UN City Disaster Resilience Scorecard[i]

Peter Williams[1], Dale Sands[2]

[1]IBM [2]AECOM

Contact: peter.r.williams@us.ibm.com, dale.sands@aecom.com

Introduction

Increasing population growth and urbanization, combined with climate change, are placing more people and economic activity potentially in harm's way. We therefore need to think through how we can improve cities' resilience to the various harms that might befall them. This paper describes the contribution that the City Disaster Resilience Scorecard (Williams et al., 2015) ("the Scorecard") can make to this endeavor. The Scorecard was written pro-bono by IBM and AECOM[ii] for the United Nations Office for Disaster Risk Reduction (UNISDR)[iii].

What do we mean by disaster resilience? Unfortunately, the term "resilience" is in some danger of becoming a meaningless portmanteau comprising - variously – disaster, economic, social, environmental and cultural resilience, to name a few. Most recently the generalized term "climate resilience" has also started to be used. One way to sort through these definitions, borrowing from the work of Fiksel (2015) is to think of a spectrum ranging from chronic to acute stress, where:

- Disaster resilience is the ability to respond to acute stresses, whether climate, seismically or otherwise induced, and revert back to some acceptable position afterwards (note – not necessarily the same position). Manmade disasters can be included in this definition too, if required.

- Chronic stresses are the background or ongoing pressures associated with the environmental, economic or social fabric of a community. Chronic environmental stress in this context refers to gradual trends such as sea-level rise, pollution, ground-water over-use and soil erosion that threaten community sustainability.

- Chronic and acute stresses interact, as for example where deforestation around the headwaters of a river may increase the risk of flash flooding in a city down the river; or where chronic stress on the social fabric undermines the ability to respond to an acute stress event such as a heatwave (Klinenberg, 2013).

---

[i] This paper is part of the IRGC Resource Guide on Resilience, available at: https://www.irgc.org/risk-governance/resilience/. Please cite like a book chapter including the following information: IRGC (2016). Resource Guide on Resilience. Lausanne: EPFL International Risk Governance Center. *v29-07-2016*
[ii] http://www.aecom.com/
[iii] http://www.unisdr.org/campaign/resilientcities/home/toolkitblkitem/?id=4

It will be evident that if risk is defined as "probability x impact", improving disaster resilience as defined here *may* require reducing probability through mitigation actions; and will *definitely* require reducing impact, again through mitigation but also through improved planning and response. Said differently, using the insurance industry definition of risk, improving disaster resilience *may* involve addressing hazards (especially if manmade disasters are included), but it will *definitely* require addressing exposure and vulnerability. Further if, as may well be the case for any given city, risk cannot be removed entirely, disaster resilience may require acceptance of that risk and the improvement of "rebound" capacity, such that cities and their societies and economies can "reboot" after a disaster as rapidly and as smoothly as they can while dealing with the financial impact.

Objectives of the Scorecard

For cities to become resilient, they first need to be able to measure where they are, and to gauge whether they are becoming more or less resilient over time. The first objective of the Scorecard is therefore to enable cities to understand, across the entire spectrum of issues associated with disaster resilience, their resilience *baseline*: where they are strong, and where they need to devote time and attention to address weaknesses that may be identified. The intent is that the city's scores are then revisited periodically, to see whether the city has become more resilient as a result of its efforts - or perhaps less, where for example population may have grown in a relatively unsafe area or the climate may have changed.

The second objective of the Scorecard is to encourage cities to begin to think about disaster resilience where they have not done so; or where they have, to encourage them to address blind-spots that may hitherto have existed. For this reason, the Scorecard is in the public domain and may be used entirely free of charge.

The third objective is a little less tangible, and that is to act simply as an agenda for discussions that need to happen. To varying degrees, all cities are functionally fragmented across different departments and agencies; and all are dependent on neighboring cities, other tiers of governments, private sector entities such as utilities or phone companies (or simply large employers or economic actors), and on civil society organizations and NGOs. All of these organizations need to be operating on shared assumptions and expectations – 'one version of the truth'. The Scorecard has proven its value on multiple occasions in facilitating the necessary discussions.

It is worth pointing out two objectives that the Scorecard does NOT have:

- Like all such instruments, it focuses on the 'what' – as in what needs to be addressed. It does not directly attempt to prescribe the 'how' - as in how each weakness should be addressed. This is because, while in some cases the required remediation may be obvious, in many other cases it may require specialist input (for example engineering, or social marketing) to determine. However, it is quite possible to complete the Scorecard as 'step 1' in a 2 step exercise where 'step 2' consists of brainstorming and researching what the remediation strategy needs to include.

- The Scorecard is not intended to enable direct city-to-city comparisons. This is for several reasons. Because of the complexity of cities, and thus of resilience as a subject, such comparisons could be highly misleading; and a poor outcome could lead to a city suffering

increased insurance premiums or capital costs, the risk of which might act as a disincentive to complete the Scorecard in the first place.

The Scorecard Instrument

So what is the Scorecard? Let's begin with the proposition that disaster resilience is a "system-of-systems" issue: it affects multiple physical and social systems in the city, and therefore needs to be addressed in each of these systems. Recognizing the breadth of the issue, the UN has defined the "Ten Essentials" of disaster risk reduction, as shown in Figure 1 below:
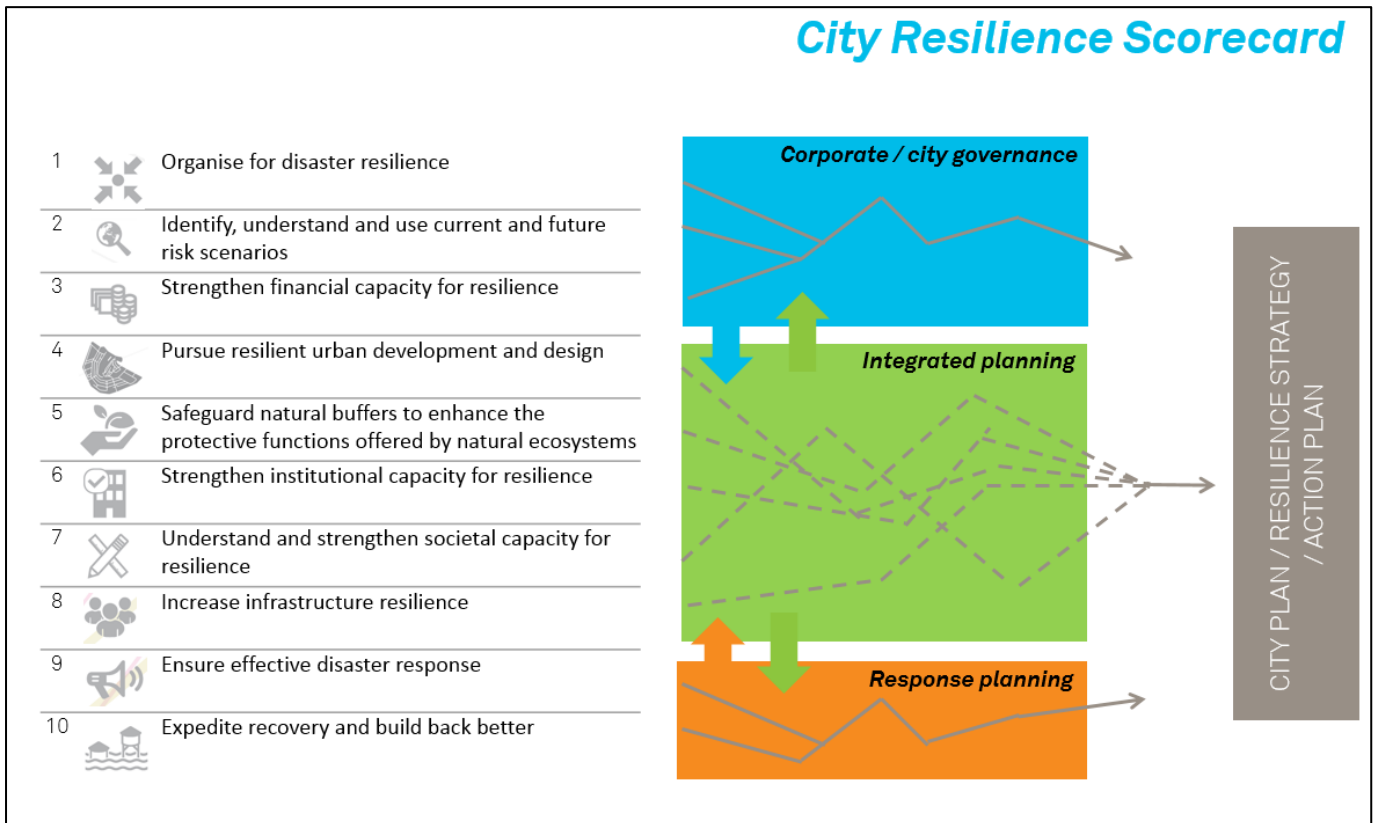

City Resilience Scorecard

1. Organise for disaster resilience
2. Identify, understand and use current and future risk scenarios
3. Strengthen financial capacity for resilience
4. Pursue resilient urban development and design
5. Safeguard natural buffers to enhance the protective functions offered by natural ecosystems
6. Strengthen institutional capacity for resilience
7. Understand and strengthen societal capacity for resilience
8. Increase infrastructure resilience
9. Ensure effective disaster response
10. Expedite recovery and build back better

Corporate / city governance

Integrated planning

Response planning

CITY PLAN / RESILIENCE STRATEGY / ACTION PLAN

Figure 1: The "Ten Essentials" – Figure taken from the Scorecard (op cit)

Together the "Ten Essentials" have the merit of providing a holistic coverage of the disaster resilience field. As noted, the focus is on *disaster* resilience and not - at least not directly - on the wider definitions of resilience (social, environmental, cultural). The Ten Essentials do however include those other factors *where they affect disaster resilience*. It is worth keeping in mind that:

- While the focus of UNISDR is on natural disasters, there is no intrinsic reason why manmade disasters or acts of terrorism could not also be included, among the scenarios (Essential 2) for which the city is planning.

- While some cities may face an immediate one or more obvious hazards such as an earthquake risk or a hurricane-prone coastline, in others, the hazards may be harder to identify and may in fact come from smaller events perhaps acting in combination.

The Scorecard then takes the "Ten Essentials" and breaks them down into a set of individual measurements (in total about 90), each scored 0 through 5, where 0 means zero preparation and 5 means perfection. Guidance is provided on how to allocate scores. A sample of the Scorecard is shown in Figure 2 below:

Subject/Issue	Item measured	Indicative Measurement	Indicative Measurement Scale	Comments
1.1 Organization and coordination	1.1.1 Co-ordination of all relevant **pre-event** planning and preparation activities exists for the city's area, with clarity of roles and accountability across all relevant organizations.	Presence of organizational chart documenting structure and role definitions at each relevant agency to achieve a single overall point of co-ordination. Structure agreed and preferably signed off by all participants via MOU or similar.	5 – Single point of coordination exists with agreed roles and responsibilities. 4 – Single point exists but with some minor exceptions. 3 – Single point exists in principle, but with some major omissions, or lack of agreement on some major areas. 2 – Initial steps taken to create a single point of coordination. 1 – No single point but plans exist to create one. 0 – No single point and no plans to create one.	The single point of co-ordination may be a person, or a group or committee (with sub-groups or committees as appropriate). It will coordinate the relevant (see below) activities of: - The city government and, if separate, highways, police, armed forces/civil defense, water, energy, or any other relevant city organizations); - Other tiers of government (eg state, ward-level) or neighboring municipalities); - Private sectors organizations with relevant roles – for example, utilities, phone companies, healthcare, logistics companies, fuel depots, property companies, and so on. Some cities may have different organizational arrangements for different types of disaster. However, these need at least to work through the same coordination point (person or committee) to ensure consistency in response arrangements; and also to enable management of simultaneous disasters as applicable. The test of relevance is whether the organization or activity must contribute in any way to preparing for the event scenarios covered below in Essential 2.
	1.1.2 Coordination of all relevant **event response** activities in the city's area, with clarity of roles and	Presence of organizational chart documenting structure and role definitions at each relevant	5 – Single point of coordination exists with agreed roles and responsibilities.	As above – the single point may be a person or a group.

Figure 2: Sample of UN City Disaster Resilience Scorecard

As written all assessments in the Scorecard count the same. In practice, assessments (or indeed even entire Essentials) may be weighted as required.

There are two modes of completing the Scorecard. The first is through a detailed investigation of a city's total resilience posture, which may take some weeks or months, depending on the size of the city and how many separate entities - public, private and social - are involved in making it resilient. In concept this is somewhat like a consulting engagement. The second is to use the Scorecard as the basis for a one or two day workshop (with or without a questionnaire) to gather data in advance. In such a workshop, one might seek to allocate scores to each of the 90 separate assessments, or one might simply allocate one score for each Essential, while using the individual measurements as "attention getters" to make sure each Essential has been considered fully. The majority of the implementations to date have been via workshops, although having set the scene, so to speak, with their workshops, we know that a number of cities now plan to follow up with the detailed investigation.

Metrics and the Scorecard

The Scorecard is in effect a set of metrics, and these can be read from the text itself. Two additional metrics however may be of interest.

- The Scorecard was awarded the Notre Dame Global Adaptation Index (ND-GAIN) Corporate Adaptation Prize for 2015[iv], in recognition of its effectiveness, and of its exemplification of public-private cooperation.

- While we cannot be sure, we believe that about 30 cities, distributed across every continent, have now used the Scorecard in some form. We are aware of plans for approximately another 15-20 at the time of writing.

Bibliography

Fiksel, J. (2015*). "Resilient by Design: Creating Businesses That Adapt and Flourish in a Changing World"*, Island Press, Washington, DC, 2015, pp. 160-161.

Klinenberg, E. (2013). Adaptation, How can cities be "climate-proofed"? *New Yorker*, published online on 2013/10/07, available on http://www.newyorker.com/magazine/2013/01/07/adaptation-2

Williams et al., (2015). *"Disaster Resilience Scorecard for Cities"*, compiled for the UNISDR by IBM and AECOM, available on http://www.unisdr.org/campaign/resilientcities/assets/documents/privatepages/Resilience%20Scorecard%20V2.2%20-%20April%2030th%202015.pdf

---

[iv] http://gain.org/nd-gain-prize