



## Module 4: Pursue Resilient Urban Development and Design

Uscore2: City-to-City Peer Review Tool

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## INTRODUCTION

Uscore2 is a peer-to-peer review process for cities. Designed with funding from the European Commission, it enables cities to share and learn from good practice in Disaster Risk Reduction (DRR) in other cities across the world. Uscore2 focuses on the use of city-level peer reviews as a tool with which the activities of one city in the area of disaster risk management and civil protection are examined on an equal basis by fellow peers who are experts from other cities. This approach facilitates improvements in DRR through the exchange of best practice and mutual learning, whilst also maintaining impartiality and transparency. This peer review programme integrates an evidence based methodology for impact evaluation, enabling participants to demonstrate the value generated by the investment in the peer review.

Cities undertaking a peer review of Pursue Resilient Urban Development will generally be undertaking this as part of a wider review as outlined in the 'Uscore2 Step-by-Step Guide to City-to-City Peer Reviews for Disaster Risk Reduction'. The Step-by-Step Guide provides an essential overview of the peer review process, the Impact Evaluation Methodology (IEM) used to measure the impact of the peer review, and the 11 modules for conducting city-to-city peer reviews for DRR.

It is strongly recommended that cities interested in inviting another city to peer review their DRR activity work through the Step-by-Step Guide as a precursor to undertaking Module 4. This Module Guide gives information relevant to those steps in the peer review process which are specific to Module 4.

During the development of Uscore2, the peer review process has been piloted by three cities: Amadora (Portugal), Salford (UK) and Viggiano (Italy). The pilot cities spoke positively of their experiences:

"Peer reviews are interactive and about mutual learning, exchange of best practice and policy dialogue, a support tool for prevention and preparation under the EU civil protection mechanism and promote an integrated approach to disaster risk management, linking risk prevention, preparation, response and recovery actions."





## BACKGROUND

The aim of this module is to support cities in assessing their built environment to make it as resilient as possible and to draw on relevant risk information to help pursue safe and sustainable urban development (UNISDR, n.d.).

Development pressures and strong economic interests have led to the urbanisation of areas which face potential risks from earthquakes, volcanic activity, forest fires, floods, winter freezes, etc. (UNISDR, 2015). Due to the rise in the number of disasters which affect urban areas, urban development and design needs to be planned with the risk of disasters in mind, taking into account the relationships between habitable space, vulnerability and exposure (Birkman et al. 2013). One aspect of reducing a population's exposure to disasters is to incorporate vulnerability mapping, preparedness and mitigation activities into urban design (Henstra 2010), as well as ensuring that it has the capacity to absorb and adapt to risks (Fox-Lent et al. 2015).

Cities should evaluate how effectively they integrate disaster risk reduction (DRR) with land-use practices, urban planning, development policies, ecosystem protection and building codes (UNISDR n.d). These assessments should take into account how the level of DRR integration in these areas impacts capacity building and how effectively it can minimise the disruption and destruction of critical infrastructure (UNISDR n.d).

As a result, when considering effective urban planning and development cities might consider:

- The existing urban situation (e.g. age of buildings, building form and building condition)
- The population and their household requirements
- Land use, including locations for new housing and economic activity

- Distribution of social infrastructure to provide essential services to the population (health, administration, school and higher education, security, telecommunications, etc.)
- Physical infrastructure to ensure urban areas function properly (transport networks, utilities such as water, electricity and gas)
- City and town centres, other locations and key destinations with concentrations of activity
- Urban design and building standards (UNISDR, n.d.).

Urban planning must also consider factors which may pose risks as a result of the territory within and around urban areas. Such factors may include geology and seismic risk; hydrogeological and geomorphological risks; ecosystems and extreme weather. Migration of populations may also put strain on urban development and can lead to increases in informal settlements which exacerbate vulnerability issues (Meerow et al., 2016). As a result, it has become increasingly important for new developments and retrofitting programmes to consider land-use, urban planning and building regulations which adhere to codes and standards that recognise DRR / resilience issues.

Effective strategic planning in the urban development context needs to define all the potential risks that may affect the region, capture all relevant data to build risk scenarios and outline how prevention and management of emergencies will be coordinated. Effective urban development must also: plan the management of existing and future settlements; introduce construction methods that guarantee the safeguarding of people, infrastructure and essential health care and carefully consider environmental protection (EMI, 2008; Musa et al., 2015).

Increased participation of all stakeholders in emergency planning and management is of growing importance as a result of expanding urban populations (Meerow et al., 2016). Risk mitigation and improvement of infrastructure and basic services should be a participatory process taking into account cultural diversification (Birkman et al., 2013; Henstra, 2010). It is therefore important for urban development to incorporate exemplary sustainability principles and for cities to foster collaboration and coordination with local and non-local stakeholders engaged in sustainable development (UNISDR, n.d).

Peer reviews are able to help cities evaluate their understanding of existing issues within the urban environment, and their related risks, in a comprehensive manner. The peer review process will also support city's thinking on how to incorporate risk reduction analysis into urban planning policies and codes, and how these can be maintained, updated and enforced (Johnson and Blackburn, 2015). Using a multi-stakeholder approach, the peer review supports a participatory strategy to foster holistic approaches for urban development.



### Further Information

For further information on peer reviews visit: [www.Uscore2.eu](http://www.Uscore2.eu). Also refer to ISO 22392 when published. Currently it is in draft and will contain further information about peer reviews.

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## HOW CAN THE PURSUIT OF RESILIENT URBAN DEVELOPMENT BE ASSESSED AND IMPROVED?

The description of Essential 4: Pursue Resilient Urban Development taken from the UNISDR's Making Cities Resilient website and given below, describes the activities a city should be demonstrating to improve resilience in this area. A city's capacity for effective urban development involves a number of organisations, however, many planning decisions and responsibilities for the enforcement of building regulations often lie with local government.

### Essential Four: Pursue Resilient Urban Development

Ability to study the existing urban situation

- State of the buildings in relation to the main risks of the city;
- Distribution of the population and of the economic activities of the city and their ability to respond to risks.

Proper urban planning actions to increase resilience

- Land use and zoning for a proper and functional management of urban and suburban areas, to improve urban resilience;
- Using new techniques for designing and building public and private infrastructures that can respond positively to external stresses;
- Implementation of service structures to enhance areas intended to accommodate momentarily the population involved in a catastrophic event;
- Upgrading building codes and promoting the process of building retrofitting to appropriate high standards;
- Improvement of urban areas for public spaces that can contribute to mitigating risks and reducing technical infrastructure which may require ordinary and extraordinary maintenance;
- Incorporate sustainable design principles exemplary of a new development model. Link to other existing standards where appropriate (BREEAM, LEED, Greenstar, etc.);
- Periodically updating codes and building standards to take account of changes that the territory may face over time;
- Design areas for population support and mitigation in case of a catastrophic event.

Participatory definition of urban development policies

- Involvement of local stakeholders interested in appropriate and proportionate participatory decision-making processes during urban planning;
- Coordination between the various departments of the city to define urban development plans;
- Trans-boundary interaction with knowledge centres and institutions to incorporate new standards of resilient and sustainable development;
- Policies and organisation structures in place to verify and to enforce urban planning regulations.



## HOW CAN THIS BE MEASURED?

The following table describes the high level indicators for Essential 4 taken from the Disaster Resilience Scorecard Preliminary Level Assessment. These are used in this Module as indicators against which to gather evidence and make recommendations.

Ref	Subject / Issue	Question / Assessment Area
P 4.1	Land use zoning	Is the city appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production, and population centres?
P 4.2	New urban development	Are approaches promoted through the design and development of new urban development to promote resilience?
P 4.3	Building codes and standards	Do building codes or standards exist, and do they address specific known hazards and risks for the city? Are these standards regularly updated?
P 4.4	Application of zoning, building codes and standards	Are zoning rules, building codes and standards widely applied, properly enforced and verified?

The full Detailed Assessment from the Disaster Resilience Scorecard for Cities is available through the following link:

<http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=4>.

## METHODOLOGY

### PHASE 2, STEP 7: INFORMATION TO SEND TO REVIEW TEAM PRIOR TO THE REVIEW TEAM VISIT

Please refer to the Step-by-Step Guide for advice on both conducting and hosting peer reviews. This section sets out information that is specific to this Module which begins in Phase 2.

As set out in the Step-by-Step Guide if Modules 1 (Organise for Disaster Resilience) and 2 (Identify, Understand and Use Current and Future Risk Scenarios) are not undertaken at the same time as Module 4, then an overview of both the city's disaster risk governance and DRR risk assessment should be included in the pre-visit information sent to the Review Team.

The Host City should aim to send the pre-visit evidence to the Review Team three months ahead of the Review Team's visit. It is recommended that the pre-visit evidence is limited to 3 – 5 items for each Module.

#### Suggestions for the type of pre-visit evidence that could be shared between cities

A selection of evidence should be sent to the Review Team before their visit to the Host City. This could include the type of information listed below or any other information that the two cities agree would be of benefit.

It is **highly recommended** that the Host City prepare a **summary** of how the city pursues resilient urban development including:

- An overview of the Host City's governance arrangements that would oversee and regulate urban development
- A summary of the Host City's masterplan
- The disaster risks the Host City routinely considers in its urban planning and development
- The demographics of the Host City and the pressures on its urban development, whether of growth or decline in population and changing industrial sectors.

In addition, **no more than 4 other items** should be selected from the suggestions below to demonstrate the Host City's baseline capacity for pursuing resilient urban development.

#### Overview: A Shared Understanding of Roles and Responsibilities

- A plan or other document that provides an example of how institutions in the Host City are planning to work together to pursue resilient urban development
- A plan or protocol describing how the Host City engages with the most vulnerable and at need populations in the city in urban development and the application of building codes and standards
- A structure chart and description of who, in the Host City, holds the roles and responsibilities for ensuring resilient urban development
- The outcomes of local completion of the UNISDR's Disaster Resilience Scorecard for Cities, Essential 4.

#### P4.1: Land Use zoning

- A summary or map of at-risk areas for disaster risk overlaid with land use zoning
- A summary or map of how at-risk areas are predicted to change in climate change scenarios with a description of how this is affecting land use zoning
- A description of how the balance between industrial risk and residential areas are managed
- A description of major infrastructure / critical local infrastructure and its role in generating and / or mitigating risk.

#### P4.2: New Urban Development

- An example of a new development illustrating how measures to reduce the impacts of disaster risk scenarios and climate change predictions have been designed into the scheme
- An example of how natural capital is being enhanced in new developments
- An example of a new development that is pursuing accessibility, equality and inclusivity in its design
- A city code or guideline for new development that encourages physical, social and / or economic resilience.

#### P4.3: Building Codes and Standards

- A building code within the Host City that addresses a known disaster risk
- A report to the local government setting out updates to the Host City's building standards / codes
- Public material encouraging uptake of measures to retrofit buildings to protect them in case of known risks e.g. earthquakes
- Host City guidance about energy efficiency in buildings
- An outline of the review process for building codes and standards.

#### P4.4: Application of Zoning, Building Codes and Standards

- An example application form to seek Host City approval for new buildings that are compliant with the city's zones, codes and standards
- A description of the process for enforcing and verifying building codes and standards
- Host City statistics illustrating the enforcement action taken with respect to zoning, codes and standards.



## PHASE 2, STEP 8: ARRANGEMENTS FOR THE PEER REVIEW VISIT

As described in the Step-by-Step Guide, in the 3-6 months before the peer review visit, the Host City and Review Team are recommended to agree an agenda for the visit. This will include a range of activities to enable the Review Team to understand how the Host City is strengthening and improving the resilience of its urban development. The types of activities could include some or all of those listed below, or any other relevant actions. It is anticipated that the review of this Module will take a day. For all interviews, the Host City should ensure translators are available if they are required.

At the start of the Review Team's assessment of Module 4, the Host City is **highly recommended** to make a **presentation** to the Review Team which sets out its approach to pursuing resilient urban development.

This could include information about:

- The governance arrangements in the Host City for resilience in urban development
- An overview of the Host City's masterplan
- The main opportunities and challenges for the Host City's future urban development, including safeguarding protective ecosystems, informal development, social issues and trends, together with industrial and economic projections and incentives
- Any post-disaster plans for rebuilding and restoration, including how the Host City's zoning, codes and standards would encourage building back better in the recovery phase

### Who should the Review Team interview?

When considering who is important for the Review Team to interview and / or receive a presentation from, it is **highly recommended** that the **Mayor** and / or other key local political leaders who will give leadership in urban development are included and available. The Host City and Review Team should consider all Modules being assessed during the peer review and combine relevant questions with each senior politician or officer into one appointment.

The Host City and Review Team may also wish to consider who would be most appropriate to interview in light of their initial exchange of pre-visit information, any plans for future developments and also the most probable and most severe disaster scenarios for the Host City. Suggestions include:

- Officials who are responsible for drawing up and leading the Host City's Urban Development Strategy Masterplan
- Leaders of the organisations critical to promoting the role of urban development in DRR in the public, private and voluntary sectors
- Practitioners and technical experts who have been involved in urban development and creating and enforcing building codes and standards
- Local researchers and academics examining the resilience of the Host City's urban development or advising on future climate change scenarios
- Local residents from development in at-risk areas or from new developments and representatives of the most vulnerable communities



- Senior managers from infrastructure providers who need to maintain essential services to citizens in disasters
- Practitioners who have been involved in a city-to-city knowledge exchange to strengthen the Host City's approach to resilient urban development.

### How can the Host City multi-agency capacity be demonstrated?

In addition to interviews and presentations, suggestions for activities within the programme for the visit include but are not limited to:

- Visits to new developments within the Host City that illustrate new or innovative approaches to DRR and overall urban resilience
- Site visits to industrial sites that could pose risks to residential areas to explore approaches to site safety and pollution management in case of a disaster affecting the site
- Visits to sites that demonstrate how the natural environment and green infrastructure is being used to safeguard the Host City against disaster risk
- Site visits to buildings which have or are being retrofitted to increase their resilience to disaster risks
- Talking with community representatives including, if possible, those who have experienced and been involved in urban development planning and / or responding to informal urban expansion
- Visit a team researching and assembling data on urban development and DRR
- Visit to an academic organisation teaching about resilience and DRR in urban development
- Accompanying a Host City official on an inspection to verify the application of building codes and standards to new developments.

For all interviews and site visits the Host City should ensure translators are available if they are required.



## PHASE 2, STEP 9: REVIEW TEAM: GATHERING EVIDENCE

The Review Team will gather evidence from the pre-review information submitted before the peer review visit, together with information from interviews and activities undertaken during the visit, to gain a view of the effectiveness of the existing capacity for pursuing resilient urban development.

This will include:

- How effective the Host City is in assessing potential disaster risks, including those predicted through climate change projections and incorporating these into its approach to pursuing resilient urban development
- How effective the Host City is in preventing the creation of new disaster risk
- How effective the Host City is in using zoning, building codes and standards to reduce existing disaster risk
- How the Host City promotes inclusive and accessible urban development for the whole of society.

The Review Team will structure their evidence gathering and interviews to enable the Host City to describe and demonstrate their approach against each of the indicators included in the Disaster Resilience Scorecard Preliminary Level Assessment. Overall, the Review Team should determine:

- Who leads / contributes / coordinates / assesses performance in this area? Is this effective? Is shared ownership of DRR evident?
- Who is missing / underperforming or underrepresented?
- What skills and experience are evidenced? Are there deficits?

- What activities currently support performance in this area, are these activities effective?
- What, if any, additional activities would the Host City like to undertake in future? What are the barriers to extending activities?
- How are resources / information / training shared? Are there exclusions or barriers to access?
- How is the Host City accessing local / national / international sources of expertise to improve DRR in this area? Which networks is the Host City part of to support this activity?

Although the Review Team should design their own detailed questions in order to explore issues they consider relevant in the context of the Host City, the following questions are offered as suggestions that may be helpful in stakeholder interviews for Module 4. They are example questions and it is wholly acceptable to tailor them or, equally, not to use them, according to the individual peer review.

The Review Team could choose to select just the relevant questions as well as asking additional questions that have not been listed below.



Ref	Subject / Issue	Suggested Questions
P 4.1	Land use zoning	<p><b>Is the Host City appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production and population centres?</b></p> <ul style="list-style-type: none"> <li>• Is the Host City appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production and population centres?</li> <li>• How does the Host City assess disaster risk? How does the city understand the potential impacts, exposure, vulnerability and coping capacities across different sectors in the city including residents, businesses and agriculture?</li> <li>• How does the Host City approach land use zoning?</li> <li>• What arrangements are in place to factor disaster risk assessments into land use zoning?</li> <li>• How are risks associated with climate change incorporated into the Host City's urban planning arrangements?</li> <li>• How do land use zoning and urban development process in the Host City avoid creating new risk, reduce existing risk and help to manage residual disaster risk?</li> <li>• How is the input from different sectors and stakeholders coordinated to influence urban development and DRR in the Host City? How are the vulnerable and those in need included in consultation for urban development?</li> <li>• How is disaster risk and emergency response included in the Host City's masterplan / urban development plan?</li> <li>• What arrangements are in place through the masterplan / urban development plan to safeguard the natural environment and ecosystems that provide a protective function for the Host City?</li> <li>• How does the urban development plan address the protection of the Host City's cultural heritage?</li> </ul>
P 4.2	New urban development	<p><b>Are approaches promoted through the design and development of new urban development to promote resilience?</b></p> <ul style="list-style-type: none"> <li>• How do new developments take account of the need for resilience and a reduction in disaster risk?</li> <li>• How does the Host City ensure measures to mitigate disaster risk are incorporated in new developments?</li> </ul>

Ref	Subject / Issue	Suggested Questions
P 4.2	New urban development	<ul style="list-style-type: none"> <li>• How do new developments incorporate and respond to the disaster risks projected in climate change scenarios?</li> <li>• What are the main challenges faced by the Host City in urban development and DRR?</li> <li>• How do new developments seek to meet the needs of the most vulnerable and adopt a whole-of-society approach?</li> <li>• What arrangements are in place to ensure the resilience of infrastructure providing essential services to new developments?</li> <li>• How does the Host City's masterplan / urban development plan include considerations about how to build back better following a disaster?</li> <li>• How does the Host City ensure it is continually identifying and learning from good practice in pursuing resilient urban development?</li> <li>• Is there an annual training and awareness program in the Host City for urban development and DRR?</li> </ul>
P 4.3	Building codes and standards	<p><b>Do building codes or standards exist and do they address specific known hazards and risks for the Host City? Are these standards regularly updated?</b></p> <ul style="list-style-type: none"> <li>• What is the framework of building codes and standards in the Host City?</li> <li>• How do building codes and standards in the Host City address known hazards and risks?</li> <li>• How does the Host City assure itself of the effectiveness of the inclusion of DRR policies in building codes and standards?</li> <li>• How do building codes and standards meet the needs of the whole of society to encourage inclusive and accessible urban development?</li> <li>• What arrangements are in place for updating building codes and standards?</li> <li>• How are the building codes and standards being updated to reflect climate change projections?</li> </ul>



Ref	Subject / Issue	Suggested Questions
P 4.3	Building codes and standards	<ul style="list-style-type: none"> <li>• What arrangements are in place to ensure building codes and standards encourage the retrofitting of buildings and infrastructure vulnerable to disaster risk?</li> <li>• How do building codes and standards support the installation, upgrade and maintenance of resilient infrastructure?</li> <li>• How are building codes and standards updated to reflect new advances in scientific and technical understanding?</li> <li>• Does the Host City regularly draw on learning and good practice from other cities to update its building codes and standards?</li> <li>• How are urban design solutions and building codes improving resilience and maximizing city response capability?</li> </ul>
P 4.4	Application of zoning, building codes and standards	<p><b>Are zoning rules, building codes and standards widely applied, properly enforced and verified?</b></p> <ul style="list-style-type: none"> <li>• What arrangements are in place within the Host City to apply and enforce land use zoning, together with building codes and standards?</li> <li>• How does the Host City maintain records and data about the application of land use zoning, verification activity and enforcement action?</li> <li>• How does the Host City balance needs for urban growth and the attraction of new investment and businesses with measures for reducing disaster risk, including minimising inappropriate development on vulnerable sites?</li> <li>• What powers are available to the Host City to apply, verify and enforce land use zoning, together with building codes and standards?</li> <li>• Who is in overall charge in the Host City for urban development and DRR?</li> <li>• How does the Host City assess whether its approach to land use zoning and the application / enforcement of building codes and standards is sufficient to promote principles of equality and non-discrimination in resilient urban development?</li> </ul>

Ref	Subject / Issue	Suggested Questions
P 4.4	Application of zoning, building codes and standards	<ul style="list-style-type: none"> <li>• How does the Host City assess whether its approach to land use zoning and the application / enforcement of building codes and standards is sufficient to address increased disaster risks described in climate change projections?</li> <li>• What makes the Host City's approach to resilient urban development effective?</li> <li>• What are the particular strengths of current arrangements for pursuing resilient urban development?</li> </ul>

## PHASE 3, STEP 11: RECORDING INFORMATION AND DRAFTING INITIAL RECOMMENDATIONS

The Step-by-Step Guide describes how the Review Team can record information during the peer review visit and includes a generic form that can be used to capture information during individual presentations, interviews and other activities.

At the end of each day, it is recommended that the Review Team assemble to consider all the information that it has heard during the day and summarise the evidence to understand:

- Areas of good practice and strengths on which the Host City can build
- Areas where further information may be needed before the peer review visit is finished
- Areas where possible recommendations for the future may be made.

This process will help to inform both the remainder of the visit and the drafting of the peer review outcome report.

The two tables below are offered as a way of recording the overall findings for Module 4 together with the initial recommendations arising from the activities experienced during the day.



## SUMMARY OF INITIAL FINDINGS

	Comments	Justification for assessment	Good practice identified
<b>P 4.1 Land use zoning</b> Is the Host City appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production and population centres?			
<b>P 4.2 New urban development</b> Are approaches promoted through the design and development of new urban development to promote resilience?			
<b>P 4.3 Building codes and standards</b> a) Do building codes or standards exist and do they address specific known hazards and risks for the Host City?  b) Are these standards regularly updated?			
<b>P 4.4 Application of zoning, building codes and standards</b> Are zoning rules, building codes and standards widely applied, properly enforced and verified?			
<b>Other</b>			



## INITIAL RECOMMENDATIONS

	Description of areas for potential development	Justification	Time horizon
E.g. Building codes or standards exist, and they address specific known hazards and risks for the city.	E.g. Building codes should be robustly enforced.	E.g. Prevention of sub-standard property being developed and increasing associated risks.	E.g. Short, medium, long term implementation
<b>P 4.1 Land use zoning</b> The Host City is appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production and population centres.			
<b>P 4.2 New urban development</b> Approaches are promoted through the design and development of new urban development to promote resilience.			
<b>P 4.3 Building codes and standards</b> Building codes or standards exist, and they address specific known hazards and risks for the Host City.			

INITIAL RECOMMENDATIONS			
	Description of areas for potential development	Justification	Time horizon
<b>P 4.3 Building codes and standards</b> Standards are regularly updated.			
<b>P 4.4 Application of zoning, building codes and standards</b> Zoning rules, building codes and standards are widely applied, properly enforced and verified.			
<b>Other</b> <b>Area / issue</b>			







