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Urban Wreckage and Resiliency: Articulating a Practical Framework for Preserving, Reconstructing, and Building Cities

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URBAN WRECKAGE AND RESILIENCY: ARTICULATING A PRACTICAL FRAMEWORK FOR PRESERVING, RECONSTRUCTING, AND BUILDING CITIES

JOHN TRAVIS MARSHALL* AND RYAN MAX ROWBERRY**

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INTRODUCTION

Horror stories of urban natural disasters were once the occasional subject of glossy National Geographic articles or newspaper “shock” pieces.¹ The articles described doomsday scenarios replete with ravaged cityscapes, flooded subway tunnels, submerged iconic buildings and landmarks, and scores of casualties. They also estimated multi-billion dollar price tags for disaster response and long-term recovery efforts.²

In the last decade, these articles, which seemed more science fiction than clarion calls for action, proved prescient. In 2005, Hurricane Katrina and catastrophic failure of floodwall systems reduced New Orleans to a lifeless, nearly uninhabitable city for weeks.³ Katrina proved to be the third most expensive natural disaster in modern world history.⁴ Ensuing storms proved Katrina was no fluke: Hurricane Rita (late 2005) and Hurricane Gustav (2008) nearly delivered a second knock-out

1. See, e.g., Erik Holm, *A New York Hurricane: So Long, Subways*, WALL ST. J. (Sept. 1, 2010, 5:06 PM), <http://blogs.wsj.com/metropolis/2010/09/01/hurricane-earl-new-york-hurricane-so-long-subways/> (cautioning two years before Sandy’s landfall that “even a minor hurricane that lands in the wrong spot at the wrong time would bring destruction far worse than the region has ever seen”); *The Man Who Predicted Katrina*, PBS (Nov. 22, 2005), <http://www.pbs.org/wgbh/nova/earth/predicting-katrina.html> (interview with Louisiana State University professor who described the catastrophic flooding of New Orleans that would come to pass when Katrina’s floodwaters toppled the city’s floodwalls, lamenting in 2004 that “it . . . look[s] like it’s going to [take] a catastrophe in order to mobilize [the infrastructure changes necessary to protect New Orleans]”); Joel K. Bourne, Jr., *Louisiana Wetlands: Gone with the Water*, NAT’L GEOGRAPHIC, Oct. 2004, at 92, available at <http://ngm.nationalgeographic.com/2004/10/louisiana-wetlands/bourne-text> (Ten months before Katrina’s landfall, this article explained in detail why “[t]he Federal Emergency Management Agency lists a hurricane strike on New Orleans as one of the most dire threats to the nation, up there with a large earthquake in California or a terrorist attack on New York City.”); Mark Fischetti, *Drowning New Orleans*, SCI. AM., Oct. 2001, at 76, available at <http://www.scientificamerican.com/article/drowning-new-orleans-hurricane-prediction/> (possibly the best known account predicting Hurricane Katrina’s devastation almost four years before the storm); Erik Larson, *Hurricanes on the Hudson*, N.Y. TIMES, Sept. 25, 1999, <http://www.nytimes.com/1999/09/25/opinion/hurricanes-on-the-hudson.html> (discussing a study the “Army Corps of Engineers released in 1995, in which the [C]orps concluded that even a modest hurricane, on just the right track, could drive an immense storm surge into lower Manhattan, submerge Kennedy Airport and drown a few subway trains”).

2. See, e.g., Bourne, Jr., *supra* note 1, at 92 (recounting a doomsday scenario in which a hurricane would strike New Orleans, leaving tens of thousands dead and sewage and industrial waste blanketing the city); Chris Carroll, *Hurricane Warning: In Hot Water*, NAT’L GEOGRAPHIC, Aug. 2005, at 72, available at www.ngm.nationalgeographic.com/2005/08/hurricane-warning/carroll-text (predicting that the Atlantic seaboard will see decades of catastrophic hurricanes); Rick Gore, *Wrath of the Gods: A History Forged by Disaster*, NAT’L GEOGRAPHIC, July 2000, at 37; Michael Parfit, *Living with Natural Hazards*, NAT’L GEOGRAPHIC, July 1998, at 2.

3. See *The Man Who Predicted Katrina*, *supra* note 1 (describing the conditions of New Orleans after Hurricane Katrina).

4. See Amy Liu, *Rebirth on the Bayou: Lessons from New Orleans and the Gulf Coast*, NEW REPUBLIC (Aug. 26, 2011), <http://www.newrepublic.com/blog/the-avenue/94251/rebirth-the-bayou-lessons-new-orleans-and-the-gulf-coast>; see also *Counting the Cost*, ECONOMIST (Mar. 21, 2011, 5:30 PM), http://www.economist.com/blogs/dailychart/2011/03/natural_disasters.

punch to New Orleans and the Gulf Coast.⁵ The Atlantic Coast's personal experience with catastrophic natural disasters followed several years later. In 2011, Tropical Storm Irene swiped New York City causing billions in damage.⁶ Just a year later, Hurricane Sandy, a rare and powerful late season storm, decimated large swaths of the New Jersey and New York coastlines, including parts of the lower tip of Manhattan and New York City's densely populated coastal neighborhoods.⁷

The federal government along with many state and local governments, has gained intimate, painful, firsthand knowledge about how major disasters can envelop and cripple American metropolitan areas. Such disasters carve, in stark relief, the characteristics of urban areas that help them endure crisis or rebound quickly from disaster.⁸ They serve as a type of x-ray film illuminating a city's "broken bones"—the systems critical to its thriving, but which are missing or mired in dysfunction. Governments at all levels now face the daunting challenges of rebuilding cities quickly and ensuring they are stronger than before the disaster event.⁹

Unsurprisingly, this has proven to be a tough task. The road to recovery for disaster-stricken cities such as Des Moines, Joplin, New Orleans, and New York has been slow and punctuated by adversity.¹⁰ This challenge of rebuilding and simultaneously cultivating more resilient cities has become the focus of engineers, architects, economists, plan-

5. See Helen Gibbons, *Gulf Coast Impacts of Hurricane Gustav and Ike Documented by USGS Extreme-Storms Group*, USGS (Oct. 2008), <http://soundwaves.usgs.gov/2008/10/>.

6. Sam Dolnick, *Recovery is Slower in New York Suburbs*, N.Y. TIMES, Aug. 28, 2011, www.nytimes.com/2011/08/29/nyregion/wind-and-rain-from-hurricane-irene-lash-new-york.html.

7. See Ginger Adams Otis, *Hurricane Sandy, One Year Later: Tracing the Superstorm's Path from Inception to Destruction*, N.Y. DAILY NEWS (Oct. 26, 2013, 5:27 PM), www.nydailynews.com/new-york/hurricane-sandy/sandy-1-year-storm-winds-article-1.1495677.

8. See e.g., Judith Rodin, *A Stronger, More Resilient New York*, Rockefeller Foundation (Jun 11, 2013), <http://www.rockefellerfoundation.org/blog/stronger-more-resilient-new-york>.

9. See Christine Becker, *Disaster Recovery: A Local Government Responsibility*, PM MAG. (Mar. 2009), <http://webapps.icma.org/pm/9102/public/cover.cfm?title=Disaster%20Recovery%3A%20A%20Local%20Government%20Responsibility&subtitle=&author=Christine%20Becker>.

10. See, e.g., Kyle Munson, *5 Years Later: Remembering the 2008 Flood*, DESMOINESREGISTER.COM (June 8, 2013), <http://www.desmoinesregister.com/article/20130609/NEWS/306090021/5-years-later-remembering-2008-flood>; Tara McKelvey, *Two Years After a Tornado, Joplin Struggles to Rebuild*, BBC NEWS (May 22, 2013, 10:13 PM), <http://www.bbc.co.uk/news/world-us-canada-22578180>; John T. Marshall, *Weathering NEPA Review: Superstorms and Super Slow Urban Recovery*, 41 ECOLOGY. L.Q. (forthcoming 2014) (describing the extraordinary delays in delivery of federally-funded, long-term recovery projects to the residents of New Orleans); Laura Trevelyan, *Superstorm Sandy: US Marks One Year Anniversary*, BBC NEWS (Oct. 29, 2013, 8:50 AM), <http://www.bbc.co.uk/news/world-us-canada-24721439>.

ners, non-profits, lawyers, building construction specialists, foundations, and policy makers.¹¹

A common, fundamental question being asked is: How do we develop communities that can withstand disaster but also adapt to the myriad challenges posed by natural hazards, economic crises, and/or dramatic population shifts?¹² This paper suggests that governments use a City Resilience Index as a policy tool to measure cities' comparative resiliency. A City Resilience Index employs quantitative metrics that provide critical data to governments, allowing them to identify current problems, track progress, and create more refined incentives for cities to incorporate specific tools, programs, and policies into their current and future planning.¹³ It also provides critical, comparative data for the formulation of more rapidly deployed, targeted responses to catastrophic disasters.¹⁴ Devising and implementing a long-term recovery plan is a daunting process that leaves most states and cities flying blind.¹⁵ With the aid of an index, key players in developing resilient cities—governments, the private sector, non-profit and philanthropic organizations, and most importantly, city residents—have a compass to guide disaster preparation and response, or simply to advocate for policy changes and investments to ensure the long-term vibrancy of cities.¹⁶

A broad range of potential components may comprise a City Resilience Index—from health care, to schools, to social services, to transportation infrastructure.¹⁷ This article looks at just two index components: (1) housing and (2) historic resources. We select these two critical con-

11. The Rockefeller Foundation has recently launched an initiative to select 100 resilient cities and endow them with financial support to create a chief resilience officer (CRO) along with technical support and resources to develop and implement plans for urban resilience over the next three years. *See generally The Rockefeller Foundation 100 Resilient Cities Centennial Challenge*, ROCKEFELLER FOUND., <http://100resilientcities.rockefellerfoundation.org/> (last visited April 24, 2014). New York City and Boston have also recently conducted in-depth studies on the vulnerabilities of their respective cities and strategies to make them more resilient. *See* CARL SPECTOR & LEAH BAMBERGER, CLIMATE READY BOSTON (2013), *available at* www.cityofboston.gov/news/uploads/30044_50_29_58.pdf; MICHAEL R. BLOOMBERG & N.Y.C., PLAN NYC: A STRONGER, MORE RESILIENT NEW YORK (2013), *available at* <http://www.nyc.gov/html/sirr/html/report/report.shtml>.

12. One monograph examining resiliency in general calls this “preserving adaptive capacity.” ANDREW ZOLLI & ANN MARIE HEALY, RESILIENCE: WHY THINGS BOUNCE BACK 6–8 (2012).

13. *See* Christina Hernandez Sherwood, *Ranking the ‘Resilience’ of Hundreds of U.S. Cities*, SMARTPLANET (July 20, 2011), <http://www.smartplanet.com/blog/pure-genius/ranking-the-resilience-of-hundreds-of-us-cities/> (discussing city resilience indexes and factors that are considered in compiling indexes).

14. *Id.*

15. *See* Adam Stone, *Long-Term Recovery Planning: What You Need to Know*, EMERGENCY MGMT. (May 15, 2013), <http://www.emergencygmt.com/disaster/Developing-Long-Term-Recovery-Plan.html>.

16. *See* *Resilience*, RESILIENTCITY.ORG, <http://www.resilientcity.org/index.cfm?id=11449> (last visited April 24, 2014) (discussing how city resilience will allow cities to prepare and cope with future disasters).

17. Sherwood, *supra* note 13.

cerns because they represent important facets of virtually every city. Mindful of how housing and historic resources have figured prominently in recent long-term recovery programs,¹⁸ this paper identifies factors that are critical to evaluating resilience in these areas, and suggests how these factors might be measured to create a City Resilience Index score.

Part I of this paper describes what a City Resilience Index is and why it is an effective public policy tool. Part II of this paper explores the reasons why a City Resilience Index supplies governmental, non-governmental, and private citizens with a valuable guide to prepare for and overcome natural disasters and other challenges that threaten a city's vitality. Drawing on lessons from recent disasters in the United States and abroad, Part III describes two essential components of any City Resilience Index: (A) housing and (B) historic resources. It specifies several of the critical and practical constituent parts of each of these two index components and fashions a framework for measuring their resilience.

I. WHAT IS AN INDEX AND WHY SHOULD POLICYMAKERS AND SCHOLARS CONSIDER USING ONE?

Put simply, an index is a policy tool that identifies components critical to a city's long-term resilience *and* establishes a framework to measure these components.¹⁹ While there is a defined, robust scholarship in engineering and the social sciences that examines and measures urban systems that are critical to community resilience (e.g. environmental sustainability and transportation infrastructure), legal scholarship is just beginning to emerge.²⁰

18. The Disaster Relief Appropriations Act and Sandy Recovery Improvement Act of 2013 call for establishment of a Unified Federal Review process to coordinate environmental reviews required by environmental and historic preservation laws, including the National Environmental Policy Act (NEPA). See Sandy Recovery Improvement Act, Pub. L. No. 113-2, 127 Stat. 4, 45-46 (2013). See also *FEMA's Project Worksheets: Addressing a Prominent Obstacle to Gulf Coast Rebuilding: Hearing Before the Ad Hoc Subcomm. on Disaster Recovery of the Comm. on Homeland Sec. & Governmental Affairs U.S. S.*, 110th Cong. 17-19 (2007) (statement of Perry "Jeff" Smith, Jr., Acting Director of the Louisiana Governor's Office of Homeland Security and Emergency Preparedness), available at <http://www.gpo.gov/fdsys/pkg/CHRG-110shrg37355/pdf/CHRG-110shrg37355.pdf> (singling out the federal environmental and historic reviews required when using Community Block Development Grant (CBDG) funds as a major impediment to timely response to Louisiana's housing recovery following Hurricanes Katrina and Rita).

19. HEATHER K. GERKEN, *THE DEMOCRACY INDEX: WHY OUR ELECTION SYSTEM IS FAILING AND HOW TO FIX IT* 11 (Princeton Univ. Press 2009).

20. See YALE CTR. ENVTL. L. & POL'Y ET AL., 2012 ENVIRONMENTAL PERFORMANCE INDEX AND PILOT TREND ENVIRONMENTAL PERFORMANCE INDEX 7-9 (2012), available at http://www.epi.yale.edu/files/2012_epi_report.pdf (creating a measurable environmental performance index to reduce environmental stresses to human health and promote ecosystem vitality and sound natural resource management) [hereinafter 2012 ENVIRONMENTAL

There is a small cadre of law review and legal journal articles—notably an article by Professor Patricia Salkin—that offer resilience “checklists” or “toolboxes” that city leaders may consult to ensure that they are thinking comprehensively about sustainability.²¹ But legal scholars have been slower to explore a framework that subjects these legal toolboxes, or their individual components, to some type of meaningful measurement. Without some way to measure city resiliency indicators, cities do not know whether their policies are achieving desired outcomes.

Measurable data and information, however, are the keys to better policy making and implementation. An index offers “an empirical foun-

PERFORMANCE INDEX AND PILOT TREND]; Liesel Ashley Ritchie & Duane A. Gill, *The Role of Community Capitals in Disaster Recovery*, RISK INSTITUTE 1 (2011), http://www.riskinstitute.org/peri/images/file/symposiums/Community_Recovery_from_Disaster/social,%20day%203.pdf (focusing on how communities promote resiliency pre and post-disaster by considering their capacity in seven “capital” areas: “natural, built (physical), financial (economic), human, social, political, and cultural.”); Susan L. Cutter et al., *A Place-Based Model for Understanding Community Resilience to Natural Disasters*, 18 GLOBAL ENVTL. CHANGE 598, 601 (2008), available at http://people.oregonstate.edu/~hammerr/SVI/Cutter_etal_GEC_2008.pdf (proposing the use of a “disaster resilience of place (DROP) model” to measure community resilience); Kathleen Tierney & Michel Bruneau, *Conceptualizing and Measuring Resilience: A Key to Disaster Loss Reduction*, TR NEWS 17 (May–June 2007), http://onlinepubs.trb.org/onlinepubs/trnews/trnews250_p14-17.pdf (suggesting a four-factor framework for characterizing and measuring resilience: robustness, redundancy, resourcefulness, and rapidity); see also Raymond H. Brescia & Sonia Steinway, *Scoring the Banks: Building a Behaviorally Informed Community Impact Report Card for Financial Institutions*, 18 FORDHAM J. CORP. & FIN. L. 339, 342, 361–63 (2013) (indexes also function as effective tools for promoting changes in commercial business practices; the Community Impact Report Card (CIRC) was created to give “communities across the country . . . [the ability] to shape and improve the behavior of the banks that serve them by offering consumers an easy means to assess the quality of the bank products and services available to them.”).

21. See Patricia E. Salkin, *Sustainability at the Edge: The Opportunity and Responsibility of Local Governments to Most Effectively Plan for Natural Disaster Mitigation*, 38 ENVTL. L. REP. NEWS & ANALYSIS 10158, 10158 (2008) (suggesting that local governments’ vulnerability to natural hazards can be largely mitigated through forward-looking land use planning that incorporates strict compliance with federal and state hazard mitigation laws); John R. Nolon, *Disaster Mitigation Through Land Use Strategies*, 23 PACE ENVTL. L. REV. 959, 963–64 (2006) (asserting that state legislatures “have delegated to [local governments] the principal legal authority to determine how much and what type of development may be built in disaster-prone areas” and that local governments should “use this same legal authority to develop the adaptive capacity to conduct land use planning that builds centers and neighborhoods, increases their tax base, provides for needed transportation and other infrastructure, provides affordable housing and jobs, prevents stormwater runoff, protects coastal environments, preserves wetlands and habitats, and accomplishes a host of other land use objectives”); see also Margaret E. Byerly, *A Report to the IPCC on Research Connecting Human Settlements, Infrastructure, and Climate Change*, 28 PACE ENVTL. L. REV. 936, 936–37 (2011) (enumerating specific criteria for sustainable city design); Anna K. Schwab & David J. Brower, *Increasing Resilience to Natural Hazards: Obstacles and Opportunities for Local Governments Under the Disaster Mitigation Act of 2000*, 38 ENVTL. L. REP. NEWS & ANALYSIS 10171, 10173–74 (2008) (suggesting five general action strategies that local governments could follow to mitigate disaster risk).

dation for policy analysis and a context for evaluating performance.”²² As several authors note, the benefits of a data-driven, measurable, transparent index are legion, and include: providing a map showing where we are; driving decision-making and debate about community goals; identifying current problems and priority issues; establishing a baseline for performance comparisons; highlighting successful policy models; benchmarking how close a jurisdiction is to achieving certain goals; tracking management trends; inspiring rigorous, transparent data collection; and serving as a yardstick for citizens by giving them figures that show actual results.²³

It should be noted that the ultimate objective of a City Resilience Index is to fashion an easy-to-read, straightforward policy tool that can be applied to judge the relative resilience of cities on, and across, a variety of levels; not as a blunt instrument for public shaming.²⁴ Nevertheless, a properly calibrated index will, as an inevitable byproduct, reveal programs that are effective as well as highlight areas where policies need to be curtailed and funding redeployed.²⁵ More importantly for the purposes of this paper, a City Resilience Index focuses pre- and post-disaster government decisions regarding where and how government manpower and resources should be invested. And in post-disaster contexts, where housing recovery is often driven initially by private sector efforts, a City Resilience Index offers non-profit and philanthropic entities a framework for targeting their grant funds and organizational resources to bolster cities in key areas that may be compromised.²⁶

II. THE NEED FOR A CITY RESILIENCE INDEX.

Imagine your hometown’s cityscape following a disaster, such as an earthquake or hurricane. Or, consider what that city might look like

22. YALE CTR. ENVTL. L. & POL’Y ET AL., 2008 ENVIRONMENTAL PERFORMANCE INDEX 8 (2008), available at http://www.yale.edu/epi/files/2008EPI_Text.pdf [hereinafter 2008 ENVIRONMENTAL PERFORMANCE INDEX].

23. See GERKEN, *supra* note 19, at 29, 64–65; 2008 ENVIRONMENTAL PERFORMANCE INDEX, *supra* note 22, at 12.

24. See *infra* Section II.

25. See 2008 Environmental Performance Index, *supra* note 22, at 12.

26. Hurricanes Katrina and Rita exposed a fundamental lack of cooperation between and among the city’s non-profit, philanthropic, financial services, and local government organizations. In the wake of the storm and an arduous period of long-term recovery, each of these communities has agreed in principle that they can achieve more by acting in consort. See URBAN FOCUS LLC, CAPITAL ABSORPTION IN NEW ORLEANS 3 (2013) (copy on file with the authors). Sponsored by the Greater New Orleans Foundation, the Ford Foundation, Living Cities, and Harvard University’s Initiative for Responsible Investment, New Orleans-based representatives from each of these critical community development stakeholders have come together with the common understanding that “[t]he strategic use of public, philanthropic, and private capital can provide a clear path forward for future capital deployment and lead revitalization of key corridors.” See *id.*

with its blocks pocked by vacant and abandoned homes and buildings. A map might be helpful as a damage assessment report, enabling you to understand the scope of the city's damage or blight. The map might also identify potential targets for recovery and revitalization. We have seen these maps on the pages of the New York Times, The Wall Street Journal, and several other newspapers depicting the story of disaster and crisis.²⁷

A typical map, however, cannot capture information about the potential capacities and limitations of a city's or state's staff, its laws, its policies, and its for-profit and non-profit institutions. A map merely fixes physical targets for redevelopment and revitalization. A City Resilience Index can serve as a tool for describing whether a city or state can deliver meaningful assistance to a target neighborhood, block, or community of people, such as low-income renters.²⁸ An index is a tool for city redevelopment partners working on the frontlines of important initiatives to revitalize a city.²⁹ Federal and state governments, as well as the philanthropic and non-profit entities working to help communities recover from disaster or crisis, such as New Orleans' experience following Hurricane Katrina, could have more efficiently and expediently deployed assistance to Gulf Coast communities if they had basic information regarding the strengths and weaknesses of local government partners.

The federal government's allocation of long-term recovery funds to the Gulf Coast, Louisiana, and New Orleans was unprecedented.³⁰ Unfortunately, the federal government dispensed the long-term recovery funds without any objective tool to measure how effectively, efficiently, or equitably state and local governments could move the federal funds.³¹

27. See, e.g., Adam Nossiter, *Largely Alone, Pioneers Reclaim New Orleans*, N.Y. TIMES, July 2, 2007, http://www.nytimes.com/2007/07/02/us/nationalspecial/02orleans.html?pagewanted=all&_r=0 (mapping current housing occupation levels in the city's neighborhood) [hereinafter *Largely Alone, Pioneers Reclaim New Orleans*]; In *New Orleans, Businesses Take First Steps Back*, N.Y. TIMES, Sept. 17, 2005, <http://query.nytimes.com/gst/fullpage.html?res=9D06E0DF1F31F934A2575AC0A9639C8B63> (showing eight maps furnishing detailed information regarding the location of banks, hotels, universities, and hospitals that remained closed or had reopened in the weeks following Hurricane Katrina).

28. See 2008 ENVIRONMENTAL PERFORMANCE INDEX, *supra* note 22, at 12.

29. See *id.*

30. See generally Victor B. Flatt & Jeffrey J. Stys, *Long Term Recovery in Disaster Response and the Role of Non-Profits*, in *DISASTERS AND SOCIOLEGAL STUDIES* 216–217 (Susan Sterett ed., 2013) (examining the inadequacy of the legal framework of disaster response in long-term disaster recovery).

31. The federal government has historically maintained expertise in furnishing short-term or emergency aid in the wake of disasters, but until recently it has had less experience partnering with state and local governments to navigate the multi-year path to long-term recovery. See *id.* at 216 (stating that “[c]ompared to short term efforts, long term recovery is considered the weaker link in the recovery picture” and that “long term recovery has historically not been planned comprehensively at the federal level.”). Hurricane Katrina exposed this federal shortcoming for managing long-term recovery. *Id.*

In the heat of the continuing humanitarian, environmental, and political crisis, Congress and HUD did not have time to ‘kick the tires’ or look ‘under the hood’ of the Gulf Coast jurisdictions that would ultimately receive federal funds.³² They had little other than anecdotal information about questions that would be vital in determining how a successful long-term recovery would proceed.³³ They likely had no objective information on the practical questions that would ultimately have a major influence on the City of New Orleans’ slow post-Katrina recovery: does a local government have a functional redevelopment authority, land bank, housing office, land trust, or community development agency? Does the redevelopment authority have experience acquiring and disposing of large volumes of properties? Does the housing office have a housing plan developed in conjunction with local stakeholders that sets priorities for meeting a community’s housing needs? Does the city support any local community development financial institutions devoted to helping bring about important community development projects? Does the city’s community development agency have a procurement policy that meets local, state, and federal requirements? Do city agencies have a history of complying with federal regulatory requirements for environmental review, wage and hour thresholds, relocation, or civil rights laws?

Designing and implementing long-term recovery efforts might be more effective and less a matter of guesswork if federal, state, and local governments could understand the challenges and capacities of the local governments that they must assist. It is not good enough to have an anecdotal understanding of the challenges faced by local governments. There should be a more detailed evaluation of the range of community resources—governmental and non-governmental—that will figure critically in implementation of any long-term disaster recovery efforts. Federal and state governments should have a pre-disaster ‘picture’ of local government capacity.

A City Resilience Index can provide that valuable snapshot.³⁴ The goal of this index project is to provide cities, states, and national governments with a well calibrated tool they can use to evaluate whether a city is in a position to pull the many levers of the machine of long-term recovery as opposed to having to endure the time-consuming, expensive, and frustrating process of inventing the long-term recovery machinery necessary to heal a city and help it thrive.³⁵ A City Resilience Index could be composed of dozens of factors. In this article we sketch out how this Index might look for just two factors critical to cities nationally and

32. *See id.* at 221–222.

33. *See id.* at 217–218.

34. *See generally* 2008 ENVIRONMENTAL PERFORMANCE INDEX, *supra* note 22, at 12.

35. *See generally id.*

internationally: housing development and the preservation of cultural and historic resources.

Designing and producing a City Resilience Index represents a major undertaking.³⁶ Think about cities and how they encompass a wide range of essential systems and resources. Each system is critical to the daily lives of residents, businesses, visitors, and major stakeholder institutions. If one browses a local government's homepage listing for its major departments, the website covers many of these critical systems, or at least important parts of them: cable television, fire, police, parks & recreation, planning & development, solid waste, wastewater, and water—just to name a handful.³⁷ A thriving city sustains all of these systems—or it creates partnerships to sustain them.³⁸ Failure to administer any one of these systems following a disaster critically impedes that city's long-term recovery from the crisis event.³⁹

Ideally, a City Resilience Index would take the pulse of each of these key city systems.⁴⁰ Professor Heather Gerken's efforts to lay groundwork for the Democracy Index illustrate the challenge of a resilient cities indexing enterprise.⁴¹ The Democracy Index represents a tool for improving just a single critical system: the government elections system.⁴² To meaningfully improve and inform local government election policies, Gerken suggests three separate index metrics.⁴³ But she emphasizes that the Democracy Index's power to spur election policy improvements depends largely on the finer points of defining and collecting appropriate data for these metrics.⁴⁴ In other words, the process and resources involved in building even a 'single system' index are formidable. Imagining a City Resilience Index that covers multiple city systems looms as an enormous undertaking.

We think this project is worth pursuing because a City Resilience Index potentially provides a much bigger 'carrot' and promises a much larger and more effective 'stick' than even the Democracy Index. There are at least three critical properties that give the Democracy Index such powerful potential force to drive change: (1) the looming threat of exposing poorly performing local election operations⁴⁵ (the 'stick'); (2) the ability to highlight the work of effective local government election staffs⁴⁶ (the 'carrot'); and (3) the capacity to give the public easy-to-understand

36. See GERKEN, *supra* note 19, at 5–6.

37. See, e.g., *Department Descriptions*, CITY OF TAMPA, http://www.tampagov.net/department_list_webapp/departments.aspx (last visited April 24, 2014).

38. See *infra* Section III.

39. See *infra* Section III.

40. See 2008 ENVIRONMENTAL PERFORMANCE INDEX, *supra* note 22, at 12.

41. See GERKEN, *supra* note 19, at 5–6.

42. *Id.* at 66.

43. *Id.* at 28.

44. See *id.* at 28–29.

45. See *id.* at 82–86.

46. *Id.* at 80–81.

information that it can use to advocate for better election administration.⁴⁷ A City Resilience Index uses these same three vectors to propel change. But it also taps at least two additional forces for change and better public policy.

First, the City Resilience Index helps measure a local government's likely aptitude for carrying out essential city building tasks.⁴⁸ This City Resilience Index also gives the federal government important information about the type of technical assistance it may need to supply to assist local governments to develop essential city building capacities.⁴⁹ In the event of disaster, the measurement also gives federal and state governments critical intelligence about the relative strengths and weaknesses of local governments so that federal and state governments can calibrate their response to address needs they know local governments cannot handle.⁵⁰ Further, as was so well documented following Hurricanes Katrina and Rita, non-profit and philanthropic funders are often the first entities ready to open their wallets to jump start long-term neighborhood and city rebuilding efforts.⁵¹ However, these non-profit and philanthropic funders usually have minimal insight into the relative sophistication and functionality of the local government. They have no sense of whether they will be funding a short-term band-aid until a high-functioning local government assumes full control of long-term recovery efforts. Or, in the case of New Orleans, non-profits and philanthropic groups have no appreciation for the fact that they may supply the principal "boots on the ground," not just for weeks or months, but for a period of years following a disaster.⁵² Immediate disaster response and the challenging road to long-term recovery require deep, continuous, and far-reaching coordination among local, state, and federal government partners.

It is extremely difficult to establish coherent boundaries between index categories that have a legal effect and those that may be less legal in nature. We have, for example, decided to exclude considerations that might fit more naturally into the finance category of a resilient cities index. This category would include indicators such as the local government's bond rating, the amount of its annual debt service as a proportion of its total annual budget, or the average length of time it takes a

47. GERKEN, *supra* note 19, at 68.

48. *See* Sherwood, *supra* note 13.

49. *Id.*

50. *Id.*

51. *When the Cameras Stop Rolling, Nonprofits Remain*, THIRD SECTOR: NEW ENGLAND, http://www.tsne.org/site/c.ghLUK3PCLoF/b.1424995/k.1D68/Articles__Nonprofits_Response_to_Katrina.htm (last visited Feb. 27, 2014).

52. *See, e.g.*, Ellen Freudenheim, *Volunteering to Help Rebuild New Orleans*, ELLENFREUDENHEIM.COM, <http://ellenfreudenheim.com/articles/travel/usa/volunteering-to-help-rebuild-new-orleans/> (last visited April 24, 2014).

city to pay its outside contractors.⁵³ We have also decided to exclude indicators that would fall into the category of customer satisfaction or process improvement. It is not hard to see how a city's commitment (or lack thereof) to improving its public interface affects delivery of housing and historic preservation services.⁵⁴ If they have not done so already, we suggest to our colleagues in the field of public administration that (a) public finance and (b) public sector customer service are two critical categories for a larger City Resilience Index. A city in which residents are unhappy, finances are questionable, and local business partners are disgruntled will struggle.⁵⁵ Residents, businesses, and service providers operate as indispensable partners in helping cities run efficiently and rebuild quickly. If local government finance systems are efficient and its customer service systems are fair and timely, chances are, they are more likely to improve their neighborhoods and seek out local government contracts.⁵⁶

III. BUILDING THE INDEX: FIRST THOUGHTS ON CITY RESILIENCE INDICATORS

Profoundly traumatic and destructive experiences associated with Katrina, Sandy, or any other major disaster are wasted if all that is expected of government-led relief is a band-aid to mend an injured community. Disasters generally expose what is not working correctly in a community. Although no two cities are identical, their general strengths and their dysfunctions likely share some common DNA. Thus, disaster recovery is not only about rebuilding cities stronger than they were be-

53. A city that is unable to pay its contractors in a timely manner under normal, non-urgent circumstances will face enormous challenges post-disaster complying with detailed federal requirements for documenting recovery work completed. See Michelle Krupa, *Companies That Helped N.O. Getting Paid 2 Years Later*, THE TIMES-PICAYUNE (Oct. 12, 2009, 11:22 PM), http://www.nola.com/news/index.ssf/2008/03/companies_that_helped_no_getti.html. See also, THE PUBLIC STRATEGIES GRP., CITY OF NEW ORLEANS: A TRANSFORMATION PLAN FOR CITY GOVERNMENT 2, 6, 8 (Mar. 1, 2011), available at http://www.nola.gov/chief-administrative-office/documents/nola_transformation_plan/. Soon after taking over City Hall from former Mayor C. Ray Nagin, Mayor Mitchell Landrieu's administration retained an outside consultant to provide the City with recommendation for reforming how the City does its day-to-day business. On the subject of paying outside contractors, the consultant did not mince words, noting that "[a]s everyone knows, New Orleans . . . has great trouble paying its bills on time. Solving that problem would improve the city's image with the business and nonprofit community, while helping the city hire better contractors, faster (since many will not now compete for city work because the city pays so slowly)." See *id.* at 19.

54. For example, does a local government offer "one-stop shopping" or streamlined permitting for building and other development permits? See THE PUBLIC STRATEGIES GRP., *supra* note 53, at 11.

55. *But cf.* Clayton P. Gillette, *Plebiscites, Participation, and Collective Action in Local Government Law*, 86 MICH. L. REV. 930, 945 (1988) (Professor Gillette describes the theoretical proclivity of individuals to choose where they live based on the package of services offered by local government, noting that "municipalities provide packages of goods or services, the total of which attracts potential residents").

56. THE PUBLIC STRATEGIES GRP., *supra* note 53, at 8.

fore a disaster event, but also about taking note of a city’s relative strengths and weaknesses, and spreading the word to other cities to help make them stronger—regardless of whether those cities should face any immediate peril from hurricane, tsunami, tornado, wildfire, or earthquake.

Disaster events such as Katrina and Sandy are not just cautionary tales. They allow us to distill the local government’s experiences down to factors that helped the city adapt to, and overcome, adversity. At the same time, we see a city’s unattractive underbelly. We have the chance to assess the factors whose absence or near-absence may have hobbled the city before disaster and then left the city in a poor position to rebound post-disaster.⁵⁷ If we can isolate these critical factors and then find a way of meaningfully measuring their presence in cities, then we will have a tool that allows for a constructive dialogue about how to build and sustain resilient cities.

Drawing on lessons of recent catastrophic disasters, Part III of this article suggests critical legal indicators that can be used to build stronger cities. Part III(A) outlines the legal index indicators that might be used to analyze the relative vitality of cities’ housing programs. Part III(B) delineates the factors that may be helpful in assessing state and city programs that promote the preservation of historic and cultural resources. The indicators are presented immediately below in Table “1”.

TABLE “1”
*Examples of Index Categories and Indicators*⁵⁸

<i>Policy Category</i>	<i>Subcategory</i>	<i>Indicator</i>
Housing and Community Development	Local Government Housing Development Legal “Toolbox”: <i>Planning</i>	Housing plan or strategy adopted by local government (housing plan developed in conjunction with local stakeholders that sets priorities for meeting a community’s housing needs)

57. See, e.g., Amy Liu, *Rebirth on the Bayou: Lessons from New Orleans and the Gulf Coast*, BROOKINGS (Aug. 29, 2011), <http://www.brookings.edu/blogs/the-avenue/posts/2011/08/26-resilience-hurricane-liu> (“Like Japan and its resurgent qualms over nuclear energy or Haiti with its government so weak it can’t serve those in need, Katrina and the levee failure exposed all that was badly broken in New Orleans.”).

58. In preparing this preliminary table of resilient city index categories and indicators, the authors’ framework has been strongly influenced by the template supplied by the Environmental Performance Index (EPI). See 2008 ENVIRONMENTAL PERFORMANCE INDEX, *supra* note 22.

	Local Government Housing Development Legal “Toolbox”: <i>Partnerships</i>	Duly procured agreements with Local or Regional Non-profit (CDCs, philanthropic organizations, etc.) and/or For-profit Housing Developers to Rehabilitate or Construct Affordable Housing At Scale (10 or more units)
	Local Government Housing Development Legal “Toolbox”: <i>Property Acquisition, Disposition & Stewardship</i>	Duly authorized property acquisition through two or more legal tools for property acquisition, including private market purchases, eminent domain, code lien foreclosure, and land swaps (local government must follow local, state and federal requirements for acquiring property, including environmental review and appraisal requirements – at scale)
Preservation of Historic and Cultural Resources	Technology – GIS Database	Information on location of historic properties incorporated into state and/or city database
	Technology – Social Media Interface	City or state-maintained portal to gather information and comments on individual historic properties
	Regulatory — Streamlined Review Processes	State or city streamlined regulations integrating the environmental and historic resources review processes

A. Resilience Index Indicators for Housing

In this initial version of the City Resilience Index, the housing category includes just a single subcategory: the Local Government Housing Development “Toolbox.” The housing category would likely be expanded to multiple subcategories as work continued on this Index. For instance, at least one of the additional housing subcategories would likely cover the legal landscape for redevelopment activities.⁵⁹

59. A housing subcategory focusing on the legal landscape for redevelopment activities might assess potential external obstacles to, and assets for, housing development programs. Each city must do the work of housing and neighborhood development in a distinctly

The Housing Development “Toolbox” subcategory evaluates the important housing development “levers” or “pulley” that a local government has, or should have, at its disposal. This subcategory focuses on legal strategies and partnerships that tend to sustain and promote safe and affordable housing. Keep in mind that the Index does not serve merely as an inventory or checklist. The Index aims to measure whether local governments use these important housing development tools as well as the level of sophistication and the capacity at which they are being used.

i. Local Government Housing Development “Toolbox”

City dwellers want to go home to safe neighborhoods with well-maintained houses or apartment buildings. Although private real estate development interests drive a large share of a city’s residential housing development, local governments, in partnership with state and federal governments, can play a vital role in promoting development and affordable housing options.⁶⁰ Cities not only contribute land or vacant buildings for these housing initiatives, but they often make financial investments in housing development and redevelopment, providing the critical gap financing that allows the projects to proceed.⁶¹

Local and state governments can play an even larger role during long-term disaster recovery. A catastrophic disaster may destroy tens of

local context. For that reason, cities often have a unique history of partnering with the federal government to create and preserve housing assets. See ALAN MALLACH, *STABILIZING COMMUNITIES: A FEDERAL RESPONSE TO THE SECONDARY IMPACTS OF THE FORECLOSURE CRISIS* 3 (Feb. 2009), available at http://www.brookings.edu/reports/2009/02_foreclosure_crisis_mallach.aspx. Some partnerships have been more positive and constructive than others. See e.g., PARTNERSHIP FOR SUSTAINABLE COMMUNITIES, *Case Studies*, <http://www.sustainablecommunities.gov/studies.html> (last visited April 24, 2014). The federal relationship is just one facet of the multi-layered housing development landscape. Peter W. Salsich, *Saving Our Cities: What Role Should the Federal Government Play?*, 36 *URB. LAW.* 475, 504 (2004). Housing development strategies are also dictated by numerous state and local laws as well as the existence—or not—of active state, local, non-profit, and philanthropic institutions. See Becker, *supra* note 9. Any of these factors can enrich or dampen a city’s development climate. Embedded in the landscape of laws and community organizations or institutions in which a local government pursues its housing goals are potential pitfalls that could frustrate its efforts as well as springboards that could augment those efforts. A future, more detailed, analysis of the housing category, might thus attempt to measure the important influence of the surrounding legal environment on a resilient housing sector.

60. See NYC: THE OFFICIAL WEBSITE OF THE CITY OF NEW YORK, *NYC Affordable Housing Resource Center*, <http://www.nyc.gov/html/housinginfo/html/home/home.shtml> (last visited April 24, 2014).

61. See NYC: THE OFFICIAL WEBSITE OF THE CITY OF NEW YORK, *NYC Recovery: Community Development Block Grant Disaster Recovery*, <http://www.nyc.gov/html/cdbg/html/home/home.shtml> (last visited April 24, 2014).

thousands of homes.⁶² Many families will have no insurance or insufficient insurance coverage.⁶³ Federal disaster block grant dollars supply states and cities with funds for rebuilding neighborhoods where there is an urgent need, such as a disaster, or the need to build housing for low- and moderate-income families.⁶⁴

It is not, however, safe to assume that different local governments possess comparable tools to promote neighborhood housing development. One local government's housing development experience may be largely limited to selling vacant properties to Habitat for Humanity for single-family housing construction. Another local government may have significant experience layering federal grants with federal tax credits and private foundation dollars. One city may not be able to find enough capable low- and moderate-income housing developers to spend the city's annual allocation of federal block grant funds, while a different city may enjoy intense competition for federal grant monies.

Under normal, non-urgent circumstances, it may make little difference to all but the city's poorest residents whether a local government effectively manages its federally funded housing programs. The level of interest in the local government's ability to spend federal grant funds efficiently increases dramatically following disasters.⁶⁵ Suddenly, the fortunes of residents of every disaster-ravaged neighborhood, regardless

62. Hurricane Sandy damaged or destroyed more than 650,000 homes. U.S. DEP'T OF HOUS. AND URBAN DEV., Hurricane Sandy Rebuilding Task Force, HURRICANE SANDY REBUILDING STRATEGY: STRONGER COMMUNITIES, A RESILIENT REGION 13 (Aug. 2013), http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2013/HUD_No.13-125 (follow "Read the full Hurricane Sandy Rebuilding Strategy" hyperlink to download pdf).

63. The 2005 hurricane season damaged an astounding 66,609 of 87,589 owner occupied housing units in the City of New Orleans, which represents 76% of owner-occupied housing units. U.S. DEP'T OF HOUS. AND URBAN DEV.'S OFFICE OF POLICY DEV. AND RESEARCH, CURRENT HOUSING UNIT DAMAGE ESTIMATES: HURRICANES KATRINA, RITA, AND WILMA 23 (Apr. 7, 2006), *available at* https://gnocdc.s3.amazonaws.com/reports/Katrina_Rita_Wilma_Damage_2_12_06__revised.pdf. More than 38% of damaged units either had no insurance or had property insurance but lacked flood insurance. *Id.*

64. To comply with the U.S. Department of Housing and Urban Development's programmatic requirements, state and local governments must ensure that the projects they fund with CDBG dollars meet one of three required "national objectives": Activities benefiting low and moderate-income persons, activities eliminating slum and blight, and activities addressing urgent community development needs. *See* 24 C.F.R. § 570.208 (2014) (national objective compliance for entitlement grantees); 24 C.F.R. § 570.483 (2014) (national objective compliance for the states). *See also* U.S. DEP'T OF HOUS. AND URBAN DEV., *CDBG Disaster Recovery Assistance*, http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/drsi (last visited April 24, 2014) (providing a summary of programmatic requirements for HUD's disaster Community Development Block Grant awards, including the requirement that grantees satisfy one of three HUD national objectives).

65. Campbell Robertson, *A Race for a New Mayor; a Trial for an Old One*, N.Y. TIMES, Jan. 27, 2014, http://www.nytimes.com/2014/01/27/us/politics/a-race-for-a-new-mayor-a-trial-for-an-old-one.html?_r=0 (describing New Orleans' increasingly more engaged sophisticated electorate following Hurricane Katrina and the current mayor's boast that he cleared the clog in the pipeline of federal recovery funds caused by the previous mayor).

of income, depend in some way on the aptitude and experience of state and local governments in facilitating housing development. A local government struggling for proficiency with only the most basic legal tools to promote housing development will be outmatched and fundamentally overwhelmed when disaster strikes and its neighborhoods must be rebuilt.⁶⁶ To be sure, it is difficult to imagine that any local government can easily bear the stress of post-disaster rebuilding. All city residents affected by disaster will encounter tremendous adversity.⁶⁷ But it is the very low-income, low-income, moderate-income and even middle-income families that will have a great personal stake in the city's ability to design, implement, and manage critical facets of the neighborhood housing recovery.⁶⁸

It is important for the federal government, state governments, non-profit and philanthropic developers, and the general public to have the ability to gauge the capacity of the local government to promote sophisticated housing development. The following three housing index indicators are examples of the factors that would likely be important in determining whether a local government possesses the necessary legal "toolkit" to pursue the sophisticated housing development that promotes affordable and equitable housing opportunities under non-crisis circumstances. This same legal toolkit is essential for confronting the enormous problems that challenge a community following a disaster. A more mature City Resilience Index would include a number of additional housing indicators.

a. Planning Tools

When disaster strikes, almost everyone, including the chair of the planning board and board staff, becomes preoccupied with the steps that they must take personally to rebuild their homes. Thus, this is not an ideal time to *plan* for rebuilding. Rather, this is the time to mine and implement existing plans so that cities and their neighborhoods can address their essential housing needs and follow guidelines that have been

66. See Amy Liu, et al., *Introduction*, in RESILIENCE AND OPPORTUNITY: LESSONS FROM THE U.S. GULF COAST AFTER KATRINA AND RITA (Amy Liu et al. eds., 2011).

67. See Raymond H. Brescia et al., *Crisis Management: Principles that Should Guide the Disposition of Federally Owned, Foreclosed Properties*, 45 IND. L. REV. 305, 328, 328 n.196 (2012) (explaining that Katrina's floodwaters hit low-lying, low-income neighborhoods hardest, but that those waters "devastated the lives of all New Orleanians, destroying their homes or school or churches and depriving many of their jobs").

68. See John Marshall, *Weathering NEPA Review: Superstorms and Super Slow Urban Recovery*, Vol. 41, No. 1 ECOLOGY. L. Q. __ (forthcoming 2014) (describing that "[w]ith a few notable exceptions, the neighborhoods that endured the most severe flooding were home to lower- and middle-income African American families" and that the lengthy regulatory and administrative delays in implementing the city's long-term recovery strategy meant that these same neighborhoods recovered most slowly).

carefully developed to make sure the next generation of housing development is stronger, greener, safer, and more affordable.

The housing category of the City Resilience Index should include at least one indicator for assessing whether local governments have plans in place to address the adversities presented by disasters.⁶⁹ This index indicator would credit cities for adopting comprehensive plans and procedures for updating those plans on a regular basis. Enhanced index scores will be possible for jurisdictions that have adopted a comprehensive plan with a housing component that includes detailed goals and objectives for developing housing to serve the city's very low-income and low-income families.⁷⁰ Such goals and objectives might include specific plans and strategies for moving families out of harm's way in the event of disaster and allowing for higher-density development in areas that are considered safer.

There are three reasons why it is critical for City Resilience Index's housing category to include a planning indicator. First, it cannot be taken for granted that all local governments have housing plans or policies. When Hurricane Katrina struck in 2005, New Orleans did not have a housing policy—not even a policy that could have been modified in the wake of Katrina.⁷¹ Second, plans stake out a path and priorities for orderly development prior to the chaos of crisis.⁷² If a local government

69. See Patricia E. Salkin, *Sustainability at the Edge: The Opportunity and Responsibility of Local Governments to Most Effectively Plan for Natural Disaster Mitigation*, 38 ENVTL L. REP. NEWS & ANALYSIS 10158, 10159 (2008) (Professor Salkin urges that one important way we can help diminish vulnerability at the local level is by making sure that the requirements of federal and state hazard mitigation laws are: (a) incorporated in local comprehensive plans and (b) implemented “through local land use planning and zoning techniques.”).

70. The U.S. Department of Housing and Urban Development defines low-income families as those whose income does not exceed 80% of the area median income (AMI). See U.S. DEP'T OF HOUS. AND URBAN DEV., OFFICE OF POLICY DEV. & RESEARCH, FY 2014 HUD INCOME LIMITS BRIEFING MATERIAL, HUDUSER.ORG 1 (Dec. 1, 2013), available at http://www.huduser.org/portal/datasets/il/il14/IncomeLimitsBriefingMaterial_FY14_v2.pdf. A very low-income family earns no more than 50% of AMI. See *id.* For example, in 2014, the median family income for a New Orleans family of four is \$58,800.00. See 2014 MTSP INCOME LIMITS REPORT, NOVOGRADAC AFFORDABLE HOUS. RES. CTR. (2014), available at http://www.novoco.com/low_income_housing/resource_files/income_limits/2014_mtsp_income_limits_report_121813.pdf. A family of four earning 60% of the New Orleans AMI is earning \$35,280.00. See *id.*

71. See TRANSITION NEW ORLEANS TASK FORCE, HOUSING 28 (Apr. 2010), available at <http://www.policylink.org/atf/cf/{97c6d565-bb43-406d-a6d5-eca3bbf35af0}/MAYOR'S%20HOUSING%20TASKFORCE.PDF>. (More than four-and-a-half years following Katrina, the City of New Orleans still had not developed a comprehensive housing plan to guide post-disaster housing investments.); see also ROBERT B. OLSHANSKY & LAURIE A. JOHNSON, CLEAR AS MUD: PLANNING FOR THE REBUILDING OF NEW ORLEANS 236 (American Planning Ass'n 2010) (noting that “[p]rior to Katrina, the city lacked a formal neighborhood planning program and was perceived to be insensitive to citizen views. Furthermore, it lacked an up-to-date comprehensive plan, and the zoning ordinance was obsolete.”).

72. See OLSHANSKY, *supra* note 71, at 236 (commenting that “[t]he difficulties of postdisaster recovery are arguments for doing planning all the time. Planning anticipates

has adopted and updated a comprehensive plan, then that document gives the local government basis for making tough or even unpopular redevelopment decisions following disasters. In the wake of a catastrophic disaster, the local governments implementing the recovery strategy generally should not be expected to make tough decisions regarding a rebuilding triage process.⁷³ In other words, local governments often face political pressures not to adopt redevelopment priorities that make long-term recovery more sustainable and feasible by prioritizing or circumscribing neighborhood recovery.⁷⁴ The City of New Orleans issued building permits immediately after the storm for every neighborhood in the City—even the lowest lying neighborhoods that sat in the shadow of failed floodwalls.⁷⁵ Further, the City did not initially require homeowners to elevate their homes as a condition of receiving a building permit.⁷⁶ Third, housing plans and policies should protect the interests of low- and moderate-income residents who are most vulnerable following a disaster and who face the greatest housing needs. In New Orleans, 55% of damaged homes were rental units and 20% of those units (16,000) were affordable to extremely low-income households.⁷⁷ Low-

how to manage change and prepares local governments for decisions that will arise in the future. It is best to prepare for these things in normal times when heads are calmer.”).

73. Hurricane Katrina precipitated a contentious debate about how the city should be rebuilt and who should decide which neighborhoods should be resettled. See Lawrence N. Powell, *What Does American History Tell Us about Katrina and Vice Versa?*, 94 J. AM. HIST. 863, 863–76 (Dec. 2007), available at <http://journalofamericanhistory.org/projects/katrina/Powell.html>. Ultimately, the City of New Orleans rejected the idea of a building moratorium in some neighborhoods and chose not to place any restrictions on rebuilding. Adam Nossiter, *Rebuilding New Orleans, One Appeal at a Time*, N.Y. TIMES, Feb. 5, 2006, <http://www.nytimes.com/2006/02/05/national/nationalspecial/05rebuild.html?pagewanted=all> [hereinafter *Rebuilding New Orleans, One Appeal at a Time*].

74. See OLSHANSKY, *supra* note 71, at 37–71 (narrating in detail the City of New Orleans’ six month effort to craft a plan for rebuilding the city and recounting the intense disagreement between factions that wished to shrink the city’s footprint and those that saw such efforts as a veiled attempt to prevent African Americans from returning to the city to rebuild).

75. See *Rebuilding New Orleans, One Appeal at a Time*, *supra* note 73.

76. See Brad Heath, *Rebuilt N.O. Homes At Risk Without Required Elevation*, USA TODAY, Sept. 19, 2008, http://usatoday30.usatoday.com/news/nation/2008-09-18-home-elevation_N.htm (reporting that federal investigators determined that the City of New Orleans allowed as many as 2300 homeowners rebuild without elevating their homes as required by applicable federal flood insurance regulations).

77. See Kalima Rose, *Bringing New Orleans Home: Community, Faith, and Non-profit Driven Housing Recovery*, in RESILIENCE AND OPPORTUNITY: LESSONS FROM THE U.S. GULF COAST AFTER KATRINA AND RITA 99, 113 (Amy Liu et al. eds., 2011). Katrina not only struck with historic force, it struck at the heart of one of the nation’s poorest communities. See Amy Liu, et al., *Introduction*, in RESILIENCE AND OPPORTUNITY: LESSONS FROM THE U.S. GULF COAST AFTER KATRINA AND RITA 1, 3 (Amy Liu et al. eds., 2011). (More than 1 million of the 5.8 million living in Katrina’s strike area lived in poverty). See *id.* Many of the city’s poor residents lived in rental housing and, according to FEMA 79% of families displaced by Katrina were renters. See Kalima Rose, *Bringing New Orleans Home: Community, Faith,*

income renters are the people who have slim resources to ride out a longer-term disaster recovery. Yet these low-income renters are also the people who most often fill critical service industry jobs.

b. Partnership Tools

Constructing or rehabilitating housing is an expensive endeavor. It requires special expertise. To build housing at scale demands even more resources and greater skill. Generally speaking, if local governments aim to improve housing stock, then they must prove capable of partnering with private and non-profit housing developers. Knowledgeable affordable housing developers can, in turn, magnify the value and impact of local governments' housing investments by leveraging tax credits, philanthropic program related investments (PRIs), bank loans, and private capital.⁷⁸ It cannot be assumed, however, that all local governments have this important ability to broker sophisticated housing development deals.

The housing category of a City Resilience Index should include at least one indicator for assessing whether local governments have duly procured agreements with local or regional for-profit and non-profit housing developers that have resulted in rehabilitation or construction of affordable housing at scale. This Index indicator would not give credit to cities for arriving at agreements that fail to yield occupied housing units. Instead, the Index would give enhanced credit to local governments for each different developer with which it partnered. A further boost in scoring could be made for the number of units developed as a proportion of the city's overall affordable housing units.

There are at least two reasons why it is critical for the housing index of a City Resilience Index to include an indicator that measures local government development partnerships. The first reason is that the private sector frequently spearheads long-term redevelopment efforts following a disaster.⁷⁹ This is especially true of mission-driven non-profit developers who will pursue projects even when national and regional economic conditions push private developers largely to the sidelines; as

and Nonprofit Driven Housing Recovery, in RESILIENCE AND OPPORTUNITY: LESSONS FROM THE U.S. GULF COAST AFTER KATRINA AND RITA 99, 110–11 (Amy Liu et al. eds., 2011). The levee failures caused by Katrina flooded over half of New Orleans rental housing units. See 153 CONG. REC.S8064–65 (June 20, 2007) (statements Sens. Dodd and Landrieu).

78. Foundations and non-profit housing development partners figured centrally in pushing New Orleans' long-term recovery forward. The Greater New Orleans Foundation raised \$25 million following Katrina to promote housing redevelopment and strengthen the city's network of non-profit housing developers. See GREATER NEW ORLEANS FOUNDATION ET AL., CAPITAL ABSORPTION IN NEW ORLEANS 3 (Sept. 2013) (copy on file with the authors). This fund leveraged over \$120 million in additional investments. See *id.*

79. See Bill Bynum, *Rebuilding New Orleans and the Gulf Coast*, GREEN MONEY, <http://www.greenmoneyjournal.com/archives/winter-2011-2012/rebuilding-new-orleans-and-the-gulf-coast/> (last visited April 24, 2014) (explaining that the Gulf Coast's recovery has proceeded forward with private and non-profits investments and innovations, including advances in housing, retail, food, and personal finance).

was the case for a long period during the Katrina recovery.⁸⁰ A firm that has a good track record developing affordable housing under normal circumstances could emerge as a strong candidate for a development partnership when the local government is responsible for deploying tens of millions in housing recovery funds following a disaster. The second reason is that a city's failure to support and cultivate a community of public, private, and non-profit housing development organizations—which would lead to a low score in that part of the index—represents a critical deficit of which federal and state governments should be aware. For instance, New Orleans was not well positioned to address demands of long-term recovery because the city could point to few entities capable of doing housing redevelopment work.⁸¹ This is critical because, for redevelopment of low and moderate-income housing following disasters, there is a need for community development entities that have some proven capacity to effectively use federal block grant funds as well as federal tax credit funding.⁸²

c. Property Acquisition, Disposition & Stewardship Tools

Cultivating safe and affordable housing depends not only on the local government's skill at cultivating partnerships with developers and leveraging funds, but also its expertise for assembling residential property, disposing of it, and monitoring its condition across a city.

The housing category of a City Resilience Index should include at least one indicator for evaluating whether local governments can effectively manage matters relating to residential properties, including public health and safety code compliance and lien foreclosure. This Index indicator would recognize local governments for such aptitudes as: their demonstrated success in acquiring residential properties through timely and properly administered code lien foreclosure⁸³ or eminent domain

80. See Diane Glauber & David Zisser, *Innovative Post-Disaster Community-Based Housing Strategies*, in *BUILDING COMMUNITY RESILIENCE POST-DISASTER* 371, 375 (Dorcas R. Gilmore et al. eds., 2013). See also Brenda Bratton Blom and Woody Widrow, *The Role of Nonprofits and Religious Organizations in Emergency Response*, in *BUILDING COMMUNITY RESILIENCE POST-DISASTER* 133, 139–49 (Dorcas R. Gilmore et al. eds., 2013) (discussing broadly the contributions of international, regional, and local non-profits and religious organizations to immediate and long-term Katrina recovery efforts).

81. See Kalima Rose, *Bringing New Orleans Home: Community, Faith, and Non-profit Driven Housing Recovery*, in *RESILIENCE AND OPPORTUNITY: LESSONS FROM THE U.S. GULF COAST AFTER KATRINA AND RITA* 99, 103 (Amy Liu et al. eds., 2011) (noting that before Katrina, New Orleans had a just a few community development organizations with the capacity to carry out neighborhood development work).

82. See *id.*

83. See David A. Marcello, *Housing Redevelopment Strategies in the Wake of Katrina and Anti-Kelo Constitutional Amendments: Mapping a Path Through the Landscape of Disaster*, 53 *LOY. L. REV.* 763, 817–18 (2007) (describing how “[c]ode enforcement is potentially the most powerful and productive redevelopment strategy in the City’s arsenal” but

procedures;⁸⁴ the range of real estate disposition strategies that successfully return residential properties to commerce, including individual sales; sales of multiple properties through requests for proposals; and property swaps with private, non-profit, or government entities.⁸⁵ Additional index credits could be awarded to cities for volume of properties disposed. For example, the Index could award points on a sliding scale that measures a city's sales of property as a percentage of the total number of properties sold on the private market each year in that jurisdiction and/or the value of properties sold or swapped as a percentage of the total value of real estate owned by the city.

There are three reasons local government property acquisition, disposition, and stewardship are critical to a resilient city. The first is that a basic function of local government is to intervene and protect citizens and the neighborhoods in which they live when private market forces cannot eliminate persistent blight or abandonment.⁸⁶ Prime causes of these conditions are negligent absentee owners and so-called "heirs' properties," where multiple family members own fractional interests in a single property due to the family's failure to probate wills or otherwise administer estates.⁸⁷ The second is that following disasters, cities suffer

lamenting that the City had failed to explore "its full potential" as a means of passing clear title to purchasers at code lien foreclosure auctions).

84. Eminent domain will generally take a leading role in any city's comprehensive redevelopment efforts, but particularly in post-disaster situations. See John J. Costonis, *New Orleans, Katrina and Kelo: American Cities in the Post-Kelo Era*, 83 TUL. L. REV. 395, 401 (2008). Large-scale urban redevelopment efforts present a range of real estate challenges. Among those challenges are assembling multiple parcels of property in a unified effort and under unified ownership, allowing clustered redevelopment of formerly occupied or abandoned properties, and acquiring property whose tangled title problems often prevent private market acquisition. See *id.* at 404–06.

85. See Glauber & Zisser, *supra* note 80 at 380 (noting that consensus built following Katrina that land swaps were a valuable tool for, among other purposes, "shrink[ing] the city's footprint without destroying neighborhood integrity").

86. Natural disasters and human-made catastrophes such as the mortgage foreclosure crisis unravel local real estate markets in ways that demand government intervention. See Brescia et al., *supra* note 67, at 305–07. Brescia also analyzes the range of possible legal tools that the State of Louisiana and the City of New Orleans have to address not only the devastation caused by Hurricanes Katrina and Rita, but also historic real estate market problems caused by blight and abandonment. *Id.* at 336–41. See also Gordon Russell, *Faded Midwestern Cities Offer Ways New Orleans Could Slim Down to Match Its Smaller Population*, THE TIMES PICAYUNE, Nov. 28, 2008, http://www.nola.com/news/index.ssf/2008/11/smaller_smarter_faded_midweste.html (documenting New Orleans' struggle to balance problems associated with a glut of vacant and abandoned properties with citizens' interest in repopulating neighborhoods throughout the city, causing critics to urge that "the city needs to provide incentives to align housing supply with demand and avoid bad public investment strategies").

87. See Heather K. Way, *Informal Homeownership in the United States and the Law*, 29 ST. LOUIS U. PUB. L. REV. 113, 117–19, 151–58 (2009) (illuminating the circumstances that cause homes—particularly homes occupied by low-income families—to become tangled in land title problems associated with tenancy-in-common ownership among a few or perhaps even hundreds of relatives).

widespread problems with poor upkeep of properties.⁸⁸ Widespread blight and dilapidation of property retards citizens' efforts to rebuild their neighborhoods and discourages new outside investment.⁸⁹ The third reason that a local government's (or in some instances a state's) skill in managing real estate and overseeing code compliance is so important is that disasters force cities to employ many different real estate strategies across its recovering neighborhoods.⁹⁰ A homeowner buyout strategy for redeveloping a neighborhood directly impacted by disaster should be tailored to the market structure; the strategy for a neighborhood where the disaster undermined an already weak real estate market should be different than the strategy for neighborhoods where the disaster destroyed a stable real estate market.⁹¹ Resilient cities will have experience using a range of real estate acquisition and disposition techniques.

B. Resilience Index Indicators for Preservation of Historic and Cultural Resources

Like housing, historic resources comprise a significant, core aspect of all cities, and historic preservation's "matrix of laws, incentives, [and] policies . . . has become a fundamental tool for strengthening . . . communities."⁹² Cities did not somehow emerge fully formed; they developed gradually, usually in oscillating, uneven lurches of development over time.⁹³ Indeed, a simple walk around any city reminds us that urban areas are vibrant, living-landscape palimpsests of our past-pockets of which have been preserved, rehabilitated, or revitalized. These pockets

88. See, e.g., Frank S. Alexander, *Louisiana Land Reform in the Storms' Aftermath*, 53 LOY. L. REV. 727, 730-31, 734 & n.29 (2007) ("[a]ccording to the 2000 Census, New Orleans had an estimated 27,000 . . . unoccupied structures" that number swelled as many as 100,000 properties following Hurricane Katrina).

89. Vacant and abandoned properties have a toxic effect on surrounding homes and businesses. Not only do vacant properties push down surrounding home values, but they also can trigger higher insurance rates. Further, when homes are abandoned and not occupied, businesses have little incentive to rent or buy properties to open stores and offices. High levels of neighborhood abandonment cause an economic drag on the community. See, e.g., *Implementation of the Road Home Program Four Years After Hurricane Katrina: Field Hearing Before the H. Comm. on Fin. Servs., Subcomm. on Hous. and Cmty. Opportunity*, 111th Cong. 95 (2009) (statement of Ommeed Sathe, Dir. of Real Estate Strategy, New Orleans Redevelopment Auth.).

90. Brescia et al., *supra* note 67, at 328-35.

91. See *id.* at 330-33.

92. DONOVAN R. RYPKEMA ET AL., MEASURING ECONOMIC IMPACTS OF HISTORIC PRESERVATION: A REPORT TO THE ADVISORY COUNCIL ON HISTORIC PRESERVATION BY PLACEECONOMICS vi. (2d ed. 2013), available at <http://www.achp.gov/docs/Economic%20Impacts%20v5-FINAL.pdf>.

93. An excellent introductory survey on the oscillating development of cities and towns in the United Kingdom is MICHAEL ASTON, INTERPRETING THE LANDSCAPE: LANDSCAPE ARCHAEOLOGY AND LOCAL HISTORY (1985).

of tangible memory—buildings, parks, and single-family homes to name a few—are critical to a city’s overall resilience and should be included in every City Resilience Index. Indeed, many city dwellers live in historic structures or housing made possible through historic preservation programs.

In this initial version of the City Resilience Index, our discussion of the historic resources category is divided into two parts. For those who might question the inclusion of historic resources in a City Resilience Index at all, the first part offers a brief analysis of some of the most important benefits historic preservation brings to cities and how those benefits increase overall urban resilience.

The second part delineates three important historic resources preservation tools that a state and/or local government should have (or develop) to ensure long-term resilience. This part concentrates on technological and legal strategies that promote historic preservation and utilize its unique capacity to foster urban resilience. As noted above, the City Resilience Index is designed to measure not just if state and local governments possess these tools, but how well they are being used.

i. Historic and Cultural Resources Preservation and Urban Resilience

Scholars have long noted the numerous benefits that flow from preserving historic and cultural resources.⁹⁴ The most important of these from a resiliency standpoint is that historic resource preservation is a powerful, broad-based impetus for economic development. For instance, the most recent statistics from the National Park Service reveal that, in 2012, economic impacts related to the federal historic preservation tax credit—a 20% credit for qualifying rehabilitation expenditures—accounted for the creation of approximately 58,000 jobs, generated \$3.4 billion in gross domestic product (GDP), and produced over \$2.5 billion in income.⁹⁵ Just as important as the dollar figures, many of the 744 certified rehabilitated buildings that leveraged this credit in 2012 were “abandoned or underutilized, and all were in need of substantial rehabilitation to return them to, or for their continued, economic viability.”⁹⁶ Several of these rehabilitated buildings reside in older urban cores and have breathed new life into once derelict domains.⁹⁷

Detailed research regarding the economic benefits of historic resource preservation in states and localities also reveals that it is a potent economic driver. In Georgia, for example, heritage tourism sustains 117,000 jobs, generates roughly \$204 million in wages, and levies \$210

94. *See, e.g.*, SARA BRONIN & RYAN ROWBERRY, HISTORIC PRESERVATION LAW IN A NUTSHELL (forthcoming publication 2014) (manuscript on file with the author).

95. NAT’L PARK SERV., U.S. DEPT OF THE INTERIOR, ANNUAL REPORT ON THE ECONOMIC IMPACT OF THE FEDERAL HISTORIC TAX CREDIT FOR FY 2012, at 3, 5 (2013), *available* at <http://www.nps.gov/tps/tax-incentives/taxdocs/economic-impact-2013.pdf>.

96. *Id.* at 1.

97. *Id.* at 15.

million in local taxes on an annual basis.⁹⁸ For the decade 2000–2010, the rehabilitation of historic resources in Georgia (usually buildings) resulted in 10,168 local jobs and over \$420 million in income for Georgia workers and proprietors.⁹⁹ Analyses of the economic impacts of historic resource preservation for Utah, Connecticut, Delaware, and Florida tell similar stories: historic preservation creates local jobs; revitalizes older neighborhoods; enhances local sustainability measures; adds needed affordable housing; boosts local taxes; and provides a powerful source of local revenue.¹⁰⁰ Historic preservation is thus a key component in spurring the economic revitalization and resilience of older communities in metropolitan areas, cities, and towns.

Historic resource preservation also has a powerful, positive effect on mental health and the ability of people to cope with change—traits that are desperately needed during a disaster event. Pioneering studies in England have found that adults and teenagers who live in areas with higher concentrations of historic buildings are more likely to have a stronger sense of place.¹⁰¹ This reinforced sense of place has many positive benefits on self-esteem and identity, which in turn lead to stronger, more civically engaged communities.¹⁰² English researchers also discovered a positive, significant link between the historic environment and social capital—the bonds that connect groups and individuals.¹⁰³ Adults and teenagers who visited historic properties or cited to a local building

98. See DONOVAN D. RYPKEMA & CAROLINE CHEONG, PLACEECONOMICS, GOOD NEWS IN TOUGH TIMES: HISTORIC PRESERVATION AND THE GEORGIA ECONOMY 2 (2010), available at http://georgiashpo.org/sites/uploads/hpd/pdf/Economic_impact_study.pdf.

99. *Id.* at 4.

100. See DONOVAN D. RYPKEMA ET AL., PLACEECONOMICS, PROFITS THROUGH PRESERVATION: THE ECONOMIC IMPACT OF HISTORIC PRESERVATION IN UTAH (2013), available at http://www.placeeconomics.com/wp-content/uploads/2011/03/profits-through-preservation_utah-shortreport.pdf; DONOVAN D. RYPKEMA & CAROLINE CHEONG, PLACEECONOMICS, INVESTMENT IN CONNECTICUT: THE ECONOMIC BENEFITS OF HISTORIC PRESERVATION (2011), available at [http://www.cultureandtourism.org/cct/lib/cct/Economic_Impact_Study_\(Final_6-2011\).pdf](http://www.cultureandtourism.org/cct/lib/cct/Economic_Impact_Study_(Final_6-2011).pdf); DONOVAN D. RYPKEMA & CAROLINE CHEONG, PLACEECONOMICS, THE DELAWARE HISTORIC PRESERVATION TAX CREDIT PROGRAM: GOOD FOR THE ECONOMY, GOOD FOR THE ENVIRONMENT, GOOD FOR DELAWARE'S FUTURE (2010), available at <http://history.delaware.gov/pdfs/rypkemaReport.pdf>; TIMOTHY MCLENDON ET AL., Ctr. for Governmental Responsibility, ECONOMIC IMPACTS OF HISTORIC PRESERVATION IN FLORIDA: UPDATE, 2010 (2010), available at http://www.law.ufl.edu/_pdf/academics/centers-clinics/centers/executive_summary_2010.pdf.

101. DAVID BRADLEY ET AL., 5395 ASSESSING THE IMPORTANCE AND VALUE OF HISTORIC BUILDINGS TO YOUNG PEOPLE: FINAL REPORT TO ENGLISH HERITAGE 5 (2011), available at <http://www.english-heritage.org.uk/publications/historic-buildings-young-people/importance-value-historic-buildings-young-people.pdf>; David Bradley et al., Sense of Place and Social Capital and the Historic Built Environment: Report of Research for English Heritage 2 (2009), available at http://hc.english-heritage.org.uk/content/pub/sense_of_place_web.pdf.

102. See BRADLEY ET AL., SENSE OF PLACE, *supra* note 101, at 8.

103. *Id.*

or monument as being unique or special are likely to have a higher level of social capital, an important element in individual health as well as strong, resilient communities.¹⁰⁴ These findings about the importance of historic resource preservation to the mental health and resiliency of individuals and communities echo the results of research in other fields that display the positive power of connecting present generations with the past: psychologists are discovering that children who know about their family's history (good and bad) are more resilient because they can better moderate the effects of stress;¹⁰⁵ and military academies have learned that "teaching recruits about the history of their service increases their camaraderie and ability to bond more closely with their unit."¹⁰⁶

ii. Resilience Index Indicators

On economic, social, and psychological levels, historic preservation is a key component of city and citizen resilience. But what indicators can be used to show how well a city is supporting such resilience? In this part we discuss three City Resilience Index indicators for the preservation of historic and cultural resources. There are undoubtedly many more. The first two indicators are based around technology that assists governments in fulfilling their legal obligations to catalogue and make accessible detailed information about historic and cultural resources. The third indicator is a regulatory tool that can ensure swift, accurate assessment of historic resources following a disaster event.

a. Online Historic Resources Database

A fundamental principle for any effective and resilient historic resources management framework is simple in theory, yet bedeviling in practice: *know what you have*.¹⁰⁷ It is particularly difficult to know all of the historic resources located in a city because there are so many forms they can take—commercial buildings, archaeological sites, residential homes, public buildings, parks, monuments, battlefields, museums—and

104. *Id.* at 3, 8.

105. See, e.g., Tage Rai, *Mental Resilience and Narratives: Physiological Stress Responses to Media Coverage of 9/11* 2 (Alfred P. Sloan Ctr. for Myth and Ritual in Am. Life Emory Univ., Working Paper No. 51, 2006), available at <http://www.marial.emory.edu/research/index.html>; Amber Lazarus, *Relationships Among Indicators of Child and Family Resilience and Adjustment Following the September 11, 2001 Tragedy* 12 (The Emory Ctr. for Myth and Ritual in Am. Life, Working Paper No. 36, 2004), available at <http://www.marial.emory.edu/research/index.html>.

106. Bruce Feiler, *The Stories That Bind Us*, N.Y. TIMES, Mar. 15, 2013, http://www.nytimes.com/2013/03/17/fashion/the-family-stories-that-bind-us-this-life.html?pagewanted=all&_r=0.

107. See generally *Domesday: Britain's Finest Treasure*, THE NAT'L ARCHIVES, <http://www.nationalarchives.gov.uk/domesday/> (last visited April 24, 2014) (showing that the Domesday Book, the oldest surviving public document in England and perhaps England's best known survey, was designed around this principle).

each year more and more resources may be classified under law as historic.¹⁰⁸ Nevertheless, most states, and some local governments, have historic resources statutes that require them to catalogue historic and cultural resources and offer them protections.¹⁰⁹ To fulfill this obligation, many governments around the world utilize an online, publically accessible, searchable inventory using geographic information systems (GIS), which visualizes, analyzes, maps, and interprets data related to physical geography, including historic resources in urban areas.¹¹⁰

The historic resources category of a City Resilience Index should include at least one indicator for assessing whether a state and/or local government uses an online, searchable historic resources inventory utilizing GIS. This index indicator would give no credit for using an online historic resources database without GIS. Instead, the index would give a minimum score to cities and/or states that use a publically accessible GIS-based historic resources database with the possibility of enhanced scores for using databases that allow for the inclusion of detailed information about each historic resource—building type, building name, the architectural style, the identity and age of the structure, boundaries of an archaeological site, and physical properties of the monument (e.g., support system, interior features, technical fittings)—and for having input 80% or more of a city’s known historic resources into the database.¹¹¹

There are several reasons why the historic resources category of a City Resilience Index should include an indicator focused on an online inventory utilizing GIS. Here, we mention only two. First, GIS databases are already a widely used planning tool, and they can be relatively inexpensive to establish and maintain.¹¹² In fact, the Getty Conservation Institute and the World Monuments Fund have just rolled out an open-source geospatial software system—ARCHES—that is purposefully built to help inventory and manage all kinds of immovable heritage to inter-

108. A resource must typically be fifty years old and meet requirements for significance and integrity before it may be designated as historic. See Bronin & Rowberry, *supra* note 94, at ch. 2.

109. See *id.*

110. For a domestic example of a state historic resources inventory using GIS, see *Georgia’s Natural, Archaeological, and Historic Resources GIS*, GNAHRGIS, <https://www.gnahrgis.org/gnahrgis/index.do> (last visited April 24, 2014) [hereinafter GNAHRGIS]; For a description of the online Istanbul Cultural Inventory, see Ryan Rowberry, *Anchoring Memory in the Face of Disaster: Istanbul’s Cultural Heritage Preservation Regime*, BAĞÇEŞEHİR U. L. REV. (forthcoming 2014) (manuscript on file with the author).

111. Most historic resources databases are far from complete. For example, despite Georgia’s valiant efforts to transfer hand-written field survey notes for historic resources into its online database (GNAHRGIS), numerous older field survey reports and pictures have yet to be included. See GNAHRGIS, *supra* note 110 (follow “here” hyperlink under “Disclaimer”).

112. See *What is Arches*, ARCHES: HERITAGE INVENTORY & MANAGEMENT SYSTEM, <http://archesproject.org/what-is-arches/> (last visited April 24, 2014).

nationally adopted standards.¹¹³ The ARCHES system is free and any organization can download, install, and customize it.¹¹⁴ Second, GIS databases have the capability of layering information spatially on a digital map.¹¹⁵ This allows governments to perform a range of activities that are important to a city's long-term resilience during normal life and that are even more critical following a disaster.¹¹⁶ Some of these activities include pinpointing individual resources or grouping historic resources by zip code, county, or neighborhood; determining the needs and priorities for investigation, research, conservation, and management of historic sites in targeted areas or by type of resource; formulating management plans for investigating and/or conserving and leveraging historic resources; creating risk maps for particularly vulnerable historic resources; and raising awareness among the public and other authorities about the types and condition of historic resources in their areas.¹¹⁷

b. Crowdsourcing Interface

A powerful technological tool state and local governments can wield to foster city resilience through preserving historic resources is online crowdsourcing. Simply put, online crowdsourcing allows someone to obtain needed services and/or content by soliciting voluntary contributions from the online public community rather than hiring employees or paying contractors.¹¹⁸ It has been an extremely effective, low-cost tool for preserving historic resources in many countries.¹¹⁹ The National Library of Finland, for instance, is using online crowdsourcing to index its scanned archives.¹²⁰ Similarly, the University of Cape Town in South Africa is using online crowdsourcing to transcribe collections containing the Bushman's language, stories, and way of life.¹²¹ The National Geographic Society is using online crowdsourcing to analyze millions of satellite images of Mongolia showing potential archaeological sites in the hopes of discovering the tombs of Genghis Khan and his descendants.¹²² And an English non-profit organization has utilized online crowdsourc-

113. *Id.*

114. *Id.*

115. *See id.*

116. *See id.*

117. *Id.*

118. *See, e.g.,* CROWDSOURCING.ORG, <http://www.crowdsourcing.org/> (last visited April 24, 2014).

119. *See* Tommaso De Benetti, *Digitalkoot: Crowdsourcing Finnish Cultural Heritage*, CROWDSOURCING.ORG (Feb. 8, 2011), <http://www.crowdsourcing.org/document/digitalkoot-crowdsourcing-finnish-cultural-heritage/9397>.

120. *Id.*

121. Ngoni Munyaradzi, *Crowdsourcing to Preserve Bushman Heritage*, CROWDSOURCING.ORG (Nov. 14, 2012), <http://www.crowdsourcing.org/article/crowdsourcing-to-preserve-bushman-heritage/21527>.

122. *See Field Expedition: Mongolia*, NAT'L GEOGRAPHIC, <http://exploration.nationalgeographic.com/> (last visited April 24, 2014).

ing and online crowdfunding—funds donated by the interested public online—to provide both finances and labor for an expert-led excavation of a Bronze Age causeway composed of millions of timbers in the Cambridgeshire fens.¹²³

The historic resources category of a City Resilience Index should include at least one indicator for assessing whether a state and/or local government uses a crowdsourcing interface on its inventory website. This index indicator will only give credit to local and/or state governments if they utilize an online crowdsourcing portal in conjunction with its historic resources inventory website. Enhanced index scores will be possible for jurisdictions that have organized five or more historic resources crowdsourcing events in a single, calendar year.

There are two reasons why the historic resources category of a City Resilience Index should include a crowdsourcing interface indicator. The first is scarce government resources.¹²⁴ City and/or state authorities responsible for historic resources never have enough time, money, and staff to document and catalogue all known historic resources.¹²⁵ It would be relatively easy to create an online portal attached to a state or local historic resources inventory website. This portal could offer training modules to citizens on historic resources recording practices and standards and afterwards ask them to collect and upload descriptive information, statistics, pictures, videos, and maps on historic resources in their neighborhoods. While prominent historic resources are likely to have been catalogued, online crowdsourcing can be extremely useful for recording smaller-scale historic resources (e.g., façades) that deserve cataloguing and protection but are low priority. To ensure quality control, any information uploaded to this portal could be screened and vetted by the appropriate authorities before adding it to the inventory. In this way, cities and/or states could gather and preserve vast amounts of data related to their historic resources in a short period of time and at minimal cost.

Second, online crowdsourcing fosters civic pride, a sense of community, and a deeper, more tangible connection to the city's past, particularly for those of younger generations who are adept at using technology.¹²⁶ The social effect of such participation is an increased resilience to

123. Jason Palmer, *Flag Fen Hosts 'Crowdsourced' Bronze Age Archaeology Dig*, BBC NEWS: SCI. & ENV'T (Aug. 13, 2012), www.bbc.co.uk/news/science-environment-19192220.

124. See e.g., *The Economic Problem*, available at <http://www.ssag.sk/SSAG%20study/EKO/scarce%20resources.pdf> (discussing the governments limited amount of resources).

125. See *Issues for Historic Resources*, LANDSCAPES2.ORG, <http://www.landscapes2.org/issues/HistoricRes.cfm> (last visited April 24, 2014) (discussing the "limited funding for historic preservation projects").

126. See e.g., Mark Newman et. al., *Understanding the drivers, impact and value of engagement in culture and sport: An overarching summary of the research* 28 (July 2010),

economic shocks or natural disasters because community participants in historic preservation crowdsourcing become intimately invested in the future of the city.¹²⁷ Additionally, this strategy offers governments and communities peace of mind knowing that, should a disaster occur, as many historic resources as possible have been preserved for future generations.¹²⁸

c. Streamlined Environmental/Historic Review Process

During times of disaster, lengthy environmental and historic resources review processes can jeopardize the integrity of historic resources, keep residents in historic structures from rehabilitating their homes, and stop local governments from restoring critical historic areas. State and local environmental and historic resources review processes are usually modeled on two federal statutes: the National Environmental Policy Act (NEPA);¹²⁹ and Section 106 of the National Historic Act (NHPA).¹³⁰ Most state environmental protection statutes closely track NEPA by requiring an environmental review when a proposed agency action significantly impacts, or is likely to significantly impact, the environment.¹³¹ Similarly, the NHPA requires the governor of every state to appoint a State Historic Preservation Officer (SHPO) to administer a preservation program in the state.¹³² The SHPO consults with federal agencies when a federal undertaking has an effect on the state's cultural heritage that is listed on or eligible for listing on the National Register

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/71231/CASE-supersummaryFINAL-19-July2010.pdf (elaborating on English research that has begun measuring the positive impact that participation in cultural endeavors has on people); *see also, e.g.*, BRADLEY ET AL, SENSE OF PLACE, *supra* note 101, at 3, 8 (discussing the positive effects of a historic environment).

127. *See, e.g.*, Rai, *supra* note 105, at 2 (discussing how individuals with more historical knowledge had great mental resilience following 9/11).

128. *See, e.g.*, *Crowd Sourcing Used to Gather Property Information*, GEOENGINEERS.COM, <http://www.geoengineers.com/news/crowd-sourcing-used-gather-property-information> (last visited April 24, 2014) (discussing how “Crowd sourcing leverages technology to enable communities, agencies, and even privately held businesses contribute information and data to help fill a public need.”).

129. NEPA requires that federal agencies prepare a “detailed statement” for “major federal actions significantly affecting the quality of the human environment” prior to initiating any such action. 42 U.S.C. § 4332(C)–(D) (2012).

130. NHPA Section 106 requires federal agencies to “take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register” prior to initiating action. 16 U.S.C. § 470f (2012).

131. For example, the State Environmental Protection Acts of California, Connecticut, and Georgia require an environmental impact statement whenever a state project “may” significantly affect the environment. *See* CAL. PUB. RES. CODE § 21100(a) (West, Westlaw through urgency legislation through Ch. 1 of 2014 Reg. Sess. and all propositions on the 6/3/2014 ballot); CONN. GEN. STAT. ANN. § 22a-1b(c) (West, Westlaw through 2014 Supplement to the General Statutes of Connecticut, Revision of 1958); GA. CODE ANN. § 12-16-4(a) (West, Westlaw through the end of the 2013 Regular Session).

132. 16 U.S.C.A. § 470a(6) (2000).

of Historic Places as well as the State Register.¹³³ Such federal undertakings include federal permits, licenses, or funding that state or local governments need to begin rehabilitating or protecting historic resources.¹³⁴ Thus, prior to the granting of federal, state, or local permits and funds for the rehabilitation of historic resources, both an environmental *and* historic resources review must be completed for each individual historic resource.¹³⁵

As implementation of the environmental and historic review processes taught post Katrina, inartful implementation of these processes can impede important long-term recovery efforts.¹³⁶ Federal long-term recovery monies cannot be dispensed to reimburse state and local governments for recovery work until the environmental and historic reviews are completed.¹³⁷ That means homeowners repairing their residences following a disaster event—whether historic or not—and seeking reimbursement through a state or local government’s federally-funded home rehabilitation project, cannot receive reimbursement for repair costs until an environmental review has been performed on the home.¹³⁸ Ironically, this could potentially delay repairs to historic properties. Unnecessary delay in protecting and rehabilitating historic resources after a disaster may be avoided by creating a regulation, streamlining

133. Importantly, the SHPO is required to cooperate with federal agencies, state agencies, local governments, organizations, and individuals to “ensure that historic properties are taken into consideration at *all levels* of planning and development.” 16 U.S.C.A. § 470a(b)(3)(F) (2000) (emphasis added).

134. The NHPA regulations define an undertaking as:

a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including [a] those carried out by or on behalf of a Federal agency; [b] those carried out with Federal financial assistance; and [c] those requiring a Federal permit, license or approval.

36 C.F.R. § 800.16(y)

135. For instance the distribution of Department of Housing and Urban Development Community Development Block Grants to state and local governments qualify as a major federal action under NEPA (requiring an environmental review) as well as federal undertaking under NHPA (requiring a Section 106 historic resources review).

136. See Eric Holdeman, *Hurricane Katrina and the Lessons Learned from Mississippi's Recovery*, EMERGENCY MGMT. (Aug. 29, 2012), <http://www.emergencymgmt.com/disaster/Hurricane-Katrina-Lessons-Learned-Mississippi-Recovery.html>; see also *Hurricane Katrina Critical Challenges*, WHITE HOUSE, <http://georgewbush-whitehouse.archives.gov/reports/katrina-lessons-learned/chapter5.html> (last visited April 24, 2014).

137. See 24 C.F.R. § 58.22(a) (2013); see also DANIEL R. MANDELKER, *NEPA LAW AND LITIGATION* 7:10 (2d ed. 2013).

138. See, e.g., *Rep. Clarke Urges Fewer Restrictions on Sandy Relief*, U.S. CONGRESSWOMAN YVETTE D. CLARKE (July 3, 2013), <http://clarke.house.gov/media-center/press-releases/rep-clarke-urges-fewer-restrictions-on-sandy-relief> (In a letter to HUD Secretary Shaun Donovan, a member of New York City’s congressional delegation asked that HUD “waive environmental reviews for homeowners to expedite repairs.”)(quote from press release summary not the letter itself).

the environmental and historic resources review processes during times of disaster.

The regulation category of a City Resilience Index should include at least one indicator assessing whether state and/or local governments have a streamlined environmental and historic review process that will operate in times of disaster.¹³⁹ The index indicator will give cities and/or states credit for having a streamlined regulation in place. Enhanced index scores will be possible if a jurisdiction has adopted some form of programmatic agreement with the Federal Emergency Management Agency (FEMA) to coordinate and expedite the environmental and historic resources review processes.¹⁴⁰

There are several reasons why the regulation category of a City Resilience Index for state and local governments should include a streamlined regulation for the environmental and historic review processes. The first is time. Following disaster, there is no time for legislators to devise a streamlined alternative to the normal review processes; they are busy tending their families, homes, and devastated communities. Such streamlined regulations may take many forms. One possibility is for state and local governments to integrate their environmental and historic resources review processes, much like the federal government has recently done.¹⁴¹ This helps to avoid duplicative review efforts, saving time and resources. Another possibility is for states and/or localities to sign a programmatic agreement with FEMA “to exclude specific routine activities from Section 106 review and streamline project evaluation during all phases of emergency response.”¹⁴² Prototype programmatic agreements are available online.¹⁴³

The second reason is money. As noted above, environmental and historic resources review processes must be completed *before* the dis-

139. See *Essential Eight: Environmental Protection and Strengthening of Ecosystems*, UNITED NATIONS OFF. FOR DISASTER RISK REDUCTION, <http://www.unisdr.org/campaign/resilientcities/toolkit/essentials/view/8> (last visited April 24, 2014); see also NATURAL HAZARDS CTR., HOLISTIC DISASTER RECOVERY: IDEAS FOR BUILDING LOCAL SUSTAINABILITY AFTER A NATURAL DISASTER ii (rev. 2005), available at www.riskinstitute.org/peri/images/file/HDR.pdf.

140. A Model Statewide Programmatic Agreement has been created by the Advisory Council on Historic Preservation and the Federal Emergency Management Agency. This Model Statewide Programmatic Agreement is designed to be customized by individual states and localities. See *Federal Emergency Management Agency Model Statewide Programmatic Agreement*, ADVISORY COUNCIL ON HISTORIC PRES., <http://www.achp.gov/fema-pa.html> (last updated Sep. 21, 2010) [hereinafter *FEMA Model Statewide Programmatic Agreement*].

141. See COUNCIL ON ENV'T QUALITY EXEC. OFFICE OF THE PRESIDENT & ADVISORY COUNCIL ON HISTORIC PRES., NEPA AND NHPA: A HANDBOOK FOR INTEGRATING NEPA AND SECTION 106 (March 2013), available at www.achp.gov/docs/NEPA_NHPA_Section_106_Handbook_Mar2013.pdf.

142. *FEMA Model Statewide Programmatic Agreement*, *supra* note 138.

143. See *FEMA Prototype Programmatic Agreement*, ADVISORY COUNCIL ON HISTORIC PRES., http://www.achp.gov/fema_prototype_pa.html (last updated Dec. 18, 2013); see also *Programmatic Agreements*, FED. EMERGENCY MGMT. AGENCY, <http://www.fema.gov/environmental-planning-and-historic-preservation-program/programmatic-agreements> (last updated June 15, 2012).

bursement of moneys to facilitate the protection or rehabilitation of historic resources. Put simply, not a dime of federal, state, or local moneys can flow to restore or repair historic resources until these reviews are completed.¹⁴⁴ But, if states and/or cities have streamlined regulations and a programmatic agreement in place before disaster strikes, these reviews can be finished efficiently so that money can be released to help rehabilitate historic buildings and homes. Otherwise, many historic resources may be in danger of festering in mold or mildew, or falling due to prolonged structural instabilities.¹⁴⁵

IV. CONCLUSION

This article contributes to an ongoing and longer-term exploration of how an index can be used as a tool to build better cities and to prepare them to weather adversity. As a growing body of scholarly work examining urban resilience signals, it is more essential than ever that cities learn from disaster experiences to both nurture thriving cities and bolster their defenses to all manner of adversity. An index promises to serve as a transparent, data driven tool to assist in this effort.

Legal scholars and experienced legal practitioners can make particularly valuable contributions to the establishment of an index as a policy tool. As most of the Index indicators discussed in this article show, proficiency at using legal tools and knowing how to navigate legal requirements are core competencies for city building and long-term disaster recovery.¹⁴⁶ The City Resilience Index promises to support and focus the day-to-day work of federal and state lawmakers and policy administrators. The City Resilience Index also offers agencies at all levels of government the opportunity to advance significantly the way they think about crafting disaster response laws.

The federal legislative response to Hurricanes Katrina and Rita displayed a restrained and largely reactive view of the federal – state – local community development partnership. Under that view, the federal

144. *See* Louisiana Land Trust, Disclosure of Environmental Factors (copy on file with the authors). If a person purchased a so-called Road Home buyout property—a property acquired from a Louisiana homeowner who wished to sell her home instead of rebuilding—from the State of Louisiana’s Louisiana Land Trust (LLT), the prospective purchaser was furnished with a disclosure form. The disclosure informed the purchaser that “[b]ased on the State of Louisiana’s Office of Community Development’s review of all residential properties sold to the State of Louisiana under Option 2 and 3 of the Road Home Program [e.g., the buyout program], a review of environmental data bases, site reconnaissance, and comments received from various federal, state and local agencies, a number of environmental factors and conditions were identified for certain properties that may warrant disclosure.” *See id.* The form also provided several lines for the LLT to check if the property raised any of the enumerated environmental or historic review concerns. *See id.*

145. *See, e.g., Mold & Mildew Preventative Treatment Following Natural Disasters*, MOLD INSTITUTE USA, <http://www.moldinstituteusa.com/Resources/naturaldisaster.php>.

146. *See supra* Part III.B.

government's principal recovery role was to furnish money to the states, provide limited technical assistance to disaster stricken communities, and unleash programmatic audits to chase down expected non-compliance on the back end of disaster recovery projects.¹⁴⁷ The City Resilience Index reinforces recent federal efforts to calibrate urban revitalization policy more effectively than was done for New Orleans and the Gulf Coast.¹⁴⁸ This new federal approach emphasizes and demands coordination, cooperation, and communication between and among federal, state, and local governments.¹⁴⁹ The federal approach to deploying

147. Initial federal recovery legislation from 2005 and 2006 put special emphasis on funding HUD Inspector General review and monitoring of local government agencies by threatening back-end audits. HUD official Fred Tombar, III, reported that the State Road Home Program was audited over 52 times between June 2006 and August 2009. *See Implementation of the Road Home Program Four Years After Hurricane Katrina: Hearing Before the Subcomm. on Hous. and Cmty. Opportunity of the Comm. on Fin. Servs.*, 111th Cong. 8 (2009) (statement of Frederick Tombar, Sr. Advisor for Disaster Recovery, U.S. Dep't of Hous. and Urban Dev.), available at <http://www.gpo.gov/fdsys/pkg/CHRG-111hhr53250/html/CHRG-111hhr53250.htm>. Congress' supplemental Hurricane Katrina recovery legislation earmarked \$9,000,000 for the HUD Inspector General oversight. Meanwhile, the same federal recovery legislation provided only modest funding for technical assistance — \$400,000. *See* H.R. 4939, 109th Cong. (2006) (enacted).

148. The federal government's response to the devastating neighborhood impact of the mortgage foreclosure crisis represents an example of pairing grant funds with proactive technical assistance. *See* Notice of Availability: Notice of Funding Availability (NOFA) for the Neighborhood Stabilization Program 2 Under the American Recovery and Reinvestment Act, 2009, 74 Fed. Reg. 21377 (May 7, 2009). The Neighborhood Stabilization Program 2 (NSP-2) promoted acquisition and redevelopment of vacant and abandoned properties and was designed to help local governments overcome local limitations that may have been obstacles to getting crisis response dollars into a city's neighborhoods. *See* MALLACH, *supra* note 59. Further, NSP-2 was explicitly data driven to give government grant funds the greatest chance of reaching communities in need. *See* IRA GOLDSTEIN, MAXIMIZING THE IMPACT OF FEDERAL NSP INVESTMENTS THROUGH THE STRATEGIC USE OF LOCAL MARKET DATA, *in* REO & VACANT PROPERTIES: STRATEGIES FOR NEIGHBORHOOD STABILIZATION 65 (2010), available at <http://www.bos.frb.org/commdev/REO-and-vacant-properties/index.htm>.

149. The Sandy Recovery Improvement Act represents one of the chief examples of Congress' efforts to rethink how the federal government can most effectively deliver help to state and local governments following catastrophes. *See* Disaster Relief Appropriations Act and Sandy Recovery Improvement Act of 2013, Pub. L. No. 113-2, 127 Stat. 4. For instance, the Sandy Recovery Improvement Act, directs that federal agencies implementing disaster recovery projects need not complete separate environmental reviews to satisfy regulatory requirements imposed by different regulatory regimes, such as FEMA and HUD administrative rules for environmental review. *See Landrieu Praises Passage of Disaster Relief Funding, Critical Reforms*, MARY LANDRIEU: U.S. SENATOR FOR LOUISIANA (Jan. 28, 2013), http://www.landrieu.senate.gov/?p=press_release&id=3580. Post-Katrina long-term recovery efforts were delayed by such redundant and duplicative requirements. *See id.*; *see also* U.S. DEP'T OF HOUS. AND URBAN DEV., HURRICANE SANDY REBUILDING TASK FORCE, HURRICANE SANDY REBUILDING STRATEGY: STRONGER COMMUNITIES, A RESILIENT REGION 13 (Aug. 2013), available at [http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2013/HUD No.13-125](http://portal.hud.gov/hudportal/HUD?src=/press/press_releases_media_advisories/2013/HUD%20No.13-125) (President Obama created the Hurricane Sandy Rebuilding Task Force by Executive Order, signed December 7, 2012, "to ensure the [Sandy] recovery benefitted from cabinet-level focus and coordination" and to "identify[] and work[] to remove obstacles to resilient rebuilding while taking into account existing and future risks and promoting the long-term sustainability of communities and ecosystems in the Sandy-affected region").

disaster relief thus eschews the conception of the federal role in disaster recovery as one that delivers money to the states, allows local governments to founder as they implement recovery plans, and then ‘catches’ those local governments in frustration or failure through post-hoc audits. A City Resilience Index can be an integral part of a more collaborative way of implementing long-term disaster and urban revitalization policy. It can identify the coordinated, concrete and, thus, most cost-effective steps that cities can take—long before disasters strike or even if disaster or crisis never strikes—to neutralize critical community vulnerabilities and create more resilient cities.

