RESEARCH REPORT

Institutionalizing Urban Resilience

A Midterm Monitoring and Evaluation Report of 100 Resilient Cities

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December 2018

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Preface

The world today is more densely populated and more interconnected than ever before, with more than 70 percent of the global population projected to live in urban areas by 2050. Cities are centers of innovation and prosperity, yet they disproportionality bear the impacts of 21st century challenges, such as climate change, inadequate infrastructure, population growth, and social and economic inequity.

In 2013, The Rockefeller Foundation launched 100 Resilient Cities (100RC) to help cities around the world become more resilient to the physical, social, and economic challenges that are a growing part of the 21st century. It was founded on the belief that business-as-usual models of reactive planning and siloed decisionmaking will not engender the fundamental strength and flexibility essential for cities and communities to thrive in the face of shocks and stresses. 100RC supports the integration and implementation of resilience into member cities' planning and projects. Leveraging its expertise, network of partners, and suite of tools and services, 100RC works hand-in-hand with member cities to

- embed resilience in cities' processes, policies, and practices through creation of a citywide Resilience Strategy and hiring of a chief resilience officer, and
- build resilience into and deliver prioritized projects through support from 100RC and its partners in implementation.

The Rockefeller Foundation provided financial support for the Urban Institute to evaluate the impact and sustainability of 100RC and assess what is working well and what should be improved in the ongoing management, implementation, and collaboration with member cities. The evaluation also considered to what extent 100RC can be regarded as a philanthropic model for building national resilience. We are grateful to Carlos Martín and his team from the Urban Institute, as well as partners from C-230 Consultores, Ricardo Energy & Environment, Oxfam UK, and Zerihun Associates for the timely lessons from this evaluation, which have helped to inform both the Foundation's and 100RC's urban resilience work going forward.

We are pleased to share the evaluation with our partners and stakeholders and to contribute to the broader learning in the field of urban resilience. By advancing this public-philanthropic collaboration, we hope to continue to strengthen global cities' resilience, enabling people, communities, and institutions to be prepared for, withstand, and emerge stronger from future shocks and chronic stresses.

Michael Berkowitz, President, 100 Resilient Cities
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Acknowledgments

This report was funded by The Rockefeller Foundation. We are grateful to them and to all our funders, who make it possible for Urban to advance its mission.

The views expressed are those of the authors and should not be attributed to the Urban Institute, its trustees, or its funders. Funders do not determine research findings or the insights and recommendations of Urban experts. Further information on the Urban Institute's funding principles is available at urban.org/fundingprinciples.

In particular, the evaluation team thanks Veronica Olazabal, director of measurement, evaluation and organizational performance at The Rockefeller Foundation, her predecessor, Nancy MacPherson, and her colleagues, Jessica Freireich, managing director of organizational performance, and Shawna Hoffman, specialist for measurement, evaluation and organizational performance, for their consistent guidance and strategic oversight of the work.

Special acknowledgment goes to all the past and present staff at Urban Institute and its partners—C-230 Consultores, Ricardo Energy & Environment, Oxfam UK, and Zerihun Associates—who have contributed to various components of the work's data collection, analysis, and project management efforts. This group is too large to name individually, but includes many of this report's authors. Related thanks go to the external advisors to the work: Rolf Pendall of University of Illinois at Urbana-Champaign and nonresident fellow at the Urban Institute; Philip Berke at Texas A&M University; and Tracy Gordon and Charles Cadwell from the Urban Institute's Tax Policy Center and Center on International Development and Governance, respectively.

All team members extend thanks to the staff and leadership within the 100 Resilient Cities offices for their collaboration in helping define the evaluation's scope, their assistance in assembling and sharing data, and their openness to feedback and applying lessons from the monitoring and evaluation—qualities that are rare among programs of this nature. We especially note the critical roles of current 100 Resilient Cities program contacts in helping produce this report: Ameneé Siahpush, associate director of monitoring and evaluation, network, knowledge and impact; Paul Nelson, vice president of network, knowledge and impact; and José Antonio Mendoza, associate for data analysis and visualization, network, knowledge and impact. Other 100RC staff, including Elizabeth Mercer, chief strategy officer, and former staff members Leah Flax and Amy Armstrong, were also instrumental in helping design this work and coordinate—exhaustively—with the evaluation team. We are indebted to you all.

Finally, the evaluation team acknowledges the various 100RC partners, comparable programs, and academics who must remain nameless, and all the staff in cities that have opened their doors repeatedly to our data collections. Our most enthusiastic appreciation is reserved for the chief resilience officers in the 22 study sample cities who have been enormously generous with their time and knowledge and honest with their communications. Their encouragement as we explore the only major multisite experiment in urban resilience has been critical beyond words.

Introduction

On April 29, 2013, The Rockefeller Foundation's Board of Trustees approved "a global challenge to identify 100 cities…to build greater resilience, particularly at the city level, as natural and man-made shocks and stresses grow in frequency, impact, and scale."[1]

In its first year, 100 Resilient Cities (100RC) identified the need to transform fundamental public institutions, functions, and operations in city government as its primary strategy to impact how cities mitigate shocks and reduce chronic stressors, particularly among poor and vulnerable citizens. The program promotes practices such as inclusive planning, comprehensive analyses of external shocks and internal stressors, consensus building, and cross-sector collaboration to effect systemic change in these cities' governance. 100RC selected and has worked extensively with three city cohorts; cohorts of approximately 30–35 cities were announced in December 2013, December 2014, and May 2016. The cities have moved through 100RC's milestones accordingly, but with some unique variations in pacing.

The program recently reached a threshold in its history, with almost half of its cities completing the intensive review and discovery process leading to the publication of Resilience Strategies. Now in its fifth year, 100RC has become a dominant subject of curiosity among practitioners and scholars in the nascent field of resilience; 100RC is among the first global urban initiatives to employ a consistent set of tools, supports, and resources across so many diverse cities—and certainly the first of its size to have the explicit mission of building city-level resilience.

Despite its influence, practitioner, scholar, and funder communities continue to have questions about 100RC's intervention and its aspirational goals, including its network of chief resilience officers (CROs) selected to spur change in city government operations ("Lifecycle 1," in 100RC terminology), its support of the development of Resilience Strategies in its participant cities to transform their planning institutions ("Lifecycle 2"), and its identification of technical and funding resources to implement the Strategies' resulting projects or "initiatives" ("Lifecycle 3"). Ultimately, 100RC is an experiment in city transformation—one attempting to remain true to a theoretically supported model at an unprecedented scale of cities across the globe.

This midterm report—the first to be externally released as part of the monitoring and evaluation effort conducted by the Urban Institute and its global data collection partners—sheds light on three of 100RC's four core goals to date. Additionally, the report addresses features of the overall 100RC model and its organizational structure to update the Foundation on its investment, provide strategic insights to the program, and inform the broader resilience community about the current state of its outcomes.

Midterm Outcomes

Several patterns have emerged thus far across each of the four studies: cities, partners, champions, and model.

Resilient Cities

Increasing the resilience capacity of its member cities is 100RC's primary goal, and the program seeks to achieve this both through institutionalizing changes in cities' long-term governance and supporting specific projects and services that yield more immediate benefits. The 100RC model employs specific and strategic tools to this end, such as the CRO appointment, orientation, and intensive guidance; the Resilience Strategy Guidance Manual and corresponding assessment exercises; and the initiative prioritization process.

The evaluation team monitored the early execution of 100RC's engagements with cities in a previous formative evaluation ("M&E Phase 1"). Since late 2016, the team has dived deeply into a purposive sample of 22 cities to assess 100RC's desired outcomes for institutional changes and project implementation ("M&E Phase 2"). The cities are generally representative of 100RC geographies, city governance types, economic developmental levels, shocks, and the three member-city cohorts. Data assessed for this report were collected for each sample city at three semiannual points to date: the third quarter of 2017 (including retrospective baseline data collection for cities that were well into their 100RC membership), the first quarter of 2018, and the third quarter of 2018.

INTERVENTION

The 100RC intervention—the resources, services, and guidance that 100RC provides and the expectations and milestones to which cities commit—has largely remained consistent across cities and true to the model over time. This has been particularly true since 100RC made tweaks to specific tools, such as the Perceptions Assessment and Asset and Risk Tool. In late 2015, 100RC introduced more flexibility to program processes and timelines, including tailoring the sequence and pacing of intervention in each city. These tweaks were made in response to lessons learned from the first year, feedback from some cities in its first cohort, and, more recently, from cities' desire to implement initiatives before Strategy finalization. Cities' motivations for 100RC participation have been consistent and have followed along key themes: global recognition, potential funding, access to knowledge resources, and the intrinsic benefits to their cities' institutional transformation or resilience building from participation.

Despite the consistent application of all model services, the intensity of intervention has modulated depending on each city's progress toward meeting expected deliverables. This variation has been intentional. For example, some sample cities have graduated into the implementation phase with sufficient resources and capacity after the Strategy phase to advance their initiatives independently. In those cases, 100RC has diverted resources elsewhere, such as to other cities with more entrenched bureaucracies or other institutional challenges (e.g., frequent political transitions) that continue to tread along the path toward Resilience Strategy release and that may require more concentrated 100RC services. In each case, 100RC has purposefully tempered its offerings based on periodic internal review of cities' conditions and capacities at key moments along their journey.

Among the 22 sample cities, 5 are still in Lifecycle 1, 4 are in Lifecycle 2, and 13 are in Lifecycle 3. Two have stalled in their progress despite 100RC's offers of assistance, with the functions of one former CRO for a post-Strategy city currently being renegotiated. 100RC is constrained in its ability to further the relationship with both cities. Beyond these two cities, managing political instability has been a dominant program challenge. Over half of the full population of member cities and almost half of the evaluation sample has undergone significant political transition during 100RC membership. Fidelity to the 100RC intervention, then, is predicated as much on external factors in the cities as on 100RC itself.

Regardless, cities' perceptions of the 100RC intervention has largely been positive. Across the sample, including the post-Strategy cities referenced above, cities' governments began to publicly define resilience in ways that aligned with 100RC and a diversity of individuals in the cities identified specific local needs for resilience building in increasingly consistent ways. Perceptions of 100RC among the city stakeholders that work more closely with the program have been generally complimentary. One critique is of 100RC's prescriptive procedures and aggressive time frames as being at odds with local urban conventions, notably among the first cohort of cities who were exposed to offerings as they were instituted; 100RC's intentional pacing and decreased prescriptiveness respond to that criticism. The team continues to monitor the general uptake of 100RC's intervention as a form of process study to help explain the outcomes described below.

INSTITUTIONALIZATION

The evaluation team tracks changes in 12 areas of institutionalization within the planning processes, cross-sector silos, and citizenry engagement among the sample cities. To date, 100RC is contributing positively—that is, in at least half of the cities—across 6 of the 12 areas:

- the explication of resilience in city planning, including delineating shocks and stressors

- the internal consistency across member cities' plans
- the establishment of a central resilience office or similar cross-sectoral coordinator
- a reduction in the strength of governmental silos
- commitments from city leaders and state or national entities for resilience efforts
- changes to budgetary review procedures or leveraged funds for resilience-building efforts

Some cities have successfully integrated resilience concepts from their Strategies into other major urban planning documents. All but one city has embedded a resilience officer in city hierarchies. Additionally, de-siloing efforts are moving forward at a steady clip and often as a direct consequence of the collaboration required to produce the Resilience Strategy. Positive change across the six areas is notable to varying degrees in six of the sample cities. The number of cities that experience these changes and the magnitude of the change per city will continue to evolve as all cities transition through the three 100RC lifecycles in the next three years.

The following are the six other institutionalization areas that remain unchanged on the whole:

- the use of evidence for planning
- the consistency of city plans with state and national entities
- operational commitments from the same entities
- community participation processes
- the centrality of vulnerable populations
- governmental transparency

In some cities, these indicators were at high levels or were consciously acted upon by the city before 100RC membership and have simply not altered since. No city has experienced negative effects because of membership in any of the outcomes of interest (e.g., no city is more siloed). However, the two cities with implementation stoppages have also reverted to pre-100RC levels in the latest snapshot despite positive institutionalization changes early in their 100RC affiliation.

Exploring the types of cities that are experiencing these changes is also telling. To that end, the evaluation team is also tracking seven external, independent conditions in the cities ranging from the nature of cities' shocks and stressors to the cities' political dynamics and economic conditions. Though not intended to be impacted by 100RC, these traits are likely to contribute to the program's outcomes

in cities. Three major factors appear to emerge among those cities that seem to be more receptive to engaging 100RC in making these internal transformations.

First, the robustness of planning and other city functions before 100RC membership influences cities' professional capacity to undergo the Resilience Strategy process. This factor is highly associated with the level of social and economic development of the nation in which the city is located. Among the cities in lower-income nations, core institutions and planning practices were weaker, less robust, less consistent, and had fewer resources than their wealthier counterparts at entry into 100RC. Cities with these characteristics also experienced challenges and delays in even taking up the 100RC intervention administratively.

A second factor is the size of the city and its corresponding governmental bureaucracy. Larger metropolises tend to require more investments in time and resources to coordinate, plan, and operate in the direction of shared goals. Smaller cities had fewer resources with which to catalyze change but can compensate with alacrity, internal cooperation, and external partnership.

Third, political transitions shape the commitments to both the CRO's and Resilience Strategy's longevity—especially when the transitions involve the handing of reins to opposition political parties and drastic upheavals of administrative staff. In instances across cities of all economic stripes and sizes, the intentional rejection or disinterest of a city's new leadership in the previous administration's resilience-building efforts are emerging as an increasingly acute challenge to 100RC's outcomes. Major transitions occurred already in Medellin, Colombia; Montreal, Canada; Durban, South Africa; and Byblos, Lebanon, and are occurring in Addis Ababa, Ethiopia; Colima, Mexico; Melaka, Malaysia; Santiago, Chile; and jurisdictions of Greater Miami, United States. In some cases, new leaders have shown interest in continuing predecessors' efforts, rebranding initiatives or appointing their own CROs in the process.

Considering all three factors, currently, medium-sized cities in middle- to higher-income contexts that have stable leadership commitments appear to have enough capacity and familiarity with global urban trends but are not so bureaucratic to make institutional transformation an impossible goal. Cities such as Norfolk, Virginia, USA; Wellington, New Zealand; and Rotterdam, the Netherlands, have had larger, positive institutionalization rates than peers to date.

However, as evaluations are made, it is important to keep in mind that the member cities started their 100RC engagements at different times. Cities in the final cohort who are just appointing CROs and are embarking on their Resilience Strategies are expected to show signs of institutionalization later. Ultimately, institutionalization outcomes cannot be assessed fully until each city has had the

opportunity to publish their Resilience Strategy and begin work on institutional change—approximately three to four years per an analysis of urban governance literature and practice.

In that time, three other factors may also shape institutional change in ways not readily apparent in the study's sample cities but are reported anecdotally among the wider population of 100 cities: transitions in the individuals holding the CRO title; a major hazard event or shock, such as a hurricane or terrorist attack, which could increase the immediate focus on resilience-building efforts according to current literature; and a significant change in social and economic conditions (or "stressors"), such as worsening income inequality or unemployment that could decrease resilience-building efforts as cities focus solely on economic distress factors rather than the gamut of long-term challenges.

The movement of certain types of cities toward institutionalization of resilience concepts should not be interpreted now as excluding other cities from potentially achieving similar institutionalization rates later: all cities are not on the same schedule. Further, numerous independent contextual factors come into play that shape the rate of resilience institutionalization in addition to the those noted above. 100RC's two- to three-year direct funding to cities combined with the intensive technical assistance often can only circumvent these more obdurate factors temporarily.

SOLUTIONS AND INITIATIVES

Just over half of the sample (12 of 22 cities) has published Resilience Strategies through 100RC and another one city has published a Strategy on its own—a sample rate of Strategy completions comparable to the rate among the full population of 100RC cities (48 percent). Strategies specify cities' resilience-building goals and articulate the actions, projects, and policies—the "initiatives"—on whose progress cities commit to embarking. All cities report helpful guidance from 100RC in ensuring that initiatives prioritized in their Strategies are developed by consensus, have some degree of feasibility, and are expected to deliver multiple resilience benefits for residents.

Cities that published their Strategies as recently as the past six months have already begun identifying their priority initiatives based on intrinsic need, available resources (from 100RC and otherwise), and local political will. Per self-reported progress from seven of these cities to 100RC administrators, over 55 percent of their collective proposed initiatives are either under way or completed, though the absolute quantity and proportions of initiatives in these categories varies across individual cities. There is a lower rate of advancement for initiatives among the remaining five cities, though this variation can be partially explained by how recently their Strategies were published or by their purposeful decision to focus on a few feasible initiatives.

In all cases, many initiatives under way are in functional areas that will likely require several years to complete, including city program changes, campaigns, or events ranked as the initiative type with the highest current number of discrete initiatives in these 12 cities, followed closely by physical infrastructure or capital projects. Some cities have expressed confidence in being able to pursue their stated initiatives independently—without 100RC resources—though they attribute the identification of initiatives to 100RC's Strategy support and the capacity to pursue them to 100RC's support of the CRO. Like earlier stages in 100RC's intervention, 100RC's role in the progress of initiatives depends as much on cities' capacity as on 100RC's post-Strategy services.

Finally, the association between the institutional changes and the capacity to implement initiatives continues to grow. Cities that are implementing initiatives note the critical role that 100RC-induced institutional changes have had in their ability to coordinate initiatives and the authority provided by 100RC membership for the CRO office in its capacity to advocate for initiatives. In several cases of implementation, cities report the cross-sector and cross-department relationships developed during the Strategy as feeding directly into initiative activity.

Transformations in cross-sectoral planning and operational de-siloing as well as having a central resilience coordinator, like the CRO, appear to be effective institutionalization schemes for initiative implementation. This pattern appears regardless of the role of 100RC in the initiative activities of Lifecycle 3; one city that engaged deeply with 100RC during CRO appointment and its Resilience Strategy development experienced high institutionalization outcomes. The same city has embarked independently on Strategy initiatives without the need for further 100RC assistance and resources. 100RC continues to negotiate the balance between authentically and comprehensively undergoing Lifecycles 1 and 2 and the political and public demand for the tangible products of Lifecycle 3.

Partners

An additional path toward building cities' resilience is 100RC's selection of partners from civil-, private-, and multilateral-sector organizations to assist in providing local thought leadership (the Strategy partners) and in identifying and elaborating specific solutions or initiatives (the platform partners). This pathway is particularly relevant today as more cities make the transition from development of their Resilience Strategies to initiative implementation.

100RC foregrounded the need to leverage other resources early in its inception; The Rockefeller Foundation furthered the idea through its directives that viewed these partnerships as critical to its goal for cities. Yet, 100RC also had distinct goals for its partners; the program hoped that the

partnerships and their interactions with member cities would result in innovations in the partners' tools and services, new approaches to their engagements with cities, and a proliferation of resilience-related resources being offered at scale, particularly to nonmember cities.

The monitoring and evaluation team conducted extensive organizational document reviews and repeated interviews with samples of both types of partners over the course of several years. The effort to date has suggested that the goal of leveraging partnerships to further Strategies and implementation has largely not been achieved. The expected returns to these partners have been more reputational and less financial, organizational, or operational. Virtually all organizations maintain the same missions, markets, staffing, intellectual property, service delivery, and interpartner collaborations as before their 100RC partnership. They have not read cities' Strategies outside of their traditional lens of business development. For many of the sample organizations, the partnerships have ended or expired, and 100RC is developing new partners. Given the expected relevance of partnerships as more cities enter Lifecycle 3 in the coming years, however, the nature and intensity of partner engagements—and the outcomes on partner organizations—may vary considerably from what the evaluators observed over the past few years.

Cities' experiences with partners continue to be mixed, though a few cities that have reached the implementation stage note positive relations with some of the formally identified 100RC partners. In these cases, 100RC was a helpful matchmaker. The evaluation team is also monitoring changes in solicitation, procurement, and contracting procedures. Cities' procedures and bureaucracies in these areas have largely not changed during 100RC engagement, and the availability of new potential partners has not appeared to alter them. As such, cities' institutional capacities also appear to play a role in the partnerships established between 100RC and independent organizations.

Again, as more cities embark on Strategy implementation and, presumably, more platform partners are engaged, the value of these constructs may change. To that end, 100RC is revisiting the integration of partners with a primary focus on their role in cities' outcomes. However, future monitoring and evaluation efforts will de-emphasize this pathway given the stability of past findings except in relation to their involvement in cities' implementation of specific initiatives.

Champions

Another critical goal for 100RC running parallel to city resilience is the fostering of individual advocates for the urban resilience movement and the support of a community of practice through which the advocates can learn, share experiences, and replicate strategies. This pool of resilience "champions" is

composed largely of the various CROs and their staff but also incorporates some senior city government leaders (e.g., mayors and city managers). By elevating champions and tapping their respective professional networks, 100RC hopes to cultivate the practitioners, including and with the assistance of city leaders, into resilience professionals.

Through two rounds of surveys of all current and former CROs and through in-depth structured interviews with peer-identified champions, the monitoring and evaluation team has noted significant progress along this path. There was no global urban resilience network before 100RC, though a few communities of practice and established city networks existed for related areas (e.g., sustainability, climate adaptation) or professions (e.g., city managers, environmental directors). Now, CROs consistently report their 100RC network of peers and, in turn, their peers' networks, as being instrumental in understanding the fundamental shocks and stressors their cities face, identifying the knowledge resources to promote solutions, and learning how to navigate the internal politics of city government while attempting to transform city institutions.

Since becoming CROs, an overwhelming number of survey respondents noted being engaged in and reliant on the 100RC network: 88 percent in the 2017 survey with notably relaxing, diffusing, and de-concentrating ties between CROs in the second survey in 2018. Respondents to both surveys reported future communications with fellow CROs as "likely" or "extremely likely." With the study's focus on the CROs, survey responses also demonstrate that the CROs' individual networks have increased in every case. CROs have given public speeches, been approached by cities outside of 100RC (typically neighboring cities), and used the 100RC network to connect non-CRO colleagues with their counterparts across member cities to share technical expertise. The majority of members in the network have effectively become ambassadors for the resilience movement both within the global market and for neighboring cities and regions in their own countries.

Further, the 100RC experience sheds light on intercity networks in general on at least two counts. First, the evaluation observes how frequently CROs leverage information from one network to bear fruit or relevance in another. Leveraging occurs both from the 100RC network's collective knowledge to a CRO's and her city's immediate needs and from tapping into member cities' professional staff as a resource to the network. 100RC provides a relatively dense network among CROs that can readily transfer information both into and out of their respective cities.

However, this momentum may not be sustained for individuals who are not CROs or who move on from the CRO position (with some evidence suggesting that personal networks shrink) and for the overall network if there is no central convener, like 100RC, to provide the medium for connections. Over one third of member cities have experienced a CRO transition to date. The institutionalization of a

CRO function regardless of the individual occupying the position (as noted in the evaluation of city outcomes), then, is as critical to the creation of the resilience profession as 100RC's incubation of the individuals who hold the CRO title.

Second, the evaluation tracks how core network nodes—the "champions among champions" of the 100RC network—have developed and evolved over time. Interviews with peers and staff in their city governments traced specific champion characteristics, including deep and longstanding ties with their cities and personal internalization of their cities' resilience goals; their professional capacity to be conveners, articulate visions, and solve problems; and their positioning near senior city leaders.

The 100RC Model

INFLUENCE

Dating back to July 2015, the monitoring and evaluation team has tracked changes in the scholarship and practice labeled "resilience," and 100RC's role in it. Invariably, 100RC is an example of urban resilience interventions in the scholarly and practitioner literature. Its signature components—CROs and cities' Resilience Strategies—have been replicated beyond its member cities. Other data 100RC communications staff maintain corroborate the amount of attention and the number of requests that 100RC receives as an influential agent in the evolving resilience movement.

Despite 100RC's attempts to publicize its theory of change, details about *how* 100RC fulfills its role through its range of services and tools are somewhat murky for observers beyond the immediate 100RC stakeholders. Officials from comparable resilience-building programs and scholars whose geographic interests overlap with 100RC member cities especially note this sentiment.

SOUNDNESS

100RC is an innovation in multiple regards, not the least of which are its scale of interventions (e.g., 100 cities) and depth of engagement (via embedded advocates, their curated network, and technical assistance providers). 100RC's approach to integrating "shocks" and "stressors" and its focus on long-term institutional change in how cities plan, function, and provide services reflects the holistic transformation disaster scholars and climate advocates have advised to achieve more thoughtful inclusion, de-siloing, and equity.

Other programs have supported individual projects, typically public works and infrastructure improvements in relation to climate and other environmental hazards. Institutional transformation as

the key to urban resilience is the fundamental hypothesis of the 100RC experiment and the path most supported by scholarship and resilience activists. Alternatives to The Rockefeller Foundation's charge simply have not been created. 100RC's theory of change, then, will likely be relevant for some time.

The transition to implementable solutions is a recent practical focus of 100RC, though implementation has been included in the theoretical model since the program began. Final evaluation findings will help determine the magnitude and direction of the relationship between comprehensive, institutional change and its resulting benefits to citizens.

OPERATIONS

The intensity of engagement across 100 cities spanning the globe requires an organizational structure and business model that is new to philanthropy. For several reasons, The Rockefeller Foundation spun off 100RC in 2014 as a distinct entity, albeit with significant investor requirements and persistent confusion among cities about the roles between the organizations.

Based on comparisons of operational criteria between 100RC's current organization and a traditional grantmaking program, the evaluation team has found that the theory of change could not have been implemented through the latter. The Foundation's operational constraints prohibit the staffing skills and breadth, the entrepreneurial flexibility and risk tolerance associated with urban interventions, and the intimacy of relationships across such a broad and geographically diffused population of cities among other criteria. Philanthropic resources have proven themselves to be critical seed capital for building city resilience, but philanthropic entities appear to be less efficient for operationalizing and executing programs and knowledge at a scale like the one established for 100RC.

A critical caveat to this observation is that 100RC developed the theory of change and its goals after its establishment. That is, an internal program could have devised a different set of goals and grantmaking strategy (e.g., simply funding public works projects) with staff and resources suited to its needs. The hypothetical program would have to define resilience differently, however, and with less of a focus on the building of long-term, sustained local capacity.

100RC's organization model, though, is still evolving, particularly in its commitment to help member cities transition into implementation after Strategy publication while assisting the other cities—including cities beyond the 100—with their Strategies. Like its theoretical soundness, though, 100RC's operational sustainability is predicated on its future ability to incubate other funders and harness staff, knowledge, and resources during the transition into implementation.

As the signature program within the Foundation's resilience portfolio, 100RC ultimately provides lessons to the Foundation about the Foundation's commitment and longevity to specific places (member cities) at a large scale and to individuals (champions) and the potential benefits from connecting them to each other in an enduring network more than it sheds light on philanthropic operational strategies.

Advisory Note and Next Steps

As the evaluation proceeds, these lessons will continue to emerge and stabilize. This document is the third report produced for The Rockefeller Foundation regarding the 100 Resilient Cities program as part of the outcome evaluation and the first to gather the data collected to date in the form of a midterm synthesis. It is the result of almost four years of monitoring and evaluation activity, beginning with a formative evaluation ("M&E Phase 1") conducted from November 2014 to March 2016 that lead into the current outcome evaluation begun in September 2016 ("M&E Phase 2").

This outcome evaluation is scheduled to complete in 2022, when final changes in city institutional transformation should be discernible and will be reported publicly. The final summative report will describe the outcomes of 100RC's efforts to transform its cities' operations in ways that produce sustainably resilient institutions (and potential alternative contributing factors) and to implement initiatives that yield discrete resilience benefits for its citizens.

This report describes outcome conditions and emergent patterns to date only. Readers should not interpret these findings as final. Rather, this analysis' results are provided to update the Foundation's leadership and provide strategic insights to the 100RC program on the status of its primary interventions. The public release of this report also satisfies the Foundation's goal to contribute to the public good by sharing these findings with other resilience practitioners and scholars.

A threshold number of cities have produced Resilience Strategies and are now moving to implement them. These cities are currently laying the groundwork for their strategy initiatives as other cities continue in the Strategy process. The remaining evaluation effort will focus on city changes (resilient cities pathway) and the 100RC intervention (or model) rather than the other outcome goals discussed in this report. By the time of the evaluation's final data collection in 2021, evidence of the outcomes of these initiatives as well as the fundamental institutional transformation in cities at the core of 100RC should be apparent.

Resilient Cities Pathway

Cities are 100RC's primary focus—they are the fundamental unit of the program's intervention. The program believes cities' resilience can improve through changes to the ways that they govern and provide services to their citizens. Though the program pursues other parallel goals (that is, other "pathways"), the final impact that 100RC seeks is to "catalyze social, economic, and physical resilience" in its cities. This goal is supported strongly in the scholarly and professional literature (Araos et al. 2016; Béné et al 2014; Masson-Delmotte et al., forthcoming; Rosenzweig et al. 2011; Solecki 2016). In fact, 100RC's fundamental problem statement on the need for urban resilience is the component of 100RC's theory of change with the strongest academic support.

The goal and the strategy are both supported in the literature, albeit with preliminary evidence. Early work related to the need for resilience tended to focus on hazards and physical risks, vulnerability, and mitigation (Comerio 1998; Godschalk et al 1999). Later work has expanded this frame to be more conscious of the social and economic contexts in which hazards (or any "shock") transpire (Adger et al. 2006; Brown, Dayal, and Del Rio 2012; Sapirstein 2006; Thomalla et al. 2006; Wallace and Wallace 2008). Influenced by studies on climate change adaptation as well as the broader human-environment system in cities, urban resilience studies increasingly look at institutional barriers and opportunities within city government (Klinenberg 2002; Wheeler and Beatley 2004).

This literature notes that cities' resilience challenges are multisectoral, multifaceted, and contextually specific (Bicknell, Dodman, and Satterthwaite 2012; Cutter, Burton and Emrich 2010; Sherrieb, Norris, and Galea 2010). Consequently, urban resilience interventions need to involve social and economic strategies as much as physical ones (Jha, Miner, and Stanton-Geddes 2013; Tanner et al. 2009). However, the literature's findings diverge between studies that find that effective resilience-building interventions should be varied and tailored to specific city contexts and those suggesting more prescriptive processes, solutions, and implementation.

100RC has chosen to balance these recommendations by assembling an intervention with clear schedules, deliverables, and expectations of cities that align with fundamental institutional reforms while providing the intensive technical assistance and complementary services tailored to get each city across those finish lines. The program's primary points of intervention include the delivery of funds to support a CRO, the provision of intensive technical assistance and complementary services (including partner and internal staff expertise) to produce a Resilience Strategy and, after, the promulgation of initiatives that measurably increase resilience for the city and citizens.

Past evidence also supports these strategies. The literature suggests that resilience planning and plans are needed in cities (Berke and Smith 2009). Literature also cite notable barriers to successful implementation, including the lack of funding, institutional constraints, and difficulties in anticipating long-term physical and social needs such as climate change scenarios (Biesbroek and Lesnikowski 2018; Bulkeley 2013). Some evidence indicates that resilience activities should include a focus on institutional change in government operations as well, such as de-siloing efforts between emergency management and community development entities (Aylett 2015; Martín et al. 2016). However, past attempts to transform city government or public operations and planning through staffing, intensive technical assistance, or funding are few and far between and have provided few documented outcomes or impacts.

Though supported in scholarship and practice, the 100RC effort at city transformation is still, ultimately, an experiment. 100RC has extensive, prescriptive, and urgent requirements of its member cities—requirements that are often in conflict with the traditional and vernacular ways in which various cities work. How 100RC implements these requirements across such a wide and diverse group of cities to achieve these transformational objectives is the subject of this evaluation effort.

The monitoring and evaluation team has embarked on an intensive set of public and internal city government document reviews, structured interviews with city officials and citizens, and observations of events through site visits. They produced a preliminary dataset (including retrospective baseline and current data) in the summer of 2017 and have continued conducting regular city contact semiannually thereafter. These intensive data collection efforts end with a final site visit in winter of 2021. These data will be used to assess whether and to what extent city grantees have institutionalized the planning and operational practices introduced during their 100RC engagement. The design relies on current resilience planning and governance tools with guidance from external subject-matter advisors.

The study began with a purposively stratified sample of 22 cities, selected with 100RC input across all cohorts, regions, and other city characteristics (table 1). Figure 1 shows the timeline of milestone completions for these cities in relation to their original entry into 100RC. No sample city from the third cohort has published a Resilience Strategy to date.

TABLE 1

M&E City Sample by Select Sampling Criteria and Current Stage

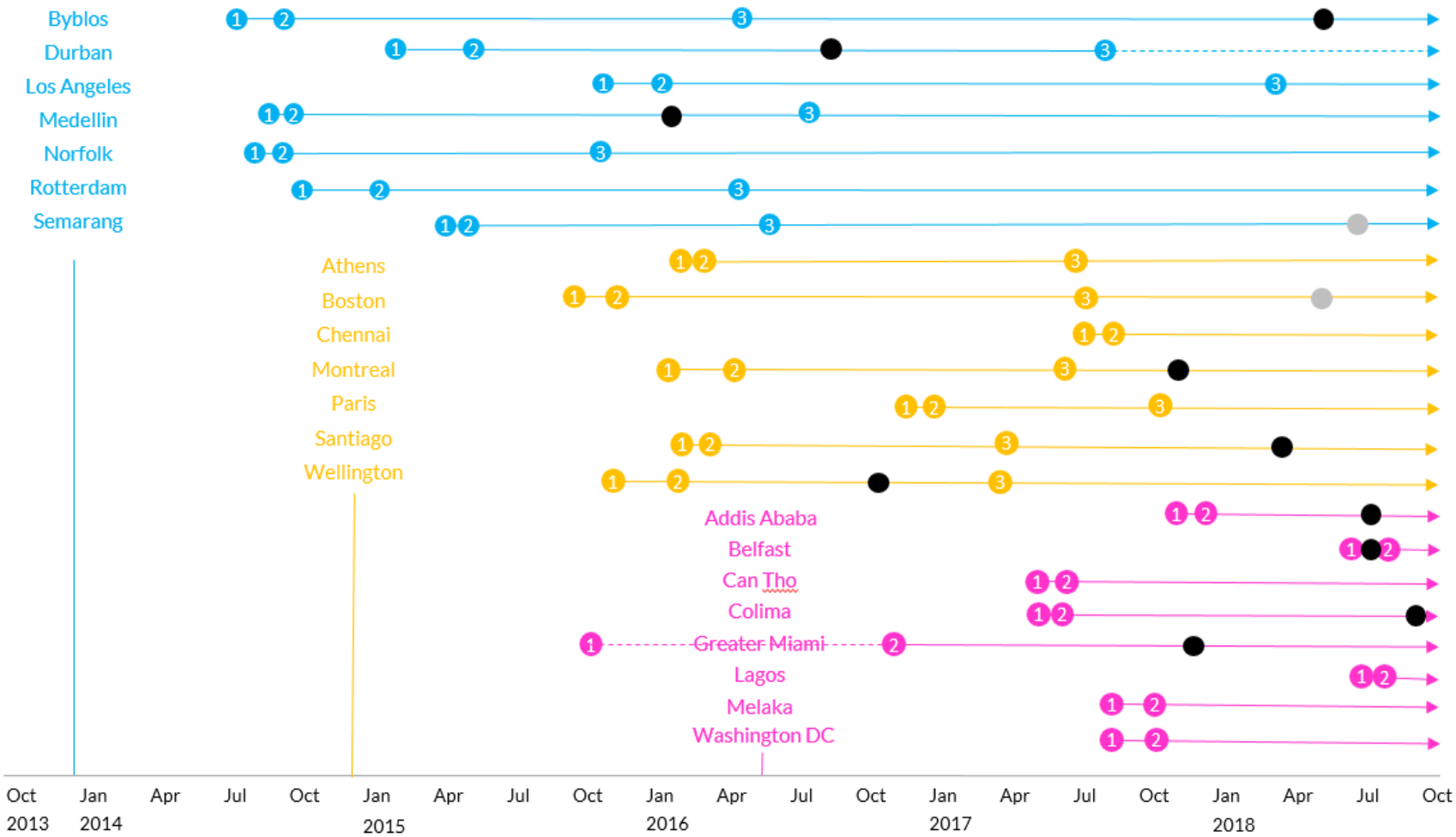
		Sampling Criteria (*Sept. 2016*)					
Sample city	**Country**	**Region**	**100RC cohort**	**Most recent natural disaster**	**Size**	**Level of national development**	**100 RC Lifecycle[a]**
Addis Ababa	Ethiopia	Africa	3	3 years or less	Medium	Low income	1
Athens	Greece	Europe	2	3–10 years	Medium	High income	3
Belfast	UK	Europe	3	Over 10 years	Small	High income	1
Boston	United States	North America	2	3 years or less	Medium	High income	3
Byblos	Lebanon	Middle East	1	Over 10 years	Small	Upper middle	3
Can Tho	Vietnam	Asia	3	3–10 years	Small	Lower middle	2
Chennai	India	Asia	2	Over 10 years	Large	Lower middle	2
Colima	Mexico	Latin America	3	Over 10 years	Small	Upper middle	2
Durban[b]	South Africa	Africa	1	Over 10 years	Medium	Upper middle	3
Greater Miami	United States	North America	3	3 years or less	Large	High income	2
Lagos	Nigeria	Africa	3	Over 10 years	Large	Lower middle	1
Los Angeles	United States	North America	1	3 years or less	Large	High income	3
Medellin	Colombia	Latin America	1	Over 10 years	Medium	Upper middle	3
Melaka	Malaysia	Asia	3	Over 10 years	Small	Upper middle	1
Montreal	Canada	North America	2	3–10 years	Medium	High income	3
Norfolk	United States	North America	1	3 years or less	Small	High income	3
Paris	France	Europe	2	3 years or less	Large	High income	3
Rotterdam	Netherlands	Europe	1	Over 10 years	Medium	High income	3
Santiago	Chile	Latin America	2	3–10 years	Large	High income	3
Semarang	Indonesia	Asia	1	3–10 years	Medium	Lower middle	3
Washington, DC	United States	North America	3	3–10 years	Medium	High income	2
Wellington	New Zealand	Oceania	2	3–10 years	Small	High income	3

[a] 100RC's three lifecycle stages are defined as (1) the orientation with the city and the hiring of the CRO hire; (2) the development and publication of the Resilience Strategy; and (3) the implementation of Strategy initiatives. These lifecycles are as of September 2018.

[b] Beginning with Progress Report 2 (March 2018), analysis of Durban's outcomes relies only on public document review as Durban withdrew from 100RC and the evaluation after the independent publication of the city's Strategy in August 2017.

FIGURE 1

M&E City Sample Timelines in 100RC



URBAN INSTITUTE

Notes: Blue cities are the first cohort (announced December 2013), yellow are the second (December 2014), pink are the third (May 2016). Black dots are significant political transitions, and grey dots represent CRO transitions. Numbers represent lifecycle milestones: 1 = the orientation with the city and the hiring of the CRO hire; 2 = the development and publication of the Resilience Strategy; and 3 = the implementation of Strategy initiatives.

Learning Questions

Several contributing factors influence where the sample cities are now and where they will be in 2022, not the least of which is the 100RC intervention itself. Each city's preexisting capacity and internal commitment to the transformation of its planning institutions and operations also heavily influences the outcomes of interest as well as the success of individual Strategy initiatives.

For now, however, some preliminary responses to The Rockefeller Foundation's original learning questions can be provided with the repeated disclaimer that these reflect changes only from the cities' pre-100RC state (which varies by membership entry date) to the summer of 2018.

- *Have cities institutionalized resilience through key processes, structures, rules, laws, and operations (e.g., budget, regulatory, enforcement, procurement)? Does institutionalization happen more frequently in certain regions or contexts? To what extent are changes in cities' policies and practices likely to sustain?*

  Member cities in the evaluation sample appear to be institutionalizing resilience across half of the indicators under study, though to varying degrees that tend to correlate with the duration of their tenure in the program. For example, cities in the first 100RC cohort show more institutional change across a wider number of indicators than their later peers.

  As explored later in this chapter, the speed with which cities can make these changes—and potentially make them durable—is also associated with other contextual factors, such as the size of the cities' bureaucracies (typically, proportional to the size of the cities' populations), the level of general economic development for the nations in which the cities rest, and the frequency of political transitions in city leadership (and the consequent severity of partisan transitions).

  Two cities, however, have reduced their momentum in the last year and have reverted to pre-100RC conditions for some indicators. Institutionalization requires time by definition. Later data collection and analysis will be instrumental in determining the longer-term sustainability of institutionalization efforts as well as the key determinants of sustainability (e.g., political transitions or CRO changes).

- *How is the function or role of the CRO becoming integrated into the city administrative structure? How centralized or how integrated is that role becoming? Do some city organizational structures work better than others and under what circumstances?*

  With only one exception, the CRO positions in all sample cities remain or have recently been appointed, including cities that have graduated from 100RC's Strategy process and direct funding.

Among the remaining 11 Lifecycle 3 cases with CROs, 9 CROs have preserved their titles and distinct resilience offices. In two of these cases, the first individual appointed as CRO has transitioned and a new CRO has been appointed. The remaining two CROs have taken on other titles and roles (particularly in emergency management and environmental sustainability) while preserving their CRO responsibilities and authority.

The primary organizational factor associated with the success of a CRO appears not to be the hierarchical location, title, or organizational resources allotted but in the level of support from senior city leadership.

- *Do the resilience strategies represent a strong point of view of actions a city must take? Are these views widely supported and understood? Do strategies lead to greater resilience?*

  Based on both the level of deliberation between city stakeholders in the Strategies' development and the attention that city leaders pay to their respective Strategy finalization and release, the Strategies represent strong points of view for the cities. In some cases, the Strategies also present innovations to broader resilience movement by highlighting the links between various shocks and stressors (e.g., institutional racism and climate or hazard risks) and by presenting initiatives with benefits across a variety of social, economic, and environmental outcomes.

  In theory, strategies lead to greater resilience both in their development (by cross-sector dialogue that sows the seed for further mission-driven city activities) and in their product (the initiatives). A conclusive causal link cannot be determined until enough time has elapsed to evaluate whether the development benefits are institutionalized and the initiatives are realized.

- *To what extent was 100RC successful in scaling a holistic definition of resilience across diverse cities?*

  In the sample cities, different respondents' interpretation of their cities' shocks and stressors and their resulting definitions of resilience are converging within cities. In turn, the various cities' definitions are aligning more closely with the holistic definition put forth by 100RC. This process has not been without its challenges, but the integration of social and physical domains has proved to be transformational for many city institutions (particularly their emergency management, environmental, and long-term community and economic development entities) and most individuals involved in their cities' Strategy development.

- *How are cities understanding of the shocks and stresses changing between application and strategy?*

  In every sample city, including those that are still developing Strategies, the proposed lists of primary shocks and stressors has changed from the original application. In a few cases, this change

is dramatic; for these cities, the concepts of shocks and stressors have dramatically altered a preexisting local focus on either the physical environments of cities or on a singular social concern. 100RC's advocacy for holistic city resilience assessments has forced realignment there. In the other cities with more subtle evolutions, change has largely been instigated by the 100RC requirement of hosting inclusive deliberations with a wide variety of city populations and interests.

- *To what extent has the 100RC engagement improved cities' capacity to design and implement resilience solutions? Are solutions and thinking consistent with greater resilience framing? To what extent are improvements attributable to the methods and tools that were provided by 100RC?*

  Among the 12 cities that have published 100RC-endorsed strategies and consequently identified initiatives, CROs and associated city staff report that the engagement processes and cross-sector collaborations associated with the Strategy played a critical role in their ability to define initiatives.

  With regard to the 100RC role in the initiatives, though, the implementation is a work in progress. In fact, projects from the first cohort are currently undergoing planning and resourcing. The second cohort of cities are embarking on initiative selection and prioritization. Meanwhile, none of the third cohort of cities have released Strategies yet, though they are expected to begin doing so shortly and embark on initiatives shortly thereafter. Most cities that are further along in their initiatives note 100RC's expertise in identifying other funding and knowledge resources (occasionally including 100RC platform partners). A few others have chosen to either limit their exposure to 100RC's post-Strategy offerings or are pursuing initiatives without needing additional resources from 100RC based on the program's earlier Strategy assistance.

- *How useful and relevant were the platform resources to the member city stakeholders (from the perspective of both cities and partners) compared with other nonplatform providers? Did the cities alter the ways in which they identify or acquire solutions from providers as a consequence of platform engagement?*

  Platform resources have proven less enticing than originally envisioned. Most cities expressed confusion about the process of engaging partners, and in how they would ultimate benefit from engagement. A few cities have had positive interactions with their partners, however. As more cities enter the implementation phase in the next two years, their reliance on the 100RC platform versus other service providers may change. In the meantime, no city has notably altered its processes for defining solutions or for acquisition and procurement of solutions providers with a few exceptions from design competitions in handful of sample cities.

- *Has the city's engagement with 100RC incentivized them to commit their own resources to resilience? To what extent has the 100RC partnership leveraged other public resources? To what extent has the 100RC partnership been used to leverage private or philanthropic resources in resilience building activities?*

  As cities move into the implementation stage, there is a wide distribution of resulting city commitments. Cities such as Norfolk and Boston have parlayed their 100RC membership into fundraising efforts from other civil-, public-, and private-sector entities. A handful of cities have committed extensive resources using bond revenues (such as in Greater Miami) or general city, state, or national coffers (e.g., Wellington and Rotterdam) and potentially multilateral resources (Byblos and Can Tho) to finance specific initiatives. Otherwise, cities' internal commitments have tended to manifest solely in continued funding of resilience offices after Strategy graduation.

- *How are CROs and cities institutionalizing data collection and monitoring in the long-term?*

  Data collection and analysis, particularly around shocks and stressors, as well as their transparency to the cities' residents are tracked as institutionalizing indicators in the study. To date, there have been only minor detectible changes in these outcomes in relation to the cities' pre-100RC conditions and none that can be attributed to 100RC membership with the exception of a resilience scanning tool under development in Rotterdam.

- *Have underrepresented populations, particularly the poor and vulnerable, benefited from the work?*

  The Resilience Strategy process is designed to include a diversity of populations in each city and identify initiatives from which the poor and vulnerable benefit. Representatives from these groups report mixed feelings about the former, with some noting the expedited time frame for community engagement as a detriment to full and inclusive engagement. No representatives from the graduated cities, though, have criticized the resulting Strategies. The path cities take to implement the initiatives that benefit these groups—and the extent to which the initiatives are not watered down and the benefits are ultimately materialized—begins now.

- *To what extent are citizens and politicians voting for or running on a platform of resilience? To what extent are they talking about holistic resilience in major speeches (such as in a "State of the City" talk)?*

  All senior city leadership officials in our sample expressed support for their CROs, Strategies, and general resilience-building efforts at key milestones, such as the Strategy release. In a handful of cities, senior executives (e.g., mayors or city managers) have repeatedly and publicly supported the efforts. However, resilience has not become a central focus of political campaigns or of the broader

political discourse in most cities. There is only one exception: a metropolitan leader aligned his own ambitions with the opportunities presented through 100RC's push for shared governance.

Other Findings to Date

The monitoring and evaluation team has collected extensive information from multiple sources across four domains of outcomes: (1) the 100RC intervention (for monitoring and process study); (2) the institutionalization of resilience planning; (3) the institutionalization of resilience city operations; and (4) external, independent factors that are not expected to be affected by 100RC's intervention but that will likely contribute to the outcomes.

The synthesis across data from the past three data collections is summarized below by each construct (or theme) under each domain. Each construct with its respective indicators are listed in appendix A along with the qualitative measures for each.

100RC Intervention

M&E Phase 1 produced a wide set of qualitative data regarding the take-up and perceptions of the 100RC intervention in cities. Phase 1 noted a generally positive convergence across its sample cities across all five themes regarding why and how cities are engaging with 100RC, and their perceptions of that engagement. The sample of cities in Phase 1, however, only includes those cities among the earliest 100RC cohorts that had engaged sufficiently with 100RC such that implementation could be detected.

These same themes are seen in M&E Phase 2, though data collection is targeted at specific cities in the Phase 2 sample depending on the theme and its relevant to cities at different points in the 100RC lifecycle. Phase 2 samples cities across the 100RC universe, which includes some cities with more widely varying levels of engagement with 100RC than those in Phase 1. For example, a few cities in the Phase 2 sample have been in 100RC membership but have experienced delays in appointing a CRO or publishing a Resilience Strategy. As such, the Phase 2 observations presented here shed light on how the 100RC intervention has played out in more deliberate cities to supplement the Phase 1 findings about how 100RC played out in the more expeditious ones.

The M&E team has monitored five constructs regarding the reception to the 100RC intervention in cities since Phase 1 and into Phase 2.

INTEREST AND MOTIVATION

This construct includes information about each city's reason for applying to 100RC, the motivation for staying in the program, and the evolving expectations of 100RC's engagement. In Phase 2, we collected information on the original motivations from "pre-Strategy" and "Strategy" cities—that is, those cities for whom grants are still in place. Perceptions of the ongoing participation is the focus of this theme in "post-Strategy" cities.

The motivation for participating in 100RC is consistently high among the Phase 2 sample cities except for the two cities whose involvement has been paused. All cities expressed strong interest and, therefore, were motivated to apply to 100RC, though large cities tend to describe their interest in 100RC within the context of their participation with other resources and programs. Like Phase 1 formative evaluation findings, the reasons for participation remain the funding, networking, global recognition, and technical assistance that could lead to transformation in city processes. In cities that have moved into implementation phase and have a clearer understanding of the 100RC resources that are available at that point, networking and technical assistance are increasingly added as motivators.

NEED FOR RESILIENCE

The team collected information about the cities' self-perceptions about their resilience challenges and opportunities at the start of 100RC engagement and its evolution thereafter. The baseline data presented in Progress Report 1 noted how this sentiment was less consistent at the onset of membership in the first cohort of 100RC cities and became increasingly consistent during the cities' participation. In contrast, later cohorts appeared to have more consistent perceptions of resilience building early on, and those perceptions appear to be aligned with the 100RC definitions and objectives.

The need for resilience building expressed among the Phase 2 cities continues to be as strong as it was in past evaluation reports. Every city has clear descriptions of their challenges that include both shocks and stressors. Some cities noted an evolution before 100RC membership in how they articulated shocks and stressors. Others crystallized that approach only after exposure to 100RC concepts and guidance; at least one city was influenced directly by 100RC even before membership and its respondents' descriptions of shocks and stressors had already generally converged. Subsequent data collection efforts continue to support this pattern.

RESILIENCE DEFINITIONS

The team collected information about different stakeholders' use of the term resilience in relation to the definition promulgated by 100RC and how city stakeholders operationalize it for their professional

and civic purposes. Earlier reports noted the challenge of competing interpretations of what resilience means and how various stakeholders act upon those definitions within the same city despite the increasingly common use of the term.

In the Phase 2 city sample, the inclusion of cities that have had longer delays in their 100RC lifecycle introduces a few cases with a wider gap in buy-in and understanding of resilience concepts than noted earlier. For example, some large cities and cities in less-developed contexts appear to struggle more with developing consensus around resilience definitions and activities—though this trend appears to be waning as more cities move through the 100RC lifecycle. Instead, we note an increasingly consistent need for resilience assistance, a continued push toward higher awareness about resilience terminology within their cities, and the alignment between the cities' perceptions of the issue and 100RC's holistic concept of resilience that extends beyond any one shock.

100RC OFFERINGS

Information about the stakeholders' familiarity with different 100RC offerings, their use, and their perceived value was collected for all city types. Both the praises and the concerns regarding the 100RC offerings that were aired in Phase 1 were repeated in this Phase 2 collection. For example, we observe that some cities in the Phase 2 sample repeat the critique reported in Phase 1 that 100RC guidance occasionally has bordered on the pedantic and been too "one-size-fits-all." Presumably after the tweaks created after the first few years of activity, 100RC's model has matured and is applied with some level of fidelity in all cities. Some cities—particularly smaller ones—even report gratitude for the detailed guidance; one city's respondent wished that 100RC could have more requirements of cities.

The 100RC network and the cities' individual contacts within 100RC technical staff are consistently commended, though perceptions of the roles of strategy partners and access to platform partners remain slightly mixed. The programmatic tweaks begun after the second city cohort were selected and the increasing Strategy flexibility appear to have reduced the volume of cities' criticisms around 100RC's purportedly rigid uniformity, as well.

Concerns or confusion about the "lifecycle 3" or initiative implementation offerings from 100RC that were first aired at the end of the first monitoring efforts among the post-Strategy cities, however, persisted. In most cases, the uncertainty has to do with when the cities can tap into offerings like the platform partners and the potential volume of resources that are included in those offerings. In the most recent data collection effort, the number of cities expressing this concern have grown—though this can largely be explained by the number of cities completing their Strategies.

STRATEGY IMPLEMENTATION

The M&E team continues to collect data about current plans for implementation, the prioritization of projects or actions, and project timelines and resource needs. As more sample cities graduate from the Strategy development process and turn toward executing their Strategies' proposed projects, actions, or initiatives, the number of questions around project implementation, funding, and expectation-setting has increased. Among "post-Strategy" cities (the 12 sample cities that released Strategies at least three months before the last data collection), there are early signs of implementation of a few projects. However, two sample cities are implementing initiatives before publishing Strategies.

Per the most recent 100RC administrative records (September 4, 2018), there are 147 initiatives currently under way among this group of cities, with 21 initiatives completed. Another 135 initiatives have either not started, are paused, morphed into other efforts, or have been shelved altogether. The stage of development among the initiatives under way ranges widely, as do their nature and subject matter; the highest proportion of initiatives in the works are advocacy campaigns, followed by capital infrastructure developments.

Analysis of previous and current data supports the idea that a few cities are progressing further, particularly medium-sized cities in middle- and higher-income nations and from the first 100RC cohort, in comparison with their cohort cities. This trend persists in the latest data collection, with the further nuance that a few of these cities (e.g., Wellington) are moving ahead with implementation without the need for additional 100RC resources or assistance based significantly on the lessons and guidance they received from 100RC participation during their Strategy development. Some of these initiatives are already bearing fruit for their citizenry too with and without further assistance. Wellington has already restructured emergency water supplies to accommodate likely delays in public water delivery, Norfolk's city council has passed resilience zoning overlays, and a few cities have integrated resilience measures into their scorecards, budget reviews, and monitoring.

A few cities continue to be hampered in their implementation efforts because they lack the resources to continue, because they have undergone recent political transitions that are not consistently supportive of the efforts, or because other entities in city government have taken authority over the initiatives and the processes for expediting them have resorted to conventional bureaucracies. Several cities that produced their strategies within the last year, however, have moved forward with implementation. In most cases, though, the implementation plans have either changed significantly or are just starting. Continued support, especially after leadership transitions, have kept initiatives on track in those cases.

The last two waves of data collection reinforce the observation that five critical factors contribute to successful implementation. The first factor is basic political will, particularly with regard to continuity in commitments despite leadership changes. Several sample cities will face leadership changes in the next year that may alter their initiatives' progress. Second, access to funding is a common challenge across the board, and cities of all kinds have had to creatively use existing national or multilateral resources, such as special revenue or debt schemes. The third factor is technical assistance and knowledge resources, for which 100RC and other global networks likes C40 Cities and ICLEI (as reported by CROs) are helpful. The emergent fourth factor is the ability of a CRO or equivalent to advocate for the initiative, as opposed to the initiative being folded back into an existing entity without a clear champion.

Finally, many CROs noted that the identification and integration of cross-functional working teams during the Strategy development process helped with implementation activity earlier in the evaluation. Currently, this observation appears to also take a personalized form: having a champion that can continue to convene the working groups that pursue the initiatives as well and benefit from the shared knowledge from the teams is noted as a new asset. In most cases, these teams were established during the Strategy development process and encouraged by 100RC after Strategy publication to ensure continuity to priority actions. The emergence of this factor suggests that the transformational changes embedded within the 100RC theory of change—namely, the institutionalization of formal de-siloing and cross-functional collaborations as well as the continuity of a coordinating role like a CRO—are correlated with a city's ability to implement resilience projects.

CROs' implementation skills and the 100RC's capacity-building guidance appear consistent across post-Strategy cities and there is no indication that they negatively affect the overall implementation of a city's initiatives, even where CROs have transitioned.

Resilience Planning Outcomes

A major objective of the 100RC program in the domain of planning is for member cities to produce and implement Resilience Strategies through an intensive planning development process. 100RC's core hypothesis in this domain is that cities, through the 100RC Resilience Strategy process, will produce urban resilience plans during the 100RC intervention (the Strategies) but will also transform and institutionalize their planning processes to increase resilience in the long term. By incorporating resilience thinking in urban planning processes, member cities can achieve tangible results such as incorporating resilience measures into land-use regulation or expanding community participation in major planning.

In the 100RC theory of change, we assume cities did not integrate resilience into plans and institutional planning practices before 100RC but, after undergoing the Strategy process, will do so in the future. During baseline data collection, the M&E team sought to tell the story of the contemporary planning functions in each city before 100RC and their integration of resilience concepts and practices during 100RC (depending on the duration of membership). If a city has produced its Strategy, the team looks for changes in planning processes and the city's planning functions beyond the Strategy itself. These data are compared with data collected over the next four years (the expected time frame for planning changes to occur) to determine 100RC's institutional transformation is sustained.

There are six planning constructs that are of primary interest—meaning that the 100RC theory of change intends to affect them—that the literature supports and that we believe data in our sample cities that can help define.

EXPLICATION OF RESILIENCE

The clear explication of plan goals is an essential aspect of good planning, but their explicit and implicit integration of comprehensive resilience building is 100RC's objective. Gaps in city plans' mention of resilience existed across the sample of cities before 100RC. Only two cities (Greater Miami and Melaka) referred to or considered broader resilience building or specific shocks and stressors in their plans before 100RC, though a few were approaching this point. This burgeoning group of cities included those that had embarked on citywide plans for related topics, such as environmental sustainability or climate change mitigation. Ultimately, these gaps support the assumption in 100RC's theory of change. In most other cases, references to resilience before 100RC were largely implicit.

In the latest rounds of data collection, there is increasing evidence among the sample cities that have completed their Strategies that these cities are starting to reference resilience concepts in their traditional planning activities outside of the Strategy. In one case, the Resilience Strategy has become the city's de facto municipal plan. Two cities report interest in updating their Strategies, implying a significant change in the cities' library of planning products. In other cities with more established planning institutions, though, the Resilience Strategies appear to be modestly but still noticeably shaping traditional planning practices.

The Strategies are often occurring simultaneously to major city plan revisions or updates; in most cases, the Strategies are purposely integrated into those planning processes, leading to explicit and authentic references to resilience terminology in those plans. In the handful of cities reported in previous evaluation updates where this integration had not occurred, the latest documents collected

from planning releases in the last six months suggest that it is increasingly happening. As other cities with traditional institutions come upon their periodic revisions, this trend is likely to grow.

USE OF SCIENCE AND EVIDENCE

The use of physical and social science evidence is a core aspect of creating a strong resilience plan. This refers to using evidence to understand the relevant shocks and stressors that a city faces and estimating the changes that could be most impactful. The team looked for information in plans that points to metrics and studies and their appropriate uses in supporting specific actions or policies.

Most cities, appropriately, but to varying degrees, relied on some rigorous science and evidence before 100RC. The use of physical and social science evidence in our sample cities' planning before 100RC follows the same patterns as those observed for the overall state of cities' planning institutions: a city's level of economic development and its overall size are associated with its planning institutions' ability to identify and accurately interpret appropriate sources of science and evidence for sound and clear planning and, eventually, actions. Large cities with significant resources are more likely to be able to fund direct research and study in support of their plans, have access to the national and regional data sources and researchers that are needed to produce evidence efficiently, and have the internal intellectual and professional capital to use the evidence in ways that support policy and program action.

In our sample, however, there are many cities in middle-income countries that have generally strong scholarly and governmental supports for integrating resilience-related research findings into their plans. The studies are often supported by multilateral and philanthropic organizations. Ultimately, however, the indicators for this construct have seen the least amount of change in our study to date.

INTERNAL CONSISTENCY WITH OTHER CITY PLANS

Integration into the larger municipal context requires internal consistency within the constellation of other plans that the city has adopted. Cross-referencing can illuminate this, but the M&E team also looked at the level of knowledge and buy-in by other city agencies to see if traditional planning boundaries (e.g., housing or economic development) are blurred through the holistic vision that the Strategy embodies.

Internal consistency in planning across the sample cities varied widely before 100RC membership. Cities with weak planning processes and institutions typically did not have consistency across plans simply because internal planning inconsistencies mirror weak planning in general. In most cases, a modest amount of internal consistency and coordination occurred in sample cities because it is required

or constrained by statute. These cities' plans mirror city operational silos, even when the resulting plans are assembled into a single master plan.

Over the last year, however, a few sample cities increased the quantity and quality of their consistency checks beyond statutory requirements. This improvement occurred in places that were undergoing major planning efforts including the Resilience Strategies.

VERTICAL INTEGRATION WITH BROADER JURISDICTIONAL PLANS

Like looking for consistency across other plans within the city, the evaluation team looks to see if a city's plans are integrated within the broader context of regional, state, national and, in some cases, international plans. Again, the team has looked for the frequency and depth of cross-references in plans but also for the involvement and buy-in of higher levels of authority into the local plan.

Before 100RC, most our sample cities' planning processes and their resulting plans were integrated with regional, state, and national plans in some way. The depth of that integration—and the specific jurisdictional levels with which integration occurred—varied depending on national planning contexts and the centrality of the specific cities to their state or region. In the cities where planning processes are required and mandated by state or national governments, often those in countries with highly centralized national government structures, plans are well integrated with state and national plans almost by definition. In other cases, integration occurs because of specific requirements for information, elements, and formats of plans from the state or national government rather than because of general centralization.

Member cities that are composite metropolitan regions (such as Greater Miami and Santiago), exceed the typical integration requirements because of the unique nature of their jurisdictional composition. However, an intentional effort to better integrate the city's resilience planning with its state or national entities has appeared in only a handful of cases. Where present, this integration has often been tied to the release of funds or other incentives beyond what may be required by regional convention. The evaluators have found only one case of deteriorating integration, in which the national government has elected to play a heavier hand in local planning. The city's internal resilience efforts, then, run the risk of being less integrated and more dictated with its governance entities. In most cases, though, the team has seen little change in this construct overall.

COMMUNITY ACCESSIBILITY TO PLANS AND PARTICIPATION IN PLAN DEVELOPMENT

A central tenet of resilience planning is the ability of the diversity of local citizens to access the plan and participate in its development. The evaluation team documented changes in the citizenry engagement process in city planning before and during 100RC membership.

Evidence of involvement of the general citizenry in the planning processes and public access to planning documents before 100RC membership varied widely, primarily because almost every city has engagement requirements (imposed internally as well as from a higher-level government). Yet, the quality of actual participation data is mixed. In some cases, the engagement requirements are minimal or known to be minimally enforced; these tend to follow the pattern seen among the sample cities with weak planning institutions that are also primarily in less-developed countries. Other sample cities, including several in the developed world, have historical requirements for community engagement but have little to no documentation of enforcement or implementation.

Three sample cities entered 100RC with robust engagement requirements and documented participation and have actively employed strategies to ensure fuller participation since membership; in the case of Wellington, this was explicitly a consequence of Strategy requirements. However, there remains little other change in the quality and quantity of community engagement by planning institutions in the other sample cities now. Community awareness and participation activities are particularly challenging aspects of contemporary urban planning, and several cities in the sample are experimenting with citizenry surveys, neighborhood "enhancement" or "empowerment" teams, or "café conversations" in the hope of improving these practices' impacts in the future.

ALIGNMENT WITH VULNERABILITIES AND VULNERABLE POPULATIONS

A final core aspect of resilience planning is ensuring that the needs of populations most at risk of negative impacts from shocks and stressors are addressed directly. The evaluation team was tasked with identifying any substantive definitions for vulnerable populations in cities' plans and any actions for addressing their vulnerability. The identification of and response to social vulnerability is another outcome for which baseline data from the sample cities varies widely but for which there is some evidence that attention to vulnerability follows along the patterns of size and national economic development seen in the strength of general planning institutions. Simply, the wealthier and larger the city, the more attention it paid to disparities and inequalities, though even in that type of city there have been noticeable gaps in safety nets after various shocks

Many sample cities did not have explicit demographic counts, geographic analyses, or distinct recommendations for addressing vulnerable populations within planning and continue not to today. A handful of cities loosely discussed variations in service access related to vulnerable populations but do not have explicit demographic counts, geographic analyses, or distinct recommendations for addressing them. Some of these cities are known to have ignored subpopulations (like households in informal settlements). Another group of sample cities maintain robust accounting of specific and relevant vulnerabilities, but they do not consistently identify strategies for addressing those vulnerabilities. In many cities within this group, though, the planning documents and processes are not necessarily where specific strategies or programs are devised. For example, social service programs may monitor these populations instead.

In slight contrast to the baseline evidence for other outcomes, about one third of our sample cities had or were developing planning documents that intentionally focused on vulnerable populations and included strategies and actions in this area as well as detailed accounting processes. The vulnerable populations in question ranged from the more universal (low-income households) to the local (immigrants or refugees, religious and racial groups, crime victims, and the indigenous). As more cities complete Strategies in the next year (and undergo the 100RC requirement to study vulnerable populations as part of that process), attention to vulnerable populations may spill over to the cities' other planning efforts.

Resilient City Operation Outcomes

Another primary objective of the 100RC program for its cities is that, through the commitments of city leaders to resilience functions and activities, cities will transform their operations in the long term in ways that achieve tangible results and institutionalize processes that build resilience. In this domain, the chief resilience officer (CRO) is the innovation. She is the catalyst for operational change, and her function is the transformative lever. CROs facilitate coordination across city government (including applying resilience lenses to budgeting and programmatic decisions); with private and civil sectors; with counterparts in neighboring, regional, and national government; and with the citizenry.

The evaluation team is tasked with telling the story of cities' contemporary operations across six constructs: governance structure, functions, budgets, public discourse, accountability, and sector engagement, and how resilience concepts and practices transform them. The existence and nature of the CRO position over the long term is a critical chapter in this story. A few cities in our sample had been undergoing general operational change before 100RC, and others were establishing resilience-related

approaches and activities across city operations during their engagement (typically, active cross-silo working groups and political commitments to climate adaptation or disaster mitigation)..

To date, however, there has been less operational change over the data collection snapshots than planning change except for the CRO positions. As the literature points out, this lag is anticipated since operational changes in cities tend to require more time. The wealth and size of cities appear, again, as significant determinants in operational change, as does timing of 100RC cohorts. For example, none of the first cohort of cities had a CRO before 100RC, nor did they use resilience budgeting lenses, have explicit leadership commitments to resilience, or collaborate with their neighboring jurisdictions or national governments around resilience efforts. In contrast, a few of the third cohort of cities in our sample did have these champions before their intervention. This phenomenon suggests both that cities have the capacity to learn about and duplicate operational change from other cities, but also that 100RC is motivating that change beyond its membership.

GOVERNMENTAL STRUCTURE

Government structure (the organization form) establishes the context to understand how resilience building is likely to be developed across city government operations. Data were primarily collected on the permanence of new structural elements designed to embed resilience thinking in city operations—namely, through the CRO. Many cities had sustainability directors, climate change offices, chief innovation officers, or other entities charged with one component of transforming city operations beyond traditional functions. No city had an established resilience office or CRO before 100RC membership except one: Greater Miami (technically, two of the CROs within the three-jurisdiction "city" had CROs).

All but one of the cities continue to formally have a CRO position or a resilience coordinating unit now. In some cases, the individuals who first held the title have transitioned or are transitioning. In a handful of post-Strategy cities, the CRO has taken on a new title but still coordinates the same Strategy or initiatives. A few CROs also have leveraged significant support from senior leadership and increased their influence into other areas of work. Two cities have also appointed formal resilience liaisons in other city offices beyond the official resilience office.

FUNCTION ("SILOS")

In contrast to the overall city structure, the evaluation team also looked for data on specific subject areas, procedures, and practices that each entity (agency, department, or commission) manages or has authority over. The teams tracked the degree to which "silo busting" occurred before or during 100RC with regard to resilience only (as opposed to the general information tracked separately). Information

comes both from formal descriptions of functions as well as stakeholder perceptions of the state of integration across city operations.

The evaluation team found evidence across city size and developmental contexts of the reduction of silos and improvements in cross-functional collaborations both before and after the sample cities entered 100RC. Among cities with weak or modest general city operations, the presence and strength of silos were often difficult to detect because, by definition, the operational framework was ambiguous. Among the cities with stronger general operations, a few cities displayed clear silos before 100RC membership and continue to do so. However, 100RC membership appears to have boosted the efforts of five cities that had effectively begun significant cross-department and outcome-focused restructuring before 100RC. In two different cases, there are also strong political pushes toward government transformation alongside 100RC. For other cities with comparatively weak city operations, the strength of silos was classified as modest as a default.

These collaborations' durability appears to be associated with project implementation, though the causal order is not clear—that is, whether collaboration yields new projects or projects yield new collaborations. However, the pattern suggests that Strategy implementation may yield further institutional de-siloing. As other large cities with notoriously strong city government silos implement Strategy initiatives in the next year, there may be additional signs of institutional transformation and further tearing down of city bureaucracies.

POLITICAL AND PUBLIC DISCOURSE

A key objective of 100RC is to enable city leaders with language and motivation around resilience building and foster resilience champions. As such, evaluation teams collected data on how resilience discourse has been mobilized in political and public discourse through statements in the public arena (media and city records) as well as interviews with key stakeholders.

Leaders from most of the cities have vocalized some level of support for their resilience-building efforts at the onset of 100RC membership. The explicit support continues and has increased in a handful of cities despite political transitions. In one notable case, a leader's political platform centered on operational transformation aligned with 100RC's efforts and general resilience building. A single exception exists to this pattern in a city that underwent political transition and has largely disassociated itself with its former CRO.

On the whole, though, political discourse tends to be mild, but supportive of resilience rhetoric. For example, resilience was not the subject of political campaigns in any of the cities that underwent municipal elections in the last year. As such, there has been little to no change in this construct to date.

TRANSPARENCY AND ACCOUNTABILITY

Information on the degree to which the city's operations are open to public scrutiny and accountability are tracked by documenting the ease of access to city documents and resources (other than planning documents described in the previous section), the openness of public data, open performance monitoring, and other forms of accountability in relation to resilience shocks and stressors in the sample cities.

In all the cases in which general city operations were weak before 100RC (again, cities that are highly associated with low levels of economic development overall), there are few or only token signs of transparent and accountability. Where they exist, these signs typically include laws regarding transparency and corruption with little evidence of implementation that have not changed during 100RC membership.

In contrast, a few cities created "open data initiatives" or "performance scorecards" before 100RC, which they use, though not exclusively, in support of their cities' resilience-building efforts. Typically, these are cities with more financial and professional capacity. For example, Rotterdam is piloting a resilience scanning tool for identifying and reporting on individual initiatives with 100RC.

Yet, most sample cities maintained and implemented relatively perfunctory rules about transparency of operational functions, activities, and outputs only, with generally limited intentional targets for establishing accountability or methods for monitoring them. These cities would post a limited amount of information about their functions and outputs online, report to city managers and legislators in formal reports, and would provide information upon request—though not in always in accessible ways or with the intention of soliciting accountability. These mechanical practices mirrored the engagement practices in many cities' planning noted previously and have not changed noticeably during the 100RC membership.

BUDGET OPERATIONS

100RC does not expect to change the structurally mandated ways that cities budget or their primary sources of revenues and causes of expenditures, but it does expect cities to look at harnessing those processes to better serve resilience-building purposes. The unique funding and fund leveraging of city operations for resilience activities is an important mirror of changes in operations that may suggest

resilience institutionalization. The evaluation teams collected data on those financial phenomena across public, private, and philanthropic sources in cities along with information on general budgets and budgeting processes. Teams looked for unique funding and fund leveraging of city operations for resilience-specific activities from public, private, and philanthropic sources in cities.

Before 100RC, three cities had relatively robust funding from external sources for their resilience-related activities, with sources ranging from the World Bank and other multilaterals to nationally procured public-private partnerships. Other cities had similar budgeting arrangements but less funding directly targeted to resilience projects. Many of them benefitted from funding through other global networks, such as C40.

Since entering 100RC, six cities have been able to attract significant additional funding sources for resilience activities largely because of their 100RC participation, and there is some potential funding coming to a handful of others. Per city reporting and internal corroborations by 100RC, for example, cities have directly invested or leveraged up to US$3.35 billion across 288 investments on their own across the entire 100RC network. The 22 sample cities have invested a slightly higher proportion than their share in total direct and leveraged values (US$1.1 billion across 62 investments) but in a proportional share of investments.

These sources or types of investment include new regional loans, disaster recovery funds, foundation grants, and municipal bond issuances. Norfolk leads the pack currently with an extensive pool of funding from national, state, and philanthropic funds during 100RC, which they could not access earlier. No city, except jurisdictions in Greater Miami, had funding for resilience offices or resilience budgeting "lenses" or filters before 100RC, though a handful are experimenting with these currently.

GOVERNANCE OPERATIONS

Finally, the evaluation team has collected data on the explicit commitments or denials of commitment—in the form of public support, funding, or project advocacy—from vertical governance entities in support of the city's resilience efforts. Entities include neighboring cities, regional entities, states, nations, and multilaterals externally as well as districts or neighbors within cities.

The points in these relationships in which there is collaboration and commitment for resilience building beyond the status quo—the focus of this set of indicators—are modest, both before and after 100RC. Four cities had particularly robust sets of commitments and collaborations across governments before 100RC that, in almost all cases, have expanded during 100RC. Three other cities have seen a rise in collaborations and commitments during 100RC.

External Factors

The evaluation team has also tracked a series of other indicators for constructs that are not expected to be altered directly by 100RC's intervention, though these factors may contribute to the expected outcomes or provide signals that other changes are occurring that 100RC did not intentionally plan. Indicators are being tracked for general city characteristics, general planning operations and plans, general city operations, political conditions and policy context, social conditions, financial conditions and operations, and governance condition.

Macroeconomic, political, and environmental factors beyond 100RC's efforts continue to shape the potential outcomes as much as the intervention itself. The team has noted some overt change just in the last six months in these contributing, contextual factors in a handful of cities that is publicly known, such as civil strife in Addis Ababa and the potential effects on Belfast given Brexit negotiations along with several mayoral, gubernatorial, and national elections. Natural and social disasters, such as Hurricane Irma in Greater Miami, the Skirball and Creek fires in Los Angeles, flashfloods in Athens, and Boston's winter flooding, have also shaped the cities' involvement in resilience building.

In some cities, these factors appear to contribute to the urgency and call to arms of resilience. In a few cities, however, changes in external factors, particularly partisan political transitions, present challenges to 100RC's and CROs' efforts. Almost half of the sample cities have undergone significant changes in leadership that involve partisan changes and differences in philosophies about the roles and functions of city government. In one city, political transitions are the cause of the resilience effort's extended pause.

Other cities are experiencing transitions that may lead to changes in the CRO role and the overall resilience-building effort. In these cases, though, new leadership often appears disinterested in or unsure of the effort at the onset rather than explicitly opposed to it, leaving the opportunity for explicit support later in the administration.

On the whole, though, the other contextual indicators remain largely unchanged, and the early patterns identified at baseline regarding a city's economic development level, city size, and time to incubate 100RC's intervention still hold as dominant trends across the member cities. The pattern holds true for the institutional frameworks (city planning and operations) that shape these indicators beyond those expected to be transformed by 100RC. Two of the six construct areas are highlighted.

GENERAL PLANNING PRACTICES AND PLAN

The M&E team collected information for all sample cities on the number, frequency, and product of a wide array of city plans, including major city plans (e.g., master plans), plans for large city departments or functions (e.g., housing, transportation, economic development), plans focused on a city's explicit shocks and stresses that are not departmental plans (e.g., water management or hazard mitigation), unique visionary plans similar to the Strategies but in other topic areas (e.g., sustainability, climate, or green plans), and the nature of planning authorship and authority.

Across all data for each of the general planning indicators, there appears to be a relatively strong pattern: a city's level of economic development is associated with the breadth, depth, and overall strength of its plans and planning institutions. Planning practices and products in the sample cities in lower-income countries for which data have been collected are notably weaker or largely ineffective. The same quality holds true in at least one sample city in a middle-income country so far in our data collection. This observation may be somewhat obvious, but the pattern does not appear to be linear. Most of the sample cities in middle-income countries appear to have strong planning processes and institutions, often because of state or national decree.

Another factor in the robustness of basic city planning institutions is the size of the city's population, though this emerges more as a proxy for the intellectual and financial capacity of the city government to maintain planning institutions and implement plans themselves. This pattern also is nuanced, with large cities having strong institutions and plans but, in some cases, having too many plans that are too complex to be tied consistently to actionable projects and city outcomes.

GENERAL CITY OPERATIONS

The evaluation team also has collected information for all sample cities on a variety of fundamental characteristics that define city operations. This includes general data regarding the composition of the city government such as basic descriptions of the organizational structure of government, the number and professional capacity of its employees, their distribution across the government within specific departments, and the explicit missions or authority of those departments.

Data are also collected to document any special initiatives that the city government may have undertaken that are not directly related to resilience-building efforts but that could shape how the government views them. For example, de-siloing or efforts to coordinate action across the city "open government" initiatives and other transparency efforts, and "big data," city command centers, and performance monitoring and evaluation are current trends.

Similar patterns across the cities' income and developmental context and city size that are described in the planning constructs are seen in city operations as well. Cities in low-income nations typically had weak city operations before 100RC and little to no capacity to undertake some of the commitments and transformations that wealthier cities had undergone before and during 100RC. Smaller cities have smaller city government operations, but the efficiencies and collaborations within government varied widely regardless of size. In fact, some of the largest cities have had entrenched bureaucracies since before their 100RC membership if not decades before.

Partners Pathway

In addition to its goals for member cities, 100RC expects external partners to develop, innovate, and deploy new tools and internal lines of work based on their 100RC participation. 100RC employs two groups of these partners: strategy partners (the organization hired to intensely assist city government produce Strategies at a local level), and global and regional platform partners (the primarily civil- and private-sector entities with tools that can be used to implement the initiatives identified in Strategies). The following discussion presents past analysis to evaluate this goal.

Strategy and platform partners are considered essential in 100RC's theory of change because they play a key role in delivering resilience tools and services to cities, ultimately strengthening the marketplace for resilience offerings. Eventually, the demonstrated benefits in the form of business development opportunities and internal transformation are expected to underlie partners' post-100RC engagements.

The importance of evaluating these partner effects lies in contrast to the acute lack of literature on the private sector's motivations and transformations from investments in city governance in general and resilience building in particular. The study of private-sector engagements in cities has an extensive history (Ratcliff, Gallagher, and Ratcliff 1979). For example, formal city planning activities and institutions like planning commissions invariably have included private-sector representation. Private philanthropic investments in municipal arts, recreation, education, and other public goods have also been explored (Davis 1973; Gautier and Pache 2015; Stroup and Neubert 1987). This relationship has supported private-sector growth about long-term workforce development and created short-term benefits to businesses for both positive and critiqued ends (Jones and Bachelor 1993; Stone 1989; Zunz 2011). A benevolent self-interest stands apart from the more traditional roles that private-sector actors play in city government with regard to their involvement in economic development plans, regulatory advocacy, and tax and subsidy rules, and related public governance over business activities, such as land acquisition that are largely profit motivated (Logan and Molotch 1987).

However, the intensity of this relationship has waned in the past several decades because of increased economic globalization and the diminishing interest in local city policies (Austin and McCaffery 2002; De Socio 2007; Hanson et al. 2010). In its stead, there has been an evolving relationship commonly referred to as "strategic philanthropy" (Nevarez 2000; Porter and Kramer 2006; Post and Waddock 1995). The goals of this interaction are often about establishing social or political legitimacy as much as near-term business motives (Giridharadas 2018; Sanchez 2000; Su and He 2010).

Unfortunately, most of the literature on the involvement of private-sector actors in city government and public goods has been limited to case studies or anecdotal histories (Maas and Liket 2011). Regardless, the literature makes clear that the private sector has been explicitly involved in general city planning and government in numerous ways—particularly as they relate to business affairs and largely for business motives. Regarding the specific issues related to resilience, the literature is still nascent. Extant literature conveys a strong belief that planning related to climate change and disaster management, for example, ought to involve stakeholders from the private sector but offers little research to assess the difference such inclusive planning makes (Smith 2011).

To assess the impact of 100RC on its partners, then, the evaluation team reviewed findings from the earlier formative evaluation. Partners reported three primary motivations for participating and engaging in cities: general business development opportunities (particularly by private-sector organizations); access to peer thought leaders and practitioners (particularly among foundations and institutions); and the intrinsic reward from achieving the 100RC objective of delivering solutions to urban problems (particularly the nonprofit partners).

These motivators helped the team track the ongoing engagements between cities and partners over the past year and to track the market for resilience products and services and the transformation in internal business operations (final constructs with respective indicators are listed in appendix A). A purposive sample of 28 partners across sector, organizational history, size, partnership type (strategy or platform), and level of engagement with cities to date were tapped as cases from the pool of approximately 110 partners at the time. In-depth corporate and public reports about the partners were supplemented with interviews with the key contacts.

Of these 28 partners, however, many have transitioned out of their relationships with 100RC and new partners have joined. As such, all the findings presented in this chapter are from the selection of 100RC's earliest partners, and most of these partners (particularly platform partners) have not been actively involved in Strategy implementation since a minority of cities had published Strategies during this study.

This study within the broader monitoring and evaluation project is complete, yet many of the same questions regarding the role of independent partnerships and their effect on these organizations—particularly among private-sector partners—will remain relevant as 100RC pursues further implementation.

Learning Questions

Consistent responses to The Rockefeller Foundation's original learning questions about 100RC partners were found across the formative and current summative studies.

- *To what extent did partners learn about city resilience by working with member cities as a result of 100RC engagement? Do platform partners engage with multiple cities based upon the parameters of their 100RC offering? Do platform partners engage with a diverse representation of cities in the 100RC network?*

  To the extent that partners brought some resilience-related expertise to a city, they did not generally learn much about the subject beyond understanding specific needs of cities in which they had not worked. However, partners tended to be assigned to places where they could have some capacity, ultimately leading to a biased identification of engagements. Some partners did learn about current approaches in their field for which their knowledge is applicable, however.

- *Did working with 100RC spur partners to innovate around resilience and find ways to address unmet resilience needs? Did they make any modifications to their existing tools and services based on their work with member cities? Did they create new tools and services, and are they deploying these tools and services in member cities and beyond? Did working with 100RC enable new partnerships among partners themselves to develop new tools to meet unmet resilience needs? Are solutions scalable and replicable?*

  Partners did not report significant innovations in their services as a consequence of 100RC engagements. Two partners, however, launched a cooperative strategy to integrate some of their services and offer them to member cities and beyond. Though there is public evidence that this only occurred in one city to date.

- *Are they deploying more frequent or different (including innovative) resilience tools and services to cities now than before partnering with 100RC? Has the nature of their engagement with other cities changed as a result of engagements with 100RC cities? Are they deploying to member and nonmember cities?*

  Several partners strategically used engagements to expand existing services into new markets more than to innovate. Most continue to work in many cities including and beyond member ones.

- *Are resilience strategies (and its discrete deliverables) a useful tool in articulating needs and opportunities to potential solution providers and solution developers? What, if anything, needs to be changed or added to the 100RC strategy activities and protocols to better articulate these needs?*

  Per current policy, 100RC clearly distinguishes the development of Strategies by cities and their citizens from the introduction of partners who present solutions. As such, the matchmaking has been particularly onerous given that most partners continue to provide services in confined lines of

business, industry sectors, or geographic markets. In many ways, however, public dissemination of partners' work has also shaped the Strategies, and their proposed initiatives and challenges primarily remain with the ways in which cities procure services. 100RC is reevaluating this transition to potentially introduce solutions earlier in the process.

- *How have partners responded to the value proposition of the platform? How useful and relevant were platform resources to the member city stakeholders (from partner perspective)?*

  In general, the platform provided a business development opportunity for partners, along with some recognition through their affiliation with a major global, philanthropic effort. Other original motives, such as collaborating with other thought leaders or providing extensive value to member cities, have largely not been reciprocated.

Other Findings to Date

At baseline—that is, before becoming partners—less than a handful of partners had envisioned the role of resilience as a source of either internal transformation or competitive advantage in their markets. From baseline to the present, this perception remains and has largely not manifested into many actual partner changes, though a few partners have noted the rearticulating of service offerings around resilience themes. Advances appear to have occurred primarily in business development. In potential contrast to other goals, then, 100RC's expectations for its partners have not been met, at least among the partner organizations in the study's biased sample.

100RC Intervention and Engagement

During the formative evaluation, the evaluation team noted that the relationship between cities and partners was mixed but largely negative. City staffs' opinion of strategy partners seemed largely based on the CRO's personality, the partner's specific technical knowledge, and the partners' presence in their city. This led to some tension regarding roles. CROs valued the access to platform partners but also noted a lack of clarity about which partners they could engage and an uncertainty about the ramifications for bringing in certain corporations into local contexts. Some CROs expressed reservations about corporate profit or marketing motives.

Findings from the ongoing outcome study expand on these concerns. Partners reported substantial variation in the number of cities for which they had provided tools and services. They also reported some basic understanding of the process for their engagements but were not always clear about how cities' Strategies limited or opened opportunities for them in general. Partners funded their 100RC

work through internal mechanisms or government and private grants. Most reported business development goals related to their involvement with 100RC, such as expanding their city-based work, forming relationships with new cities, and developing partnerships with other organizations. Strategy partners, obviously, have had the most frequent and extensive engagements.

Marketplace Outcomes

Though several partners reported offering the same tools or services as they did before working with 100RC, others modified their offerings by, for instance, tailoring tools to fit specific needs of cities, making technological improvements on tools, and expanding services. Variations on offerings that partners developed included data tools and risk maps, although most platform partners reported that variation as typical of their services and, therefore, largely unchanged since entering 100RC partnership. Strategy partners reported more leveraging from their contractual partnership than the platform partners reported from their pro bono partnership though, again, platform partners reported limited engagement so far. A minority of partners reported increases in demand for their tools and services within and beyond cities in the 100RC network; these sample partners included those in the platform, who they observed increased interest among key city officials and stakeholders to address risk and promote resilience and to deal with resilience issues in a systemic manner.

Respondents noted both enablers and barriers to their current delivery of resilience tools and services, though they focused heavily on barriers. Typically cited barriers include issues with working in the context of cities' complex organizational and procurement structures (including political transitions), dealing with funding and resource challenges when cities needed more involvement than partners could offer, and establishing effective working relationships with CROs who were spread thinly. In terms of enablers, partner organizations most commonly discussed drawing on successful past resilience projects of their own to garner support from city leaders and relationships with city leaders.

Internal Operation Outcomes

Findings showed little evidence that partners have changed their business operations because of involvement in 100RC, except for a strong emphasis on developing new marketing materials (e.g., brochures, booklets, handouts, social media, white papers, presentations, changes to their website) among a few. Some respondents indicated that it is too early in the partnership engagement for significant changes in the organizational practices and culture. Most partners reported using the term "resilience" and embedding the term in their organizations' marketing materials and business development dialogues before they started as a 100RC partner. Less than a quarter of respondents noted any change in their already sharpened understanding of the term since partnering.

Most respondents reported no change in their organizations' mission or vision since becoming a 100RC partner, including changes around making their mission more resilience focused. This was likely because of partners' preexisting resilience focus and their missions and activities already reflecting this to some extent. However, a few partners reported new strategies for prioritizing resilience-related work, including adopting more holistic approaches to resilience efforts, adapting work they did as a 100RC partner to apply to more cities, and working closely with city officials—though implementation has yet to happen on the whole.

At this point and with this biased sample of early partners, engagement with 100RC—and with cities through 100RC—has provided *potential* immediate and longer-term returns to strategy and platform partners, respectively, more than *actual* returns. The expected returns are largely financial, but they are also reputational and intellectual, with partners of all stripes using their status to familiarize themselves with resilience concepts, stakeholders, and future clients. Private-sector partners noted harnessing the strategic advantage of locating places and people for future business opportunities. For nonprofit or multilateral partners, the investment reflects a desire to identify strategic opportunities in which to direct their assistance and resources.

Partners did not report creating any particularly innovative new offerings because of engagement with 100RC, relying mainly on reengineering established processes. There have been similarly few shifts in partners' internal operations, including missions, markets, staff size, staff capacity, intellectual property, service delivery time and channels, or interpartner partnering to date. Finally, their competitors pre-100RC remain, though most partners noted that 100RC has helped them to differentiate themselves from the bulk of their competition by establishing niche qualifications.

Most cities will be or are just embarking on Strategy implementation stages, and partners are still cautiously optimistic or guarded about prospects for returns on their investments from the platform engagement. Partners, too, noted cities' resource gaps and the procurement challenges for sustaining the Strategy momentum, which, in turn, could translate into changing demand for the supply of resilience tools and services. As a tool for cities' resilience efforts, then, partners from all sectors are likely—and even necessary (Pinkse and Kolk 2012). However, as means to changing the partners from within, 100RC's expectations appear to be unrealized so far.

100RC is revising its approach to partner engagement with a focus on the partners' roles in cities' institutional outcomes—and, more directly, cities' implementation of Strategy initiatives—rather than on the internal changes within partners that was hypothesized previously. To that end, this study is discontinued.

Champions Pathway

100RC expects its cities' leaders and enabled champions (specifically, the CROs) to contribute to and spread resilience thinking through the 100RC network and through their support of the resilience movement in their own local and regional networks. In contrast to the partners pathway, the potential capacity of networks to generate, promote, and transfer resilience-related strategies and best practices is heavily supported by the literature (COWI 2013). Yet, the methods for making a robust, successful, and sustained network are varied.

Evidence about city networks affirms their increasing importance for sharing resilience lessons (Alger 2011). It is argued that cites must be brought together in a network that encourages global environmental governance (Bulkeley 2005; Gustavsson, Elander, and Lundmark 2009). Though there is strong political and ideological support for these networks (Giest and Howlett 2013; Hakelberg 2014; Lidskog and Elander 2010; Toly 2008), efforts often fall short of expectations as the ability to deliver results depends on many factors that are often not considered by all network members (Fadeeva 2005). Beyond city outcomes, network use also leads to outcomes relating to the management and structure of the network itself. Bouteligeir (2013) notes that city-to-city networks often face complex power dynamics and unequal involvement is unavoidable. Successful curation of the network is therefore needed, especially in a network's early formation.

With regard to outcomes, 100RC hypothesizes that a community of practice, and even a new resilience profession, could emerge from its network. Substantial evidence exists regarding the role of professional associations as a network for transferring policy and program solutions (Ammons 1994; Balla 2001; Bingham et al. 1981). Communities of professional practice and their occasional evolution into formal professions constitute a set of networks that is especially prevalent across city stakeholders but for which literature provides mixed findings (Nerland and Karseth 2015). Historical studies of professions demonstrate that this process has occurred in relation to city government (Brooks 1988; McDonald 2010).

Much of this literature suggests that the institutionalization of formally recognized city professions has come about because of mandates (that is, the need for skill sets to accomplish a requirement like land use planning), out of a basic functional need in cities for certain skill sets (like emergency planners), or out of a desire to create legitimacy for city activities and policies through certain sets of knowledge (Knowles 2011; Pugh 1989; Stillman 2005). 100RC has the potential for generating a profession of

resilience officers, but a valued body of knowledge that is distinct from other professions (especially planners, emergency managers, and public works administrators) must be built.

Early on, 100RC hoped to promulgate the individuals in the network as the future advocates, or champions, for the resilience movement. More recently, 100RC has also considered the broader network of ideas and stakeholders beyond the CROs as critical components of this ecosystem. There is much literature to provide insight into urban champions and networks. Many case studies note the factors associated with successful outcomes. Invariably, a primary factor is the enabling politics and power (Bahadur and Tanner 2014). Anguelovski, Chu, and Carmin (2014) argue that effective long-term decisionmaking and program institutionalization require "sustained political leadership from the top, departmental engagement, and continued involvement from a variety of stakeholders."

The literature on the engagement of city leaders has generally focused on differences in leadership organization in cities, such as the allocation of authority between mayors, city councils, and city managers. Leadership development is a more common topic in the public administration literature, with studies analyzing leadership's role in promoting credibility and effectiveness. Several authors have provided general overviews of the issues at work (Hambleton and Sweeting 2014; Liddle 2013). Gabris, Golembiewski, and Ihrke (2001) argue that credibility plays an important role. Relatedly, other studies focused on succession planning to build sustainable talent pipelines (Jarrell and Pewitt 2007). Studies of innovative city leadership positions in history primarily focus on municipal governance reforms, such as those leading to the mid-century institutionalizing of professional city managers (Couperus 2014).

In all cases, the potential for catalyzing a new city-level profession from networks is strong, as demonstrated by the relatively recent professional histories and institutionalization of city planners and emergency managers. Virtually every other program that attempts to build urban resilience that the evaluation studied promoted the desire for and capacity of networks between city-based professionals. To be sustained, however, a network must be more than a clearinghouse. All members must start producing and sharing knowledge that is of use to the other members. Otherwise membership will drop. Through its use of multiple webinars, site tours, topically focused discussion groups, and in-person meetings and summits (not to mention extensive informal discussions occurring between CROs outside of the formal channels), 100RC has attempted to build this knowledge sharing.

To explore these outcomes, all 100–150 current and former CROs have been tracked through social network analysis from two surveys of CROs only and through 100RC's administrative records. The team measured the state and nature of the CRO network throughout 100RC engagement to identify CRO champions and document their actions and practices through interviews of a purposive

sample of "champions among champions." The analysis below describes responses to the second survey, summarizes changes since the first survey, and briefly reviews the analysis of champions behaviors conducted for previous portions of the study.

Learning Questions

- *To what extent did the network support knowledge sharing, learning, and capacity building among CROs and their teams? To what extent did the network support and collaboration and replication of successful resilience building activities?*

  During Phase 1 of the M&E effort, participation in the 100RC network was especially viewed positively by CROs, including both participation in the summit and formal communications channels and through informal conversations and bonding occurring between CROs. Respondents consistently reported the network being 100RC's most productive component. CROs have initiated informal associations based on common interests and geographies in addition to opportunities arranged by 100RC—a midterm outcome accomplishment. Within and across cities, professionals are using networks to exchange knowledge and promote their collective efforts.

  In the current evaluation, the evidence suggests that the CROs' perceptions and use of the 100RC network continues to be strong, with an overwhelming majority of CRO survey respondents noting their active engagement. As noted in the first survey, their primary motivation has been the access to knowledge and information about strategies to do their work. Becoming a CRO and engaging in the network also bring personal benefits. As reported in the first survey, an overwhelming majority of CROs reported having more extensive networks after becoming CROs. A slight majority of CROs also noted collaborations with other CROs as having led to new initiatives outside of the 100RC network for their cities as a result.

- *To what extent has 100RC helped shape what an urban resilience practitioner is?*

  In most cities, CROs were identified as critical conveners within city governments and across sectors and as conduits of information and solutions both and in out of their cities. In some cases, this role expands upon current functions in cities' emergency management, environmental, or planning departments. Yet, the nature of having an internal advocate with the ear of senior city leadership and eye toward a city's full set of services and challenges is novel. Cities with comparable positions (e.g., sustainability leads, climate czars, chief innovation officers) have experimented with novel practitioner roles, but few interventions exist that have shaped those. Aside from

professional associations for traditional city posts, such as urban planners or emergency managers, the closest comparable professional development efforts to the 100RC network are the US-focused Urban Sustainability Directors Network and the international ICLEI. However, neither of those programs are exclusively focused on resilience practices. As such, 100RC's creation of the CRO is unique and influential.

- *Have leaders in member cities gained recognition as champions and spokespeople for resilience? What are the main drivers in garnering this recognition?*

  CROs have come to personify the resilience movement in member cities more than any other professional, including senior city leaders. As noted in the findings from in-depth interviews regarding the "champions among champions," certain behavioral characteristics appear to factor into this recognition. These individuals saw themselves and were seen by colleagues as "conveners," "facilitators," "articulators," or some similar role as a locus point for resilience discussion in their cities. Their multiple access points to city government based on extensive experiences as well as their current advantageous posts in relation to the city executive provided "unique seats at different tables" from which they could effectively build trust between diverse constituents because of their myriad experiences and demonstrated commitment to the city and demonstrate an above-average fluency in resilience issues and "city speak" such that they could be a translator for these diverse constituents

  Other fundamental characteristics that enable champions to succeed are: their ability to set a vision as manifested in the city's Strategy; their capacity to communicate that vision effectively to city government and community stakeholders; and their skills in being problem solvers and connectors that establish new solutions to problems and identify resources.

- *To what extent do the CROs/mayors/other city leaders change thinking and increase awareness toward a more resilient state in the 100RC cities, and why? Have CROs been more or less successful changing thinking among city leadership? City stakeholders? Residents? How has this change in thinking led to enhanced capacity and practice in the implementation of the resilience strategy?*

  The CRO hiring and the city's Resilience Strategy have received nominal media and popular press attention. Yet, ultimately, the effect of the resilience movement must be on the city's institutions and in the successful implementation of initiatives. CROs' long-term effects on their cities, citizens, and city leaders are a work in progress.

- *Have city champions in 100RC cities become ambassadors of resilience beyond member cities?*

  Yes. Per responses for both CRO surveys, the CROs are overwhelmingly and consistently holding discussions with other nonmember cities (especially with other cities' governments and research

organizations). From formal presentations to informal guidance, CROs are helping neighboring cities and beyond in their states or regions. Discussions often lead to new shared initiatives.

Other Findings to Date

The evaluation team conducted surveys of all current and former CROs in every city in the summer of 2017 and again in the summer of 2018. In the interim, the team conducted in-depth interviews with the local colleagues and staff associated with the group of CROs identified as "champions among champions" to better understand their behaviors and daily practices.

Within the year between surveys, the CRO population underwent significant transitions that should be considered when interpreting this study's findings. By the summer of 2017, there had been only 13 CRO transitions among the 85 CROs appointed in member cities in 100RC's entire history. The cohort of CRO individuals who completed the first survey tended to be long-serving CROs who were the original position holders. In contrast, there were 28 transitions among CRO-office holders in the past year. 100RC's intense attention to CROs early on has evolved into a conscientious effort to address a broader group of stakeholders in member cities.

In this chapter, we focus on the last CRO survey responses and the changes they present to the CRO network. As such, the discussion does not reflect the recent changes in 100RC approach. A total of 46 CROs responded to the 2018 survey—a 40.4 per cent response rate of all former and current CROs. The respondents are distributed across five groups (table 2), depending on their status as a current or former CRO as well as whether they responded to the 2017 survey. The pool comes largely from ongoing and former CROs who responded in 2017 and not from the many new CROs this year. This bias, along with the fact that former CROs are ineligible to participate in formal 100RC events, inform this year's findings. As many former CROs responded to the 2018 survey as new CROs (21.7 percent for both)—an obvious self-selection bias.

Table 3 provides demographic and geographic characteristics for the 46 CROs who responded to the 2018 survey in relation to the 2017 respondents. The number of male respondents continue to be slightly higher than female CROs (56.5 versus 43.5 percent). Most of the respondents are between 30 and 60 years old (although we have missing age information for 39.1 percent of the respondents). The geographic distribution of the respondents across regions is comparable across both surveys and to the overall CRO population, as are the proportions of CROs across their histories with local government experience. Notably different, however, is the larger proportion of former CROs who responded to the

most recent survey as compared with the first survey—a likely consequence of the increase in the overall transitions in CROs that have occurred in the last year.

TABLE 2

Group Assignments for 2018 Resilience Champion Survey Respondents

Group	Definition	Responses	Share of responses (%)	Actual pop.	Response rate (%)
1	Current CROs who responded to 2017 and 2018 surveys	23	50	41	56
2	Current CROs who responded to 2018 survey only	3	7	13	23
3	Former CROs who responded to 2017 and 2018 surveys	6	13	16	38
4	Former CROs who responded to 2018 survey only	4	9	17	24
5	New current CROs since last year's report	10	22	27	37
Total		46	100	114	40

Notes: Included in the 46 respondents are five CROs who did not fully complete the survey. Of the five, two are in group 1, one is in group 2, one is in group 3, and one is in group 4. We note throughout the report when a table includes a response from a partial respondent. Social network analysis on the 100RC network relied on the 42 respondents who fully completed the relevant section of the survey. Population counts come from 100RC administrative data. Six 100RC cities have had no CRO.

TABLE 3

Demographic and Geographic Characteristics of CRO Survey Respondents

	Share of 2017 respondents (no. of respondents)	Share of 2018 respondents (no. of respondents)
Gender		
Female	44% (26)	44% (20)
Male	56% (33)	56% (26)
Age		
Under 30 years	3% (3)	2% (1)
30–45 years	48% (28)	26% (12)
45–60 years	36% (21)	24% (11)
Over 60 years	12% (7)	9% (4)
Missing	2% (1)	39% (18)
Geographic region		
Africa	3% (2)	9% (4)
Asia	14% (8)	22% (10)
Central America and Caribbean	2% (1)	2% (1)
Europe	14% (8)	17% (8)
Middle East and North Africa	5% (3)	4% (2)
North America	46% (27)	26% (12)
Oceania	5% (3)	4% (2)
South America	12% (7)	15% (7)

	Share of 2017 respondents (no. of respondents)	Share of 2018 respondents (no. of respondents)
Years of local government experience		
Less than 1 year	10% (6)	9% (4)
1–2 years	7% (4)	13% (6)
2–5 years	24% (14)	26% (12)
5–10 years	12% (7)	15% (7)
More than 10 years	41% (24)	30% (14)
None	7% (4)	7% (3)
Years since started CRO position		
Less than 1 year	36% (21)	7% (3)
1–2 years	25% (15)	39% (18)
2–3 years	25% (15)	20% (9)
3–4 years	5% (3)	11% (5)
4–5 years	NA	4% (2)
Missing	9% (5)	20% (9)
Current CRO status		
Current CRO	93% (55)	78% (36)
Former CRO	7% (4)	22% (10)

Note: 2017 *N* = 59; 2018 *N* = 46.

The 100RC Network

Data collected in the first survey corroborate anecdotes about the CROs' perceptions and use of the 100RC network. An overwhelming majority (88 percent) of 2017 CRO survey respondents noted their active engagement, with most reporting a primary motivation of access to knowledge and information about strategies to do their work. Over 78 percent report having more extensive networks after becoming CROs. For the most recent survey, many of these patterns persist, though there are many significant alterations in the composition of the network itself; for example, 37 cities have undergone transitions among the individuals holding the CRO title. The changes in the respondent composition, especially with the increased number of former CROs and the increased involvement of other city officials in the 100RC network, likely introduce a bias into the analysis.

NETWORK STATISTICS

At the time of the second survey fielding in the summer of 2018, 114 CROs were eligible to participate, meaning that they had been active in the program at any point in their city's membership. A total of 42 CROs responded and completed the survey section on CRO relationship; the survey prompted

respondents to answer questions about any of 114 CROs. CROs were asked to report about themselves and about their relationships with other CROs. For this reason, results from our social network analysis are relevant to all 114 CROs. However, because many CROs did not respond to the survey, some network ties are likely to have gone unreported and do not appear in the analyses.

As with any professional network, many individual CROs entered and exited the network in the past year. As such, it is useful to understand the extent to which these individual-level patterns impacted the larger structure and form of the network as a whole. Ideally, the structure of the CRO network would remain similar or grow stronger over time, even as individuals move in and out. It would also expand to include non-CRO staff in the member cities. Below, network-level descriptive statistics for 2018 are compared with the same statistics from 2017.

Overall, the CRO network has lower levels of connectivity in 2018 than 2017 and appears to have diffused rather than expanded with continuous intensity. The network today—again, when viewed only as the individual CROs—is made up of many isolated CROs (i.e., those who have zero reported ties to other CROs), and a few small clusters of connected CROs, some of whom are not connected to the larger network. Table 4 presents network statistics that help further characterize the differences between 2017 and 2018.

The network density is a ratio of the number of ties that were observed in the network relative to the total number of potential ties that could exist if every CRO was connected to every other CRO. In this population of CROs, there are 12,882 possible directional ties in a network with 114 CROs. In the 2018 network, CROs reported a total of 44 meaningful ties (i.e., ties that involve at least monthly interaction and were perceived as useful). This means that the density of the network is 0.003: about 0.3 percent of all possible ties are present. Relative to 2017, the number of meaningful ties in the network has decreased substantially both in absolute and relative terms.

The mean shortest path captures the extent to which the network is closely or distantly connected on average. It is the number of ties needed to connect any two CROs. For example, if CRO A and CRO B have a relationship, then they are connected by a single path. In the 2018 network, the shortest network path between all possible pairs of CROs is 1.32 connections, suggesting that the network is not as broadly connected as before. Rather, most of the connections exist in small clusters. Compared with 2017, when there were far more reported ties and more expansive connections, the network in 2018 has constricted overall.

Degree centrality, summarizes patterns in direct connections between CROs—in other words, their connectivity. “Leadership power” is measured as the number of incoming ties for a given CRO (i.e., how

many other CROs reported having a relationship with a specific CRO). On average, CROs in 2018 have 0.39 incoming ties, lower than the average of 1.8 in 2017, which reflects the increase in isolated CROs in the 2018 network (82 CROs had zero incoming ties reported). These numbers reflect lower connectivity between CROs overall in 2018, though a handful of CROs are more highly connected, with 1 to 3 incoming ties. These CROs hold positions with the network that are advantageous for initiating and leading activities.

TABLE 4

CRO Network-Level Statistics, 2017 and 2018 Analyses

	Mean or proportion	Median	Min.	Max.
Density				
2017	0.021	--	--	--
2018	0.003	--	--	--
Shortest paths				
2017	3.16	--	1	7
2018	1.32	--	1	3
Centrality (degree)				
2017				
Leadership power (incoming ties)	1.83	1	0	8
Potential to influence (outgoing ties)	1.83	1	0	10
All ties	3.66	3	0	18
2018				
Leadership power (incoming ties)	0.39	0	0	3
Potential to influence (outgoing ties)	0.39	0	0	5
All ties	0.77	0	0	6
Indirect centrality (betweenness)				
2017	35.28	0	0	476
2018	0.17	0	0	9

A second observation under degree centrality is the "potential to influence." This concept is measured as the number of outgoing ties. or how many other CROs for which a specific CRO noted having a relationship. On average, CROs in 2018 have 0.39 outgoing ties, again notably lower than 2017. However, there is variability in this measure as well: 91 CROs have zero outgoing ties, others have 1–3 outgoing ties, and one CRO has 5 outgoing ties. CROs with higher counts of outgoing ties may be better equipped to share information that could help or influence other CROs.

Finally, indirect connectivity (betweenness centrality) indicates the extent to which CROs are conduits for knowledge and information sharing across the network. In this analysis, betweenness is a measure of how often one CRO serves as a bridge between other CROs. It is best to interpret indirect connectivity scores relative to their distribution in the network (rather than in absolute terms); CROs

with relatively high indirect connectivity are the 'glue' that keeps the network whole, by providing indirect connections between otherwise distant CROs. Importantly, variability in indirect connectivity shrunk in 2018, relative to 2017.

The representativeness of the 2018 survey respondents could bias the overall network statistics, particularly given the disproportionate number of former and very recent CROs who responded. Yet, there are useful insights from these observations regardless. Practically speaking, the fact that current observations of the network as being more constricted than last year is based on the increased number of CROs who are connected in small clusters, with many isolates. On the one hand, because these smaller clusters are isolated from each other, it is unlikely that information is flowing well across the whole network and between diverse groups. On the other hand, this creates an opportunity for a key player—potentially, either 100RC or a CRO—to step up and be a bridge between disconnected clusters of CROs.

NETWORK PARTICIPATION

Table 5 includes all 100RC engagements, including those that occurred before 2017 for which we have CRO-level attendance information. Across all years, high shares of CROs attended at least one webinar and one summit, and relatively high shares attended at least one group orientation, one conference, and one workshop. Both the median and average number of events attended were less than 1 for all types of events except for webinars and summits. A number of CROs and their staff also participated in online discussions and message boards, which were created in 2017.

Reflecting overall changes, observations at the CRO level with regard to the reasons for and perceived benefits of interaction appear more muted but as generally positive as before. Table 6 provides common reasons that CROs interacted with each other and if the CRO considered the relationship as useful or if the other CRO also perceived the relationship to be useful. In the 2018 survey, CROs 91.1 percent of ties were considered useful to the CROs who reported them, but only 74.4 percent of those ties were also useful to the other CRO. All ties included were considered at least "somewhat useful," however.

TABLE 5

Share of Formal Cross-CRO Engagement Events in 100RC Network

Percentage of all CRO respondents except where noted

	2014	2015	2016	2017	2018	Total
Webinars (online seminars with multiple CROs)	92	81	68	37	85	81
Summit (annual pan-CRO conferences)	100	88	33	87	-	79
Group orientation (100RC events w/multiple CROs present)	-	14	32	22	6	47
Conference (cross-city meetings inc. strategy releases)	-	14	32	37	-	42
Workshop (cross-city intense topical discussions)	-	-	23	17	32	42
City visit (cross-city site tours)	-	-	10	-	6	8
Institutional collaboration announcements (agreements for long-term engagement)	-	-	8	-	-	5
Other events (all other documented CRO exchanges)	-	-	3	2	-	4
CRO online community	-	-	-	20	24	-
Other city staff in online community	-	-	-	19	30	-
Number of formal events (excluding the online community)	5	14	43	36	20	118
Number of CROs	24	43	60	96	73	106

Source: 100RC administrative documents, including narrative monthly newsletters but excluding informal notes and messages.
Notes: Percentages are of all CROs eligible to participate in formal activities at some point within the given year (i.e., excluding former CROs) except the online community. Percentages for the CRO online community engagement are out of all 114 CROs. Other city online community engagement represents the percentage of all 100 cities that had staff other than the CRO participate. Totals include CROs who participated in at least one event from 2014 to 2018.

TABLE 6

Reasons for Useful CRO Relationships

Percentage of all CRO respondents except where noted

	Share of 2017 Survey		Share of2018 Survey	
Reason for relationship	**Useful for respondent**	**Useful for nominee**	**Useful for respondent**	**Useful for nominee**
I need to discuss 100RC processes and requirements.	52	53	14	17
I want to share my achievements with this CRO.	11	14	2	1
I connect personally with this CRO.	33	33	10	9
I need moral or professional support from this CRO.	17	15	2	2
I need technical information from this CRO for a specific activity.	32	25	16	14
I need guidance from this CRO to accomplish my work in my city.	36	30	10	7
I provide technical information to this CRO about my city's activities.	15	20	7	8

Reason for relationship	Share of 2017 Survey		Share of2018 Survey	
	Useful for respondent	Useful for nominee	Useful for respondent	Useful for nominee
I provide strategic guidance to this CRO based on my experience.	9	13	2	2
I want to stay abreast about a specific resilience topic.	21	22	9	9
I am collaborating with this CRO on a new funding opportunity.	12	12	9	10
I am working with this CRO on a new professional opportunity.	1	1	4	4
Other	10	10	17	19

Notes: Share in 2017 *N* = 399 total ties. Perceived as useful to respondent *N* = 372; perceived as useful to nominee with some overlap *N* = 300. Share in 2018 *N* = 270 total ties. Perceived as useful to respondent *N* = 246; perceived as useful to nominee with some overlap *N* = 201. CROs were asked to identify up to three reasons for the relationship in the 2017 survey and only the primary reason in the 2018 survey.

Drops among the responses between years reflect the fact that CROs were asked to identify up to three reasons for their relationship with other CROs in the 2017 survey but only one primary reason in the 2018 survey. Therefore, 2017 and 2018 percentages are not directly comparable; rather, the distribution of reasons across years can be compared. These remain largely unchanged.

Eighty percent of the reported relationships involved interactions that occur less than monthly, an uptick of about 20 percent (59.4 percent in 2017) from last year's analysis (table 7). The remaining 20 percent of CRO relationships occur at least monthly, with varying levels of interaction. As with last year's analysis, there appear to be two subgroups of CROs in the network: one group has connections that do not involve frequent interaction and another group has significantly more frequent engagement.

TABLE 7

Frequency of Useful Interactions between CROs

Percentage of all CRO respondents per year

Frequency of interaction	2017	2018
Multiple times per day	4	3
Daily	7	0
Weekly	7	1
Biweekly	6	2
Monthly	16	15
Less than monthly	59	80

Note: 2017 *N* = 399 total interactions; 2018 *N* = 270 total interactions.

GENERAL PERCEPTIONS OF NETWORK PARTICIPATION

The second survey builds on the first survey's analysis through a series of questions on overall network participation distinct from relations with other individual CROs, as well as perceived benefits from

participation. CROs' answers reveal the overall condition of the network and, importantly, depict trends in participation as the network has changed over the last year.

Responses to the 2018 survey show that interest in participation remains generally high despite the decrease in individual ties between CROs. Over 80 percent of CRO respondents remain either highly engaged or somewhat engaged in the network (table 8). However, there is a significant uptick in the portion of respondents who feel somewhat unengaged, increasing from 12.1 percent in 2017 to 19.5 percent in 2018. Interestingly, this is not because of the inclusion of former CROs in the survey; current CROs (represented in groups 1, 2, and 5) had notably lower rates of high engagement than former CROs (represented in groups 3 and 4). Though the low responses for groups 3 and 4 caution against making conclusions about former CRO engagement in the network, the increase from 2017 to 2018 in the share reporting being somewhat unengaged is notable.

TABLE 8

Intensity of Participation in the CRO Network

Percentage of all CRO respondents per year or group

		2018					
	2017	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**	**Total**
Highly engaged	35	22	33	75	100	20	29
Somewhat engaged	54	52	67	25	0	60	51
Somewhat unengaged	12	26	0	0	0	20	20
Highly unengaged or not engaged at all	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100

Notes: Includes CROs who indicated that they continue to participate in the 100RC CRO Network in any way. N includes responses from partially completed surveys. 2017 *N* = 58; 2018 *N* = 41; group 1 *N* = 23; group 2 *N* = 3; group 3 *N* = 4; group 4 *N* = 1; group 5 *N* = 10.

Shifts in reasons for network engagement provide further context. Every reason the survey provided was selected less frequently in 2018 than in 2017 (table 9). Yet, the most significant decrease was in the need for guidance from other CROs about Strategies (from 72.4 to 30.4 percent), a change that is likely explained by the fact that more cities completed Strategies in 2018 and did not need further guidance. Similarly, other significant decreases were seen in seeking information about 100RC processes (67.2 to 39.1 percent) since cities had graduated from their original 100RC obligations.

TABLE 9

Primary Reasons for Engagement

Percentage of all CRO respondents per year or group

		2018					
	2017	Total	Group 1	Group 2	Group 3	Group 4	Group 5
I want to stay abreast of the state of city resilience globally.	66	54	61	67	50	100	70
I need technical information from other CROs about specific activities.	67	52	61	67	50	100	60
I want to hear about new funding or program opportunities for my city.	66	52	52	100	25	0	80
I need to receive information about 100RC processes.	67	39	39	67	50	100	50
I like to connect personally with other CROs.	62	39	48	67	50	0	30
I need guidance from other CROs about their strategies for doing work.	72	30	39	67	25	100	20
I want to share my achievements with other CROs.	31	24	17	100	50	0	20
I want to provide strategic guidance to other CROs based on my experience.	35	24	35	33	25	0	10
I want to provide technical information to other CROs about my city's activities.	31	22	44	0	0	0	0
I need moral or professional support.	19	13	13	33	25	0	10
I want to hear about professional opportunities for me.	12	11	4	33	25	0	20

Notes: Includes CROs who indicated that they continue to participate in the 100RC CRO Network in any way. Respondents could select as many reasons for engagement as apply. Percentages are the portion selecting a particular reason. *N* includes responses from partially completed surveys. All CROs 2017 *N* = 58; all CROs2018 *N* = 41; group 1 *N* = 23; group 2 *N* = 3; group 3 *N* = 4; group 4 *N* = 1; group 5 *N* = 10.

The distribution across 2018 groups shows that rates are highest for group 2 (current CROs who did not respond to last year's survey). New CROs (group 5) were more likely to cite receiving information, news, or funding as reasons for engaging with the CRO network. The CRO's engagement levels, therefore, likely reflect the ebbs and flows of 100RC city membership across lifecycle milestones.

Champions among Champions

Though slightly less pronounced than in 2017 because of an overall diffusion and contraction in individual CRO ties, the difference between the group of CROs who are generally unengaged versus those who are centrally engaged persists. The "champions among champions" recognized by peers for their efforts are virtually located at the hub of network activity, reporting frequent interactions with others and being reported by others for the same. These champions were a special focus of previous studies in the evaluation, and findings from those analyses are updated and summarized here with 2018 survey data.

CURRENT CHAMPION STATUS

Three measures were used to determine the champions among champions within the CRO network. The first is the frequency of formal activity as depicted in 100RC administrative data. The team identified seven champions for 2018 because of the limited variation in participation. The second measure is based on analysis of CRO-to-CRO interactions described earlier with the overlay of ties that were perceived as useful and involved interactions on at least a monthly basis (i.e., reflecting a strong relationship). CROs reported 44 ties to other CROs in 2018 in this category. Eleven champions were identified by this process, suggesting a wider and more diffused network of these leaders. Third, a process of simple identification was used as CROs were asked to name peers in both surveys.

The network maps for both 2017 and 2018 using all three measures is presented in figure 2. Overall, the findings demonstrate that the larger CRO network in 2018 continues to be made up of two subgroups of CROs. Similar to what we saw in the 2017 network, there is an active group of CROs with many connections and a group of CROs who remain isolated. Relative to 2017, the overall network seems to have become more dispersed, with fewer central CROs. The large central cluster of CROs that appears in the 2017 network is no longer present and has been replaced by several smaller clusters that are disconnected from each other but that often maintain a focal CRO within each.

CHAMPION BEHAVIORS AND PRACTICES

Within the network, champions were seen—and saw themselves—as useful conduits of information about 100RC processes and requirements. Yet, what made them "tick" was a source for much curiosity. The evaluation team conducted a series of in-depth interviews with the CROs who were identified as champions by their peers and with individuals within those CROs' cities who could speak intimately about the champion CROs' daily professional activities, work practices, personal traits, and other professional behaviors.

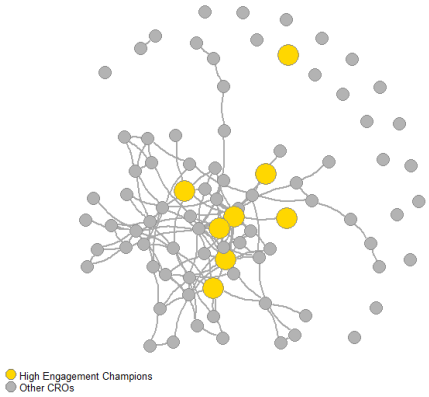
CRO champions universally cited deep and longstanding ties to their cities as a key ingredient to their success. This was especially true for those who had to deal with changes in leadership during their time as CRO. They all saw themselves and were seen by colleagues as "conveners," "facilitators," "articulators," or some similar role as a locus point for resilience discussion in their cities. Their multiple access points to city government (based on extensive experiences) provided "unique seats at different tables" from which they could (1) effectively build trust between diverse constituents because of their myriad experiences and demonstrated commitment to the city and (2) demonstrate an above average fluency in resilience issues and "city speak" such that they could be a translator for these diverse constituents.

FIGURE 2

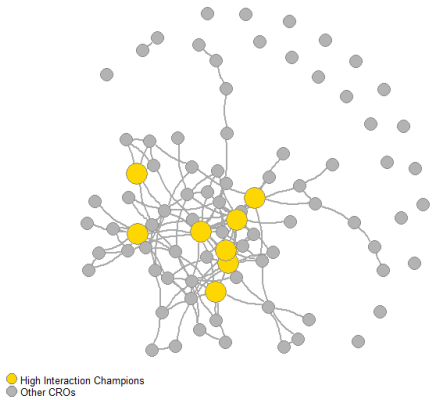
100RC Network Maps with Champions

2017

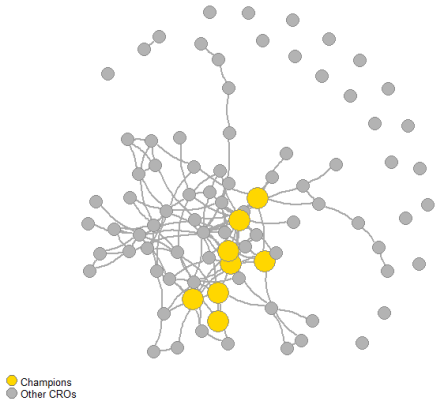
High activity engagement champions[a]



Highly frequent and useful interaction champions[b]

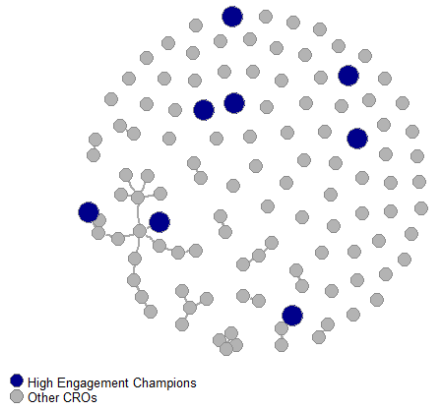


Nominated champions

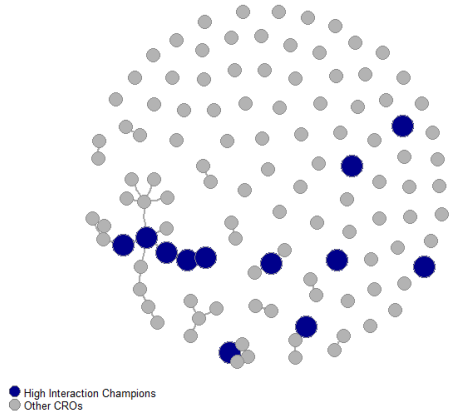


2018

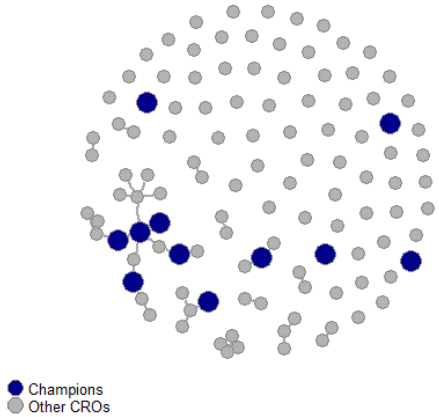
High activity engagement champions



Highly frequent and useful interaction champions



Nominated champions



Note: Gray nodes represent all CROs.

[a] Ties between CROs are based on interaction analysis. The eight CROs highlighted for 2017 and the eight CROs highlighted for 2018 had the top 10 percent of engagement activity for engagements in time period.

[b] Ties between CROs indicate that regular (at least monthly) and useful interactions were reported. Eight CROs highlighted for 2017 had the top 10 percent of interactions, as did twelve CROs noted in 2018.

[c] Ties between CROs are based on interaction analysis. The eight CROs highlighted for 2017 were in the top 10 percent of nominees. Eleven CROs were in this category for 2018.

Fundamental characteristics that enable champions to succeed are their ability to set a vision as manifested in the city's Strategy, their capacity to communicate that vision effectively to city government and community stakeholders, and their skills in being problem solvers and connectors who establish new solutions to problems and identify resources. Champion CROs broadly share these core traits, however, there is some variety in how they accomplish goals, including different types of team management approaches, communication styles, and perceptions of their role as CRO. Personal traits like flexibility, passion, and curiosity were noted, but organizational ties to senior leadership were described in both positive (ascribing credibility and authority) and negative (potential politicization) ways.

Within their cities, all champion CROs noted that their most critical and used network consisted of senior leadership, including offices of mayors and department or agency directors—effectively de-siloing at the top. Civil society networks were viewed as a second critical group. With regard to the sustainability of their own role within that network, though, there was no consensus among the champions; some argued for institutionalization of resilience offices and others valued the degree of freedom that accompanied a less-integrated body.

Champions were unsure about how to measure their own success since they struggled with separating their professional achievements from their cities' resilience goals. When pressed, a few champions noted their ability to weather political transitions—a phenomenon that they believed could be reinforced through the 100RC network's training and peer discussions. Other recommendations for peer CROs included, first, a laser focus on their strategic vision, followed by localized "branding" or the creation of a vernacular terminology for resilience.

Network Expansion

Regardless of their individual status as champions or otherwise, all CROs reported having more professional exposure and credibility as a consequence of their local role and their participation in 100RC activities. Network participation, ultimately, had a pronounced effect on the CROs' capacity to become champions, particularly among public- and civil-sector peers. In the first survey, overwhelming majorities of CROs had given public speeches (81 percent), been approached by other cities outside of the 100RC membership but typically in the same country as the CRO (72 percent), and used the CRO connections to connect non-CRO colleagues with their counterparts across cities to share technical expertise (64 percent) since becoming CROs. A slight majority of CROs (60 percent) also noted collaborations with other CROs as having led to new initiatives outside of the 100RC network for their

cities. All respondents reported that ongoing communications with their fellow CROs over the next three years was "likely" or "extremely likely."

The first and second Resilience Champion surveys posed specific questions about how CROs participate in the CRO network and external networks through various types of engagements. The current survey findings repeat and even expand on many of these same outcomes. In aggregate, the observations suggest the continued professionalization of the resilience officer, albeit without necessarily engaging as deeply with all CROs in the network.

ENGAGEMENTS

For example, many CROs use their networks to give talks outside their city. Over 90 percent of survey respondents in 2018 had given at least one of these talks, an uptick of almost 10 percent from 2017 (table 11). More than half of current CROs in each group (groups 1, 2, and 5) have given at least five talks. Surprisingly, longer-tenured CROs did not outperform new CROs. In fact, 50 percent of current CROs in group 2 had given more than 20 talks about resilience outside of their cities, as did 40 percent of current CROs in group 5. This might indicate that newly appointed CROs have existing networks that allow them to engage in engagement opportunities regardless of their status as CRO.

TABLE 11

Number of Talks Given about Resilience Outside of City

Percentage of all CRO per year or group

		2018					
	2017	**Total**	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**
Not yet	19	10	9	0	0	33	10
Once	4	0	0	0	0	0	0
Between 1 and 5 times	24	31	32	0	20	67	30
Between 5 and 10 times	21	29	32	0	60	0	20
Between 10 and 20 times	16	12	18	50	0	0	0
More than 20 times	17	19	9	50	20	0	40
Total	100	100	100	100	100	100	100

Notes: Respondents could select only one option. *N* includes responses from partially completed surveys. CROs 2017 *N* = 58; All 2018 *N* = 42; group 1 *N* = 22; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 3; group *N* = 10.

Stakeholder groups receiving these presentations remained relatively consistent from 2017 to 2018. For both years, survey respondents indicated that stakeholders in academia, universities, and research were most frequently on the receiving end of talks (table 12). However, there was a

significantly larger portion of presentations given to national governments in 2018 (25.5 percent to 50 percent). Again, new CROs (group 5) bolstered this trend, 66.7 percent of whom had given presentations to national government staff or leaders.

TABLE 12

Type of Stakeholder Receiving Presentation

Percent of all respondents reporting for a specific stakeholder group

		2018					
	2017	Total	Group 1	Group 2	Group 3	Group 4	Group 5
Civil sector: Academia, university, or research	87	79	80	100	100	0	78
Public sector: Another local government	66	58	70	50	20	0	67
Public sector: National government	26	50	40	100	60	0	67
Public sector: Occupational organizations	38	47	50	100	40	0	44
Civil sector: Foundation, philanthropy, or charity	45	45	50	100	20	0	44
Civil sector: Multilateral or bilateral organizations	36	45	55	50	20	0	44
Public sector: State or regional government	45	45	40	100	40	0	56
International organization or institution	38	45	35	50	40	50	67
Private sector: Business or business groups	36	42	50	100	0	0	44
Private sector: Professional or trade associations	40	34	40	50	20	0	33
Civil sector: Nonprofit advocacy groups	47	32	35	100	0	50	22
Civil sector: Nonprofit service delivery groups	28	21	20	50	40	0	11

Notes: Includes CROs who indicated that they had given at least one talk outside their city after becoming CRO that was not coordinated by 100RC. Respondents could select as many types of stakeholders as apply. Percentages are the portion selecting a particular type of stakeholder. *N* includes responses from partially completed surveys. CROs 2017 *N* = 47; All 2018 *N* = 38; group 1 *N* = 20; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 2; group *N* = 9.

CROs also use their networks by giving informal advice to researchers and officials from other cities. After becoming CRO, around 79 percent of survey respondents had been approached by nonmember cities seeking advice (table 13). This number increased from around 72 percent in 2017, mostly because of longer-tenured current CROs (groups 1 and 2) of whom over 80 percent have been approached. New CROs (group 5) have been approached less frequently (30 percent of new CROs have never been approached). This discrepancy can likely be explained both by their newness to the position and by other evidence that suggests new CROs have nongovernmental networks that provide them

with engagement opportunities before becoming CRO (table 11). Where new CROs may be well-established presenters on resilience, tenured CROs may be approached more to give advice.

TABLE 13

Number of Nonmember Cities Seeking Advice

Percentage of all CRO per year or group

		2018					
	2017	**Total**	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**
None yet	28	21	18	0	20	33	30
One city	5	12	9	0	20	33	10
Between 1 and 5 cities	36	52	55	100	60	0	50
Between 5 and 10 cities	17	7	5	0	0	33	10
More than 10 cities	14	7	14	0	0	0	0
Total	100	100	100	100	100	100	100

Notes: Respondents could select one number of nonmember cities. *N* includes responses from partially completed surveys. 2017 *N* = 58; 2018 *N* = 42; group 1 *N* = 22; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 3; group 5 *N* = 10.

For new and tenured CROs, cities that are closer geographically are most likely to seek advice on resilience building (table 14). This holds for both 2017 and 2018 respondents, with 2018 respondents being approached slightly more by adjacent or neighboring cities and less from cities outside the country but within the continent. Notably, CROs have seen an uptick in cities seeking advice from outside of their continent, which may suggest that network formation is more often transcending geographic boundaries.

Further evidence indicating a growth in cross-city network expansion can be seen in table 15, which shows that nearly 66 percent of respondents in 2018 saw some new initiative outside of 100RC result in a collaboration with other CROs, an increase from 60 percent in 2017. Specific new initiatives include an engagement for a national resilience agenda and a national resilience cooperative.

TABLE 14

Type of Nonmember Cities Seeking Advice on Resilience Building

Percentage of all CRO respondents reporting a city location type

City location	2017	2018
Adjacent or neighboring cities	62	67
Cities within the CRO's state, region, or province	58	33
Cities outside the CRO's state, region, or province but within the CRO's country	64	64
Cities outside the CRO's country on the CRO's continent	43	30
Cities outside of the CRO's continent	19	36

Notes: Includes CROs that have been approached by at least one non-100RC member city. Respondents could select as many types of nonmember cities as apply. *N* includes responses from partially completed surveys. 2017 *N* = 58; 2018 *N* = 33.

TABLE 15

New Initiatives Outside of 100RC Resulting from Collaboration with other CROs

Percentage of all CRO respondents reporting an initiative type

Initiative	2017	2018
Proposals for joint funding (not yet awarded)	17	10
Awards for joint funding	14	7
Technical cooperation or exchanges	45	46
Working groups or associations	19	17
Conferences or workshops	45	39
Other (specify)	2	7
None of the above	40	34

Notes: Respondents could select as many new initiatives as apply. Percentages are the portion selecting a new initiative. 2017 *N* = 58; 2018 *N* = 41 responses for this question.

To provide context for the findings above, the 2017 and 2018 surveys asked CROs to detail their participation in professional organizations and urban networks outside of 100RC. Participation is similar for the two surveys (table 16). The participation of most survey respondents in at least one of these organizations supports the idea that CROs' networks are expanding in terms of their reach and efficacy, though perhaps only in specific ways.

TABLE 16

Participation in Other Organizations, 2017 and 2018 by Group and Total

Percentage of all CRO respondents reporting organizational participation

		2018					
Organization	2017	Total	Group 1	Group 2	Group 3	Group 4	Group 5
Asian Cities Climate Resilience Network	9	4	4	0	17	0	0
Bloomberg Mayors Challenge	41	24	30	0	17	33	20
C40 Cities Climate Leadership Group	45	51	52	33	50	100	40
Cities Alliance	9	11	13	0	0	33	10
IDB Ciudades Sostenibles	7	4	4	0	0	0	10
Int. City/County Management Association	9	13	13	33	17	0	10
ICLEI	52	44	44	100	33	33	40
UN City Development Strategies Initiative	2	2	4	0	0	0	0
UN Global Compact Cities Programme	21	7	9	0	0	0	10
UN ISDR Making Cities Resilient	19	18	30	0	0	33	0
United Cities and Local Governments	19	20	17	33	33	0	20
World Association of Major Metropolises	9	4	4	0	0	0	10
World Bank Resilient Cities Program	7	22	22	0	17	67	20
None of the above	5	11	9	0	33	0	10
I don't know	10	11	13	0	17	0	10

Notes: Respondents could select as many organizations as either they or their cities have participated in. Percentages are the portion selecting a particular organization. *N* includes responses from four partially completed surveys. 2018 *N* = 45; group 1 *N* = 23; group 2 *N* = 3; group 3 *N* = 6; group 4 *N* = 3; group 5 *N* = 10.

PROFESSIONAL NETWORKS

Looking more closely at CRO professional networks, nearly half of all CROs participated in new professional organizations after becoming CRO (table 17), showing a slight increase from 2017. Former CROs (groups 3 and 4) were most likely to have participated in new professional organizations. New CROs (group 5) were more likely to have never participated in any organizations before or after becoming CRO, which might be because of their relatively short tenure.

For those who joined a new organization, most CROs in 2018 indicated joining special issue organizations (table 18). There was a sharp decline in participation in new occupational organizations and new professional organizations.

TABLE 17

Participation in New Professional Organizations since becoming CRO

Percentage of all CRO respondents per year or group

		2018					
	2017	**Total**	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**
Yes	43	47	35	67	67	100	40
No, CRO participated in same organizations	45	47	65	33	33	0	30
No, CRO participates in no organizations	12	6	0	0	0	0	30
Total	100	100	100	100	100	100	100

Notes: Respondents could select only one response. N includes responses from four partially completed surveys. 2017 *N* = 58; 2018 *N* = 45; group 1 *N* = 23; group 2 *N* = 3; group 3 *N* = 6; group 4 *N* = 3; group 5 *N* = 10.

TABLE 18

Type of New Organizations since Becoming CRO

Percentage of all CRO respondents reporting a new organizational type

	2017	**2018**
Occupational organizations for city government staff (such as an association of local government emergency managers)	38	14
Professional organizations (such as a national planners' association)	38	5
Special issue organizations (such as climate change adaptation professionals, sustainability officials.)	91	95

Notes: Includes CROs that have participated in new professional organizations since becoming CRO. Respondents could select as many types as apply. Percentages are portion selecting a particular type. *N* includes responses from 1 partially completed survey. 2017 *N* = 25; 2018 *N* =21.

Newly joined organizations also have a more international orientation, perhaps reflecting the growing internationalism of CRO networks in general (table 19, see also table 14). In 2018, 57.1 percent of CROs joined an international, cross-continental organization, versus just 46.7 percent in 2017. New

CROs (group 5) had the largest share joining an international, cross-continental organization, although this should be interpreted cautiously given the small number of responses.

However, most new CROs have not yet seen their professional networks grow outside of their cities since becoming CRO (table 20). A larger share in 2018 indicated their extensiveness of professional networks is the same as before, an increase from 2017 from 9.1 percent to 26.3 percent, and a smaller share indicated their networks are extremely more extensive than before. Nearly 90 percent of new CROs' (group 5) networks outside of their city are either less extensive or the same as before. Current and former CROs who responded to the survey last year (groups 1 and 3) show the largest growth in networks, indicating that the longevity of CRO tenure may impact the growth of extra-local networks.

TABLE 19

Farthest Geographic Reach of New Organizations

Percentage of all CRO respondents per year or group

		2018					
	2017	**Total**	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**
Citywide or metropolitan area only	7	0	0	0	0	0	0
State, regional, or provincial area only	7	10	13	0	25	0	0
National	24	24	25	50	25	33	0
International within a single continent	16	10	0	50	0	0	25
International across continents	47	57	63	0	50	67	75
Total	100	100	100	100	100	100	100

Notes: Includes CROs that have participated in new professional organizations since becoming CRO. Respondents could select only one geographic reach. *N* includes responses from one partially completed survey. 2017 *N* = 58; 2018 *N* = 21; group 1 *N* = 8; group 2 *N* = 2; group 3 *N* = 4; group 4 *N* = 3; group 5 *N* = 4.

TABLE 20

Extensiveness of Current Professional Networks outside CRO's Cities

Percentage of all CRO respondents per year or group

		2018					
	2017	**Total**	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**Group 5**
Extremely more extensive than before	20	5	5	0	20	0	0
Somewhat more extensive than before	51	37	55	0	40	50	0
Slightly more extensive than before	20	26	30	100	20	0	11
The same as before	9	26	10	0	20	50	67
Less extensive than before	0	5	0	0	20	0	22

	2017	2018 Total	Group 1	Group 2	Group 3	Group 4	Group 5
Total	100	100	100	100	100	100	100

Notes: Respondents could select one reach level. Percentages are the portion selecting a particular reach level. Groups 2, 4, and 5 were asked to compare the extensiveness from before CRO to now. Groups 1 and 3 were asked to compare the extensiveness from last year to now, since they completed last year's survey. 2017 frequencies only include CROs who held the position at the time of the survey (*N* = 55). *N* includes responses from one partially completed survey. 2018 *N* = 38; group 1 *N* = 20; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 2; group 5 *N* = 9.

INTRACITY NETWORKS

In contrast, new CROs saw a much more immediate boost to the extensiveness of their local professional networks upon becoming CRO. Ninety percent of new CROs (group 5) saw their local professional networks grow to some extent since becoming CRO (table 21). Further confirming the CRO advantage in building local networks, the majority of former CROs (groups 3 and 4) either have the same or less extensive local networks since their tenure ended. Again, the results suggest that the way CRO status impacts an individual's network can vary across different types of networks, with further variability stemming from the longevity of a CRO's tenure. As with previous tables, a higher share in 2018 than in 2017 reported an extensiveness that is the same as before, and a lower share reported that their networks are extremely more extensive than before.

TABLE 21

Extensiveness of Current Professional Networks within CRO's Cities

Percentage of all CRO respondents per year or group

	2017	2018 Total	Group 1	Group 2	Group 3	Group 4	Group 5
Extremely more extensive than before	38	21	27	0	0	33	20
Somewhat more extensive than before	40	33	46	50	0	0	30
Slightly more extensive than before	13	14	5	50	0	0	40
The same as before	9	24	23	0	60	33	10
Less extensive than before	0	7	0	0	40	33	0
Total	100	100	100	100	100	100	100

Notes: Respondents could select only one reach level. Groups 2, 4, and 5 were asked to compare the extensiveness from before being CRO to now. Groups 1 and 3 were asked to compare the extensiveness from last year to now, since they completed last year's survey. 2017 frequencies only include CROs who held the position at the time of the survey (*N* = 55). N includes responses from one partially completed survey. 2018 *N* = 42; group 1 *N* = 22; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 3; group 5 *N* = 10.

The 2017 and 2018 surveys asked respondents to compare the composition of their professional networks within their cities from the time before they were CRO to the time of the survey (table 22). In

both 2017 and 2018, city government staff, city government leadership, academic or university groups, and foundation or philanthropic groups were most likely to be included in the composition.

Across groups, current CROs (groups 1, 2, and 5) tended to see the largest increases between time periods, whereas in some cases, former CROs (groups 3 and 4) saw decreases.

TABLE 22

Change in Composition of Professional Networks within CRO's Cities

Percentage of all CRO respondents reporting a change in professional network type

			2018					
		2017	Total	Group 1	Group 2	Group 3	Group 4	Group 5
City government staff	Before	71	60	73	50	60	33	40
	Now	89	86	91	100	100	0	90
City government leadership	Before	60	52	59	50	40	0	60
	Now	91	71	82	100	40	33	70
Private-sector large businesses	Before	36	17	27	0	20	0	0
	Now	60	50	64	0	40	0	50
Private-sector small businesses	Before	20	26	18	100	0	67	30
	Now	36	33	36	0	20	67	30
Private-sector trade associations	Before	26	21	18	50	0	0	40
	Now	55	48	59	0	0	33	60
Academic, university, or research	Before	78	74	73	100	80	100	60
	Now	93	76	91	50	40	67	70
Foundation, philanthropy, or charity	Before	53	38	41	0	20	33	50
	Now	80	64	59	100	40	67	80
Citywide advocacy groups	Before	47	38	41	100	20	33	30
	Now	66	33	27	50	40	0	50
Citywide nonprofit service delivery	Before	40	36	32	100	40	33	30
	Now	67	48	50	100	0	0	70
Neighborhood advocacy or service	Before	26	14	18	50	0	0	10
	Now	49	43	55	50	20	0	40
Resident organizations	Before	16	10	5	0	0	0	30
	Now	47	45	46	50	20	33	60

Notes: Respondents could select as many types as apply. Percentages are the portion selecting a particular type. All Groups compared the composition of their professional networks from before being CRO to now. 2017 frequencies only include CROs who held the position at the time of the survey (*N* = 55). *N* includes responses from one partially completed survey. 2018 *N* = 42; group 1 *N* = 22; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 3; group 5 *N* = 10.

GLOBAL NETWORKS

The 2017 and 2018 surveys also asked respondents to compare the composition of their professional networks outside of their cities from the time before they were CRO to the time of the survey (table 23). The composition was similar for 2017 and 2018, although participation in multilateral organizations was notably much higher in 2018 than in 2017. As with the composition within cities, current CROs tended to see the largest increases between periods, whereas former CROs saw a few decreases.

TABLE 23

Change in Composition of Professional Networks outside CRO's Cities

Percentage of all CRO respondents reporting change in professional network type

			2018					
		2017	Total	Group 1	Group 2	Group 3	Group 4	Group 5
Government staff or leaders	Before	75	76	80	100	40	0	100
	Now	89	82	90	100	60	0	89
Private-sector leaders	Before	35	42	25	50	40	50	78
	Now	51	58	50	100	40	50	78
Academic, university, or research	Before	67	76	65	100	100	100	78
	Now	89	79	95	50	60	50	67
Foundation, philanthropy, or charity	Before	53	45	40	50	60	0	56
	Now	87	66	65	100	40	50	78
Nonprofit advocacy groups	Before	44	42	30	100	40	50	56
	Now	51	42	30	100	0	50	78
Nonprofit service delivery	Before	31	29	20	100	40	0	33
	Now	53	42	25	100	20	100	67
Neighborhood advocacy or service	Before	11	21	10	100	20	0	33
	Now	33	26	15	100	0	0	56
Resident organizations	Before	4	11	10	0	0	0	22
	Now	16	18	5	50	0	0	56
Multilateral organizations	Before	6	53	50	50	20	50	78
	Now	7	82	85	50	60	100	89

Notes: Respondents could select as many types as apply. Percentages are the portion selecting a particular type. All Groups compared the composition of their professional networks from before being CRO to now. 2017 frequencies only include CROs who held the position at the time of the survey (*N* = 55). *N* includes responses from one partially completed survey. 2018 *N* = 38; group 1 *N* = 20; group 2 *N* = 2; group 3 *N* = 5; group 4 *N* = 2; group 5 *N* = 9.

In short, the observations across both surveys as well as the qualitative analysis of CRO champions' activities suggest that 100RC has developed a formidable community of practice around urban resilience. The nature of this community, further, continues to evolve: the first groups of CRO cohorts tended to be intimately connected and could easily reach each other for guidance and to share information.

As the network has expanded, there has been some diffusion in the network's centrality and softening of ties. CROs rely increasingly on a small number of peers, likely within a similar geographic or topical focus. As those mini-networks ferment, there may be additional opportunities to introduce network-wide knowledge sharing and matchmaking.

As more CRO transitions occur in member cities, 100RC is confronted with the challenge of committing resources and professional support for the individuals holding the CRO title versus supporting the cities' continued establishment of the CRO position more broadly. As the surveys' findings suggest, the individuals may very well have become resilience champions. Strategies for dealing with these transitions will help ensure that both new and former CROs continue to champion.

100RC Model

100RC is a unique intervention for the resilience movement and for municipal institutional reform as a global urban development program, and as a philanthropic intercession—particularly for The Rockefeller Foundation. As the largest and most consistently applied contemporary urban resilience intervention in scope and scale, 100RC has influenced the field of urban resilience—it has defined it in many ways. All other programs and most of the scholarship mention 100RC by name.

100RC's theory of change is not well known by scholars or other urban resilience practitioners, however. Interviews with comparable program officials as well as leading scholars in the field typically end with requests for more details about 100RC's activities (including the tools, guidance manuals, and other program materials) and their effectiveness (as described in past and current evaluation reports and knowledge management products). As such, many questions remain about how the program's tools, technical assistance, and overall operations can further influence the field and how these evolve to stay relevant in different contexts. These questions have been raised especially about cities in low-income countries and developing contexts with institutional challenges that are qualitatively distinct from most of 100RC's member cities in the developed world.

Confusion over 100RC's organization also persists. 100RC is often misidentified as being The Rockefeller Foundation by city professionals, urban resilience stakeholders, and other programs. The Foundation's use of intermediaries and seeding 100RC as a separate organization appear to have had no influence on that misperception.

As the signature program within the Foundation's formidable resilience portfolio over the last decade, then, 100RC may ultimately provide lessons to the Foundation about the evidence base and processes for launching programs, the Foundation's commitment and longevity to specific places (member cities) at scale, its affiliation with local individuals (CROs and mayors), and the potential benefits from connecting them to each other in an enduring network.

As the M&E effort proceeds, these lessons will continue to emerge and stabilize. Questions about the 100RC model's relevance in the future will depend largely on the program's operations over time, its capacity to continue serving current member cities in the near term and new members in the long term, and willingness to increase its transparency. However, this chapter synthesizes the theoretical and organizational analysis conducted by the evaluation team to date to provide preliminary answers. The evaluation team conducted four studies of the 100RC "model"—that is, the program's theoretical basis, its practical development, its mix of activities, and its organizational structure.

This review of the literature highlights changes and new findings since the initial program theory report in June 2015. This chapter also describes our analysis of purposively selected comparable resilience-building programs, for which we have continued to conduct reviews and interviews. Changes in program offerings since the formative evaluation's program theory report of June 2015 are also described, emphasizing the parallel evolution of the theoretical basis for urban resilience building at the same time as 100RC was designing and launching its offerings.

Learning Questions

Answers to The Rockefeller Foundation's learning questions about the 100RC model are based on the following: (1) a series of exhaustive literature reviews summarized here; (2) synthesis of periodic in-depth interviews and document reviews of comparable programs; (3) documentation of the evolution of assumptions in 100RC's theory of change; and (4) a qualitative review of organizational criteria in philanthropy.

- *To what extent did 100RC influence the field of urban resilience and theories of change around improving it?*

  Consistently across all literature and practitioner reviews conducted for 100RC since 2014, the 100RC effort is cited or referenced. Both the magnitude of The Rockefeller Foundation's investment and the number of cities involved are particularly noted characteristics that shape that influence. No member of the evaluation team is familiar with other urban resilience interventions receiving the same attention from city practitioners as 100RC with the exceptions of the Foundation's Asian Cities Climate Change Resilience Network, C40's City Solutions program, and the World Bank's City Resilience Program. Further, the replication of tangible, signature products such as chief resilience officers and Resilience Strategies within and beyond the member cities also demonstrate that influence.

  As one of the few consistent interventions across urban contexts that exist to meet that need currently, 100RC has been influential as a provider of resilience assistance and an advocate to others for resilience investments. This statement is not made lightly but is based on three criteria: (1) the magnitude of the Foundation's resources that have been employed to support 100RC interventions is larger than any other program globally except for the grant and loan programs from the World Bank; (2) the scale of the 100 interventions vastly overshadows any other multilateral or even national interventions; and (3) the consistency of the model allows for constant tweaking and summative learning for the entire urban resilience scholarly and professional field.

Every other urban resilience program and monograph mentions 100RC by name in its background materials—more than any other global effort to date. Regarding its chosen theory of change, however, 100RC has been somewhat less influential; few members of the resilience community are familiar with 100RC's approach to resilience through institutional change. 100RC's core strategies—including the CROs, comprehensive Resilience Strategies, and city government reforms—are innovative and distinct from other interventions. Yet, 100RC is on a longer delivery horizon for tangible projects and policies when compared with other efforts that have not emphasized institutional change, such as multilaterally funded infrastructure projects. The relationship between institutional transformations and later improvements in services, functions, infrastructure, and citizen outcomes is currently only emergent.

- *Does the 100RC model, as expressed in its theory of change, stay relevant and useful over time?*

100RC's resilience definition and approach to building resilience are marked by four principle assumptions: (1) resilience should be generalizable beyond any one shock—that is, its processes and engagement activities are meant to be employed in a variety of different scenarios and not just for one type of acute or chronic hazard; (2) resilience is a continuous condition and building resilience is long-term effort that exceeds the traditional disaster response time frames; and (3) the consideration of persistent social and economic challenges ("stressors") simultaneous and in relation to the physical and environmental risks and vulnerabilities ("'shocks") is a seminal belief that has been overlooked in the emergency management practice; and (4) these beliefs require institutional changes in how cities plan and function before and during shocks. In short, 100RC's theory of change is founded on institutional transformation in cities.

Professional critiques of these principles involve the resilience movement's perceived limitations in the face of specific shocks, such as climate change's effects, an earthquake, or a terrorist attack. The practical feasibility of catalyzing institutional change in cities with such diverse citizenry and governmental structures has also been suggested as a likely challenge to 100RC's approach. However, sociologists and geographers of disaster and related social scientists argue that the comprehensive intersection of multiple domains (e.g., shocks and stressors of all kinds) and has been a fundamental missing link in past disaster management. Further, urban planners, development governance scholars, and community activists have noted the need to foreground institutional change over or at least in coordination with specific projects; an a priori focus on projects would be interpreted as reproducing the same disparities and stressors.

In all cases, those fields have also undergone some evolution in the past several years, and now focus as much on long-term social and economic stressors as on the acute natural and environmental

shocks in part because of the literature, programs, and policies associated with the resilience movement. Resilience has already expanded traditional climate and disaster programming. The 100RC model, then, not only remains relevant but it continues to play out amid several topical and contentious debates. Evidence of the model's outcomes will be instrumental in resolving some of these debates.

The recent changes in the 100RC model regarding implementation of Resilience Strategies' initiatives, however, are still a work in progress. Introduced as a formal focus in the organization's services over the last year, implementation as a companion to the broader institutional changes of 100RC's focus to date will be a conceptual struggle, and a practical challenge regarding local time, resources, and politics. 100RC's explicit role as an ongoing provider of technical resources during implementation is referenced in its theory of change but continues to evolve.

- *What are we learning about the use of intermediaries and institutional models, as a cost-effective way for the Foundation to get greater reach across resilient cities and partner pathways?*

The intensity of engagement across 100 cities spanning the globe requires an organizational structure and business model that are largely unfamiliar to most of philanthropy. For several reasons, The Rockefeller Foundation spun off 100RC in 2014 as a new, distinct entity, albeit with significant investor reporting requirements and with persistent confusion among recipient city professionals about the roles between the two organizations.

The 100RC model presents several unique characteristics. Its operational composition is different than most philanthropic engagements as it is funded by, but functions independently from, The Rockefeller Foundation. This arrangement was intended to create an organizational environment flexible and capable of implementing the various components of the nascent program theory. Unlike many of its comparable programs, both the 100RC intervention and the organization were born at the same time. 100RC's organization model, though, is still evolving, particularly given its commitment to help some member cities transition into implementation while continuing to assist the other cities—including cities beyond the 100—with Strategies. The model is dynamic. Like its theoretical soundness, though, 100RC's operational sustainability is predicated on its future ability to incubate other funders and harness staff, knowledge, and resources during the transition into implementation.

Though many comparable programs are targeted toward a specific region or group of countries, or vary drastically in local implementation, 100RC's core strategies were designed for consistent application in cities across regions. These operational and theoretical innovations make it relevant to consider not only the outcomes achieved in member cities but also the fit and potential for replication

of 100RC's model. The model has gone through certain evolutions, documented below, and faces the need for growth and modification to join the member cities as they move toward project implementation of the Resilience Strategies,

Based on comparisons of operational criteria between 100RC's current organization and a traditional grantmaking program, the evaluation team has found that the theory of change could not have been implemented through the latter. The Foundation's operational constraints prohibit the staffing skills and breadth, the entrepreneurial flexibility and risk tolerance associated with urban interventions, and especially the intimacy of relationships across such a broad and geographically diffused population of cities embodied in 100RC operations. The seed capital for building city resilience can likely only be filled with philanthropic resources, but the operationalizing of those resources appears to be most efficiently accomplished outside of traditional philanthropic means.

A critical caveat to this observation is that the theory of change and its goals were developed by 100RC after its establishment—that is, an internal program could have devised a different set of goals and grantmaking strategy (for example, simply funding projects) with different staff and resource requirements for which the same grant program might have been well suited. Regardless, as the signature program within the Foundation's resilience portfolio, 100RC primarily provides lessons to the Foundation about its commitment and longevity to specific places (member cities), individuals (champions), and the potential benefits from connecting them to each other in an enduring network more than on philanthropic strategies.

Literature Revisited

Even to untrained readers, it is obvious that the use of resilience terminology both for climate adaptation responses and for other more acute hazards has increased. Social scientists and engineers have in recent years used the term in discussing terrorism, the refugee crisis or global pandemics, mostly using the shocks and stressors framing to understanding various facets of these problems. The concept and practice of resilience building, particularly at the city level, has received increasing attention in recent years. New contributions in both academic and grey literature, including journal articles, edited book volumes, working papers, and program reports, continue to emerge. As evaluations and assessments of resilience programs launched during the past five years proceed, this growth will likely continue.

However, many lessons can be taken from the literature now. The team's review finds that the 100RC components with the strongest scholarly support or the largest body of literature with rigorously produced evidence that corroborates 100RC's strategies, are as follows:

- 100RC's fundamental problem statement regarding the need for increased urban resilience
- The potential capacity of networks to generate, promote, and transfer resilience-related strategies and best practices
- The importance of effective community participation and engagement strategies at the local level—though the literature argues that this is time and resource intensive

Overall, the evidence uncovered in the literature and comparable program reviews for specific 100RC activities is middling—meaning there is simply insufficient past evidence, not that the hypothesis is incorrect. There is some evidence base for most of the themes of interest to 100RC and, in many cases, this evidence supports current 100RCs offerings, including many in the cities pathway (the role of philanthropy and nonprofit partnership in city government change, the potential role of other providers of resilience capacity building such as national governments and development agencies, the resilience strategy process, the effect and sustainability of city government reform) and the networks pathway (the evolution and structure of city networks in support of professionalization and sharing best practice and solutions). There is no evidence base to support or detract from the CRO position or role.

Some evidence exists regarding the partner pathway themes, but it does not support 100RC's focus, including evidence on the engagement of solution providers by cities and private-sector investments in cities. This conflict is noted in the "Partners" chapter, though the evidence was only middling and, therefore, not conclusive.

Overall, the more than 700 studies the evaluation team has examined since 2015 provided a robust evidence base at the time of launching the M&E, much of which was useful in designing indicators and constructs for evaluation fieldwork. The review's focus was on three areas: validity of the underlying problem statement, appropriateness of the program's vision of improving people's lives at scale, and effectiveness of designed interventions in having positive impacts. Since the initial program theory review in 2015, evaluators have conducted regular reviews and updates to the literature. Though the basic conceptual bases of discussions, including operational definitions, have remained unchanged in recent years, recent gray literature is focused more on operational details of resilience programming rather than conceptual issues. Several disciplines and areas of inquiry, such as emergency response and infrastructure policy, have begun contributing their own perspectives on resilience, which they recognize as a broad concept worthy of consideration.

The literature continues to grow, but with an increased focus on the interventions, policies, and programs for how to build urban resilience as much as the need for it. Among the former, most studies are still under way or, if completed, produce weak evidence of the effect or impact of urban interventions. The scope of most studies in this sparse literature center on individual land development cases as opposed to the wide array of physical, social, and economic projects that encompass potential urban resilience interventions, such as those included in many member cities' Resilient Strategies. The studies also typically estimate the gains from preventing future losses through mitigation of shocks, rather than measuring actual performance during and after those shocks.

The following discussion focuses on the evidence base for the primary 100RC model rather than the individual activities or strategies to answer the following questions: Is there a need for urban resilience building? Which sector can provide it best? Can the strategies be replicated or scaled?

CITY RESILIENCE NEEDS IN GENERAL

There is near unanimous support for the need for urban resilience building as described by citations in the "Cities" chapter, but studies recognize the complexity of methods for achieving it. In the context of rapid urbanization in developed and developing contexts, there has been a growth in the literature attempting to understand how resilience, sustainability, and other relevant concepts should be understood through an urban lens. In early days, the focus was on climate hazards, risks, vulnerabilities, and mitigation strategies, all hallmarks of climate mitigation and later adaptation literature. More recently, there has also been a systematic integration of broader understandings of resilience to include social elements and networks in part because of the literature on climate change and sustainability.

In all cases, urban resilience is acknowledged as a multifaceted condition, and interventions for increasing it are understood to be necessarily multipronged and complex. Through city case studies, public administration literature identifies a series of conditions under which urban resilience would likely improve: decentralization and local autonomy, accountability and transparency, responsiveness and flexibility, participation and inclusion, and experience and support. Further, the emerging literature on urban resilience focuses on functional, not administrative boundaries of cities, but clearly defines and operationalizes resilience to cover both physical and institutional aspects. Interestingly, social capital perspectives argue that larger cities are more vulnerable as their economic and social systems are more complex and thus stakes are higher, whereas smaller towns and communities benefit from great community integration. By bridging case studies from a range of topics, including seismic risks to the informal economy, authors argue that a governance-first approach is not only feasibly but critical.

PHILANTHROPIC PROVIDERS

The evidence base on philanthropic interventions' ability to instigate positive change in city government is mostly weak and, unlike the 100RC model, mostly focused on funding as the primary intervention (Irvin and Carr 2005). Though there is an active literature on philanthropic initiatives in relation to government, fewer publications are targeted to city or municipal governments (Clotfelter and Erlich 2001; Ferris and Williams 2014). There is a small volume of literature on philanthropic interventions targeting governance reform, as most interventions are seen merely as supplemental sources of revenue for cities with small and sporadic help. Typical interventions by foundations include influencing the local political environment for reform, building the capacity of government official (Lanfer, Brandes, and Reinelt 2013), and helping set the public agenda in ways that support resilience building (Auspos et al. 2009).

NONPROFIT PROVIDERS

As with the literature on philanthropic investment in city government, there is a large literature (mostly US-focused) on relationships between nonprofit organizations and cities, but it generally focuses on defining roles, especially in the context of service provision and autonomy rather than how nonprofits could engage or have engaged directly with city government to effect changes in city policies (Brinkerhoff and Brinkerhoff 2002; Weisbrod 1997). Since advocacy is markedly different from program implementation or policy research, studies show that partnerships with government only worked when both sides fully agreed on objectives and had incentives to cooperate, such as one side needing technical know-how and the other requiring funding (Feiock and Andrew 2006). Many nonprofits appear stuck between their humanitarian or ideological objectives and the need for managing their engagements with local communities on the other (Chaskin and Greenberg 2013). In general, then, there is little literature on the kinds of intense interactions between nonprofits and city governments that 100RC puts forth.

DIFFERENT PUBLIC-SECTOR PROVIDERS AND LEVELS

Public service providers such as water utilities or solid waste managers have become active players in resilience building, though they retain a precarious position regarding governmental entities within city boundaries despite the importance of regional strategies (Antrobus 2011; Ernston et al. 2010). Analyses of vertical government systems find that higher levels of government mostly regulate service quality through setting benchmarks or allowing them fiscal and administrative discretion to be more effective. Some studies in planning and urban studies delve deep into multijurisdictional horizontal governance systems, arguing that though cities do not operate in isolation, intercity or intercounty

coordination always poses stiff challenges (Bryan and Wolf 2010; Chapple et al. 2017). Similarly, civil engineering and public works entities focus on physical aspects of resilience, without much attention to institutional considerations (Aldrich and Meyer 2014).

Some authors have analyzed how regional or global policy efforts, such as environmental issues, can be integrated into local policy practice (Bai et al. 2010). In the US, Berke, Lyles, and Smith (2014) evaluate the effects of federal and state hazard mitigation policies on local land use policies, finding that federal policies had no effect, but state policies did. Lakoff and Klinenberg (2010) found that urban and regional governments attempted to define risk as broadly as possible to garner more resources from federal-level programs. Yet, ultimately, there is dearth of outcome or impact evaluation literature concluding whether any one urban resilience governance provider is preferable or whether programs have had any positive impact on the ground.

REPLICATION, EXPANSION, AND SCALING OF CITY GOVERNMENT–BASED INTERVENTIONS

100RC's assumption that knowledge and best practices created through the program will be replicable, transferable, and generalizable across contexts has been the subject of scholarly inquiry for years. The focus of these studies has been on nonresilience knowledge transfer, including democratic governance systems with multiple parties, a robust civil service system, pressure groups undertaking advocacy, policy entrepreneurs and subject matter experts, and involvement of supranational institutions (Krebs and Pelissero 2010; McCann and Ward 2011). The extent to which city-to-city transfers are robust depends on alignment of policy goals, structure of government, funding access, and the quality of institutions (Dolowitz and Marsh 1996; Ganuza and Baiocchi 2012; Marsden et al. 2011). There is also growing evidence, which the evaluation team confirmed in its research on the CRO network, that formal and informal networks of professionals are instrumental in transferring knowledge, though this only occurs under favorable circumstances, such as the presence of certain change agents at the local level (Wolman and Page 2002).

Though the literature suggests that there are ample opportunities for solution replication or scaling across cities, and a history of scaling because of many different reasons, there is still an ongoing tension between a movement for applying broad solutions and the need to be sensitive to their local variation. This tension plays out through the quantity of stakeholders involved, the nature of the policy or solution being transferred or scaled, and the local desire for change—if local adoption is even tenable.

100RC Theory of Change

The 100RC theory of change (ToC) continues to evolve, particularly as the program further develops assumptions about the causal steps between Strategy release, implementation, and the physical, noninstitutional changes in cities that will support quantifiable resilience improvements. However, its current form reflects much thought and evolution already. For example, the current ToC recognizes the role and potential for contribution of multiple stakeholders in cities to catalyze an urban resilient movement beyond formal governmental institutions.

This synthesis revisits the how, what, and why of 100RC's ToC, its evolution over time, and its impact on programming approaches since inception. Because the program's impact theory was informed by the program theory, it is important to understand the basis upon which the latter was formed.

EVOLUTION

The Rockefeller Foundation's first formal thinking on resilience strategies came in April 2013, after its decision to launch a global flagship initiative for the Foundation's centennial anniversary. Without specifying desired outcomes or specific ways of achieving them, early documents outlined a focus on cities as the primary unit of intervention, and on the need to build their capacity to bounce back from natural and humanmade disasters based on the Foundation's experiences in post-Katrina and post-Sandy grantmaking and its Asian Cities Climate Change Resilience Network work.

By the fall of 2013, as the idea of a chief resilience officer was solidifying within 100RC, the foundation's focus shifted toward understanding and resolving intracity politics as a bottleneck to progress. The four pathways started emerging, two each from intra- (e.g., CRO and resilience strategy) and intercity (e.g., platform and network) faces of the resilience coin. Details about the specific interventions, activities, and expected outcomes remained broad until the first cohort of cities was announced in December of that year. At that time, the ToC was elaborated on and further clarity emerged regarding near-term objectives and measurable outputs from each pathway. For these intermediate steps to produce the desired goals, pathway descriptions made several key assumptions:

- CROs would be capable and motivated.
- Successfully applied solutions from 100RC cities would scale to the regional or global level.
- The supply of goods and services focused on cities would respond accordingly.
- Resilience building concepts applied in practice would take hold among stakeholders and be sustainable.

During spring 2014, as new staff joined 100RC to oversee program implementation in the first wave of cities, several new discussions were undertaken. This resulted in the program's shifted focus toward livelihoods and impact of resilience building on people, particularly vulnerable groups, such as the urban poor. Without changing the program's goals, more detail was added to the intervention model, including standard processes such as consultation workshops at the time of program launch, CRO networking and learning events, and a resilience strategy development playbook. Within a short time, activity details and the supporting explicit ToC were developed through an iterative process driven by 100RC and The Rockefeller Foundation. By late 2014, staff experiences and initial feedback from cities further solidified the primary structure of the program, including the short- to mid-term goals.

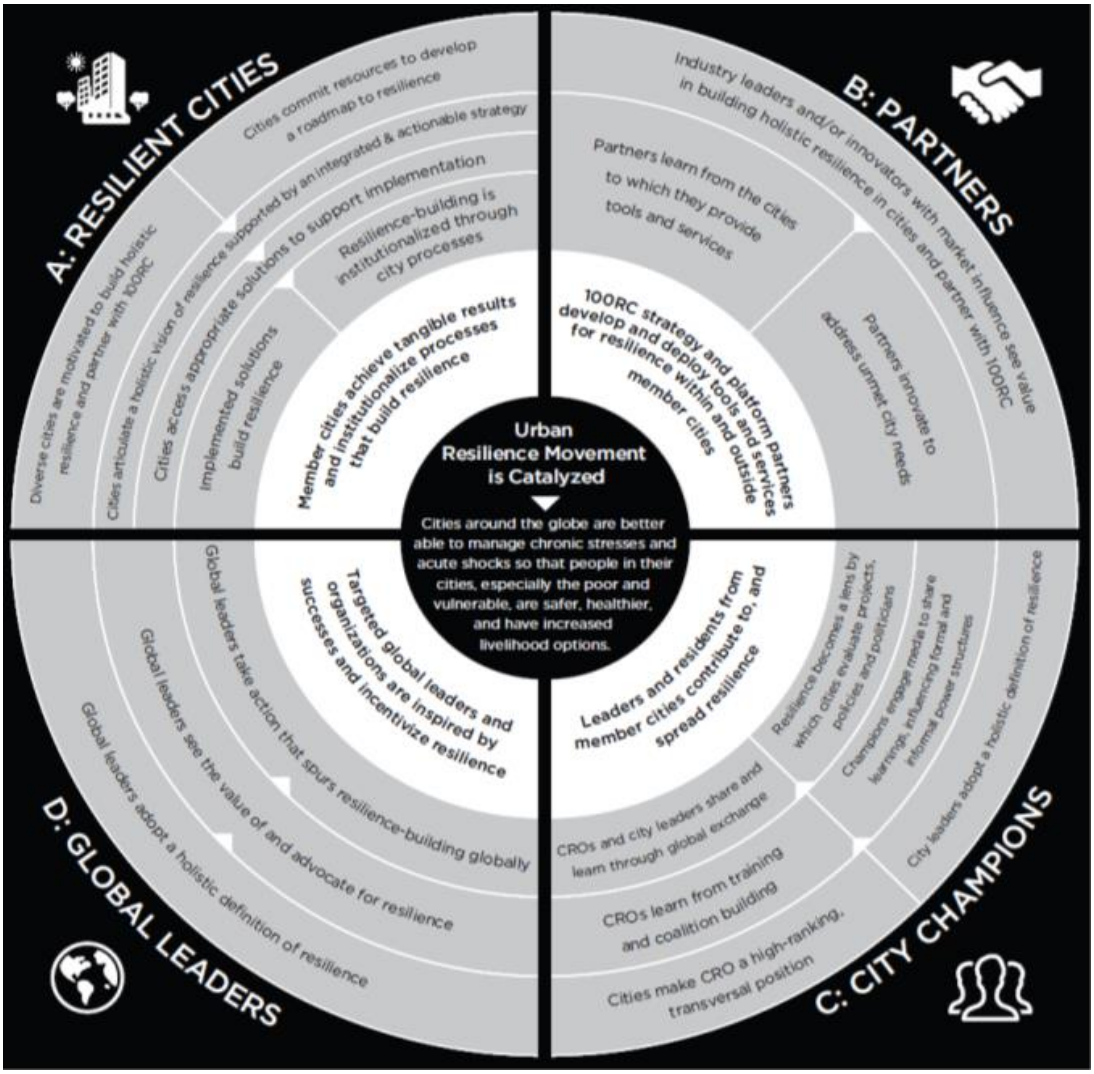
As this standardized and more robust version of the ToC took shape, a tension emerged between each city's seemingly unique policy context and the desire for generalizable learnings. 100RC's core assumption was that things working well in one city could be replicated in others at scale, resulting in improved resilience building throughout the network and the potential to develop scale economies across the wider pool of 100 cities that had yet to be selected. By 2015, 100RC staff increasingly recognized the difference in pacing for every city's Resilience Strategy. The desire to see all cities progress at a standard pace, achieve the same level of success, and experience co-learning to improve program functioning was proving more elusive than anticipated.

100RC made refinements based on feedback from the first cohort of cities, which represented a heterogeneous group in terms of population size, per capita income, history of disasters and capacity to deliver effective public services, as well as from early monitoring and formative evaluation efforts. By the summer 2015, 100RC adopted a widely accepted version of the ToC (figure 3).

Between 2015 and 2017, the ToC's value to the 100RC's implementation also became clear. It emerged as a tool for internal planning and resource allocation and for evaluation and as an analytic framework for internal reflection and lesson sharing with external stakeholders. Even then, 100RC viewed the ToC as a dynamic document with room for improvements about changing assumptions and methods or presenting them to new staff and partners.

FIGURE 3

100RC's Theory of Change



FEATURES

The ToC has several unique features worth careful consideration. First, contrary to typical ToCs of this nature, 100RC's ToC does not have a specific and articulated problem statement. This approach allows cities to define and operationalize resilience building through their own lens with their own priority-setting agenda. Often this is based on their unique history of natural or manmade disasters, governance capacity, or other factors. Second, it also does not have a standard mission or vision statements for each city to aspire toward. Instead, the objective of resilience building is locally defined and discussed in general terms of bouncing back from shocks and stressors. Third, the impact statements focused on two

key outcomes: the impact on livelihoods of urbanites and 100RC's recognition and influence at the global level.

The evaluation team identifies six key strategies in the ToC without which the program would not be able to achieve desired impact:

1. a powerful and effective leader in the form of the CRO
2. a strategy process that correctly identifies key bottlenecks in resilience building
3. a marketplace of service providers who would respond positively to the city's analytic needs
4. a universal set of solutions that makes an impact on given cities
5. resilience concepts, as described in the ToC, will hold over time and drive change
6. all key stakeholders, both within and outside city government, see the intervention's value

As individual components, many of these are not novel ideas and were already applied by other players, such as having CRO type officials floated by reinsurers, the city's strategy building process by PlanNYC, and the solutions acquisition innovations promulgated by CityMart.

In combination, however, these various strategies could provide the sufficient checks and balances such that 100RC could hedge any single one's disruption in each city. Where other programs have supported a single standard strategy, then, 100RC's gamble is that the combination of standardized activities will have a lasting effect.

Comparable Programs

Indeed, multiple other programs were evolving at the same time as 100RC. There has been a proliferation of resilience and urban governance programs launched by multilateral, nonprofit, and private actors of the past decade to respond to growing understanding of the urban resilience challenges. In this section, we position 100RC in the global urban resilience movement to understand conceptual approaches, units of intervention and desired impact.

In total, over 40 comparable programs were included in this analysis for which we systematically reviewed their various features and interviewed a selection of key program informants. Although all programs surveyed focus on urban resilience building in some fashion, they vary by types of interventions, theories of change, kinds of implementing organizations, funders, and geographical scales. The evaluation team found that no other program is exactly comparable to 100RC's breadth and

depth of engagement, though specific aspects, such as network offerings or diagnostic tools, demonstrate some overlap.

DIFFERENCES IN PROGRAM CONCEPTS AND ACTIVITIES

Definitions and Approaches

There appears to be an increasing consensus on the broader, nonclimate-specific use of the term resilience in cities, (i.e., covering a range of shocks and stressors such as a refugee crisis or terrorism). Despite this, other programs continue focusing on specific intervention areas or shocks (such as climate change adaptation or hazard mitigation) and on select groups within an environmentally or politically defined region (e.g., coastal vulnerable populations) as opposed to the gamut of shocks and stressors through broader interventions. Programs are also applying various dimensions to frame the need for resilience (e.g. sustainable cities or food security), which are driven by the goals and agendas of funding and implementing partners.

Regarding content, several programs also focus on the broader theme of sustainability at the community or citywide levels, which respondents appear to recognize as distinct from but related to resilience. In these and other cases, there is an increasing use of resilience as an organizing principal for conceptualizing and solving the diverse range of problems communities, cities, and wider regions face. However, there is still some debate and uncertainty as to the relational hierarchy between resilience and other principles, like sustainability. Programs are using several closely related terminologies, including livability, adaptation and disaster risk management, with some respondents claiming that they go hand in-hand with resilience.

Despite agreeing to the holism embodied in resilience concepts, sampled programs tend to be somewhat bounded in their approaches. Programs with well-developed theories of change at the start appear more prescriptive and thus less flexible on topical emphasis and those with diagnostic tools allow greater flexibility within programmatic parameters. For example, programs funded for a specific population or intervention (such as, technology driven smarter cities) generally adopted interventions and missions that mirrored the historical versions of those same interventions rather than integrating the wide set of constructs or contributors that are believed to constitute resilience. Programs that specify a single shock, such as acute earthquakes or climate change's chronic effects, also typically narrow the range of stakeholders and potential actions.

This lies in contrast to 100RC whose cities undertake intensive analysis, stakeholder consultations, and comprehensive review of multiple environmental, social, and economic conditions to self-identify

shocks and stressors. On the other hand, some programs evidently favor bottom-up approaches where member organizations command considerable leeway in adapting widely acceptable approaches.

Intervention

Despite many similarities with other programs' goals, 100RC's altering of fundamental city processes and operations (or "the city organograms," as one respondent noted) stands out as a unique feature in the urban resilience programming space. Other programs tended to be more circumscribed in their interventions, taking the governance environment as a given. Having said this, there exists a wide variety of flavors in approaching resilience building, such as individual professional and organizational networks, technological systems, multilateral agreements, or issue-based advocacy campaigns. Each approach has benefits but is ultimately driven by each program's structure (e.g., embedded within an international organization), origin and history (e.g., spin-off from precursor initiative), or theory of change (e.g., coexistence with nature).

Activity

Activities varied between technical assistance or local capacity building, educational or awareness campaigns, direct social assistance for vulnerable populations, support of institutional transformations supporting resilience, and provision of capital infrastructure. For the programs under review, core activities included knowledge-sharing networks, bottoms-up rapid assessments, and diagnostic tools followed by the provision of funds. Almost all programs, offer networking opportunities for resilience professionals. Some are light-touch networking, such as conference calls or webinars, but others offer more substantive engagements. This is particularly true for programs emphasizing knowledge sharing.

The team found no other program that explicitly targets fundamental change in city institutions, such as de-siloing within cities, in part because of their self-perceived limited ability to alter existing city government structures. Similarly, no other programs robustly focus on creating a city-level marketplace for resilience services supplied by specialized private and not-for-profit organizations with cities as the main clients. Only one other program is unique in its focus on private-sector engagement but mostly to the extent of setting up data-sharing platforms for improved decisionmaking.

Where these do exist, they tend have a small number of agents and are usually not tied to a broader program of interventions. Other venders have attempted to create a program that induces a marketplace for their own companies' suite of services through limited pro bono offerings like 100RC's platform partnerships. In some respects, however, other programs' offerings (e.g., resilience strategy) appear much like 100RC's, albeit with nuanced differences in their goals.

Unit of Intervention

100RC's resilient cities pathway obviously focuses on cities with a few metropolitan-level exceptions noted in our sample (Miami and Santiago). Comparable programs mostly took the city or metropolitan area as their unit of intervention. But other programs have chosen to focus on several levels of intervention, ranging from the regional and national to local communities or neighborhoods. Still others have not taken geographic units but rather demographic populations (e.g., women) or a hybrid of geography and demography (e.g., coastal low-income neighborhoods).

Rather than originating from theories of change or evidence from scholarly literature, these preferences appear simply to be artefacts of organizations' traditional scales of operation or operational considerations. For example, multilaterals are mandated to operate at larger scales requiring counterparts higher than city-level entities with significant national influence. On the other hand, the advocacy groups' mandate of protecting species habitats are within wider ecosystems that transcend administrative boundaries.

Scale

100RC's global scale covering all continents and both the industrialized and developing world through institution-altering interventions is unique among resilience programs, creating both opportunities and challenges. Working across all continents helps produce unique collaborative learning but also requires flexibility to customize offerings to every context, a significant intellectual trial and resource burden that other programs have chosen to avoid. Not surprisingly therefore, most reviewed programs focused on specific regions, continents, or selected countries by national income levels. Beneficiary cities' similarities in social, economic, and institutional circumstances, often coupled with unified funding streams, presumably facilitates thicker cross-city learning and replication without undue burdens.

Some programs have rapidly expanded their geographic focus over time without necessarily having such ambitions at the start, in part because of rapidly increasing demand for resilience programming at the city level. This was observed by many respondents over the last five years. One multilateral program and one professional association began solely localized peer learning and supports but have since experienced dramatic growth and evolution in ambitions. One of these programs continues to operate and now conducts capacity-building programs and commissions major reports on key topics though at a smaller scale than 100RC and without a local embed like a CRO.

DIFFERENCES IN PROGRAM STRUCTURES AND OPERATIONS

Funder and Budget

Spending on resilience increased in the recent past both in depth and breadth of donors. Broadly, the range of funding sources includes multidonor trust funds, cities paying for technical assistance from their own sources, membership dues, and bilateral donor programs. No program has demonstrated the ability to draw for-profit business interests or private investment for philanthropic ends beyond those that are structured solely for business development purposes. The private sector's financial contribution in resilience-building programs remains very limited, with multiple respondents reporting difficulties in creating win-win partnerships because of divergent ambitions. One program's risk-assessment network is curating conversations between insurance companies and cities but only for creating mutually beneficial data-sharing platforms that improve decisionmaking for both sides.

These varying funding mechanisms are both an outcome of program origins and ambitions, but also have key impacts on resulting program structures and theories of change. In situations in which cities are dues-paying clients, programs typically allow greater flexibility in establishing focus areas and subsequently designing interventions. But when national governments and multilateral donors are involved, more stringent program structures and accompanying reporting requirements could trump the cities' needs. This is evident in programs run by multilateral banks or international organizations, where "clients" are always national, provincial, or state governments, typically accepting concessional loans wrapped in assistance or other interventions.

Structure

Some programs are structured to allow flexibility at the city level, encouraging the design of context-specific interventions. Others are not, with teams deployed from headquarters for rapid diagnostic assessments intended to stimulate demand for analytic services, assistance, and other interventions and are backstopped by local staff. Such structures have limited maneuvering space and implement essentially one-size-fits-all–type approaches that emphasize the benefits of best practice replication.

Evidently, there is no silver bullet in structuring urban resilience building programs, and, in any event, the majority of programs only aim to influence one aspect of an otherwise highly complex challenge. Observed differences in program structure are path dependent and driven by programs' origins, funders, and disciplinary approaches often expressed in theories of change. Programs supported by a large institution tend to be more centralized and technical assistance heavy, whereas organically growing networks are structured to give significant leeway to member organizations.

A unique 100RC element is its multipronged structure attempting to simultaneously alter cities' institutional structure and create a marketplace and creating a professional network of resilience practitioners. Almost all other programs either focus only on a single pathway or aspect of resilience.

Those programs that are multipronged do not clearly articulate linkages or synergies across seemingly disparate interventions—at least publicly. Regardless, the TA and other component of reviewed programs seldom offer city-behavior–altering incentives, focusing on short- to mid-term program outputs that cities are meant to produce rather than longer-term, institutionalized transformations.

Operational History

Many resilience programs originated recently from past interventions or program areas focused on sustainability (e.g., Urban Sustainability Directors Network [USDN]), climate adaptation (e.g., Cities Alliance), or disaster-risk mitigation (e.g., World Bank). These legacy projects continue to leave their favor on current programming, both in terms of theories of change and approaches toward implementation. Regardless of origin, all reviewed programs have undergone some degree of evolution in either geographic coverage or substantive focus, often in response to demand from cities. Some programs started within industrialized countries but later expanded into developing countries (e.g., the Nature Conservancy), ostensibly to share best practices despite contextual differences.

Other changes have ranged from minor adjustments in traditional missions (e.g., Inter-American Development Bank) to major realignments toward newer focus areas or funding structures (e.g., USDN and Resilient America). Some respondents admitted that their programs learned from their own mistakes and achievements, deciding to replicate approaches underlying successes and avoiding pitfalls. For example, an interviewee noted realizing that capacity limitations would make institutional reforms impossible to achieve in second-tier cities of Latin America and the Caribbean

Some programs have already ended or have a set timeline for their completion, at which point the resources and staffing will ostensibly fold back into other ongoing operations or departments with implementing organizations. In other cases, such as the USDN, programs simply do not have end dates in view and continue growing organically. However, the sustainability of their funding model, which in turn depends on perceptions regarding their utility, will determine their duration.

The interviews elicited enthusiasm about engagement with 100RC on two primary fronts. First, a global learning agenda on resilience building was described as a positive outcome of all programs but one that 100RC could especially contribute, particularly given its own challenge of implementing meaningful institutional transformation. Second, increasing cooperation and coordination in operations at the city level with involvement of program, donor, research, and government stakeholders was also viewed as area for future growth. To this end, recognizing 100RC's unprecedented scale, ambition, and pioneering status in resilience programming, most respondents pleaded for greater openness from 100RC regarding lessons learned during design and implementation of the program.

Broadly, multiple respondents identified a fundamental challenge facing all programs—resilience building is an inherently long-term process (20+ years) that is inconsistent with the typical 3-to 5-year program or political cycles. Though no program is immune to these limitations, multiple respondents identified 100RC's intervention as having the potential to instill lasting change capable of outliving political transitions. This stimulates the burning demand for lessons learned during 100RC.

PERCEPTIONS OF 100RC

Earlier interrogations of comparable programs focused on the above two themes about their composition in relation to the 100RC model. Increasingly, the evaluation team also inquired about the perceptions of leadership and staff from those same programs about the 100RC model as well. These questions were posed of only a subset of the full group of programs described above, focusing on the programs that still exist with some notable level of activity and institutional support and have had some interaction with either 100RC programming or CROs.

Familiarity with 100RC

All respondents had heard about 100RC and the majority appeared familiar with 100RC's interventions in cities, particularly the CRO and resilience strategy. Most also claimed familiarity with the program's theory of change or had previously supported the same cities. But when probed, they generally lacked a clear understanding of the processes leading up to the publication of the strategy or steps being undertaken to track or report on Strategy projects or other activities. They were even less familiar or in some cases completely unfamiliar with partners and champions pathways interventions or how these complementary pieces fit together within the 100RC theory of change. Interviewees also noted they perceived 100RC has more structure for planning and strategy development but lacked clarity on the prospects of implementation supports.

Many have directly or indirectly interacted with 100RC staff or members of the CROs' teams across the world. For example, all the US-based CROs appear to be known in the USDN and C40 risk assessment network. CRO members of the USDN have so far organized many internal discussions on 100RC's workings across many cities, allowing members to compare implementation. Similarly, the World Bank's City Strength Diagnostic team held a series of key conversations with 100RC and RF leaderships, leading to the 2014 public commitment to integrate urban resilience building across the then major programs. Others, such as Cities Alliance, are also platform partners and have supported 100RC operations in several cities based on their preexisting projects and networks in key places.

Perceptions of 100RC Value

We observed universal appreciation of the unique and highly ambitious nature of 100RC's theory of change, which is perceived as having the potential to bring real and lasting change. Most respondents highlighted the program's goal of equipping cities with the resources to mainstream resilience concepts in city operations and planning. Because of the vast scale of the network, 100RC's ability to offer lessons from cities in other countries or continents is perceived as another major advantage, though such knowledge sharing is mostly not shared publicly. This is being particularly helpful to low-capacity, smaller cities that may not otherwise have access to frontier tools and approaches. Multiple respondents indicated that in such programs, the network tends to be prioritized over other benefits.

In contrast, multiple respondents expressed skepticism that cities with limited pre-100RC capacity in capital and human resources would experience tremendous improvements in resilience without extensive financial and knowledge resources as well as time. They indicated that despite 100RC's attempts, cities exist in environments that do not allow sufficient powers, or administrative authorities to undertake meaningful reforms requiring full implementation of 100RC. Similarly, respondents indicated an interest in witnessing "evidence" on 100RC's efficacy, including evaluation findings.

Of those few respondents familiar with other 100RC offerings, there was interest in particularly in the partner pathway; one respondent commented that 100RC' s potential demonstration of a successful model for effective private-sector engagement would be a tremendous service to the field. This is particularly important because several respondents described their own private-public partnerships, but evidently none have come even close to creating a sustainability model.

Program Recommendations

Respondents with greater exposure to 10ORC, either directly through work with the CROs or 100RC staff or indirectly through local partners, provided recommendations for 100RC consideration. They suggested 100RC should create more opportunities for engagement at the global level for knowledge sharing, particularly those related to the inner workings of the program. This emanates from widespread interest in assessing 100RC's successes and failures on the ground and drawing lessons for nonmember cities.

Some respondents expressed frustration with 100RC's apparent lack of "openness" to sharing findings or discussing operational challenges from the ground. Similarly, one respondent suggested that 100RC should also create a legacy of working with preexisting and upcoming programs by ensuring that learning from one project informs the other. Another respondent noted that, unlike peer organizations, 100RC did not appear to communicate their alignment with emergent international agendas, such as

the Sustainable Development Goals and suggested that such an approach could be to their advantage for creating influence at a global level. While appreciating 100RC's early flexibility at the city-level, one respondent suggested allowing member cities even greater flexibility in implementing core elements of program as they see fit within their local political environments, particularly for smaller cities that may not have the institutional histories or resources of larger metropolises or capital cities.

Potential Collaborations

At the 2014 World Urban Forum, several global resilience building programs (including 100RC and The Rockefeller Foundation) made the pledge to harmonize future programming by instrumental cross-program learning systems. Despite receiving significant media attention, there is still limited evidence of cross-program collaboration, particularly on theories of change. Since some programs have already ended, and others are scheduled to end at some point, distilling lessons from seminal interventions to improve design of future activities is critical for satisfying this pledge.

Though all respondents expressed enthusiasm for collaboration with 100RC, when probed, not all were able to offer specific activities. Rather, respondents offered a range of broad ideas echoing recommendations and the perceived shortcomings mentioned earlier. The primary focus was on the perceived need for better alignment of 100RC interventions with other programs, both at the global (learning) and local (operational) levels.

For this, multiple respondents suggested organizing webinars or other joint learning events in which program representatives and evaluators would share findings and otherwise discuss resilience specific topics. Others proposed identifying overlapping cities and ensuring that teams on the ground organize regular coordination meetings, ultimately for complementing each other's efforts.

The Rockefeller Foundation Investment

Finally, as part of the monitoring and evaluation of 100RC, the evaluation team continues to research several questions related to the nature and organization of The Rockefeller Foundation investment in 100RC. Indeed, ambitions outlined in 100RC's ToC were believed to require an organizational structure and business model that was largely unfamiliar to most of philanthropy. The Rockefeller Foundation recognized early on that the success of its desired urban resilience intervention depended both on the soundness of its program theory and on the appropriate fit of its implementation model. The model would also have to be implemented in a very short amount of time given the Foundation's original vision. For several reasons, The Rockefeller Foundation spun off 100RC in 2014 as a new, distinct entity, albeit with significant investor reporting requirements.

There is a long and significant volume of literature in organizational management and the structural composition of businesses (Aldrich 1979; Cameron and Whetten 1983; Mintzberg 1979). Offshoots of this work establish core criteria for understanding the inner working of any organization, such as staff quantity and skills, location and facilities, reporting hierarchies, client relationships, partnerships, level of documentation of processes and formal record keeping, financial resources, and "back office" functions like accounting and human resources (Kaplan and Norton 1996). A subset of this literature has looked at philanthropic and other civil-sector organizations (Forbes 1998; Lagemann 1999; Sheehan 1996). Recent exploration in the field mirrors the dramatic shift in organizational styles and strategy that occurred in philanthropy over the last two decades, as well (Grant 2016; Quinn, Tompkins-Stange and Meyerson 2014).

One such organizational innovation was the decision to spinoff 100RC from direct The Rockefeller Foundation auspices in the fall of 2013. Through an intensive analysis conducted by McKinsey and Company's advisors with the Foundation between August and September of that year, a variety of key criteria were reviewed to "determine the best operating structure" and eventually come to the incubation of a new, external entity "that would staff up with subject matter experts and work with chosen cities and carry out those tasks."[2]

As reported internally, the "analysis showed that the possible benefits of creating a new entity (the incubation model) made it a much more attractive option if it could be done without excessive project risk." For example, the newly created 100RC could benefit from the clear association of the Foundation brand and the other resilience-related projects in the Foundation's grant portfolio. However, the new entity could provide a speedier opportunity to hire staff and build a "center of excellence." 100RC was incorporated in early September 2013 and announced at the Clinton Global Initiative meeting in late September.

In the case of 100RC's design and implementation to date, the evaluation team has identified specific operational characteristics from the variety of criteria presented in the literature that clearly demarcate the 100RC programs' implementation as an external, independent entity in contrast from a traditional grantmaking arm of a philanthropic foundation.

STAFFING

A consistent finding in the review to date has been the value that 100RC staff provides to cities, including staff in headquarters and associate directors tasked with managing city relationships. This benefit includes support for navigating the 100RC tools and resources to make them "fit" within local contexts, technical expertise on issue areas related to urban resilience, knowledge of local government

operations, and sensitivities to the political nature of this work. Internally, 100RC has also required significant staffing to handle to operations, management, and communications of all the pathways, especially the CRO network.

Had 100RC emerged as grantmaking arm of the Foundation, the sheer staffing needs that 100RC has required to accomplish its goals would not have been feasibly supplied. This holds true administratively (the Foundation has restrictions on its hiring capacity and overhead in relation to its endowment) and in term of staff skills (the urban governance expertise needed of 100RC staff is not well aligned with the typical skills of a Foundation grant maker).

RESOURCE DEPLOYMENT

Through the resilient cities pathway, the 100RC model involves deployment of resources through cash grants to cities to support the CRO position for two-years and pro bono technical assistance and support through strategy and platform partners. 100RC staff assumed all responsibility for negotiation of agreements, deployment of resources, and management of funds. Though this may seem like the basic functionality of many foundations, in the local government partnership context it has necessitated the establishment of an appropriate level of oversight and local flexibility to achieve goals. Limitations on the Foundation's ability to directly fund city governments (particularly US member cities) also come into play.

ENTREPRENEURIALISM

100RC is endeavoring to meet an identified need (urban resilience) through a new method (institutional change). As noted in the resilient cities pathway discussions, this has required 100RC to rapidly adapt to the needs of the member cities. Leadership at 100RC recognized that the organization would need to take on a start-up mentality from the very beginning, eager to experiment and adapt as necessary to address the field gap related to city resilience building. This culture would allow them to quickly deploy tools and resources to member cities in ways that a traditional grantmaking program may not be able to do because of institutional checks and balances. 100RC, in short, could not be risk averse.

To date, 100RC has generally lived up to that requirement. 100RC learned from early monitoring and the experiences of the first wave of cities to adjust the model. Organizational governance was managed as an early internal priority for the leadership team, but they continue to face risk associated with working directly with cities and mayors. Though 100RC leadership note their risk-taking as an advantage, they also recognize the need for building organizational governance over time. Flexibility combined with accountability is especially relevant because of the heterogeneity of member cities

across cohort and city types (particularly with regard to cities in developing contexts). Regardless, this nimble approach is often not feasible in established organizations with strict processes for decisionmaking, review, and approval.

SCALE

The intensity of the city relationship and network management at a global scale across the 100 cities is unique, not only in terms of philanthropic engagements but also when compared with similar programs. This has required 100RC to be present and engaged across the globe, at a level that would not have been feasible for the staff of a major foundation with a relatively centralized physical and institutional presence.

At a practical level, 100RC created regional offices in Mexico City, London, and Singapore to complement operations in New York as well as alleviate significant travel to member cities. An early critique of the program was that the staff were "too American" (and, even "too New York"). However, the program has been able to diversify the knowledge, background, and cultural diversity of team to better respond to cities.

INSTITUTIONAL SUSTAINABILITY

The one area in which a Foundation-based organization would have foreseeably been advantageous is its obvious institutional supports. Certain elements related to 100RC's implementation model as an independent entity present challenges to the organization and its sustainability. The organization bore a higher cost, in both time and resources, at start up. Though its long-term vision is still under development, 100RC was not designed purposefully to close operations after a predetermined amount of time, nor was it intended to be solely funded by the Foundation. As a consequence, 100RC must diversify its resources, funding, and likely its value proposition to cities to secure financial sustainability in the mid to long term. This stands in contrast to the Foundation, which can tap into its endowments to selectively enter and exit programs as appropriate.

INFLUENCE

A final criterion that emerged was that of branding and influence. In this subject, though, comparison between a Foundation versus a 100RC model is middling. The 100RC implementation model caused some confusion both in member cities and among peer programs about the degree of independence between the two entities. They were often used interchangeably to describe the work on the ground. This lent legitimacy and prestige in many settings but may have undercut some intended goals related

to spinning off a new implementation entity. The level of perceived independence will likely play a role in long-term financial sustainability of 100RC.

Conclusion

In summary, the evaluation team's review of the literature in comparison to the 100RC theory of change supports the original decision by The Rockefeller Foundation to launch the program as an independent entity. Enabled by its independence and nonprofit status, 100RC can recruit and mobilize staff with skills and breadth necessary for evolving work; be nimble and maintain entrepreneurial flexibility and risk tolerance associated with urban interventions; deploy intensive resources to cities in the form of grants, TA, and partnerships; and, manage relationships across such a broad and geographically diffused population of cities embodied in 100RC operations.

The details and meat of the 100RC theory of change did not develop until after the decision to launch it as an independent entity had been made. This chronology poses an ontological challenge to this review: the organizational model supports the theoretical model, but the latter came out of the former. Alternative theoretical models could have been developed with other operational entities, including within The Rockefeller Foundation's traditional grantmaking initiatives, that would be aligned with those organizational practices. Counterfactual alternatives to 100RC, of course, do not exist.

In all cases, though, the 100RC's organization model is still evolving, particularly given its commitment to help some member cities transition into implementation while assisting the other cities, including nonmember cities, with Strategies. The model is dynamic. Like its theoretical soundness, 100RC's operational sustainability is predicated on its future ability to incubate other funders and harness staff, knowledge, and resources during the transition into implementation.

Appendix. Learning Questions and Pathway Constructs

Resilient Cities Pathway

Research questions:

- Have cities institutionalized resilience through key processes, structures, rules, laws, and operations (budget, regulatory, enforcement, procurement)? To what extent are any changes in cities' policies and practices likely to sustain?
- How is the function/role of the CRO becoming integrated into the city administrative structure? How centralized or how integrated is that function/role becoming? Do some city organizational structures work better than others and under what circumstances? Does institutionalization happen more frequently in certain regions or contexts?
- To what extent has the 100RC engagement improved cities' capacity to design and implement resilience solutions? To what extent are improvements attributable to the methods and tools that were uniquely or proprietarily provided by 100RC?
- Have underrepresented populations, particularly the poor and vulnerable, benefited from the work of 100RC and the investment of the Foundation?
- How useful and relevant were the platform resources to the member city stakeholders (form perspective of both cities and partners in comparison to other nonplatform providers? Did the cities alter the ways in which they identify or acquire solutions from providers as a consequence of platform engagement?
- Do the resilience strategies represent a strong point of view of actions city must take? Are these views widely support and understood? Do strategies lead to greater resilience?
- How are cities understanding of the shocks and stresses changing or not between application and strategy release? Are the solutions and thinking consistent with greater resilience framing?
- Has the city's engagement with 100RC incentivized them to commit their own resources to resilience building solutions? To what extent has the 100RC partnership been used to leverage other public resources (local, state, or federal) in resilience building activities? To what extent

has the 100RC partnership been used to leverage private or philanthropic resources in resilience building activities?

How are CROs and cities institutionalizing data collection and monitoring opportunities in the long-term data collection opportunities?

TABLE A.1

Intervention and Implementation Monitoring Domain

Construct	Description
Interest and motivation	The intensity of interest (low, middling, high) is measured qualitatively by the consensus of respondents' explicit desire to be in 100RC. Motivation is a descriptive identification of the primary reasons for participating: funding; global recognition; city-to-city network involvement; knowledge resources or technical assistance; and intrinsic city transformation are the goals defined from phase 1.
Need for resilience	Alignment between respondents' perceptions of the local need for resilience building as demonstrated by shared reporting of specific shocks and stressors is scaled into the following categories: dispersed (that is not aligned), converging (increasingly alignment); converged (largely aligned); and dispersing (increasingly not aligned).
Resilience definition	The consistency of definitions of resilience between respondents and 100RC is distinguished simply as "mixed" or "consistent" based on respondents' depiction of the holistic integration of shocks and stressors.
100RC offerings	Respondents' perceptions of the sum of 100RC services and tools are aggregated and then categorized as low, mixed, or high. Occasionally, a value of NA is given if all respondents are unfamiliar with or are unable to speak to the 100RC intervention.
Resilience Strategy implementation status[a]	The quantity and level of advancement of Strategy initiatives are collectively categorized as follows: "limited" if only 1–2 initiatives have seen early advancement both by CRO accounts and detectable planning or financing evidence, "modest" if 1–2 number of initiatives have advanced almost to completion or a larger number (3–6) are in early stages; or "strong" if more than 3 initiatives are completed or have advanced detectably.

[a] Tracked for post-strategy cities only.

TABLE A.2

Institutional Outcomes

Domain and construct	Final Indicators
Domain 1: Planning	
1. Explication of resilience	a. Explicit and implicit references to resilience in plans other than the Strategy b. Definition and topical operationalization of resilience in plans other than the Strategy c. Definition and topical operationalization of shocks and stressors in plans other than the Strategy d. Articulation of resilience projects or actions in the relevant plans other than the Strategy No references in planning documents beyond the Strategy to resilience and resilience-building efforts merits a "none" measure. Some loose references to the word "resilience" earn an "implicit" explication score. References with a clear understanding of the term and of the city's shocks and stressors earn a "strongly implicit" explication score. But, clear cross-

Domain and construct	Final Indicators
	reference between planning products to a robust definition, consistent identification of shocks and stressors, and to the Strategy (as developed) earn an "explicit" level of explication measure.
2. Use of science and evidence	a. Cited basis (such as credible data, scenarios, or forecasts) for defining uncertainty and dealing with uncertain futures b. Cited reliance on or use of evidence for plan priorities and decisions in plans other than the Strategy The use of evidence in planning (particularly around accurate assessments of shocks and stressors) earns "minimal" (a few references to secondary demographic or land use data and no linkage to planning decisions or recommendation), "modest" (references to risk assessment data in addition to the minimal along with clearer logic for decisions), or "extensive" (the use of primary data for conditions and risks and sound linkage to decisions) measures.
3. Internal consistency with other city plans	a. Existence and depth of cross-references across plans (particularly, on shocks but with stressors as applicable) b. Familiarity of plan authors and implementing agents beyond their purview (including the eventual Strategy) "Inconsistent" planning means no collaboration was held or reference made to other institutions' planning in the same city. "Modestly consistent" suggests some review or singular references. "Largely consistent" means that there is formal collaboration in the development of planning products and explicit cross-reference (often in the form or defined roles). "Consistent" denotes a formal, extensive collaboration and shared references and state of development.
4. Vertical integration with broader scale plans	a. Existence and depth of plan cross-references across upwards and downwards governance entities' plans b. Familiarity and involvement of state, regional, or national entities with city plans (including the Strategy) Vertical integration measures mirror the internal consistency measures using the same collaboration and cross-referencing standards and similar scale ("not integrated, largely integrated, and integrated"), but with an added middling measure of "satisfies requirements" as many cities face regulatory and constitutional specifications for submitting plans to state, regional, or national entities though this process does not necessarily lead to detectable integration.
5. Community accessibility to plans and participation in plan development	a. Procedures (formal requirements and informal) for community participation in plan development b. Representativeness and diversity of participants in recent and current plan developments c. General community accessibility, awareness, and familiarity with published plans d. Media accessibility, awareness, and familiarity with published plans (both existence of reporting and nature of commentary) The ability to participate and the quality and representativeness of engagement in city planning for the diversity of constituents is measured as "inaccessible" (no formal requirements and no detectable informal engagement), "satisfies requirements (formal requirements and modest documentation), "largely accessible" (formal requirements and extensive, documentation), and "accessible" (for formal requirements and processes, extensive documentation, and measurable engagement outcomes with clear feedback links to planning.)

Domain and construct	Final Indicators
6. Alignment with vulnerabilities and vulnerable populations	a. Procedures (including quantification) to identify vulnerable populations in plans b. Procedures to plan for vulnerabilities City planning with an "exclusive" score for alignment with vulnerable populations make no reference in plans to specific income, racial, gender, physically-challenged, and other groups facing a disproportionate effect from the shocks or stressors in question. "Modestly inclusive" scores are earned by directly referencing these communities. "Inclusive" city planning foregrounds the vulnerable populations in reference to every shock and stressor, if not as a core stressor in their own right, and makes specific recommendations for initiatives that address these groups' vulnerabilities.
Domain 2: City operations	
1. Governmental structure	a. Existence of CRO position, office, or other central resilience entity b. Organizational position of CRO position or office A binary "yes" or "no" measure a CRO or similar coordinating entity within city government, though a "partially" score was introduced when the position exists but has detectably reduced coordinating powers or reassigned roles that deemphasize resilience-building efforts.
2. Function ("silos")	a. Connections and communications between CRO and other city officials b. Non-CRO staff commitments to CRO office and activities across city departments (including Resilience Steering Committee) c. Connections and communications between city officials beyond CRO (e.g., task groups) d. Distribution of explicit authority or missions over resilience-related functions e. Evidence of "de-siloing" or coordinated action across city functions (only around stated shocks) The persistence of silos is measured by the number and quality (formal versus informal) of collaborations between government agencies and sectors. In this case, a "strong" is a negative, depicting few cross-silo collaborations. "Modest" siloes are those that remain in place but with some informal collaboration and rare formal cross-functional work. "Weak" siloes are those for which roles are more porous, both formal and informal communications are weak, and there is distributed or shared authority.
3. Political/public discourse	a. City leadership commitments to resilience activities (including public statements only) "Weak" commitment scores equate to no public statements of support for the CRO or resilience-building (and the occasional rumbling against support). A "modest" score means some formal support only, particular through perfunctory press releases and the like. "Strong" support means an active and involved support from city leadership as well as resilience being a subject of political debate.
4. Transparency and accountability	a. Use of evidence around risks or shocks for performance b. Public access to city data, reports, and organizational resources around risks or shocks "Low" transparency and accountability around shocks, stressors, and resilience efforts assumes minimal efforts to document and monitor CRO and related activities and publicly track them. "Satisfies requirements" means that there are formal requirements and modest documentation like all other governmental activity. A score of "significant" transparency requires not only the perfunctory requirements but also special attention to highlighting and monitoring these efforts (such as new public interfaces or city scorecards).

Domain and construct	Final Indicators
5. Budget operations	a. Nongovernmental revenue sources (private and civic financial commitments) b. Resilience "lens," screens, justifications or other framework for budget allocation c. CRO office or explicit resilience administration budget line item and funding d. Strategy's and relevant plans' project or action budget line item and funding A score of "none" connotes neither resilience-focused budgeting nor attempts to leverage other funds. "Some" resilience budget operations can indicate movement along either, and "extensive" requires both with additional significant movement along one or both budgetary objectives.
6. Governance operations	a. Vertical governance actors' ("upwards" and "downwards") commitments to city resilience b. Interjurisdictional governance (neighbors and metropolitan entities) actors' commitments to city resilience c. Overlapping governance (such as utilities and watersheds, limited to Strategy shocks) actors' commitments to city resilience A score of "none" connotes no functional changes or cross-governance relationships or commitments for a city's resilience-building efforts between the city and its state, regional, or national government. "Some" means that there is a limited amount of coordination (usually seen in areas like watershed management or emergency response and preparedness). "Extensive" cross-governance operations require frequent and regular state or national commitments in support of the city's efforts.
Domain 3: Contributing factors	
1. General city characteristics and shocks	a. Population (city and metropolitan region, if applicable) b. Land size (city and metropolitan region, if applicable) c. Evolution of shocks during 100RC d. Recentness of shocks. e. Severity of recent shocks (economically or socially) Secondary sources (including Demographia, the city applications to 100RC and internal 100RC administrative documents) are used to monitor this descriptive data.
2. General planning operations and plans	a. Number, frequency, and product of major city plans b. Number, frequency, and product of functional city plans (e.g., "silos" like housing, transportation, economic development) c. Number, frequency, and product of topical city plans potentially related to resilience (e.g., "sustainability," "climate," or "green" plans) d. Number, frequency, and product of city plans related to shocks (e.g., water management, or emergency mitigation and preparedness) e. Planning authority and delegations The update frequency and robustness of city plans are tracked and assessments from "weak," to "modest," and "strong" are made based on increasing frequency and quality—the latter using urban planning literature scholarship.

Domain and construct	Final Indicators
3. General city operations	a. Organizational charts or structures with staffing distribution b. Government size and capacity c. Functional authority per departments. d. Nonresilience "de-siloing" or coordinated action efforts e. "Open government" initiatives and other transparency efforts f. "Big data," city command centers, and other initiatives regarding broad city data and monitoring g. City performance monitoring and evaluation requirements and implementation Secondary sources (including the United Nations and World Bank reports and cities' own public documents) are used to monitor this descriptive construct. Functional strength is categorized into three tiers based on city service delivery to citizens.
4. Political conditions and policy context	a. Frequency of executive transitions b. Nature of leadership political beliefs regarding public investments and governmental organization c. Use of resilience language in mayoral/manager political campaigning d. Insulation of bureaucratic function from politics e. Public engagement activities with the private sector f. Public engagement activities with the civil sector Stable and unstable values are the only measures used for this construct, and these are determined based on qualitative assessment of a city's continuity but with a required descriptor for any change in the above indicators.
5. Social conditions	a. Standard of living and development (national and/or regional) b. Largest city-provided social services ($ and staff count) c. Civil-sector size (particular to shocks and stressors) d. Existence of community engagement functions and location in city organization e. Evolution of stressors during 100RC f. Vulnerable populations type (income, race, gender) and risk A proxy (World Bank developmental indicators) are used for social conditions.
6. Financial conditions and operations	a. City annual GDP per capita or economic output measure b. Procedures for taking debt or debt capacity c. Sources and recent magnitude ($) /proportions (%) of revenue by source for city government d. Authority over budget allocations e. Budget allocation process (frequency and duration) f. Nontraditional budget allocation processes (including participatory budgeting, performance-based budgeting) g. Existence, use, and nature of procurement procedures Both the strength of a city's budgeting conditions (revenue and debt capacity) and the transparency of those systems are tracked—the former categorized into "weak," "modest," and "strong" financial positions and the latter into an "opaque" or "transparent" binary. Both are based on the city administrative budget reports and, as applicable, national budgets if these are centralized.

Domain and construct	Final Indicators
7. Governance conditions	a. Qualitative centrality of city to region, province/state, nation. b. City's relationship to "upwards" entities (county, state, province, nation, international development agencies). c. City's relationship to "downwards" entities (neighborhood or sub-municipality if applicable). d. City's relationship to neighboring cities and metropolitan entities. e. City's relationship with overlapping entities (e.g., utilities, watersheds) The status of relations between the city and its state and national governments is qualitatively assessed from weak to strong based on key information interviews and document reviews of constitutional divisions of authority. A special note is tracked for the level of national centralization of city governments, as well.

Partners Pathway

Research questions:

- To what extent did partners learn about city resilience by working with member cities as a result of 100RC engagement? Do platform partners engage with multiple cities based upon the parameters of their 100RC offering? Do platform partners engage with a diverse representation of cities in the 100RC network?
- Are they deploying more frequent and/or different (including innovative) resilience tools and services to cities now than before partnering with 100RC? Has the nature of their engagement with cities changed as a result of engagements with 100RC cities? If so, how? Are they deploying resilience tools to both member and nonmember cities?
- Did working with 100RC spur partners to innovate around resilience and find ways to address unmet resilience needs? Did they make any modifications to their existing tools and services based on their work with member cities? Did they create new tools and services, and are they deploying these tools and services in member cities and beyond? Did working with 100RC enable new partnerships among partners themselves to develop new tools to meet unmet resilience needs? To what extent are identified solutions scalable and replicable?
- Are resilience strategies (and its discrete deliverables) a useful tool in articulating needs and opportunities to potential solution providers and solution developers? What, if anything, needs to be changed or added to the 100RC strategy activities and protocols to better articulate these needs?

- How have partners responded to the value proposition of the platform? How useful and relevant were platform resources to the member city stakeholders (from partner perspective)?

TABLE A.3

Partners Pathway Constructs and Indicators

Constructs	Indicators
1. 100RC partnership	a. Perceptions of 100RC partnership process b. Number of 100RC city engagements c. Perceptions of city engagements These are qualitative indicators of the partner perceptions, and quantified measures of frequency and depth of city engagements.
2. Market for resilience products and services	a. Level of cities' demands for partner products and services b. Evolution of the range, quality and pricing of partner offerings c. Quality and quantity of partner-city engagement d. Barriers to the city/demand side e. Barriers to the provider side These are descriptive indicators of the frequency and revenues of partner products for cities, but also including barriers and enablers to that marketplace
3. Internal business operations	a. Resilience work expansion outside of 100RC b. Changes in stated partner mission, vision or marketing approach c. Strategic reprioritization or reallocation of business development investments d. Processes for institutionalizing strategic shifts These are qualitative, normative indicators of the changes within the partner operations as depicted in public documents (such as corporate reports) and internal staff informants.

Champions Pathway

Research questions:

- To what extent do the CROs, mayors, and other city leaders change thinking and increased awareness toward a more resilient state in the 100RC cities, and why? Have CROs been more/less successful changing thinking among city leadership? City stakeholders? Residents? How has this change in thinking led to enhanced capacity and practice in the implementation of the resilience strategy?
- Have leaders in member cities gained recognition as champions and spokespeople for resilience? What are the main drivers in garnering this recognition?

- To what extent are citizens and politicians voting for/running on a platform of resilience? To what extent are they talking about holistic resilience in major speeches (such a "State of the City" talk)?
- Have city champions in 100RC cities become ambassadors of resilience beyond member cities?
- To what extent did the network support knowledge sharing, learning, and capacity building among CROs and their teams? To what extent did the network support collaboration and replication of successful resilience building activities?
- To what extent was 100RC successful in scaling a holistic definition of resilience across diverse cities? Through a city's industries and people?
- To what extent has 100RC helped shape what an urban resilience practitioner is?

TABLE A.4

Champions Pathway Constructs and Indicators

Constructs	Indicators
1. Sustainability of the city resilience network (100RC network)	a. Size, strength and structure of network b. Usefulness of network participation outweighing costs c. The quantity and sources of 100RC CRO network information flow These are quantitative indicators of the frequency of interactions between CROs in the 100RC network, as then mapped and tracked via network analysis.
2. Resilience professionalization (champions)	a. Replication and transfer of knowledge (diffusion and contagion) beyond network b Adaption of 100RC actions or transfer of 100RC knowledge beyond network These are frequency indicators of the networks beyond the 100RC communications, and CROs' linking of these for other purposes or goals.
3. Champion qualities and practices	a. Explicit resilience measures in public announcement by city b. Support of resilience efforts in non-100RC venues c. Credibility, authority, and political space d. Leadership and initiative These are entirely qualitative indicators collected through professional who work daily with the "champion" CROs, to define their successful behaviors.

100RC Model

Research questions:

- To what extent did 100RC influence the field of urban resilience and theories of change around improving it?
- Does the 100RC model, as expressed in its theory of change, stay relevant and useful over time? What are we learning about the use of intermediaries and institutional models, as a cost-effective way for the Foundation to get greater reach across cities and partner pathways?
- Is there a strong rationale for the use of a competition to catalyze urban resilience? How does this rationale compare with city selection strategies in other resilience-building programs?
- What lessons emerge for The Rockefeller Foundation on building networks from 100RC's network planning and activity?

Notes

[1] Letter to The Rockefeller Foundation staff from the executive team, care of N. Coleman, Re: Approval of the 100 Resilient Cities Centennial Challenge" May 3, 2013 [sic].

[2] From The Rockefeller Foundation's 2013 Board update documents.

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