20, B06 |
| | 1-3 | Situation diary | |
| 2 | ESTABLISH A COMMUNICATION STRUCTURE (with stakeholders) | | A01, A02, A03, A04, A05, A06, A07, A08, A13, A15, A19, B08, B09, B16, B17 |
| | 2-1 | Visualization of live communication | A20 |
| | 2-2 | Visualization of resource capability | A20, B01, B18 |
| 3 | CITIZEN INVOLVEMENT AND RAISING AWARENESS | | A08, A20, B14 |
| | 3-1 | Grow social capital | B11 |
| | 3-2 | Co-creation value | A15 |
| 4 | KNOWLEDGE SHARING (local, national, European) | | A01, A02, A03, A05, A06, A11, A12, A14, A20, B03, B08, B09 |
| | 4-1 | Online learning | B11 |
| | 4-2 | Resilience library | B05 |
| 5 | INFORMATION SOVEREIGNTY | | |
| | 5-1 | Information quality | A07, A09, B06, B11, B15 |
| | 5-2 | Role-based Authorization | A08, A10, A11, A12, A14, B09 |
| | 5-3 | Penetration test | A18 |

| | | | |
|---|---|---|---|
| 6 | USABILITY | | A16, A17, A19, B03, B07, B10, B11, B12 |
| | 6-1 | Publicity | A15 |
| | 6-2 | Information filtering | B01 |

The exercise was designed as follows. Cities and academic partners formed four groups. Each group was seated on a large table, representing one of the first four design goals (1-4 from Table 4). Each table was accompanied by one facilitator, who led the discussion. Facilitation was done by CIEM, and TECNUN. Additionally, CIEM as leader of WP4 was available to provide additional advice/ consultation support. Each table had post-its denoting the five stages of the maturity model. Moreover, each table was provided with a set of paper snippets, one for each of the criteria. The actual work followed a number of steps:

1. Each criterion was explained to the participants on the table. This especially should clarify technological ramifications but also illustrate how criteria are based on the CITIES' prior input. Must and may categorization and the initial consideration for which design goals a criterion might apply was ignored at this point to get the participants uninfluenced assessment.
2. Participants discussed whether the criterion is meaningful for the design goal at all and whether it might need to be rephrased or amended. Participants could also provide concrete functions to support discussion.
3. The criterion was then put down for on the five stages of the maturity model. Thereby, participants indicated that for the given design goal they regarded the criterion as required to be fulfilled when reaching the respective stage. As part of this step, criteria could be divided if they were to verbose and would apply to more than one maturity stage.
4. Participants were asked to provide hints to how they envision criteria to be implemented or how they already know information systems in their cities adhere to the criteria. Thereby, further work in WP4 should be supported.

After all criteria were processed, the participants summarized their own work. Moreover, image documentations of the aligned criteria were taken (see Figure 9 for an example) and the – very often amended – paper snippets were collected. Since the exercise provided diverse results based on the design goals, no direct summary for all workshop participants was provided as an ad-hoc conclusion. Rather, a synopsis will be given after detailed analysis in June 2016.

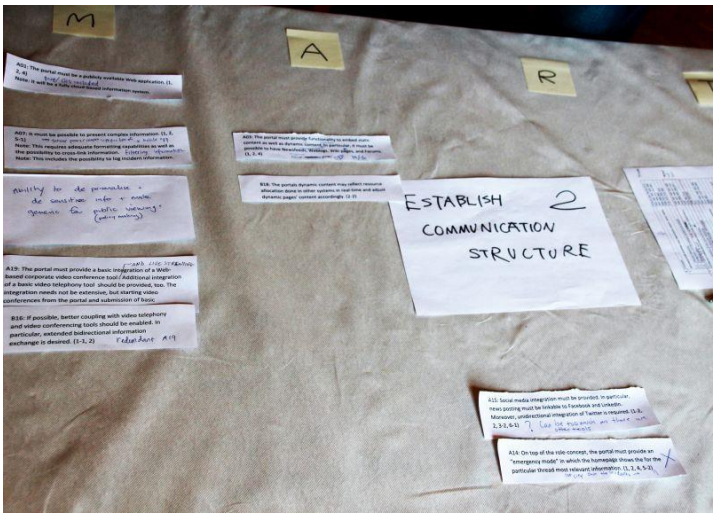



**Figure 9: Example of Work-in-Progress on the Tables**

Nonetheless, first findings can be sketched already:

- The general set of criteria sufficiently covers the interviews. Particularly for the design goal of knowledge sharing, which arguably is most readily transferred for actual functions in an information system, allowed for an almost perfectly balanced distribution of criteria among maturity stages.

- Much viable input could be gained from the participants, and the reflecting of topics fostered the understanding of the WP4 activities and their impact on the whole project. Even though the effects of this will be hard to measure, we deem these discussions extremely valuable, particularly considering that the CITIES' continuous involvement in WP4 and WP5 will be needed.

- An integration of WP4 findings with the maturity model is possible and feasible. In fact, many policies as proposed by the maturity model will require information systems to be enabled; in addition, WP4 on its own will add requirements for cities to reach a certain level of maturity.

- It is not equally easy to name concrete functions for all goals and principles. As already suggested by the mapping between goals and criteria, the third design goal – Citizen Involvement and Raising Awareness – will require much future work. While it is undoubted that meeting the goals and principles is highly desirable, setting criteria to fulfil it – let alone concrete functions for doing so – cannot be done intuitively or based on *opinions*. There are hints as to

which kind of practices, actions, and information system support does actually help. Nonetheless, an iterative and incremental process in close collaboration with the cities (as sketched in D4.1) will be needed to derive the set of functions to be suggested by D4.3 by the end of November 2016.

Summing up, the exercise was well perceived and lead to tangible, to informal, as well as to confirmative findings that will greatly aid the further work in WP4. Moreover, the exercise has significantly contributed to the integration of WP4 with the project as a whole and has facilitated the participants understanding of WP4's importance in the ongoing project

# DEBRIEF AND CONCLUSIONS OF THE WORKSHOP

The first outcome of the workshop was the identification and validation of the policies that need to be included in the preliminary version of the maturity model. In line with this, a general idea regarding the different processes and policies for building city resilience that take place in the different maturity stages was obtained among participants. Furthermore, participants agreed on the classification of the policies and the different dimensions that are included in the maturity model. A general conclusion regarding the maturity model is that it serves to identify the ideal path for the evolution of the resilience building process using general and aggregated policies. Thus, the implementation of the maturity model in a specific city should be particularized taking into account the specific characteristics of a city.

The second outcome of the workshop was the feedback obtained as result of the RSQ exercise. The RSQ was considered to be very helpful from the perspective of future development and validation of this tool in WP3 and WP5. On the one hand, it exposed the participating cities to how the tool would be used and how it would look. The RSQ exercise in Vejle also helped to gather very important 'early development stage' comments and feedback about the RSQ design and construction. The received comments also informed the future work on the tool concerning how the RSQ could be used in European cities 'in practice'. At the same time, the RSQ session in Vejle gave an opportunity to test the RSQ from a technical perspective, to check how the questionnaire performed on different machines and platforms, and to investigate whether the tool was easy to use for participants. As a result, as evidenced in this

report, all of the described learning points are expected to play a very important role in the forthcoming further refinement and expansion of the RSQ.

The last outcome of this workshop was the feedback obtained from the engagement tool session. The exercise was well perceived and lead to tangible, to informal, as well as to confirmative findings that will greatly aid the further work in WP4. Moreover, the exercise has significantly contributed to the integration of WP4 with the project as a whole and has facilitated the participants understanding of WP4's importance in the ongoing project

Finally, and as a general conclusion, this workshop was helpful for cities to identify best practices and policies in building resilience. In addition, the cities can see different problems or situations that they have not seen in their cities before, so they can start thinking about how to act before the problems arise.

# ANNEX I PARTICIPANTS OF THE WORKSHOP

| Person | Institution |
|---|---|
| 4 Participants | TECNUN |
| 2 Participants | KRISTIANSAND |
| 4 Participants | VEJLE |
| 3 Participants | STRATH |
| 5 Participants | CIEM |
| 2 Participants | GLASGOW |
| 2 Participants | ROME |
| 3 Participants | SAN SEBASTIAN |
| 2 Participants | ICLEI |
| 1 Participants | DIN |
| 2 Participants | LIU |
| 2 Participants | RIGA |
| 2 Participants | BRISTOL |

# ANNEX II EXERCISE FOR THE CITIES TO PREPARE IN ADVANCE OF THE WORKSHOP

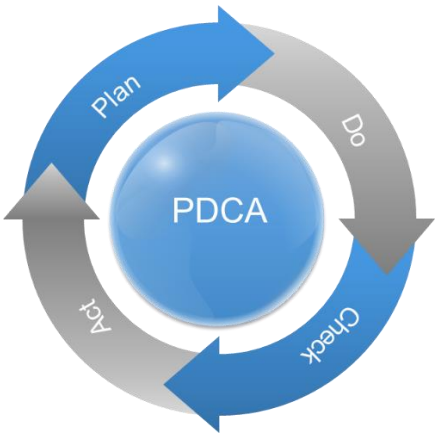
The SMR Project will develop and validate **Resilience Management Guideline**, which will provide a **robust shield** against man-made and natural hazards, enabling society to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, as well as plan for, including through the preservation and restoration of essential structures and functions. This Resilience Management Guideline will integrate 5 tools: 1) a **Resilience Maturity Model,** 2) a **Systemic Risk Assessment Questionnaire** 3) a portfolio of **Resilience Building Policies**; 4) a **System Dynamics Model**; 5) a **Resilience Engagement and Communication Tool.**

Focusing on the first tool, the maturity model serves to identify the ideal path for the evolution of the resilience building process from an initial stage to a more advanced stage, passing through a number of intermediate stages, where cities have different starting points. In our case, five are the identified stages: Starting, Moderate, Advanced, Robust, and verTebrate.

The fulfillment of the policies included in each maturity stage will allow the city to move forward to one stage to the next one improving its resilience level and also enhancing the European resilience level. However, there is not an established time to make this progress, so several years may elapse to move from the current stage to the next one. During this period of time in one specific stage the circumstances of the city may change so they should use a control and continuous improvement management process to systemize the work and boost the efficiency avoiding managing tasks individually or silo-wise.

In a recent meeting involving the four universities that are SMR partners and ICLEI we realized that the well-known PDCA cycle5 and the Integrated Management System developed in the CHAMP Project6 could be adapted and extended by the SMR project to implement the continuous improvement management process that allows including changes needed in the policies to adapt to the new situation and ensure the highest quality solution possible.

The PDCA cycle begins with the Plan step that involves identifying a goal or purpose and putting a plan into action. These activities are followed by the Do step, in which the components of the plan are implemented. Next comes the Check step, where outcomes are monitored to test the validity of the plan for signs of progress and success, or problems and areas for improvement. Finally, the Act step closes the cycle, integrating the learning generated by the entire process, which can be used to adjust the goal. These four steps are repeated over and over as part of a never-ending cycle of continual improvement.




This continuous improvement management process is repeated in each of the maturity stages, keeping in mind two cross-cutting elements throughout the complete maturity path: the involvement of stakeholders and the quality improvement. Thus, the number of the stakeholder types (including external stakeholders outside the city) involved in the resilience building process increases as we progress in the maturity stages and, the learning the cities are acquiring during the different maturity stages leads to raise the effectiveness and quality of the measures adopted in the more advanced maturity stages.

Figure 1 suggests this iterative management process to build and improve the city resilience level throughout all maturity levels, where the X axis shows the increase in the number of the stakeholders involved in the resilience building process, while the Y axis shows the quality

[5] http://www.hse.gov.uk/managing/plan-do-check-act.htm
[6] http://www.localmanagement.eu/index.php/cdp:home

improvement over the maturity stages. The increase in the size of the PCDA cycles also shows an increase in the scope of the policies included in each maturity stage.

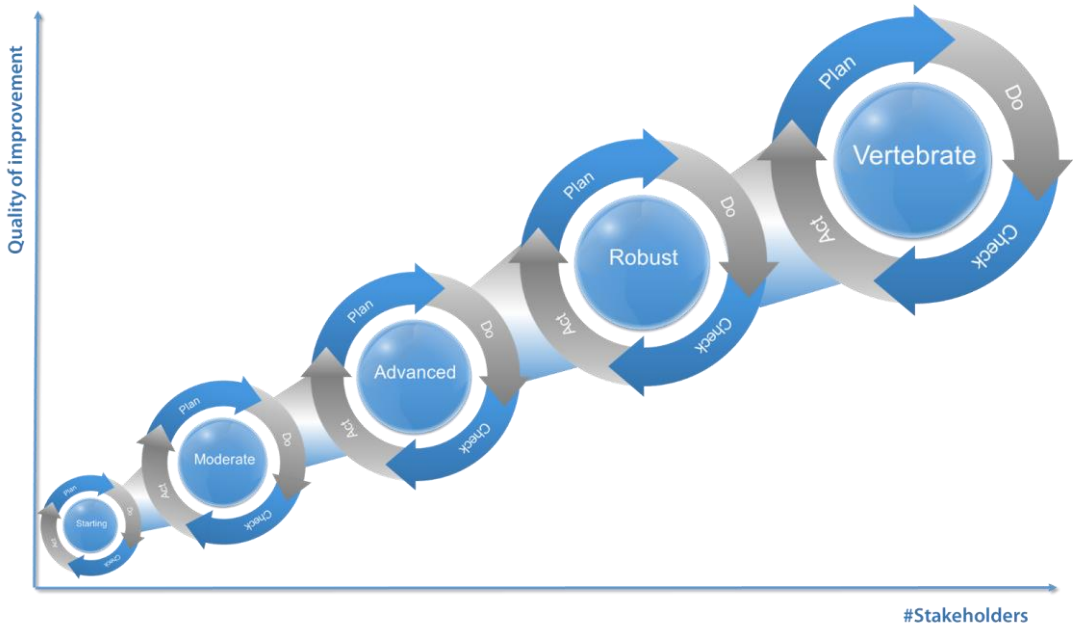



**Figure 1: Iterative process for building city resilience level.**

With the information gathered from you in the previous workshops, we have a more detailed definition of the maturity stages, but we need still to identify the policies that need to be developed in each stage. In order to prepare for the activities that we are going to develop during the Vejle workshop, we would like you to prepare the following exercises.

## Exercise 1: Validation of maturity stages description and stakeholders involved

Please, review the description and the stakeholders involved in each maturity stage and add or change any information you consider convenient. In order to make it easier to identify the changes, we would appreciate if you could add your comments using red text.

| | |
|---|---|
| | **STARTING** |

| | |
|---|---|
| **Stakeholders** | Local Government, Emergency services, CIs |
| **Description** | So far, the crisis management is basically based on risk assessment without having a multi-hazard approach. Therefore the risk assessment is still fragmented and incomplete with regard to hazards affecting critical infrastructures and man-made threats.<br>At this stage, the local government recognizes the need to develop an all-hazards and long-term resilience action plan for the city, so the resilience approach is included in the city agenda, showing their political commitment to this issue. The city has programmed policies regarding resilience development although the efforts to take this resilience approach are incipient and individual since there is no collaboration among the relevant stakeholders of the city.<br>The approach is mainly city-centred. A multi-governance approach with a global dimension is dormant. The city is not part of a larger resilience network. |
| | The city has already:<br><br>1) Incipient policies for resilience development<br><br>2) Risk assessment incomplete<br><br>3) Community involvement/ public-private cooperation incipient<br><br>4) City centred<br><br>5) City is not part of a larger network<br><br>6) Funding |

| | |
|---|---|
| | **MODERATE** |

| | |
|---|---|
| **Stakeholders** | Local Government, Emergency services, CIs<br><br>Public&private companies, Volunteers, NGOs, Regional government, |
| **Description** | The city sets up the organizational structure to manage the city's resilience action plan and a communication strategy<br><br>The risk assessment with regard to hazards affecting critical infrastructures and man-made threats are operationalized in cooperation with critical infrastructure providers. Plans to involve all the stakeholders, develop private-public cooperation, include volunteers and organizations and foster a resilience culture among citizen's agencies, have been developed. The city recognizes the relevance of a multi-governance approach with a global dimension and acts to invigorate the approach.<br><br>The city manages resilience development policies, using control measures, although there is a lack of a formalized resilience management process. The resilience management is still fragmented and siloed. The city has started planning for networking with other international cities with regard to resilience and sustainability. |
| | 1) Implementation of resilience policies using control mechanisms<br>2) Creation of a department/committee for coordinating resilience development<br>3) Risk assessment of threats affecting CIs and man-made threats<br>4) Plans to improve cooperation among all the stakeholders<br>5) The city recognizes the relevance of multi-governance approach<br>6) Networking with global cities<br>7) Communication platform established and in use |

| | **ADVANCED** |
|---|---|
| **Stakeholders** | Local Government, Emergency services, Cis<br><br>Public-private companies, NGOs, Volunteers, Regional government<br><br>Citizens, Academic and scientific entities, Media, National government |

| | |
|---|---|
| **Description** | The city has developed a framework to manage and operationalize resilience within an explicit holistic approach that integrates all sectors' critical infrastructure providers, expertise on man-made disasters and sustainability.<br><br>The progress of the city resilience action plan is monitored using indicators to gather information on the progress and effectiveness/impacts of the implemented policies.<br><br>Community resilience and private-public cooperation is part of the approach. The nodes in a multi-governance approach with a European dimension are well-linked in the plans, but not yet fully operationalized. The city is a member of a major network of European cities concerning resilience and sustainability.<br><br>The learning process and public-private cooperations are also operationalized. |
| | 1) Develop a framework to manage resilience with a holistic approach<br><br>2) Community resilience and private-public cooperation are fostered<br><br>3) Multi-governance approach with European dimension well-linked but not fully operationalized<br><br>4) City member of a major network<br><br>5) Co-creation of local institutions companies and research and innovation centers |

| | **ROBUST** |
|---|---|
| **Stakeholders** | Local Government, Emergency services, CIs<br><br>Public-private companies, NGOs, Volunteers, Regional government |

| | |
|---|---|
| | Citizens, Academic and scientific entities, Media, National government<br><br>European government |
| **Description** | The city has engaged all known agents to its resilience holistic approach. Agents are proactive and perceive value added by resilience on their quality of life and economy.<br><br>The resilience action plan is evaluated based on the collected information and the successes, and possible drawbacks of the process are reported, giving relevant feedback for the resilience action plan revision.<br><br>The multi-governance approach with a global dimension is well developed and operationalized. The city resilience action plan is improved and updated based on the feedback and suggestions received from the city stakeholders through consultations processes and participatory platforms.<br><br>The city is a member in a major network of other cities (state of the art in other robust cities, best practices) with regard to resilience and sustainability, with a proactive posture and continuous learning (be prepared for the unknown events) regarding interdependencies and potential cascading effects. In the sense of this project, one can speak of a CITY. |
| | 1) Engagement of all the agents->CITY<br><br>2) Agents perceive value- added by resilience<br><br>3) Multi-governance approach well developed and operationalized<br><br>4) City member of a major network and with a proactive posture and continuous learning<br><br>5) Awareness about city resilience level |

| | VERTEBRATE |
|---|---|
| **Stakeholders** | Local Government, Emergency services, CIs<br><br>Public-private companies, NGOs, Volunteers, Regional government<br><br>Citizens, Academic and scientific entities, Media, National government<br><br>European government |
| **Description** | The CITY excels with its resilience as part of the ecosystem (regional, national, global) resilience. The CITY acts as a vertebra in the European Resilience backbone |
| | 1) Proactive<br><br>2) CITY is part of the ecosystem<br><br>3) CITY acts as a vertebra in the European Resilience Backbone |

## Exercise 2: Identification of policies/ actions

Please, identify the actions or policies that you have already implemented in your city and the ones that you would like to implement, and classify them in the most convenient maturity stage where each policy should start its implementation process. Take into account when you classify a policy in one maturity stage that means this policy will start its implementation in that stage but it may continue its development through the next maturity stages.

Below, you will see a matrix where for each maturity stage five dimension of resilience have been identified thus, each policy should be classify following these dimensions:

1) **Robustness of infrastructure & Resources:** The city infrastructures requires robustness to resist and absorb hazards through the preservation and restoration of its essential functions. This requires redundancy, risk management and continues work on decreasing vulnerabilities apart from the deployment of resources.

2) **Preparedness:** preparedness for future needs anticipating future needs and adapting the city accordingly. Preparation can be done at all levels of society, from individuals and communities to leaders and governments. It also includes being prepared for the unexpected, such as increasing flexibility and the cities adaptive capacity.


3) **Leadership & Governance**: leadership and Governance reflect the decision-making level of the city. Commitment by the leaders is seen as essential for promoting effective strategies, inclusive decision-making and the engagement of city relevant stakeholders.

4) **Cooperation:** Cooperation is done through city and cross-regional collaboration with necessary stakeholders across city and regional sectors (including European region). Cooperation is also done at community level such as volunteer groups and citizens ability to self-organise.

5) **Learning:** Learning is achieved through monitoring of past events and on-going processes to make predictions about future needs. The city has a set of best practices which can help guide the learning activities.

There is an example that you can use it as a reference.

| | STARTING | MODERATE | ADVANCED | ROBUST | VERTEBRATE |
|---|---|---|---|---|---|
| **Robustness** | * Deploy/allocate resources for starting stage policies | * Deploy/allocate resources for moderate stage policies | * Deploy/allocate resources for advanced stage policies | * Deploy/allocate resources for robust stage policies | * Deploy/allocate resources for vertebrate stage policies |
| **Preparedness** | | | | | |
| **Leadership & Governance** | | | | | |
| **Cooperation** | | | | | |
| **Learning** | | | | | |

# ANNEX III AGENDA OF THE WORKSHOP

## DAY 1: May 9th, 2017

**Venue:** Tårnværelse, Økolariet Dæmningen 11, 7100 Vejle

| Time | Activity | Description |
|---|---|---|
| 17:25 – 17:35 | Presentation of WP6<br>Responsible: DIN | |
| 17:35 – 17:40 | Presentation of WP 7<br>Responsible: ICLEI | |
| 17:40 -17:45 | Presentation of WP 8<br>Responsible: Tecnun | |
| 17:45 - 18:15 | Rockefeller foundation presentation<br>Responsible: Rockefeller foundation | |
| 19:00 | Vedelsborg Restaurant Vedelsgade 59, 7100 Vejle | **http://www.vedelsborg.dk/** |
| 16:30 -16:45 | Feedback from Kristiansand and San Sebastian Kick Off meetings<br>Responsible: ICLEI | |
| 16:45 -17:00 | Presentation of WP1<br>Responsible: LiU | |
| 17:00 – 17:10 | Presentation of WP2<br>Responsible: Tecnun | |
| 17:10 – 17:20 | Presentation of WP 4<br>Responsible: CIEM | |
| 17:20 – 17:25 | Presentation of WP5<br>Responsible: ICLEI | |

# DAY 2: May 10th, 2016

- **Venue:** Lillesal (Second Floor), Bygningen Ved Anlæget 14B, 7100 Vejle

| Time | Script | Description |
|---|---|---|
| 08:45 – 09:00 | Welcome/Coffee | |
| 9:00 – 9:20 | **Bristol** | Presentation of cities about what they have been doing on Resilience using the maturity model as the schema that is what they have done at every stage: S, M, A, R and T |
| 9:20 – 9:40 | **Donostia** | |
| 9:40 – 10:00 | **Glasgow** | |
| 10:00 – 10:20 | **Kristiansand** | |
| 10:20 – 10:40 | **Riga** | |
| 10:40 – 11:00 | **Roma** | |
| 11:00 – 11:15 | Coffee break | |
| 11:15 - 13:00 | Policies/Action plans exercise<br>Responsible: TECNUN | |
| 13:00 – 14:15 | Lunch | |
| 14-15 – 15:45 | Revision of policies<br>Responsible: CIEM & Tecnun | |
| 15:45 – 16:00 | Coffee break | |
| 16:00 -16:45 | Definition of key terms<br>Responsible: DIN & Tecnun | |
| 16:45 – 17:00 | Final wrap up | |

| Time | Script |
|---|---|

| | |
|---|---|
| 19:00 | Dinner: Restaurant Remouladen. A bus will take all participants from the hotel to Remouladen at 18:45. |

## DAY 3: May 11th, 2016

- **Venue:** Lillesal (Second Floor), Bygningen Ved Anlægget 14B, 7100 Vejle
- **Participants:** All

| Time | Script | Description |
|---|---|---|
| 08:30 – 09:00 | Welcome/Coffee | |
| 9:00 – 10:00 | Consolidation of 1st day results | |
| 10:00 – 11:00 | Progress towards RSQ<br>Responsible Strathclyde | |
| 11:00 11:30 | Coffee break | |
| 11:30 – 13:00 | Validating the scope of the RSQ | |
| 13:00 – 14:00 | Lunch | |
| 14:00 -16:30 | Discussion about engagement tool<br>Responsible: CIEM | |
| 16:30 – 17:00 | Final wrap up | |

| Time | Script |
|---|---|
| 19:00 | Dinner: Hopballe Mølle. A bus will take you from the hotel to the restaurant at 18:30. |

# DAY 4: May 12th, 2016

- **Venue:** Meeting room at Jacob Gade Hotel

| Time | Script | Description |
|---|---|---|
| 09:00 – 10:45 | Debrief and next steps | |
| 10:45 – 11:00 | Coffee break | |
| 11:00 – 13:00 | Discussion on individual WPs if necessary | |

Possible visit to see the Jeiling monument for those interested on Thursday afternoon. About 1,5 – 2 hours.